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Series of Publications of
Islamic Organization for Medical Sciences
*Islam and Recent Medical Problems*

International Seminar on

# Human Genetic and Reproductive Technologies: Comparing Religious and Secular Perspectives

Organized by the
*Islamic Organization for Medical Sciences, Kuwait*

in Collaboration with
*WHO (EMRO)*,
*ISESCO* and *CIOMS*

*Muharam 7-10, 1427 H*
*February 6-9, 2006*
*Cairo*

***(Part II)***

Supervised by
**Dr. Abdul Rahman A. Al-Awadi**
*President,*
*Islamic Organization*
*for Medical Sciences,*
*Kuwait*

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*Kuwait*

2008

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*In The Name*
*of Allah,*
*The Most*
*Compassionate,*
*The Most Merciful*

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***Dr. Abdul Rahman Al-Awadi***

President of the Islamic Organization for Medical Sciences,
Kuwait

# Foreword

*by*
***Dr. Abdul Rahman Al-Awadi***
President of the Islamic Organization of Medical Sciences, Kuwait

This symposium comes at a time when the world is undergoing turbulent circumstances where right and wrong have been confused. Differences are not confined to difference in opinion, but have regrettably reached armed conflict and bloodshed. You will find one group claiming that the other group is without faith and thinking that it alone possesses the entire truth and is absolutely right. The other group will do likewise. Naturally, this way of thinking has come to reflect on many of life's scientific and practical aspects. There are those who think that making scientific progress in the field of human reproduction is permissible, provided that we do not infringe upon religious restrictions. They hold this opinion due to their belief that such progress would serve humankind and help it overcome its pains and realize its dreams. However, there are others who consider such progress demonic since it interferes with God's will, and therefore believe it ought to be stopped and should not be supported. Others maintain that scientific research should have absolute freedom so that it would be able to discover what has been unknown to man ever since the dawn of life. However, the great conflict between these different groups may very well be healthy, as it is for the sake of man and his wellbeing.

Some, however, consider the matter as a form of chaos which could lead to confusion in bloodlines. They consider it as an assault on man who is God's successor on earth, as it makes him the object of experimentation, and allows the manipulation of his genes and his genetic qualities. Such a course might lead some people to divide human kind into two races that do not have equal rights and duties; a master race and a race of slaves. The race of masters would deserve life with all its blessings and all its luxuries. The members of this race would have special qualities in their appearance, color, intelligence,

courage, and strength; qualities that no other human beings have. All other human beings would belong to the race of slaves and as such should have other qualities that are suited to their roles and the duties with which they will be charged. Is this the target of scientific research and its future applications? Are we then dealing with a new eugenics that is headed by the elite of the scientific society in the world? What will happen next? Some researchers think that the whole matter will not go beyond exploring the mysteries of human biological processes. They are confident that politicians are keeping a close eye on their results.

Due to what was just mentioned it was held necessary to invite members of the three revealed religions and secularists as well in an endeavor to find out their opinions and to establish some form of common ground between all these groups. All religions came from God to tell human beings that they are all equal and that there is no difference between nations or races as all human beings are God's creatures. God sent his prophets and messengers to guide them and show them the path of righteousness and to help them attain everything that is conducive to their happiness and wellbeing. He also forbade them from doing anything that would lead to their harm.

Despite the clarity of the message of the prophets and messengers of God, humankind starting with Adam has been seduced by Satan who is always tempting them to disobey God. Man succumbs to this temptation in search of knowledge or because he imagines due to his limited knowledge and reason that he could disobey God. Adam was the first to disobey God and if it were not for his repentance and God's forgiveness of his sin, the world would have been full of vice, tyranny, and corruption. In life both good and evil exist side by side and each person chooses between them both. Those whom God graced with his guidance carry the trust which God offered to heaven, earth and the mountains, but they refused to carry it.

We had to choose the elite among the followers of the three religions and the secularists to hold a discussion on critical matters which give rise to debate and to different visions. We chose the topic of heredity and human reproduction and their ramifications. We have

held this conference in an atmosphere of love and tolerance in which each group presented its views regarding each point in an attempt to clarify difficult issues by using and quoting from holy books, or by utilizing material evidence. This was done without any bias or prejudice; each group accepted the opposite point of view with grace and tolerance and discussed it in order to gain more knowledge and without any disrespect to any participant.

Specialists in Islam, Christianity, and Judaism, as well as secularists, professors of philosophy and sociology, medical doctors, and chemists have taken part in this conference. Politicians, historians, and others have participated as well. Discussants, researchers, and speakers were all looking for the truth with open minds and hearts. At the end there was agreement on many points which would lead to the welfare of man as a human being, regardless of his race, religion, or social position because most of what was agreed upon was in harmony with religious laws which came from God who is more merciful towards us than we are towards our own selves.

The conference has come to an end and everyone is calling for it to be repeated as it might guide those who determine policies and decisions, making their decisions and policies agree with religious laws.

Before I end this foreword, I would like to offer my deepest thanks and gratitude to our fellows in the International Health Organization and our fellows in the Islamic Organization for Culture, Science, and Arts who assisted us in the preparation, introduction and contribution to this conference. We pray to God to accept all our efforts and those of everyone who contributed to this conference.

# INTRODUCTION

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# Introduction

*by*
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This International Seminar is a watershed in the history of IOMS. Since 1978, this organization has not witnessed an event of such magnitude, bringing together representatives of all the heavenly religions in addition to secular thinkers. Many organizations that have recently emerged are all for dialogues and exchange of views. But most of them focus on political or theological matters. Our present seminar, however, is characterized by certain distinctive features in terms of subject matter and the type of participants.

The subject matter is about something serious that emerged in the second half of the previous century and has been growing by leaps and bounds ever since. This is genetic engineering that has developed technologies for reproduction and cloning. The reason for concern is that such technologies are being applied now on humans.

The problems put forward for discussion are purely scientific, but the perspective is religious and philosophical. The point of concern is to gauge the positive and negative impacts these innovations will have on human beings, societies, and the whole world.

As for the participants, they are highly specialized in the fields of science, religion, philosophy, ethics, social studies, economics, politics and even security. This wide range of disciplines reflect the fact that the problem is no longer confined within the folds of theologians. It has become the legitimate concern of everybody.

I would go as far as to say that this seminar sends a strong message to the administrators and decision-makers. It tells them that serious decisions of war and peace and of matters relating to the well-being and security of the peoples in this world are not their exclusive responsibility. They are also the responsibility of scientists, jurists,

legislators, sociologists and philosophers. They, too, are entitled to have a strong say in matters that could determine the fate of their compatriots. History is full of examples that show their effective roles in victories won in wars against enemies and in peace against diseases and ailments. The great leaps in economy and social changes are nothing but science in action.

The atomic bomb is the most eloquent example of what happens when the products of science are manipulated by politicians. The atomic energy was originally meant to empower man against poverty, disease and ignorance. In the hands of politicians, unfortunately, this energy turned into the most devastating weapon of mass destruction. When Opennheimer saw the incredibly destructive power of the atomic bomb he uttered his oft-quoted statement, "Today science has fallen into sin." The folly of politicians in abusing such power is demonstrated by their decision to drop the two bombs on Heroshima and Nagazaki after the battles had virtually ground to a halt. So, what was the wisdom of making those decisions? What was the gain?

Today the world is going through one of the most precarious phases of its history where wisdom and justice are giving way to the deafening noise of war planes and guns. Instead of seeking cure for diseases, laboratories are busy producing microbiological weapons in the form of mutable microbes that defy any cure and stand capable of wreaking havoc on man, animal and plant. The arsenals of deadly weapons are awash with stockpiles of all sorts of bombs: cluster, atomic, nuclear and nitronic, in addition to God knows what of unrevealed weapons that can destroy the globe fifteen times over.

On the other hand, famines claim the lives of millions of people in the third world, in addition to those who die of an assortment of diseases that could be avoided if there were adequate resoursces. Still, there are millions of refugees around the world who lack the minimum of life-sustaining necessities such as drinkable water or a roof to protect them against the ravages of time and weather. If a fraction of the huge budgets earmarked for the vicious war machine was to be allocated to humanitarian programs much of human suffering could be averted.

What actually happens, though, is that the fire of war around the world is never allowed to die down. Whenever one is put out at a hot spot, another is artificially encouraged to break out at another so that weapon factories keep turning out bombs, rockets and new death devices that are tried out on people in those war zones. So, instead of attempting to alleviate pain and promote welfare through peaceful policies of co-living, world politics bring about death and suffering to millions of people. What is worse, when industrial countries want to dump their poisonous and carcinogenic waste they never do that in their own countries of course, but go to poor underdeveloped countries for that purpose as if the people there were worthless.

The present generations are in a desperate plight; for man is destroying his brethren instead of making life easier for them. We find reference to this situation in the Quran:

> "Corruption has appeared in the land and sea, for that men's own hand have earned. (30:41)

We are in dire need of a different world state of affairs where peace replaces terror, justice replaces oppression and love replaces hatred and animosity. Were that to happen, humanity would reap the fruits of scientific progress in an atmosphere of peace and security. This rosy image is not out of man's reach, though. It can become a tangible fact if certain things are realized. Religious leaders, for instance, should be at the head of humanities march. They should declare that the whole earth is only a minor part of God's vast kingdom and that He bestows it on whoever He wants. Furthermore, the culture of pushing away the other should never prevail. Throughout the long march of humanity, there has been no record of any success achieved by doing that. In all devastating wars, past or present, there has never been an all-out winner or loser; all stand to lose and suffer.

The only alternative left for humanity is to co-live in love and harmony. Islam acknowledges this fact. The true believer, according to an attested Hadith, "Is he who believes in God, His angles, His Holy Scriptures, His Messengers and the Hereafter."

In the Quran, God (SWT) says about the believers:

> "The Messenger believes in what was sent down to him from his Lord, and the believers; each one believes in God and His angles and His Books and His Messengers; we make no division between any one of His Messengers. They say, 'We hear and obey. Our Lord, grant us Thy forgiveness; unto Thee is the homecoming'" (2:285)

In another verse, God enjoins Muslims to converse rationally with followers of other heavenly religions:

> "Say: 'people of the book! Come now to a word common between us and you that we serve non but God and that we associate not aught with Him'" (3:64)

God also commands us to be gentle and kind in our disputes with others, whether Muslims or non Muslims:

> " and dispute with them in the better way. Surely thy Lord knows very well those who have gone astray from His way, and He knows very well those who are guided." (16:125)

Such are the directives of Islam to its followers and such is its message to non-Muslims to the effect that they are entitled to the same rights and bound by the same duties. I trust that the same attitude is to be found in all other heavenly religions.

We gather today to discuss one of the most serious scientific innovations, viz., human genetic and reproductive technologies and their impact on human individuals, families and societies.

These innovations are the outcome of on-going research. Once a technology emerges and gets published, it is received by a divided public. There are those who reject it entirely. Others, however, hail it as a promising means of overcoming some of man's problems and a hopeful way to happiness and comfortable life. Both parties come up with strong arguments. The layman, therefore, feels torn apart between the two opposing views, especially as such technologies are close to the concerns of his personal daily life.

Opponents of such technologies argue that they are unethical. Their evidence is that some clinical experiments were conducted in a

way that callously violated man's dignity and ended in heart-breaking affliction. Other experiments proved to be fraught with designing errors. The published results of some experiments were found to be made up.

Eugenics is often dealt with in daily news papers, weekly magazines and academic periodicals. In the past, it was encouraged by fascist regimes for their pernicious purposes. But it has never achieved any success. The question is raised now if Eugenics is on the way back since genetic and reproductive technologies make it possible for parents to select certain attributes for their begotten children. In this respect, the questions revolve around man's dignity and freedom as well as the freedom of scientific research and the extent to which man should be allowed to seek knowledge. Is science, too, for science's sake?

The history of science shows that science and technology are our area of weakness in our modern civilization. The use of medical science and technology in Eugenics and the cure of many diseases represent the bright side which invites our approval. But this brightness is marred by three matters:

1 - Who is entitled to decide if this use is good and not evil? Is it the father, the physician or society in general? Where are the lines between them to be drawn? Should it be on the basis of the outside appearance or the inside reality? Are there safe limits to what a scientist can do in the way of reform?

2 - What is the impact of such technologies on future generations? It is well known that each gene functions harmoniously with the surrounding ones. No body can tell what would happen to this marvelous harmony if this or that gene was manipulated for improvement. The main problem is that experimentation is carried out on man, God's vicegerent on earth. There are no guarantees for an experiment to be conducted as planned. This is pretty serious when we are dealing with a human being who is considered sacred. One could disregard complications resulting from such experiments if they were conducted on inanimate objects or on other animate beings.

3 - It is customary to talk about human rights when reference is understood to be made about living adults. But what about babies? They should also be a party to reckon with. They are not consulted about anything done to them. Imaginably, a baby may not object to its parents' attempts to improve upon one of its attributes. But what if a baby is produced through cloning from two different women or a father? Isn't the grown up child entitled to know who his parents are? Is his mother one of those two women? Even if the somatic nucleus is taken from his father, he should know how he is related to that father: is he a son to that father or a twin brother? In light of these dilemmas isn't the child entitled to reject such vitiated kind of relation which will most likely hurt him in his community? The onus is on scientists to be well equipped with ethical principles before they embark on their research work. But there are those who do not recognize ethics on the premise that science is an objective matter that cares only for actual facts studied through objective methods, whereas ethics is concerned with studying human values through subjective methods giving rise to sheer controversial opinions. So it is wrong to mix this with that. Moreover, misconduct has other reasons that have led to immoral behavior:

A - As governments cut down on funds allotted to scientific research private sectors stepped in to fill the vacuum. An American company, for instance, spent over 11 billion dollars on genetic engineering research for which it recruited a personnel of 15,000 individuals. This would seem to be admirable but in fact such a situation is not as positive as it sounds. The reason lies in the difference of interests between a government and a private sector. Whereas, the former aims to promote acquisition of knowledge and to serve public purposes, the latter aims mainly at making the highest possible profit; an attitude that lends itself to all sorts of unethical behavior.

B - Some scientists are enticed by lucrative contracts to participate in secret research which is financed by the private

sector. The immoral behavior of such scientists has been the subject of many complaints filed by those in charge of academic research at universities.

C - The most ominous phenomenon in this regard is the involvement of the military in scientific research. This is often done as classified activity under the pretext of national security. This shielded liberty of action allows researchers to violate many regulations and to infringe upon any rights in order to experiment with new lethal weapons. The records are full of such practices, the latest of which is the case of the Korean scientist who claimed to have done a particular research and went as far as to publish its made-up results. When asked why he did this, he pleaded overwork and eagerness to get funds.

D - Junior faculty at universities are hard-pressed to do research and publish it in specialized magazines and periodicals in order to get promoted. Some would just do anything to reach that goal.

E - Another type of scientists would be those who know the ethical guidelines only too well, but try to get around them in an attempt to justify the kind of research they are doing. They argue for instance that society comes before the individual. Hence, a few individuals could justifiably be sacrificed in the course of experimentation so that the whole society might benefit from the findings.

Islam is crystal clear on this point: top priority is man's safety and security. God (SWT) says:

> "...that whoso slays a soul not to retaliate for a soul slain nor for corruption done in the land, shall be as if he had slain mankind all together; and whoso gives life to a soul, shall be as if he had given life to mankind all together" (5:32)

And in another verse:

> "And slay not the soul God has forbidden, except by right." (17:32)

Therefore, research and researchers should be governed by stringent ethical rules to safeguard the humanity of human beings. The question is which ethical sources should be consulted for eliciting such rules. There are two sources for ethics: heavenly religions and human endeavor, which is called secularism. The two sources have the common goals of preserving man's dignity, making him happy, overcoming poverty and disease, putting an end to famines, and living freely in a world where peace and security prevail. But each source seeks to reach these goals through its own beliefs and philosophy.

Heavenly religions are sent down by God to His Messengers and chosen Prophets for the purpose of laying the foundation of justice, propagating virtues and good manners and preserving Man's dignity. A believer would evaluate deeds as good or evil: if a deed is meant to serve God's purposes, then it is good; but if it is meant to serve the purposes of a tempter or a seducer or to grab a worldly gain, then it is evil and needs to be reconsidered. The rule that the end justifies the means has no place in any religion because it is immoral and opportunist. Good and evil, however, are relative matters that could be hard to pinpoint But Islam directs Muslims to do only what is permissible (halal) because it is good, and abstain from doing what is prohibited (haram), because it is evil.

All religions agree on the matter of Man's freedom: it is essential but not boundless; it ends where the freedom of the family or of the whole society begins. The family is a crucial unit of the society. It is a sanctified and closely-knit unit.

Good manners are held in high esteem by all religions. God Almighty describes the Prophet (PBUH) in the Quran in the following words:

"Surely thou art upon a mighty morality." (68: 4)

On the one hand, heavenly Messages were sent down to guide Man out of the dark into the light. They are meant to educate him and refine his manners so he could distinguish between " halal " and " haram ", i.e. good and evil. The difference at times are not easy to capture on the spot, but in the course of time the wisdom of

permitting certain acts and prohibiting others gradually dawns on the mind.

Some might think that religious faith is a kind of irrational prejudice against scientific advancement. Others believe that religious doctrine and scientific research are a contradiction of terms. But this is farthest from Islam. Islamic civilization has always pivoted on strong faith and useful knowledge. Along six centuries, it never stopped contributing to human knowledge in all fields of juridical and worldly sciences of medicine, pharmacology, engineering, Algebra, mathematics, astronomy, geography, encyclopedias, etc. Never in the history of Islamic civilization has a scientist been put in the harm's way because of his ideas. On the contrary, scientists and scholars in general always found favor with Muslim Rulers regardless of religion, ethnicity or gender. One of the brightest examples is the case of Musa bin Maymoun, a Jew who spread the word that he had embraced Islam. Despite his apostasy later on, his favorite position with Salahuddin remained unscathed even while he was deep in war with the crusaders.

In modern times, the Islamic Organization for Medical Sciences (IOMS) has been a witness during the past 35 years to the openness of Islamic jurisprudence and specialists in the field to all innovations of the age. Jurists have tackled them rationally and issued well-balanced resolutions on how to make use of them. The IOMS was even ahead of many Western countries in such matters as surrogacy, AIDS, etc. This obviously refutes allegations that religious thinkers are irrationally biased against scientific progress.

On the other hand, secular thinking is subject to human personal judgments which put out theories that fascinate the unbelievers. If we look into many such theories along human history we will find that they have not stood the test of time. This is only natural because they are the outcome of heretic tendencies or the inevitable result of pressures that could be psychological, economic, political or military in what has come to be called "the Devil's Deal".

Human history is full of examples of such practices. Let's take the example of wine. Prohibiting alcoholic drinks is a basic rule in Islam. The Quran is admirably eloquent on this point:

> "Oh believers, wine and arrow-shuffling, idols and divining-arrows are an abomination, some of Satan's work; so avoid it; haply so you will prosper" (5:90)

The specialized commentators of the Quran explain that the avoidance here is more inclusive that just the prohibition of drinking it: it includes coming near it, handling it, dealing in it, brewing it or sitting where it is being drunk. We Muslims did not know the secret or wisdom of this prohibition but we have always been confident it must be harmful since the prohibition came from God. So, true Muslims have always abstained from drinking. This behavior has always been sneered at by Westerners when Muslims attended their parties. Today, the West is coming to realize the wisdom of Islamic prohibition as alcoholism has taken epidemic proportions costing Western countries billions of dollars and loss of many human lives. Propagating alcoholic drinks is one of the faulty human endeavors to attain material profit and physical pleasure.

Another example of such faulty practice is the matter of smoking. Tobacco manufacturing companies knew all along that cigarette smoking was hazardous as research had proved that tobacco contained carcinogenic ingredients, some of which are also addictive. For a long time these companies had obscured information about the findings until they were forced by court injunctions in USA and Europe to place conspicuous warnings against smoking on each cigarette packet in addition to reducing cigarette advertisement to the minimum. Consequently sales dropped drastically in America and Europe. To make up for losses those companies turned to developing countries where they launched large-scale promotion campaigns for their products. Government leaders in some industrial countries went as far as to pressure their counterparts in poor, underdeveloped countries to sanction these campaigns. This is a blatant case of unethical behavior at the highest levels prompted by greed for profits at the cost of vulnerable small countries.

Another example which comes in response to a tendency to maximize sensual pleasure is the unbridled sexual liberty adopted in the West as long as the two parties to the affair are willing to go into

it without any coercion. This has led to innumerable cases of abortion giving rise to a serious social problem in the major industrial countries as young pregnant mothers risk complications that may lead to death or different health problems. This liberty is also behind the spread of infectious venereal diseases such as syphilis, gonorrhea and herpes and the billions of dollars spent on curing them. The most devastating consequence of this obsession with sexual liberties is the almost incurable disease of AIDS, often referred to as the plague of modern times. One of the basic means by which the infection occurs is proven to be sexual intercourse with several partners. Although this "plague" is claiming millions of human lives by the day, health officials in the world never cared to prohibit fornication. What is worse they even recommended the so-called "safe sex". This is a misleading term; for safe sex requires a series of precautionary measures before and during the sexual act. Yet, companies took the opportunity and mass produced low-quality condoms and exported them to Africa. So, instead of protection these devices helped spread the disease even further. The world is facing now the crisis of having to spend billions of dollars on research that aims to wipe out the disease. Using this research pharmaceutical companies are manufacturing medicines that come in useful but are too expensive for poor African nations to afford. So, the high death toll in these countries remain unabated, leaving thousands of families below the breadline. What kind of ethical behavior is that?

A recent example of a crisis that was brought about by voracity for material profits is the cow disease. Some researches have emerged recommending that cheap remnants at slaughter-houses of blood, bones and skins be processed to feed cows. Cows accumulated flesh and gave an abundant flow of milk, but they caught the disease. This is the inevitable result of tampering with nature: the cow which is a herbivore was forced against its nature to turn into a carnivore. No one expected that this would lead to a drastic change in one of the amino acids which turned the brain of the affected animal into a sponge-like object causing death in a few days. Britain lost over 2 billion Sterling pounds when its cattle had to be exterminated. Here is

the rub! When some biological research is applied we do not know what will happen in the long run after one or two generations. The case of the cow disease was the outcome of faulty human endeavor at innovation. When we consider the Islamic stance on this point, we will find that Islam prohibits eating any carnivorous animal. The reason had been mysterious until the cow disease crisis demonstrated the Divine wisdom of this prohibition.

All the above examples show that we are dealing here with ideas, mental efforts and personal judgments applied under the influence of capricious drives and economic and political pressures. History abounds with such examples that have always victimized human beings.

One of the main principles on which these secular theories are based is utilitarianism. It calls for complete freedom in thought and scientific investigations on the premise that an action is good if it helps the greatest possible number of people. This is a here-and-now materialistic principle that can be translated into figures of profits or losses when we are talking about attempts to overcome a disease, enhance certain abilities, boost economy and trade or implement a certain policy. But who can predict the impact of such attempts on human beings? Man is not only a physical being, he is also a combination of a soul, a self, and a body. He loves and hates, he gets angry but can forgive and be tolerant. In short, man has feelings and passions that cannot be measured in terms of profits and losses when projecting for the coming two or three decades or generations.

Philosophers of secularism have different points of departure and different visions. If we take the concept of " dignity", for instance, we will find a myriad of definitions, interpretations and views. But Islam defines "human dignity" clearly as the attribute which places Man above all other creatures in this universe. It is bestowed by God as the Quran explains:

> "When I have shaped him and breathed My spirit in him, fall you down, bowing before him" (38:72)

The command here is directed to the angels. This means that the

bowing in honor of Man came after God has breathed His spirit in him. Further, God (SWT) says:

> "We have honored the children of Adam and carried them on land and sea and provided them with good things, and preferred them greatly over many of those We created." (17:70)

The dignity we would like to protect is an integrated entity, no part of which should be served at the cost of another part. As mentioned earlier, Man is a combination of body, soul, mind and heart. If one organ sustains injury or malady, the whole body runs a temperature and remains awake. The Prophet (PBUH) says: "Man is God's building: cursed be he who demolishes it."

Secular philosophers, however, disagree on the concept of human dignity. Some of them consider it the exclusive privilege of those who have volition and mental ability to think, choose and use language. The question now is: what about the mentally retarded person? Isn't he, too, entitled to have dignity?

Other philosophers argue that the factor of "dignity" that must be protected pivots on human ability to make ethical choices. The ones who are characterized with this ability are the only ones who possess a free will. Again, what about those who are dispossessed of their free will for one reason or another? Should they also be stripped of their human dignity?

Some philosophers argue that the human essence we are talking about is only a fallacy. Others reject the concept and refuse to base human rights on such a chimera.

## The Sanctity of Life:

Religion considers that life is a gift from God. It should never be wasted or tampered with. God (SWT) says: "We indeed created Man in the fairest stature." (95: 4)

Although other creatures are also God's creation, Man is distinguished by special attributes. He is given a mind to think and perceive with; a will for making his decisions and choices and a language for

communication with others. He can be creative, a manufacturer and a designer. In addition, unlike other creatures in the animal and plant kingdoms, man has a civilization. So, he has been selected by God to be His vicegerent on earth. God commanded the angles to bow down to Man as a sign of investing him with respect and nobility. God (SWT) said to the angles:

> "Assuredly I know that you know not." (2: 30)

God also told them that Man would inherit the earth:

> "For we have written in the Psalms, after the remembrance, the earth shall be the inheritance of My righteous servants." (21: 105)

Philosophers are divided on the sanctity of life. Some consider that it hinges upon the value of life. This principle is ambiguous and inaccurate. It could mean that there are two kinds of life: one invested with value and another void of it, and can therefore be wasted. Could this be the life of an embryo that has no chance to live, or the life of an old man with little chance to extend any further?

Other philosophers associate sanctity with the quality of life. To some extent, this principle is similar to the above one, but it could rather open the way to sacrificing a number of people for the benefit of others in application of utilitarianism. Those who believe in this principle may approve the use of some people as a source for organs to be transplanted in the bodies of others whose lives are deemed, according to this principle, to be more valuable.

Others see that the sanctity of life is strictly a human distinctive feature. So, we must preserve it and keep it in good shape with whatever means we can employ for that purpose. This view is perhaps the closest to the religious concept and establishes the principle: "Thou shalt not kill".

The sanctity of life lays the solid foundation for an extremely important principle: man is entitled to live; his life must not be wasted or tampered with unless there is an intrinsic reason to do so. The legal system should fundamentally be based on this principle.

I have no desire to turn this introductory article into a debate

between religion and secularism. The main purpose of the seminar is to hold a dialogue between representatives of the two sides and conduct it with open minds and heart with a view to narrowing the gap between them. Difference in views, whether between followers of various religions or between Religion and Secularism, is only one of God's ways in His creation. Some would believe; others would not but cannot in any way bring harm to God: "If God had willed, He would have made them one nation." (42: 8)

The question now is: Does Islam recognize the importance of scientific research or has it persecuted scientists and researchers?

I can most confidently assure that Islam exhorts its followers to seek knowledge and pursue the path of scientific investigation. Islam elevates scholars to the high rank of being the inheritors of the prophets. It urges Muslims to contemplate the Kingdom of heavens and earth and to look into themselves. But what kind of scientific pursuit does Islam recommend?

Islam defines science as that which is beneficial to mankind. Worthy research work is that which does not contravene God' norms or put man in harm's way. Positively, it is that which helps man master his pains and opens up for him ways to a happy life where he could secure a healthy dwelling, decent food and effective medicines. In Islam, the attempt to fathom out God's ways on earth is a collective duty because it proves God's oneness, omnipotence and glory. These are the rules and basic principles set down by Islam for its followers.

Some scientists, however, lack such insight. They are driven by an obsession for knowledge and fall victims to an insatiable impulse to know more and delve deeper. So, instead of science serving man, man turns into a servant of science. Thus, they leap from one point to another and get so immersed in their pursuit even if success occurs at the expense of man's dignity or at the risk of mixing family kinship or changing God's creation.

Science is a mixed blessing; no science is good all the way or bad all the way. What matters is what one wants to use science for. Is it used to find out about a certain type of bacteria in order to devise a

method of treatment? Or is it to discover a new type of bacteria with the purpose of changing its genetic structure so that they turn into a lethal, incurable weapon for bacteriological wars? Is it to discover the gene of muscular strength so that a whole nation could be made to turn into an army of slaves for forced labor? Or is it to isolate that gene in order to use in the treatment of syntexis diseases?

There is a great need for wisdom and robust ethics to prevail, not only among common people but most particularly among scientists. We want this world to be populated by the sort of man who is merciful, God-fearing and intent on seeking good. Science is no longer confined within the bounds of the laboratory; it affects the whole society positively or negatively. Now, as society is involved in funding scientific research, it is entitled to have a say about what researchers claim to be doing inside these laboratories after the problems they are working on have been sufficiently explained. After all, it is society that stands to gain or lose when research work is put into effect.

## Some Questions to Ponder about:

Which will bring about the end of man: too much knowledge or lack of it? Will genetic engineering and the human genome lead to man's happiness or change in the wrong hands into a weapon that could ruin his life and distort his attributes and behaviors? Will the next generation accuse us of issuing resolutions that tied down research or of neglecting to do so, which gave free rein to it? This latter contingency could have ugly consequences. We must beware of pursuing enthusiastic, short-term targets that might reflect negatively on future generations.

Some people may think that no one will be opposed to having strong, intelligent and handsome children through selections made possible by genetic technologies. But, if all individuals in a society had these qualities two results could develop:

a - It could mean a return to eugenics which failed when fascist and Nazi governments issued laws to regulate it. Today, however, it would be the family who orders it and the physician who obliges by carrying out the order.

b - Compassion, kindness and sympathy would simply disappear as there would be no more handicapped, abnormally short or sickly people around. As society would be all chiefs with no Indians, individuals will fight each other in wars where survival would be only for the fittest.

Therefore, our scientists should stick to ethics when they set targets for their research programs and procedures for conducting them so that science may actually become God's way of showing His mercy to the humankind.

All these matters have been the main concern of IOMS since its inception. The Organization's policy has always been to study any biomedical innovation as soon as it appears in any publication within a carefully drawn up plan to convene seminars that gather together specialists in medicine, natural sciences, jurisprudence, philosophy, sociology, law, psychology and politics. Discussions are open, free and rational. Resolutions are made under no pressures of any kind. IOMS has no political leanings or economic interests as it is a non-profit organization funded by well known and declared sources. So, its resolutions are hailed by everybody concerned as well-balanced.

Last year, IOMS issued the Islamic Code of Medical Ethics which came in three parts:

Part I: The physician's conduct, his rights and duties towards his God, himself and community.

Part II: The world ethical guidelines concerning biomedical research from an Islamic viewpoint. Based on this, the IOMS set down the general principles and guidelines for the ethics of the medical profession such as the necessity to ethically justify its procedures and to periodically review its research plans and the importance of obtaining informed consent of subjects participating in experiments, among many other topics relating to medical and health research work.

Part III: This part comprises the Islamic views on medical and health innovations that have emerged on the international arena such as In Vitro Fertilization, surrogacy, organ transplantation, the onset

and end of human life, human genome, cloning and AIDS. Each problem was individually discussed and juridically designated.

The challenge here is not only ethical, but political as well. The political decision will determine the extent of our involvement in biotechnology if we are to step into a "post-human future". It will also determine the potential ethical abyss that such future could be holding in store for us.

The attempt to divide man up into organs and systems and further dividing each into still smaller and smaller particles until we reach the micro level has induced secular scientists to consider man in partial terms, which is different from the holistic view of theologians and philosophers.

There are those who believe that coming to know the human genome and being able to handle its defective genes will enable us to avert a lot of physical troubles and help us to lead a happy physical life. But is a healthy body sufficient to make us lead a happy life? Man is not just a body; he is also a spirit whose secret is known only to God:

> "They will question thee concerning the Spirit. Say: 'The Spirit is of the bidding of my Lord. You have been given of knowledge nothing except a little'". (17:85)

He also has a self of various levels: it could be the blaming self, the contented self, or the reassured self. Man, that is, is a being of emotions: he loves and hates, he could be generous or miserly; happy or depressed; dauntless and confident or cowardly and timid.

Reducing man's ends simply into mere attempts to alleviate pain and maximize pleasure is utterly unacceptable. It constitutes a superficial look at an extremely complicated human nature that has defied full comprehension so far and is not to reveal its secret in the foreseeable future.

Will specialists of Medical Biotechnology succeed in what their predecessors failed to do, viz., control man's creation through selection of certain requested attributes? The revolution in biotechnology does not mean just advancement in genetic engineering. There is much more

to it than that. It is a revolution in basic biology which depends on progress in various other fields. It will also help elongate life expectancy with consequent demographic changes. This will in turn have great effects on political and economic decisions. Europe, America and Japan are approaching the dilemma of a high rate of senior citizens coupled with a low birth rate. When that happens, the process of decision making will be biased to old people. There may also come a time when we see societies with female majority. Decisions will also tend to cater more for women, which means completely different trends in every walk of life.

A society where the majority of inhabitants enjoy good health and longevity may not, after all, be successful and effective. Longevity may produce life in form rather than in substance; i.e. people who just move around but do very little with almost zero contribution to the country's GNP. A country with this kind of population will be no more than a big Old People Home.

All ethical slogans must be turned into obligatory resolutions and laws. This should be done on an international scale. If a country issues strict regulations while others choose not to do so, research companies unwilling to stick to these regulations will find an outlet in those neglectful countries and flock to them especially as laboratories and equipment for this kind of research are not as sophisticated as those required for nuclear research which can be easily monitored.

Initiation into ethical principles and commitment to them must start early at school and continue throughout subsequent educational stages up to university level so that when graduates get to be involved in political or scientific activities they can be well qualified to discharge their duties within an assimilated framework of deeply-rooted professional ethics. A scientist who has been educated in this way will be highly conscientious and methodical in his research work He will never embark on a project unless he is inwardly reassured that the odds are more in favour of success and that its risks and complications do not warrant a decision not to go ahead with it. This way, we feel we are in safe hands.

In the meantime, there is a need for setting up ethics committees

formed from physical scientists, physicians, jurists, philosophers, sociologists and psychologists as well as representatives of the society to study each case by itself and take the suitable decisions. The committee should follow up new research and review old decisions in light of new results.

We should not be skeptical about scientists in biomedical and genetic fields or hastily accuse them of heresy as was the case in Europe during the Middle Ages. When Galileo at that time declared that the earth turned round the sun he was prosecuted and forced to recant his belief in the Copernican theory.

Research results must be taken seriously and studied carefully with open minds and hearts so that scientists may feel confident enough to be unreserved about the design, targets and ensuing results of their projects. Failing to do so will only force them to carry out their work in secret. In this case, we could wake up one day to a human catastrophe. The only other alternative would be to place a total ban on such scientific research and experimentation, which is virtually impossible.

Governments must shoulder their responsibilities in protecting people against hazardous experiments conducted without adequate guarantees of success or banned in other more responsible and rigorous countries. Societies must also balance freedom of science and speech against religious, ethical and political values.

Now, if the government of a certain country refuses to fund a certain research project, can the private sector take over the funding? Well, the answer is yes if refusal is attributed to lack of resources. But if it is justified by ethical or scientific reasons such as results might have adverse effects on society, the private sector should not be allowed to step in. The reasons for refusal should always be made public and circulated to all other countries, particularly the developing ones which do not have adequately qualified cadres to judge on such matters. Developed countries must provide this kind of protection against unscrupulous researchers.

Scientists everywhere should find the answer to this important question: when does life assume ethical value? The answer could be

crucial in such matters as abortion, euthanasia and experimenting on severely deformed embryos.

Developing countries which lack the qualified specialists or the necessary budgets to allocate to the above-mentioned ethical committees should seek the help of international or non-governmental organizations formed by groups of concerned ethicists and philosophers in addition to specialists in various branches of science. They closely monitor research centres and publish reports about the ethical aspects of every research program even when it is still in the bud. This has the added value of making researchers feel that they are working under the vigilant watch of hidden eyes.

It is true that developed countries encourage scientific research through abundant funds, state-of-the-art equipment and well qualified personnel. But it is equally true that these countries also have popular movements that are keen to see to it that ethical standards are observed. In an atmosphere of democracy, freedom of speech and transparency, any research project that turns out to be unethical or hazardous to public interest can easily get exposed. As such, developed countries are capable of issuing rigorous regulatory decisions and guidelines. Research companies working in the field of biomedical technology consider some of these regulations as an impediment to scientific progress. To evade them, they go to Third World countries where they can work freely as such countries lack the financial resources and the know-how to slam any restrictions. Besides, in return for lucrative offers exaggerated promises of benefits to those countries, the research companies obtain the necessary approvals for conducting their experiments there. Certainly, no official in those underdeveloped countries is allowed to even peep into or come near the laboratories. God only knows what tragic and scandalous procedures take place there.

Doesn't this situation create an ethical problem for the developing countries where land and people are so unethically exploited by research companies? That is why I'm saying that it is the moral duty of the major industrial countries to protect developing countries and

help them stand up to the greed and exploitation of companies working in the field of medical biotechnology.

The proposals I am putting forward here are easier said than done. One expects that major research corporations working in the field of medical biotechnology will not stand by and let governmental legislations and ethical regulations restrict their activities, which means dwindling profits. They will naturally put up all the resistance they can afford through strong lobbies in parliaments and government quarters. They would be supported by unscrupulous scientists who could supply them with the necessary palatable reports in order to secure the required approvals.

We have seen similar practices by the Mafia who gradually gathered wealth and strength until they expanded into a state within the State. They could buy their way into the upper echelons of the government and thus could get away with a lot of illicit transactions and activities. Along the same lines, the tobacco mafia as well as the mafia of pharmaceutical companies are trying to curb public protests and circumvent governmental restrictions.

But this should in no way discourage us. On the contrary, we should rather press on and persevere in our attempts to rein in those research companies and force them to comply with regulations and guidelines. We should be emboldened by what happened in the case of genetically manipulated foodstuffs. Most of these ran up against fierce opposition by many NGOs mindful of consumers' interests. Sales dropped as a result of these enlightened resistance.

We are faced by a multi-dimensional revolution led by greedy research companies, scientists with insatiable lust for more and deeper discoveries who are intoxicated with a dream to be in full control of Nature, and corrupt researchers who have the nerve to concoct research results in their pursuit of publicity and material gains.

Hopes are pinned on groups and world organizations who are striving to guide scientific activities and protect mankind. There are persistent and concerted efforts to study innovations in the fields of genetic engineering and medical biotechnology to ascertain that

nothing would go against man's dignity and the sanctity of human life.

In this introduction, I have expressed my personal views which do not necessarily reflect the official views of IOMS. I have opted not to comment on any of the papers presented to this seminar as this will be done by the participating eminent scholars. Their debates and discussions will be included in the seminar Proceedings.

I cannot conclude this introduction without paying tribute to the dauntless man who has been behind this great event right from the start. The decision to hold this seminar was his in the first place, braving any risks. He followed up the preparations and arrangements day in and day out, sometimes even by the hour, going through every minute detail to make sure that nothing is left to chance. I am referring, of course, to Dr. Abdul Rahman Abdulla Al-Awadi, President of IOMS.

I would also like to greet members of the Board of Trustees who approved this seminar and supported it in every way.

My thanks also go to the executive committee which has done a wonderful job of planning everything relating to the seminar and were always ready with advice and good counseling.

I would also like to express my deepest gratitude to my dear colleagues in the general secretariat for their sincere efforts and exemplary dedication. I am sure they feel rewarded when they see that their efforts have thus come to fruition. Let me also humbly add that such well-organized seminars have all the hallmarks of IOMS, thanks to the staff's love of their work and commitment to their duties

Following this introduction you will find the full program of our seminar. I pray that our endeavors towards this worthy cause be crowned with success and apologize for any shortcoming. No Child of Adam is infallible; but the best one can do when one makes a mistake is to repent it. Praise be to Allah, God of all Being.

# PROGRAMME

# FIRST DAY
## Monday, 6 February 2006

### First: Opening Ceremony

- Recitation from Holy Quran
- Address by The Minister of Public Health, Egypt
  **H.E. Dr. Hatem Moustafa Al Gabaly**
- Address by the Director of EMRO (WHO)
  **H.E. Dr. Hussain Al-Gezairy**
- Address by the Director General of ISESCO
  **H.E. Dr. Abdul Aziz Al-Tewaijry**
- Address by the President of IOMS
  **H.E. Dr. Abdul Rahman A. Al-Awadi**
- Address by the Ex-President of CIOMS
  **H.E. Dr. John H. Bryant**

### Second: Plenary Lecture

- Human Genetic and Reproductive Technologies: Comparing Religious and Secular Perspective - An Islamic Perspective
  **Dr. Hassan Hathout**

- **Tea Break**

## FIRST DAY
## Monday, 6 February 2006

# Topic I
# Humanity and Creation/The Natural World

**First Session:**
**Humanity and Creation/The Natural World**
**The Islamic, Christian and Secular Perspectives**

**Chairman** : Dr. Ibrahim Badran

**Rapporteur** : Dr. Abdul Aziz Al-Swailem

## Speakers

1 - "Given into Your Hands" (Gen 9:2): From Gardener and Tender to Master and Contemplator of Nature
**- Dr. Bruce Foltz**

2 - Rethinking the Secular Perspective on Biology: Going Beyond the Monopoly of Materialism
**- Dr. Mustafa Akyol**

3 - Humanity and Creation/The Natural Disposition of the World.
**- Dr. Assaad El Sahmarani**

- **Break and Prayer**
- **DISCUSSION**
- **Lunch Break**

**Second Session:**
**Creation of Human Being - Islamic and Christian Perspectives**

**Chairman** : Dr. Ezzeddin Ebrahim

**Rapporteur** : Dr. Aida Al-Aqeel

## Speakers

1 - "Creation and Man: a Christian View"
**- Dr. Cyril Tennant**

2 - Humanity and Creation: An Islamic Perspective
**- Dr. Jamal A. Badawi**

3 - Man's Creation in his Natural Form
**- Dr. Nasr Farid Wasil**

- **DISCUSSION**
- **Tea Break**

**Third Session:**
**Creation, Control of Nature and Ethics - Islamic and Secular Perspectives**

**Chairman** : Dr. Mohd. Haitham Al Khayat

**Rapporteur** : Dr. Maher Abdul Kader Ali

## Speakers

1 - Human Genetics and Reproduction from the View Point of the Three religions.
**- Dr. Abdul Rahman Refai**

2 - Man, Instinct, Nature and Technology
**- Dr. Ammar Al-Talbi**

3 - Islamic Perspectives on God, Humanity and Nature
**- Dr. Muzaffar Iqbal**

- **Break and Prayer**
- **DISCUSSION**

## SECOND DAY
## Tuesday, 7 February 2006

# Topic II
# Genetics, Reproductive Technologies and the Family

**Fourth Session:**
**Philosophy of Genetic and Human Reproductive Technology - Islamic, Christian and Secular Perspectives**

**Chairman** : Dr. Abdul Rahman A. Al-Awadi

**Rapporteur** : Dr. Ali Yousuf Al-Saif

## Speakers

1 - Pre-Implantation Genetic Diagnosis (PGD)
**- Dr. Lisa Lehmann**

2 - Ethical Problems of Prenatal and Pre-Implantation Genetic Diagnosis
**- Dr. Mounir A.M.S. Farag**

3 - Repercussions of human engineering and reproduction: The perspective of the three Revealed Books and the secular concept
**- Sheikh Mohd. Mokhtar Al-Salami**

- **DISCUSSION**
- **Break and Prayer**

**Fifth Session:**
**Islamic and Professional Perspectives of the Ethical Issues of Reproductive Technology.**

**Chairman** : Counsellor Abdullah Al-Essa

**Rapporteur** : Dr. Habibah Al-Chaabouni

## Speakers

1 - Islamic Perspective of Ethical Issues in ART.
**- Dr. Gamal I. Serour**

2 - Assisted-Reproductive Technologies (ART)
**- Sheikh Mohamed Ali Al-Taskheeri**

3 - Human Genetics and Reproductive Technologies: How They Reflect on the Family
**- Dr. Saddiqa Al-Awadi**

- **DISCUSSION**

- **Lunch Break**

**Sixth Session:**
**Genetics and Reproductive Technology - Islamic, Christian and Professional Perspectives**

**Chairman** : Dr. Hussein Gezairy

**Rapporteur** : Dr. Hamid Ahmed

## Speakers

1 - Christian Principles for Assisted Human Procreation.
**- Dr. Gerald R. Winslow**

2 - Human Genetics Reproductive Technologies: An Islamic Perspective.
**- Dr. Mohamed Ali Al-Bar**

3 - Genetics and Reproduction Technology from the perspective of Islamic Law
**- Dr. Abdul Sattar Abu-Ghuddah**

- **DISCUSSION**

## THIRD DAY
## Wednesday, 8 February 2006

## Topic II
## Genetics, Reproductive Technologies and the Family

**Seventh Session:**
**Reproductive Technology, DNA and Cloning - Islamic and Professional Perspectives**

**Chairman** : Dr. Ted Peters

**Rapporteur** : Dr. Mohamed Ali Al-Bar

### Speakers

1 - The Neglected Contributions of Islamic Civilization to Genetics and Reproductive Biology
**- Dr. Malik Badri**

2 - Islamic Perspective on Human Cloning, Stem Cell Research and Pre-implantation Genetic Diagnosis (PGD).
**- Dr. Aida Al-Aqeel**

3 - Contributions of Genetic Engineering Research to understand Islam as believe with facts in Quran and Sunna.
**- Dr. A. Farouk Gad**

- **DISCUSSION**
- **Tea Break**

## Topic III
## Social Impacts of Genetic and Reproductive Technologies

**Eighth Session:**
**Genetics and Reproductive Technology - Islamic, Jewish and Secular Perspectives**

**Chairman** : Dr. Mamduh Gabr

**Rapporteur** : Dr. Salah Al-Ateeqi

## Speakers

1 - Human Genetic and Reproductive Technologies - A Muslim's understanding of the Secular Perspective.
**- Dr. Shahid Athar**

2 - Reproductive Technologies: Jewish Values and their Impact on Public Policy and Social Structure in Israel.
**- Dr. Vardit Ravitsky**

3 - Human Genome: Social and Ethical Implications - An Islamic Interpretations
**- Dr. Hamid K. Ahmed**

- **DISCUSSION**

- **Break and Prayer**

**Ninth Session:**
**A Right to Reproduce, Designing Children and Genetic Counseling - Islamic, Jewish and Secular Perspectives**

**Chairman** : Dr. Gerald Winslow

**Rapporteur** : Dr. Abdulla Basalam

## Speakers

1 - Reprogenetics and Genetic Counseling - Scientific and Ethical Perspective
**- Dr. Aly A. Mishal**

2 - Laboratory and Ultrasound Prenatal Diagnosis: Prenatal Genetic Diagnosis: Scope, Applications and Limitations in Arab Countries.
**- Dr. Hanan Hamamy**

3 - A Right to Reproduce: Equality Not Liberty
**- Dr. Muireann Quigley**

- **DISCUSSION**

- **Lunch Break**

**Tenth Session:**
**Cloning, Immortality and Genetic Engineering - Islamic and Secular Perspectives**

**Chairman** : Dr. Abdel Aziz Saleh

**Rapporteur** : Dr. Abulfadl Mohsin Ebrahim

## Speakers

1 - Genetic Engineering, Social Justice, and the Future of Humanity: Confluence of Religious and Secular Concerns
**- Dr. Farhat Moazam**

2 - Recent Research on "Telomerase" enzyme, and the concept of "immortality"
**- Dr. Omar Alfi**

3 - Human Cloning from the view point of Fiqh (Shariah) and Ethics.
**- Dr. S.M. Mohaghegh Damad**

- **DISCUSSION**

## FOURTH DAY
## Thursday, 9 February 2006

## Topic IV
## How and Where do we draw the lines?

**Eleventh Session:**
**Human Being and His Creation: where we can draw lines - Islamic, Christian and Philosophical Perspectives**

**Chairman** : Dr. Ajeel Al-Nashmi

**Rapporteur** : Dr. Aly A. Mishal

### Speakers

1 - Expected Risks and Benefits of Genetic Research: Where and When We Draw the Red Lines
**- Dr. Ibrahim Badran**

2 - Where the Catholic Church Stands on Genetic Issues
**- Bishop Camillo Ballin**

3 - Our Humanness: Unalterable Essence and Changeable Actuality
**- Dr. Jaafar Sheikh Idris**

- **DISCUSSION**
- **Tea Break**

**Twelfth Session:**
**Stem Cell Controversy - Islamic, Jewish and Christian Perspectives**

**Chairman** : Dr. Gerald Winslow

**Rapporteur** : Dr. Malik Badri

### Speakers

1 - The Stem Cell Controversy: Secular Form and Religious Substance
**- Dr. Ted Peters**

2 - Test-Tube Babies
**- Dr. David Bleich**

3 - Stem Cells and Cloning Research: Similarities and differences
**- Dr. AbdulAziz Al-Swailem**

- **DISCUSSION**
- **Break and Prayer**

**Thirteenth Session:**
**Stem Cell, Prenatal Diagnosis and Reproductive Technology - Islamic Perspective**

**Chairman** : Dr. Khalid Al-Mathkoor

**Rapporteur** : Dr. Shahid Athar

## Speakers

1 - Islamic Medical Ethics Amidst Developing Biotechnologies.
**- Dr. Musa Mohamed Nordin**

2 - Stem Cells and DNA: Modern Ethical Challenges
**- Dr. Maher Hathout**

3 - Surrogacy: An Islamic Ethico-Legal and Social Perspective.
**- Dr. Abulfadl Mohsin Ebrahim**

- **DISCUSSION**
- **Recommendations**
- **Closing Session**

# ADDRESS BY
# DR. HATEM MOUSTAFA AL-GABALY

Minister of Health and Population, Egypt

# Address by
# Dr. Hatem Moustafa Al-Gabaly

Minister of Health and Population, Egypt

The Address of His Excellency the Egyptian Minister of Health and Population Dr. Hatem EL Gabaly delivered on his Behalf by Dr. Hasan El Kola.

Your Eminence Professor Mohamed Sayed Tantawi the Sheik of AL Azhar Mosque, Professor Abdel Rahman El Awadi, Professor Abdel Aziz El Toweigry, Dr. Hasan EL Gazaery, Dr. John Bryant, dear attendees, distinguished scientists and thinkers. Good morning to you all. It is with great pleasure that I convey to you the regards of His Excellency Dr. Hatem EL Gabaly, the Egyptian Minister of Health and Population who would have liked to have the pleasure of attending this very important conference, but he is obliged to be out of Cairo today for urgent reasons.

It is undeniable that the incredible progress which has taken place in the techniques of genetics and human reproduction has produced great challenges in our modern world that pertain to important issues such as the use of human cloning and stem cells as well as what is called child design and creating a special world of our own and the terrifying concomitant social effects of all this in the future. Our world is witnessing today a confusion regarding the concepts of freedom and freedom of belief. It is witnessing assaults against what some groups hold as sacred. This proves there is a lot of misunderstanding regarding many of the concepts prevalent in our world today. It also shows the importance of this conference which comes at a critical time and which is deeply needed. We hope that your discussions and the findings which you reach will contribute to humanity's progress and to the right of human beings to have a dignified life in which all people are considered equal regardless of their beliefs, a world in which every human being gets his rights without any persecution against one race, group, or faith.

*Asalamu alaikom*

# ADDRESS BY
# DR. HUSSAIN AL-GEZAIRY

Director of EMRO (WHO),
Cairo, Egypt

# Address by
# Dr. Hussain Al-Gezairy

Director of EMRO (WHO),
Cairo, Egypt

**Your Excellencies, Dear Attendees**

I extend my greetings to you and welcome you in the regional office of the WHO for the Mediterranean region. I would also like to thank you for accepting the invitation of the WHO and the IOMS and the Islamic Organization for Education, Science, and Culture and the International Council for Medical Science Organizations to attend the conference on Heredity and Human Reproduction and their Ramifications and the views of Revealed Religions and Secularism on the issue. I also wish to offer my heartfelt thanks and deepest gratitude to the venerable Egyptian government and to Dr. Hatem EL Gabaly, the Egyptian minister of Health and Population under whose sponsorship this conference is held. I welcome all my colleagues who work at fellow organizations that are taking part in the conference, particularly, Dr. Abdul Rahman Al Awadi who played the major role in launching this event. I would like to seize this opportunity to shed light on his great efforts in establishing and sponsoring the Islamic Organization for Medical Sciences and all its achievements, most important of which are the conferences and seminars that the Organization held. They are over thirty international conferences and seminars which discussed different problems and issues that attended the great progress made in the field of biological sciences, and focused on adhering to moral principles. I would also like to extend my deepest thanks and appreciation to our colleagues and co-workers particularly those who work for the International Council for Medical Science Organizations and the Islamic Organization for Education, Science, and Culture.

I also thank all the participants and would like to express my appreciation for all their efforts in preparation for this conference, and

all the time they invested and the great distances which they travelled in order to attend.

Although the entire world has made amazing and unparalleled progress in the field of knowledge and communication, yet I do not hesitate to tell you that what humankind has achieved in the present day in the fields of science and technology has not awarded it the moral certainty and assurance to which it aspires. Neither has it prevented it from injustice, doing wrong, or trespassing against the rights of others. Nor has it prevented double standards and infringement against all human rights and transgressing against what man holds as holy. Many nations are deprived of even their most basic rights to live with dignity, and in taking part in any of the fields of scientific progress. They are also deprived of being treated on an equal par with the stronger countries which have monopolized the right to determine what is right and what is wrong, and control the fates of all living human beings.

For this reason we would like to resume the discussion which we started between the believers of revealed religions in the world. At the same time, we will not ignore non-religious viewpoints. The themes for our discussion and research will be of interest to all groups regardless of their opinions, qualities, and beliefs. Human nature, the first theme, is a common factor among all people. The issue of how we should deal with genes and reproductive technologies is relevant to all societies, and to every individual and family. Due to the moral, sociological, and psychological impacts of reproduction and gene technology, views must come to some form of agreement on some principles and constraints. Setting distinguishing lines between what is acceptable and what is not acceptable will be a creative and exciting task, but will also represent a touchstone measuring the capacity of each participant for tolerance, flexibility, and communication.

**Dear Attendees**

Our conference today is characterized by the sincere wish of each of us to listen to the viewpoint of others with objectivity and to accept any view which they find plausible and convincing. We would each

like to respond to the evidence and reasons advanced by others, while at the same time presenting the views which we deem to be right and useful to human beings. We would like to present our views gently, without bias or prejudice, and we would like to show proper respect for the beliefs of others and not to belittle the views of any group that happens to disagree with our own views. Civilized behavior, which is the hallmark of scientists and the faithful, requires us to respect the right of others to present their views and beliefs. I am confident that each of us will do his utmost to listen and discuss with an open heart and mind.

# ADDRESS BY
# DR. ABDUL AZIZ AL-TEWAIJRY

Director General of ISESCO,
Morocco

# Speech of
# Dr. Abdul Aziz Al-Tewaijry

Director General of ISESCO,
Morocco

Your Excellency Dr. Abdul Rahman AL Awadi, Your Excellency the Head of the regional office of the WHO, Your Excellency the Head of the International Council for Medical Science Organizations, Ladies and Gentlemen:

In the name of the Islamic Organization for Education, Science, and Culture, I would like to welcome all members of this gathering to the opening of this international conference on "Heredity and Human reproduction and their Ramifications: the Viewpoints of the Three Revealed Religions and Secularism" which is coordinated by the Islamic Organization for Medical Sciences, the Regional office of the WHO, and the International Conference for Medical Science Organizations. At the outset, I would like to convey to you the greetings of His Excellency, the General Manager of the Islamic Organization, Dr. Abdul Aziz AL Toueigry and his wishes for a very successful conference. I would also like to offer our deepest thanks to the Islamic Organization for Medical Sciences for its efforts in preparing for this conference. Special thanks go to everyone who hosted this conference and contributed to creating circumstances that would be conducive to its success as well as to all the experts for their fruitful contributions.

**Your Excellencies, Ladies and Gentlemen**

Science is currently making great strides on the path of progress. It would therefore be not exaggeration to say that the progress made in the past twenty five years is equal to the progress that was made in the entire history of humanity. In the field of heredity, great advancement was also made so that we have great hopes for a better future for human beings.

In our Arab and Islamic societies, scientific circles are amazed at the biological revolution and wonder about the means to keep up with

it and to benefit from its applications, and its tremendous scientific achievements. Only the few, however, examine its social and cultural effects and attempt to set moral and legal frameworks to control them. Such control would prevent future catastrophes, especially after what has been said about some scientific centers in the West applying biological technologies and cloning to human beings, and what has been mentioned about the possibility of manipulating human races after successfully discovering the human genetic chart.

Despite the great and continuous development in biological sciences, our Arab and Islamic world is in a state of legal stasis. However, all fields including science, religion, law, and sociology should work together to narrow, if not altogether eliminate the gap. Scientists should enlist the contributions of specialists in jurisprudence and religion in order to prove that Islam is a religion which is suitable for all times and places.

**Your Excellencies, Ladies and Gentlemen**

This is the second conference that the Islamic Organization organizes with other parties, for a previous conference was held in London from the 25-28 of January 2005 entitled: "The Technologies of Human Heredity: A Comparison of Religious and Secular Viewpoints". This conference was organized in cooperation with the Islamic Organization for Medical Sciences and the Society for Call to Islam and the Human Heredity Team. In this conference a number of subjects related to bioethics were studied from various religious viewpoints. Since these issues were of a sensitive nature it was necessary to encourage understanding and harmony through listening to other viewpoints and attempting to understand each other as such discussions require mutual respect. And today we are taking part in this second conference and is being held in Cairo with a number of important and distinguished scientists attending.

Research has proved that the revolution that has taken place in the field of genetic engineering has created new conditions and knowledge that have completely changed the results of blood research so that it is now possible through DNA tests to find out any persons DNA

fingerprints. These fingerprints carry all the genetic qualities of a person and stay with him his entire life. They are different from those of any other person. Scientific research has proved that the fingerprint can be found by examining the DNA of one of the body fluids such as blood, saliva, or sperm, or one of the bodys tissues such as flesh, or skin, or any other substance made by the body such as hair or bone. These could be evidence which exonerates or incriminates a given person in all cases where there is a need for a person to be identified, particularly if the matter concerns a crime. It is possible to find out the real criminal in any crime by connecting the DNA fingerprint of the accused person and the DNA found at the site of the crime. Therefore, some lawyers have asked that the DNA fingerprint and blood tests be admitted as evidence in cases of proving parenthood.

**Your Excellencies, Ladies and Gentlemen**

Ever since the first experiments in cloning, the moral, religious, and legal positions concerning them have been the same the world over. It has been agreed that cloning technologies can be used on plants and animals, but that it is a crime to use them on human beings. All the religious institutions and authorities have agreed that human cloning is completely forbidden. They have suggested that anyone who performs human cloning should be severely punished according to religious law. This opinion can be found almost everywhere in the Islamic world and similar opinions were also advanced by the Catholic and the Orthodox churches.

Protecting our societies and their special features from all dangers is one of the top objectives of ISESCO. With the same goal in mind, the Islamic Organization has worked to analyze the moral implications of newly discovered technological and scientific facts, and to evaluate them in the light of Islamic moral principles and values. The Islamic Authority for the Ethics of Science and Technology was established as one of the organizations of ISESCO to evaluate scientific practices and research according to Islamic morals, values, and principles. This is done in order to shape public opinion regarding some important and sensitive moral topics. It was also established to coordinate, consult, and exchange opinions concerning the Islamic issues which are raised

from time to time. Additionally, the authority also aims at studying medical and biological practices in the fields of artificial insemination and cloning as clear from its successive agendas and activities which aim at raising awareness and fostering a sense of responsibility towards controversial moral issues. Therefore, it held a number of specialized conferences and participated in numerous international gatherings on these topics in an attempt to reinforce a complete understanding and to achieve agreement in scientific circles concerning numerous moral issues through publishing books and studies on this issue. The participation of ISESCO in organizing this important conference is part of this endeavor. Its aim is to hold a scientific, religious, philosophical, and social dialogue between Islam, Christianity, Judaism and secularism regarding some controversial medical issues and the moral implications which result from the application of new technologies in the field of genetic engineering.

**Your Excellencies, Ladies and Gentlemen**

Globalization has given rise to unprecedented change in our societies. Furthermore, the rapidly increasing pace of scientific development in our societies has helped bring people closer without discrimination between one religion and another. As religion plays a major role in our societies, ignoring it would lead us to make decisions that would be unacceptable to public opinion. Discussing the role of religion in understanding this unprecedented development will help the majority to be more accepting of these changes.

On a final note, I would like to offer my thanks and appreciation to the Arab Republic of Egypt for hosting this important international conference and for its hospitality. I would also like to thank everyone who helped make this conference successful and to thank the Islamic Organization for Medical Sciences for its close cooperation with us. Last but not least, I thank our partners: the Regional Office of the WHO, and the International Council for Medical Science Organizations, as well as the scientists who contributed to the symposium, and all the attendees. I wish them all success and hope they will make use of the information and expertise which they gain from the conference.

Thank you

# ADDRESS BY
# DR. ABDUL RAHMAN A. AL-AWADI

President of the Islamic Organization for Medical Sciences,
Kuwait

# Address by
# Dr. Abdul Rahman A. Al-Awadi

President of the Islamic Organization for Medical Sciences,
Kuwait

Dr. Ahmed Nazif, Prime Minister of Egypt,

Dr. Mohamed Sayed Tantawi, the Grand Imam,

His Holiness Pope Shenouda,

Dear Ministers and scientists,

Ladies and Gentlemen,

I would like to welcome you all in Egypt, the heart of the Arab world, and in this international conference held under the sponsorship of the four organizations. This conference is one of several conferences held by the IOMS. It derives its special importance, however, from the type of participants attending the conference as well as from the nature of the scientific material and its importance for both the present and future of humankind.

Its participants are representatives of the revealed religions, or venerable secularists. This is the first time that the IOMS holds a conference for such a unique and distinguished gathering. Moreover, the topic of the symposium is particularly important as it has to do with mans existence, and also because it will impact political decisions in numerous ways.

A clear message is being sent to decision makers in politics. The message is that people must take part in shaping their destiny. If scientists work day and night seeking knowledge in order to relieve the pains of the sick, and to provide cheap, safe, and effective medication for them. If they are trying to provide food that would keep them alive, and clothes to protect them from the cold in winter and the heat in summer. If scientists are trying to provide clean potable water for them, they are doing this in order to accomplish the main aim for which governments finance research from the money of the people. People want to see their hopes fulfilled and want to prevent scientific

achievements from falling into the hands of bad people who would use them for evil purposes instead of using them to do good. They want to prevent them from turning these achievements into means for human destruction.

I am afraid lest the voice of wisdom be replaced by the sound of bomb explosions, canon, airplanes, and weapons of mass destruction which would reap the souls of the poor, the sick, the old, children and widows.

Let us while we are gathered today raise our voices and call for people to stand together, and for the voice of wisdom to return, so that justice, love, and mercy prevail among all the peoples of the world.

If we are gathered here today in order to study the effects of the scientific achievements made in the second half of the previous century which made man the center of research, studies and applications, the twentieth century is certainly going to witness a much wider application of medical biotechnology.

Our meeting today is for the sake of good. Although we are followers of revealed religions and of secularism, and although there may be some differences between our beliefs, yet we all took the trouble of traveling from one end of the earth to the other for a noble aim which is protecting human beings and making their lives sacred; protecting their dignity and securing for them the greatest happiness and wellbeing. We are guarding against the misuse of medical biotechnology in a manner that would harm man who is Gods successor on earth. Every person in this auditorium has a veto which he will use the moment he senses even the slightest possibility for abusing man or destroying the sanctity of human life. Any such violation will be refused immediately.

This conference is looking for good and guarding against evil. If we imagine an opposite situation where a group of people have gathered in order to study the same topic, but with evil aims and intentions. If this imaginary group were trying to use this progress in order to destroy the world, then the face of science would become dark, for it would be the source of deadly weapons which would

destroy humankind. Over the course of history, it has been made amply clear that science has potentials for both good and evil. Whichever face you seek, you are going to find.

We have selected the topic of this conference with the utmost care as it represents a breakthrough which places man under the scientific microscope and attempts to study his components one by one. Heredity, genetic engineering, reproduction technology, and cloning have just broken into mans life. Some of them are, in fact, quite promising, and could lead to overcoming many of the problems which humanity faces. However, the problem is that these achievements may fall into the hands of weak souls who would use them for evil purposes.

We are facing dangers which threaten humanity and place man in jeopardy, especially that we are dealing with the issue of heredity. No one can predict what the results may be, for they may not appear right away, but may take some time. They could be destructive for the next generation or the one following it. If this happens, our own generation will be held responsible for this harm. We would all like our children to be smart, tall, and stunningly beautiful, but what if the reverse happens? Would it be the fault of the newborn baby? We would all be guilty, for he did not ask for any genetic change or improvement. No one asked his opinion, so who would be responsible?

We are in a new age of eugenics. Eugenics failed in the past when they were sponsored by fascist governments. Today, however such medical technologies will be within the reach of any family. Or is it going to be available only to the rich and not the poor? Are the rich going to use it as a tool to get rid of the poor? If cloning were permitted and a baby came to life by whatever means, official or unofficial, and he was the result of two of his fathers or of a husband and a wife, has anyone asked the baby if he would like to come to the world using this biological technique? If the nucleus was taken from the father, then who would be the father, the father or the twin? What would his relationship with his parents and society be like? How would society regard him? Would he be stigmatized?

These are just some of the problems, the research papers have many more, and we will discuss them together.

It would be quite naïve and superficial to regard man as a group of systems and organs, and to try to fix one of them if something goes wrong with it. Such a view would be erroneous, for a human being is not just a body; he is also soul, heart, and mind. All these work together, and if one of them suffers, the rest also suffer. A human being is not an inanimate being, or a machine. He has feelings of love and hatred, is a mixture of good and evil. How could we fix each of these when we do not know what it is and we do not know the factors which influence it.

This is why believers in religions, philosophers, sociologists, psychologists, and economists sensed the need to study all the dangers inherent in these technologies to come up with a scientific way to control studies and research and to guide them to the right path. By doing so the desire for knowledge would not override everything else and transform science into a giant that would enslave us.

We must control this giant, or else humanity will pay dearly for it, just as it did once before when the atomic bombs which were thrown on Hiroshima and Nagasaki in World War II. These atomic bombs represented at that time the height of technological achievement, and it was expected that they would bring great good. However, science fell into sin.

Today we are considering means of guiding these sciences to a normal course. This can only happen if we use good morals. Everyone here will try to present the opinions which he holds. Believers in religion will use sources which come from God, and will consider that if their efforts are for the sake of God, then they will be doing good, and if they are for the sake of the devil, then they will be evil. Let me speak a little about Islam and tell you that the prophet, peace be upon him, said that he came in order to complete moral principles. In the Quran, God commends the prophet's excellent morals and says that he was sent as a mercy to all people.

God ordered us in the Quran to believe in Him, His angels, His books, and His messengers "The Messenger believeth in what hath

been revealed to him from his lord, as do the men of faith. Each one (of them) believeth in Allah, His angels, His books, and His Messengers. "We make no distinction (they say) between one and another". (Al Baqarah 285). Then he cautions us and orders us by saying "Say: "O People of the book! Come to common terms as between us and you: That we worship none but Allah"(Ali Imran 64). Then he orders us to argue all matters in a polite fashion "And argue with them in ways that are best and most gracious"(Al Nahl 125). All these are means of urging us to have constructive discussions so that love and peace would prevail and all people would enjoy happiness "To you be your way and to me mine" (Al Kafirun 6). The Quran makes clear the high status that man enjoys with God, for he is preferred to all other creatures "We have honoured the sons of Adam; provided them with transport on land and sea; given them for sustenance things good and pure" (Al Isra 70). God points out that He created man in the best image and ordered the angels to kneel before him. He also taught him all the names and ordered him to tell them to the angels, and when he told them their names, God said I know what you do not know.

Religions are characterized by dividing deeds into permissible ones and forbidden ones. Permissible deeds are good ones, while evil deeds are forbidden. This is made quite clear so that no one would try to make what is permissible forbidden, or what is forbidden permissible.

This is the case with all religions, and therefore we find that the followers of these religions are convinced that morals come from God. He is the one who sent them to us through His Messengers and prophets and we have to follow them. Secularism, on the other hand, makes history and reason the sources of its theories. These human interpretations may be right or wrong, especially that in the field of medical biology, it is not possible to predict the future. Alcoholism, smoking, and unbridled freedom are all forms of human interpretations. Aids and the rise in abortion rates among the unmarried are the result of unbridled freedom. This is due to the fact that secularist postulations and philosophies are based on the principle of utility, which I personally find opportunistic. Maximizing pleasure, happiness,

and material gains all focus on the present moment. However, the losses which might ensue from such behavior in the future could be much greater especially in the area of medical biotechnology. Human interpretations in the field of morals and ethics are influenced by personal beliefs and understanding and also by the circumstances of those who have set these theories. They may be easily influenced by political or economic pressure, or by personal whims.

Does human history support any of these trends? This is what we will find out in the coming few days.

Before I leave the podium, I will suggest on the basis of my simple vision and my long experience that this dialogue continue in order to study all the new results which might appear.

I also think that we are in need of an international moral organization that would clarify both the positive and negative effects of medical biotechnology, particularly in the Third World in order to protect its inhabitants from biotechnology companies which we can expect to operate in the third world where there is no organization or control and where the value of the human being is held in less esteem than in the West.

Before I close, I would like to thank our colleagues in WHO, ISISCO, and CIOMS for participating with us in this important international conference, and for their constructive contributions in facilitating this conference.

I would also like to seize this opportunity to thank ISISCO for first coming up with this idea last year. Due to the importance of the idea and the need for examining and highlighting its different aspects, we decided last year to continue our discussions in this conference.

I would also like to offer my deepest thanks and my gratitude to the hospitable Egyptian people and to President Mohamed Hosni Mubarak and Dr. Ahmed Nazif, the Prime minister of Egypt who kindly sponsored this conference because he believes in the importance of bringing all people and religions together in our cosmic village.

I would also like to extend my thanks to our brothers in the secretariat and the executive committee of the organization for their

support of the activities of the organization and their keenness on discussing them and providing useful and helpful suggestions.

To my sons and brothers in the secretariat of the IOMS and particularly Dr. Ali Al Seif, I offer my thanks for their indefatigable efforts and the perseverance they excercised in order to complete all the tasks they were assigned in the best possible fashion. I offer each and every one of them in my name and on your behalf profound thanks and deepest regard. May God reward them for their sincere efforts.

# Topic II:
# Gentics, Reproductive Technologies and the Family

## Seventh Session
## Wednesday, 8 February 2006

## Reproductive Technology, DNA and Cloning - Islamic and Professional Perspectives

**Chairman** : Dr. Ted Peters
**Rapporteur** : Dr. Mohamed Ali Al-Bar

***Speakers:***

*1 - Dr. Malik Badri*
*2 - Dr. Aida Al-Aqeel*
*3 - A. Farouk Gad*

# THE NEGLECTED CONTRIBUTIONS OF ISLAMIC CIVILIZATION TO GENETICS AND REPRODUCTIVE BIOLOGY

*Dr. Malik Badri*
Malaysia

# The Neglected Contributions of Islamic Civilization to Genetics and Reproductive Biology

*Dr. Malik Badri*

Malaysia

By surveying the writings of modern western reproductive biologists, psychologists and geneticists one would get the conviction that the knowledge about these sciences, and the interaction between heredity and environment with their intricate workings in human development, is a subject that has only come to the fore after the current advancements in reproductive biology, psychology and genetics. Many of them write as if these sciences have no roots in earlier civilizations. As if they have fallen from the sky. This bias is particularly obvious with respect to the repression of the scientific contributions of Islamic civilization to the understanding of heredity and reproductive biology. What is the main reason for this unfair rather arrogant position?

The main reason is that western historians of science, almost without exception, consciously or unconsciously jump from the works of ancient Greeks all the way to the European Renaissance and Enlightenment. This biased leap would at times cause them to ignore more than 15 centuries of scientific developments in other civilizations. As I have recorded in an earlier publication (Badri, 2000), they bypass the Middle Ages, as if the Islamic and other civilisations were on the moon! For example, Marx and Hillix in their well-known reference on the systems and theories of psychology (Marx & Hillix, 1979), write a comprehensive detailed chapter on the emergence of modern science and psychology. They first honour the early contributors of Greek civilization, mentioning prominent figures like Pythagoras, Socrates, Plato and Aristotle who lived from the sixth century B.C. to the early fourth century B.C., they cite Euclid, 300 B.C. From Euclid they jump 15 centuries to Roger Bacon (1214-1294). Similarly, they leap 13

centuries from Galen, second century A.D., to Copernicus in the 16th century.

Some modern non-western thinkers believe that this serious omission was an intentional endeavour to convince modern western societies that their historical and cultural roots are from Greek civilization. This point of view is even supported by the writings of some western scholars who over-stress this false belief. For example, Mannuel Fox unequivocally defends the omission of the contributions of all other civilizations other than the Greeks and Israel to the modern west. In his book *Age of Reason* he emphasises that:

> "...it is imperative that a text in the history of European civilisation be fully self-explanatory. This means not only that it must begin at the beginning, with origins of our civilisation in ancient *Israel and Greece*, but that it must introduce every name or event that takes an integral place in the account and *ruthlessly delete all others no matter how firmly imbedded in historical protocol* " (Manuel, 1984: v-vi; italics added).

In the following pages the writer wishes to highlight some of the repressed contributions of Islam as a religion, worldview and civilization to the study of heredity and reproductive biology and the interaction between heredity and environment.

## The role of the female in conception:

In support of his strong stand that the AIDS virus HIV may not be the only necessary and sufficient cause behind the AIDS epidemic, the well-known scientist Root-Bernstein (1993) states that no confirmed phenomenon is greater than the fact that it is only after the sexual intercourse between men and women that babies are conceived and born. ***Yet before the eighteenth century, as Bernstein confirms, the whole world firmly believed that the baby was formed only from the semen of the man. The woman had no role at all other than being an incubator for the coming baby.*** The facts seemed to support this contention. If no intercourse, no baby; if no ejaculate from the man, no baby. Now, as Bernstein asserts, we know that the woman has an equal role with her egg without which no baby would come. ***But this***

***would not have been known before the invention of the microscope.*** He thus claimed that when scientists confirm the correlation between HIV and the development of AIDS, they may also be unaware of other co-factors.

Further research may or may not confirm the idea of Root-Bernstein, however, what concerns us in this paper is his assertion that the "world" was ignorant about the role of the woman and her egg. Dr. Bernstein and similar scientists continue to repeat that the world had to wait for the invention of the microscope to know about the role of the mother in conception because the "whole world" to them is what they had been taught by the western historians of science whose flying time machine takes them from the Greeks to the European Enlightenment. To use the above statement of Fox, they ruthlessly omit the contributions of others.

While Europe until the eighteenth century had this one-sided belief about reproductive biology, any unlettered Muslim Bedouin in the sixth century knew fully well that the woman had an equal share in the conception of the newborn. The Holy Qur'an, in a number of verses as well as the blessed sayings of the Prophet Muhammad (PBUH), clearly detailed for them the fact that the conception of a baby is a phenomenon shared equally by both man and woman. Fourteen centuries ago, the Holy Qur'anic revelation to the Prophet stated:

"O mankind! We created you from male and female" (*al-Hujurat* (49): 13).

"Verily We created man from a mixture of germinal drop. (*al-Dahr* (76): 2).

And as is documented by Zandani in Professor Keith Moore's textbook, *The Developing Human*, this "mixture" was obviously interpreted by Muslims at the time as that of male and female fluids (Moore, 1983: 12d).

This is supported by the renowned French scholar and surgeon Mourice Bucaille. He wrote the following statement in his classic book, *The Bible, the Qur'an and Science*:

> "From the moment ancient human writings enter into detail (however slight) on the subject of reproduction, they inevitably make statements that are inaccurate. In the Middle Ages- and even in more recent time - reproduction was surrounded by all sorts of myths and superstitions...How could it have been otherwise, considering the fact that to understand its complex mechanisms, man first had to possess a knowledge of anatomy, the discovery of the microscope had to be made, and the so-called basic sciences had to be founded...The situation is quite different in the Qur'an. The Book mentions precise mechanisms in... 'several dozen verses'...and describes clearly-defined stages in reproduction, without providing a single statement marred by inaccuracy (Bucaille, 1979: 198).

If we move from the Holy Qur'an to the sayings of the Prophet, we will find detailed, simplified explanations of these Qur'anic revelations. We read, for example, that a Jew asked the Prophet, "O Muhammad, what is man created from?" The Prophet replied, "He is created from both the man's *nutfah* and the woman's *nutfah*." A *nutfah* is an Arabic word for a part of a drop of fluid. The *hadith* was authenticated by Ahmad ibn Hanbal. For this reason we find all early writings of Arab and Muslim scholars and physicians mentioning this shared process as one of the great miracles of God's creation.

Before the Qur'anic Revelations and for a number of centuries afterwards, it was strongly believed that the embryo originated from the menstrual flow. Again, the disconfirmation of this false belief had to wait for the invention of the microscope. Muslim scholars and laity learnt from the Holy Qur'an that the monthly menstrual blood of women had nothing to do with the creation or development of the growing embryo. On the contrary, the Holy Qur'an affirms that the menstrual flow can be harmful to the couple if they have sexual intercourse during the woman's period and so this practice was forbidden (Surat Albaqarah, Verse No. 222). The way conception takes place and how the zygote develops into an embryo to become a foetus is detailed in the Qur'an with astonishing accuracy. This fact had already been delineated in a number of scholarly papers. However

in this article I wish to share the admiration of Dr. Keith Moore, professor of embryology at Toronto University, who included these findings in his textbook of embryology, *The developing human* (Moore, 1983). He declared in his forward that he was, "astonished by the statements (the verses of the Holy Qur'an) recorded in the 7th century AD, before the science of embryology was established" (p. viiic).

## When heredity takes a dominant or recessive role:

In other sayings, the Prophet had even explained the competing influence of the hereditary contributions of the man and the woman to the developing baby. In an answer to a question about how the growing newborn at times looks like the mother and other times like the father, the Prophet (PBUH) replied that if the part of the droplet of fluid of the father is stronger, the baby will be "pulled" to his features and if the droplet of fluid of the mother is "higher" or "above" or more dominant the child will look more like her. For the Arabs of that time, the Arabic word *nutfah* was the nearest possible description to our modern conception to the male or female gamete.

In another authenticated Hadith (authenticated by Bukhari, Hadith No. 4893), it was narrated that a man was disturbed and suspicious by the fact that his wife had given birth to a black child though both he and his wife were fair in colour. He consulted the Prophet (PBUH) about his dilemma. Instead of giving an immediate answer the Prophet asked the man whether he owns and breeds camels. The man said he was. "What is their colour?" the Prophet asked. "They are yellowish in colour", was the man's reply. "Don't they, in rare occasions, give birth to a dark camel?" The man answered in the affirmative. "How did you explain this though both parents were yellowish in colour?" the Prophet asked. "It must have inherited from a dark ancestor" the man replied. "Indeed", the Prophet said "And your son had also inherited his colour from a distant ancestor". No wiser and simplified approach could have convinced this Bedouin about the fidelity of his wife and the existence of dominant and recessive genes in the working of heredity. That is why some scholars attribute a saying to the

Prophet advising his companions when choosing a wife to be careful from the "concealed" hereditary influences.

## Modern controversy of heredity versus environment: Is it science or philosophy?

The controversy about the competing influences of nature versus nurture has been and is still one of the hottest issues of debate in modern psychology. It has generated very valuable researches in comparing the behaviour of humans and animals and in confirming whether certain attributes are hereditary or environmental in nature. Some of these researches employed highly ingenious techniques such as the use of identical and fraternal twins reared together or apart or the use of advanced photography and computers in studying the behaviour of newly born babies and children. These positive benefits are however counteracted by the misuse of the nature-nurture controversy. Contrary to early Islamic sciences that were guided by faith, spirituality, and equality of men, such modern debates spring from the materialistic philosophical platform of secular humanism and at times from the declared or undeclared supremacy of the white race. Some schools of psychology such as behaviourism, under the influence of its founder, J.B. Watson has greatly exaggerated the role of environment. To this perspective man is fully at the mercy of his environment. As though he were a dry leaf, the 'winds' of the environment can shape his life and behaviour in any way it blows. The following famous statement by Watson clearly illustrates this extreme argument:

> "Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take one at random and train him to become any type of specialist I might select...doctor, lawyer, artist, merchant-chief and, yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors" (Watson 1924, p. 104).

From the philosophical background of secular humanism, such an extreme stand would negate the existence of any unchanging religious or moral values or any permanent qualities in human nature. Since

man's behaviour and his values are the product of his environment, and since every part of the world has its unique culture, then values and morals must be relative and there is no place for any religious commandments or global ethical consciousness. Moral decisions would therefore be the sole responsibility of the people in the here and now and not that of a wise God who rewards and punishes in the Hereafter. In applying this philosophy in the field of reproductive biology, man would be free to kill an unborn child by abortion, clone himself, rent a uterus or kill or assist in killing any person whose life is depressed by an inherited or acquired untreatable disease. He only needs to be permitted by the government of the people for the people by the people.

The other excess in the nature-nurture controversy is the biological extreme point of view which is championed by scholars in fields such as evolutionary psychology, socio-biology and ethology. From the early bio-philosophical ramifications of Darwinism up to the present, man to hereditarianism has always been viewed as an animal mainly propelled by his biology in order to adapt himself to new situations. Natural selection, survival of the fittest - or for that matter, survival of the fittest genes - continues to beat the drums of nature against nurture. This approach in genetics and molecular biology has found great support in the significant discoveries in the aetiology of some inherited disorders; for example the association of an extra chromosome 21 with Down's syndrome and metabolic disorder with phenylketonuria (PKU).

Two of the most important methods used to achieve this 'biologistic' end are reductionism and biological determinism. Reductionism tries to explain the world of human individuals and societies in terms of the smaller units which make them. It is accordingly an atomistic approach. For example, the nature of man and his actions should be understood in terms of the biochemical properties of the cells that make him. And the behaviour of these cells is determined by smaller units in their bodies, namely the genes. Even his thoughts and feelings can theoretically be reduced to such units. As is said by extreme biologically-oriented psychiatrists, "Behind any twisted idea there is a

twisted molecule in the brain." Accordingly, the behaviour of man is *determined* by the properties of his genes. The way these units interact to produce behaviour is already well programmed, and thus there is no place for free choice.

Based on this extremism, a number of contemporary scientists and psychologists have overstressed the role of heredity to the extent of attributing many qualities that are clearly influenced by environmental learning and early upbringing to genes and biological aetiology. Thus we keep reading in journals and popular media about the discovery of a gene or for happiness or criminality and a biological cause for homosexuality and lesbianism.

Though apparently standing at the opposite pole of extreme environmentalism, this 'biologistic' position serves the same philosophical and political current views of secular humanism. Genetics can be manipulated to release people from the moral responsibility for what religion and global values have always considered as bad. For example if one supposedly inherits a homosexual gene or a hypothalamus that predisposes him to be a gay as Le Vay claimed (Pinel, 1993, p. 380), then no body should blame him for this perversion. Again this is the same justification for challenging traditional and religious values and bestowing man with the responsibility of deciding on his own moral code. Thus genetics which is supposed to be a purely scientific endeavour turns out to be a socio-political enterprise. It serves to justify secular humanism from a different route.

Furthermore, and this is more serious, genetics has been used to justify racial prejudice against blacks and disadvantaged people. A number of psychologists and behaviour geneticists have supported the view that it is not really the environmental deprivation that causes Africans to score less in intelligent tests as compared to whites but rather their inferior genes. Listen in this respect to H.J. Eyscenk, the famous British psychologist as he quotes a similarly prejudiced colleague by the name of Jensen:

> The myth of racial equality, while more acceptable in principle to any liberal and well-meaning person than its opposite, is still a myth: there is no scientific evidence to

> support it. Indeed, as Jensen has pointed out, the a priori probability of such a belief is small. '...Nearly every anatomical, physiological, and biochemical system investigated shows racial differences. Why should the brain be an exception?' (As quoted by Colman, 1987, p. 56).

In fact the use of biology to support racial prejudice and white supremacy is not new. As early as the 19th century Sir Francis Galton, the first scientist to study heredity and human behaviour candidly stated that African Americans are outstandingly inferior to white Americans in their native intelligence. Listen to his own words as quoted by Colman:

> The number among the Negroes of those whom we should call half-witted men, is very large. Every book alluding to Negro servants in America is full of instances. I was myself much impressed by this fact during my travels in Africa. The mistakes the Negroes made in their own matters, were so childish, stupid, and simpleton-like, as frequently to make me ashamed of my own species (Colman, 1987, p. 54).

## Heredity versus environment in early Islamic literature:

We have mentioned only examples of the blessed sayings of Prophet Muhammad (PBUH) that speak clearly about the influence of heredity. In other sayings, he asserts that environment can take the major role in influencing human behaviour and beliefs. For example in a famous Hadith (authenticated by Bukhari, Hadith No. 1296) he states that every child is born with an inherited predisposition to believe in the One God (*Fitrah*) but that it is his parents who indoctrinate him to develop other deviant beliefs. The Prophet (PBUH) speaks in this Hadith about an inherited predisposition in the hearts of men to believe in the existence of God, but it is their environment that diverts them from their inborn disposition. It is of interest to note that some modern scientists are referring to a similar inherited predisposition wired in our systems. Chief among them is Dr. Herbert Benson the well known Harvard professor of medicine. In his book, *Timeless healing,* wrote the following:

> Perhaps this tendency of humans to worship and believe was rooted in our physiology, written in our genes, and encoded in our very makeup. Perhaps it is what distinguishes us from other life forms, this innate desire to believe and to practice our beliefs. Perhaps instinctively, human beings had always known that worshipping a higher power was good for them.... The notion that humans might be wired for God seemed to me to be so beyond the realm of traditional scientific study that, as exhilarated as I was about the possibility of its being true, I was also immediately fearful (1996, p. 196).

In the last saying, the Prophet gave us an example about how a strong influencing environment can overcome a hereditary predisposition; how the home environment can distort the child's worldview in a way that will shape his attitudes, his faith and the way he perceive his very existence. On the other hand, in another saying (authenticated by Abu Dawud), the prophet explained how heredity can even influence the psychological personality traits that scholars may often attribute solely to environmental influences. This long saying is narrated as follows:

While the Prophet was sitting with a group of his companions in the city of Madina, a group of travellers arrived in the compound. With the exception of a companion by the name of Almunthir Alashja', they all hurriedly tied their camels and walked to give salams to the Prophet and kiss his hands. Almunthir, on the other hand was unhurried. He slowly took out new clean clothes from his rack and put them on instead of the dirty sweaty ones he was using during his long journey, then he slowly and gracefully walked up to the Prophet who must have watched what he had done with smiling amusement.

After greeting the Prophet with respectful salams, he took his place among his companions. The Prophet looked at him with admiration and said, "You have two characters that Allah and his Prophet like." "What are these characters O Messenger of Allah?" The first was *alhilm*. This is an Arabic word that has no one single translation in English. It stands for adjectives like clemency, forgiveness, forbearance, intelligence and patience. The second was *alanah*. For a person to be

described by this term he would have good qualities such as being unhurried, deliberate and easy going. Almunthir then asked a question that modern psychologists are still debating. He said, "O messenger of Allah! Are these two characteristics the result of my own endeavour or are they already imbedded in my natural disposition?" In modern terminology, this 7th century Arab was literarily asking the Prophet whether these two characteristics or traits had been environmentally developed in him by his own effort or were they genetically predetermined. The Prophet answered that they were imbedded by Allah in his natural predisposition i.e. they were inborn or hereditary. To this Almunthir enthusiastically exclaimed, "All thanks are due to Allah who created in me charter traits that He and his Prophet like."

I have chosen these two authenticated sayings to show the reader that the issue of nature versus nurture was a debate that was not unknown to Islamic civilization since its early days of the companions of the Prophet. I also wish to draw the attention to the reader to the fact that in these debates there was no quarrel or competition between nature and nurture nor were the results of the arguments used to support a prejudiced outlook of Arabs against non-Arabs nor advantaged over non-advantaged. Both nature and nurture are the creation of God to whom every thing belongs and to whom everything will return. This spiritual tradition was followed by all the great scholars and physicians of the golden age of Islamic civilization.

## Are there any special genes that qualify a person to be a prophet?

I wish to conclude this paper by some of my own speculations on the issue of heredity and environment that I have dared to extract from my reading into the Holy Qur'an and Blessed Ahadeeth. To answer the question I posed, I would say that indeed, to be chosen by God to be a prophet, the person should be endowed by his Creator to have special biologically determined characteristics and moral and personality traits such as truthfulness, honesty and intelligence. As stated in Islamic literature, the chosen Prophet must be handsome and must be free from diseases and physical features that repel his people. He should also be endowed with moral, spiritual and psychological

attributes that enable him to endure the "heavy" burden of spiritual Divine revelation and the patience to tolerantly respond to the cruel attacks of his unbelieving people.

We can explain the charisma and the other personality or ethical qualities in terms of our modern social and biological sciences but the spiritual dimension is obviously beyond our limited materialistic and secular sciences. In reading the Holy Qur'an with some contemplation we find that though Prophets and messengers of God have individual differences between them in terms of their physical and psychological qualities, they are all endowed with this highly spiritual nature that qualify them to bear the burden of revelation; to be in such a high spiritual level that allows angels to reveal to them sacred knowledge from God.

What is the real nature of this spiritual quality and does it have any relationship with the biological endowment of the prophet? Is it inherited? One can only guess that it must have something to do with inheritance since the Qur'an Tells us that the Prophets of God are all related to each other. At times they are as near as father and son or brothers or grandparents. For example Ibrahim is the father of both Ismail and Ishaq. Ishaq is the father of Y'qub and Ya'qub is the father of Yusuf. Muhammad and Jesus are grandchildren of Ismail and Ishaq. In describing His bounties on Ibrahim God reveals the following Verses in Surat Al-An'am in the Holy Qur'an:

> "We gave him Isaac and Jacob: all three We guided: and before him We guided Noah, and among his progeny David, Solomon, Job, Joseph, Moses, and Aron: thus We Reward those who do good (Verse No. 84)".

In another Verse (Al-Imran, Verse No. 34) Allah says that his prophets are "Offspring, one of the other". It is obvious that the reason for this Divine wisdom is not environmental. That is so because very few prophets shared the same home environment such as Mussa and Harun. Most of them lived in surroundings that were separated by centuries and thousands of miles. This then must be a different kind of inheritance.

Now what is the Divine reason or secret of this phenomenon? Will

it be too much to speculate that there is an inborn spiritual property that is inherited from generation to the next like physical characteristic and that because of its spiritual nature we will never be able to know its true nature? In modern science we have locked ourselves up in the physical. We cannot imagine that there may be non-physical "genes" that very few selected unequalled people inherit, just as there are genes that give us such rare geniuses as Einstein, Shakespeare, Ibni Sina and Alghazali. I leave this with the reader to contemplate about.

Now that we have discussed the inherited spirituality, what about the other biological and psychological qualities that qualify the person to be a prophet? In reading the Qur'an and the sayings of the prophet with some contemplation, we come to the conclusion that prophets, like normal people differed in the way they looked, the environment they lived in and the families they were brought up in and those they brought up. They also differed in their temperaments and other personality traits. Moses was tall, strong and rather emotional and quick to respond while Ibrahim was extremely kind forgiving and patient. He was arguing with angels asking God not to punish the homosexual people of Lot. Yusuf was miraculously handsome and Jesus was highly spiritual. The Holy Qur'an Tells us that the nature and nurture of each prophet is designed to suit the message he delivered, the environment of his people, the kind of test that God gives to him and the miracles that God sends to support him in his mission.

As for the kinds of miracles supporting a prophet, our scholars relate them to the nature of the society to which the Messenger of God is sent to. For example, they assert that at the time of Mussa (PBUH) witchcraft was the most respected profession. People were impressed by the magical works of the guardians of the ancient Egyptian temples. So the miracles of Mussa were to defeat the magicians and to establish the sovereignty of the one God. The Romans at the time of Jesus (PBUH) were impressed by medicine and so the miracles of Jesus were in curing the lepers and the blind. In Surat Al-Imran, Verse 49, the Qur'an states that Jesus says to his people:

"And I heal those born blind, and the lepers, and I bring the dead into life by Alla's permission."

The Arabs in the time of Prophet Muhammad had the highest regard for poetry and the beauty of expression. So, though Prophet Muhammad was unlettered and he had not authored any poetry until the age of forty, he suddenly came to the Arabs with the matchless Qur'an which stands to this day as the unequalled measure of Arabic eloquence. In describing the unrivalled language and style of the Qur'an, Pickthall said in his foreword to his English translation that it is an "inimitable symphony, the very sounds of which move men to tears and ecstasy". Indeed, it is this symphony that has miraculously kept the Arabic language young and alive to this day.

## An illustrative case of the interaction between nature, nurture And the spiritual dimension from the story of Moses

As for the other human biological and psychological qualities of the prophet one can only speculate as to why they were created in a particular form that best suits their mission. In the Holy Qur'an, this is clearest in the case of Prophet Mussa. He was sent to the Pharaoh, the most arrogant tyrant that the world had known. The Qur'an tell us that he said to his people "I am your greatest god" and "I do not see that you can have a god other than me". Mussa was given the genes of a tall strong man who can respond forcefully to any unjust provocation. In the Qur'an the daughter of Shu'aib described him as the "strong and honest". The Qur'an also tell us that when an Israeli and an Egyptian fought, he gave the Egyptian only one knock that immediately ended his life!

But if he were to be brought up by his biological Israeli parents who lived in continuous terror and harassment from the ruling Egyptians who at the time used to kill their male children and enslave their women, they would have brought him up as a fearful anxious man. If he were to go to preach the pharaoh in that condition he would have been too scared to utter a word. He would have also been anxious seeing the tyrant in his colossal palace and his magnificent throne. So Allah chose to bring him up in the very palace in which he

would begin his mission. He saw the pharaoh as parent and saw him as a normal man. He saw him in his underwear and saw him sick in bed. The palace was his home. He was not impressed like a stranger. So he preserved his biological and psychological strength to face the tyrant and to defeat him. If we study the life of every prophet we will be impressed by the Wisdom of Allah who chose for them the right genes and the suitable environment.

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# ISLAMIC PERSPECTIVE ON HUMAN CLONING, STEM CELL RESEARCH AND PRE-IMPLANTATION GENETIC DIAGNOSIS (PGD)

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Kingdom of Saudi Arabia

# Islamic Perspective on Human Cloning, Stem Cell Research and Pre-implantation Genetic Diagnosis (PGD)

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**Principles of Islamic Ethics:**

- The road to moral and spiritual perfection is described as the "quest for God" in Islam.
- The **essential core of Islamic teachings** is the **perfection of ethical conduct of a human being**. The prophet Mohammad has said *"I have been appointed as prophet of God for the completion and perfection of "moral ethics".*

**Principles of Islamic Ethics:**

- God gave man life and with that also gave man the **freedom and the authority** to do **good or to indulge into evil.**
- God also gave man **the basic knowledge of "good" and "bad"** at the time of his inception.
- The Holy Quran says *"The human soul the way he molded it and inspired it with knowledge of its evil and its good-bears witness to the fact that indeed he, who cleanses it (of all impiety), shall be successful while he, who corrupts it shall face down".*

*Surat 91: 7-10*

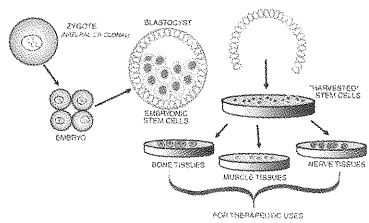
Bioethics in Islam

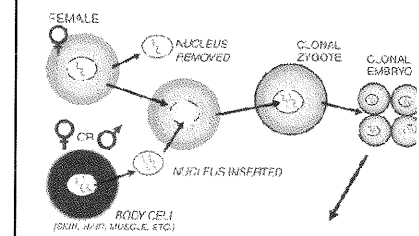
- Islam continues to **deeply influence** the beliefs, values, and customs of an estimated **one fifth** of the human race .
- The **guiding principles** of Islamic Law.

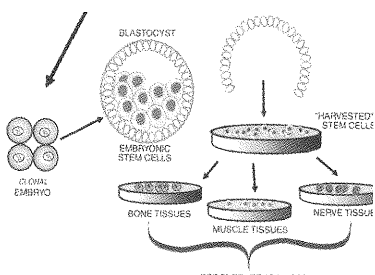
1. Maintenance of life
2. Protection of an individual's freedom of belief
3. Maintaining the intellect
4. Preservation of honor and integrity
5. Protection of property.

What are Bioethics; Bioethics in Islam:

- Islamic bioethics derives from a combination of principles, **duties and rights**, and, to a certain extent, a call to virtue.
- It is intimately linked to the broad ethical teachings of the **Qur'an** and the tradition of the Prophet Mohammad **(Sunna)**, and thus to the interpretation of Islamic law **( Sharia'ha)**.
- Development of Shariah in Islam over the ages has also required **Ijtihad** (the law of deductive logic ).
- Where appropriate, consideration also given to **Maslaha (public interest)** and **Urf (local customary precedent)**.




## Stem Cell Research
### Introduction

- Embryonic stem cells have the unrivaled ability to **differentiate into any specialized** cell type.
- The discovery of stem cells early in the 1980s had suggested **therapeutic** approaches to chronic, debilitating, and incurable diseases such as **Parkinson's disease** and **diabetes mellitus.**

## Stem Cell Research
### Introduction

- The most important characteristics of stem cells are their:
  - **Pleuripotency** (the capacity to differentiate into many different cell types).
  - **Plasticity** (the capacity to change from one type to another).

## Stem Cell Research
### Introduction

Because embryonic stem cells are **pleuripotent,** some believe that these cells hold the potential to **revolutionize medicine** by providing a source of replacement tissue that might one day restore the health of persons suffering from a variety of debilitating conditions - **neural, cardiac, skeletal muscle, pancreas and liver cells.**

## Stem Cell Research
### Introduction

- In **1998,** researchers were able, for the first time, to **isolate human embryonic stem cells.**
- In February **2004,** a team of Korean scientists produced a **line of human embryonic stem cell** in the laboratory.
- This necessitated **guideline settings for decision-making** in the field of this new challenge in different countries.

## Stem Cell Research
### Types of Cloning

1. **Reproductive** cloning: cloning to produce human beings.
2. **Therapeutic** cloning: cloning for productive human cell lines or tissues.

## Stem Cell Research
### Embryonic Stem Cell (ESC) Based Therapies

- Diabetes.
- Parkinson's disease.
- Stroke.
- Arthritis.
- Multiple Sclerosis.
- Heart failure.
- Spinal cord lesions.

## Stem Cell Research
### Embryonic Stem (ES) Cell Sources

1. **Pre-implantation embryos,** termed "pluripotent" from the inner cell mass of a **blastocyst, 4 - 5 days** after fertilization.

- The **embryo** is **unavoidably destroyed** during the process of ESCs harvesting.

## Stem Cell Research
### Embryonic Stem (ES) Cell Sources

2. Somatic cell nuclear transfer (SCNT) or cloning:

- **Research Therapeutic cloning** involves the creation of **a cloned human embryo,** which contains the same genetic characteristics as the progenitor.
- For the purpose of scientific **investigation of early human development** or for medical research aimed at developing **treatments for diseases.**

## Stem Cell Research
### Embryonic Stem (ES) Cell Sources

2. Somatic cell nuclear transfer (SCNT) or cloning: **Advantages:**

- Are **genetically** similar to the cells of the individual who donated the nucleus.
- Are **immunologically** matched to the patient and thus avoid problems of rejection.

## Stem Cell Research
### Embryonic Stem (ES) Cell Sources

3. Human EG cells:

- Derived from the gonadal ridges of aborted fetuses.

## Stem Cell Research
### Embryonic Stem (ES) Cell Sources

4. Adult tissues:

- Brain.
- Skeletal muscle.
- Bone marrow.
- Umbilical cord blood.

## Stem Cell Research
### Embryonic Stem (ES) Cell Sources

4. Adult tissues:

- Stem cells from one tissue can circulate to another tissue and adopt the developmental fate of the second tissue (a process called trans **differentiation**). eg, adult stem cells can show considerably more plasticity.
- Adult stem cells have **restricted renewal potential.**

## Stem Cell Research
### Ethical Challenges

- Morally controversial because it involves the **deliberate production,** use, and ultimate **destruction of human embryos.**
- To create new cell lines, it is necessary to **destroy preimplantation blastocytes.**
- The question is whether the destruction of human embryos in stem-cell research amounts to the **killing of human beings.**

## Stem Cell Research
### Ethical Challenges

- One side of the spectrum are the **"conceptionalist" view.**
- According to this view the embryo is a "person".



## Stem Cell Research
### Ethical Challenges

1. The human **"personhood"** and thus claims of moral status and dignity, begins at **conception,** or - as in cloning - at the **genetic beginning.**

- **Rules out** not only stem-cell research, but all **fertility treatments** that involve the creation and discarding of excess embryos



## Stem Cell Research
### Ethical Challenges

However, **defenders** of in vitro fertilization point out that **embryo loss in assisted reproduction** is **less frequent** than in **natural pregnancy,** in which more than half of all fertilized eggs either fail to implant or are otherwise lost.



## Stem Cell Research
### Ethical Challenges

2. A different moral argument underlines that **embryos** do deserve protection and a certain respect, **but not to the same extent as fully developed babies.**

- **Moral** status of embryos gradually **increases with their development.**
- Destruction of embryos can be justified.



## Stem Cell Research
### Ethical Challenges

3. Certain **milestones** exist in embryonic **development:**

- Early stage of development has the potential to develop into either one individual or several.
- No ontological individuality.
- **Prior to 14 days** of development, embryos may be used for research **(before the primitive streak).**
- **After 14 days,** the moral status of the embryo outweights the (potential) interests of others.



## Stem Cell Research
### Ethical Challenges

4. Human ESCs **cannot develop into human beings,** they should not be considered human embryos.



## Stem Cell Research
### Research Cloning Perspectives

- **"Fetalist"** perspective (focusing on the moral value of the embryo).
- **"Feminist"** perspective (with the interests of women, particularly candidate oocyte donors, playing a central role.
- Women themselves become objects of instrumental use.



## Stem Cell Research
### Alternatives for Human ESC

- Stem cell research and therapeutic cloning can only be morally acceptable if there are no good alternatives:
  - ⌘ Xenotransplantation.
  - ⌘ Use of hEG cells from primordial germ cells of dead fetuses seems from a moral perspective to be more acceptable.
  - ⌘ Adult stem cells.

## Stem Cell Research
### Alternatives for Human ESC
### Adult Stem Cell - Advantages

- Moral nature.
- Avoids **immunity** system rejection problems but may not provide a long term source of progenitor cells.

## Legislation - Stem Cell Research
### Public Policies

- Decisions about the use of governmental funds.
- To permit, regulate, or prohibit some activity such as human cloning.

## Legislation - Stem Cell Research
### Public Policies

- Announcement in 1997 of **Dolly's** Declaration.
- In **1998,** the **United Nations General Assembly** endorsed the Declaration. The Declaration expressly **banned the reproductive cloning of human beings.**
- **UNESCO's** International Bioethics Committee (IBC) on the "The use of Embryonic **Stem Cells in Therapeutic Research"** is also published in 2001.

## Cloning and Stem Cell Research

In 2003 **United Nations General Assembly** failed to pass a treaty on reproductive cloning because of insistence by some countries that the treaty include a ban on cloning for research.

## Cloning and Stem Cell Research

In 2003 **The European Union (EU)** failed to agree on conditions for funding stem cell research because of the diversity of views and policies of the countries of the EU.

## Cloning and Stem Cell Research

- On 8th **March 2005, UNGA Resolution 280/59 on cloning:**
  - Ban reproductive cloning.
  - Protection of human life in biomedical research.
  - Forbid misuse of women in research.
  - Use of biotechnology in a way to protect human rights and dignity.
  - To put clinical guidelines for research in each country.
  - A call to use national funds for research on HIV, TB, malaria.

## Legislation - Stem Cell Research
### Public Policies

- **United States,** proposed a **complete ban on human nuclear transfer,** whereas other countries wish to allow production of cells from cloned embryos.
- **Costa Rica and Germany,** it is prohibited to **destroy embryos for research purposes.**
- **Belgium and United Kingdom** allow research on surplus embryos as well as the creation of embryos for research purposes **within 14 days after fertilization.**

## Legislation - Stem Cell Research
### Public Policies

- **Denmark and Japan,** allows for research on **surplus embryos** while prohibiting the creation of embryos solely for research purposes.
- **US and German governments** have adopted policies that **restrict government funding to stem cell research.**

## Legislation - Stem Cell Research
### Public Policies

- **European countries** unanimously agree that **reproductive cloning** should be **prohibited,** there is no agreement to be found on whether or not research into therapeutic cloning should be permitted.
- Some **30 countries** including Australia, Columbia, Costa Rica, Denmark, Georgia, Germany, Japan, Latvia, Norway, Perus, Spain and United Kingdom have so far enacted a variety of laws that **prohibit reproductive cloning.**
- Embryonic stem cell **research** are a **national priority** in several countries such as **UK and Australia.**
- **Saudi Arabia** used adult ESC to treat patients with leukaemia.



## Stem Cell Research
### Conclusion

- It is recommended that research involving human embryos be permitted for therapeutic purposes with full considerations and all precautions.
- Clearly informed consent for embryo research is essential.



## Stem Cell Research
### Problems in Reproductive Cloning in Islam

**Muslim Juries**

- The loss of **kinship and lineage** due to the unnaturalness of reproduction.
- The **social harms.**
- **Unjust eugenics.**
- Contradiction of the diversity of **creation !!**



## Stem Cell Research
### Therapeutic and Research Cloning in Islam

The Holy Quran describes stages of the human creation in Surat 83:12-14:

We created man of an extraction of clay, then We set him a drop in a safe lodging, then We created of the drop a clot, then We created of the clot a tissue, then We created of the tissue bones, then We covered the bones in flesh; therefore We produced it another creation. So blessed be God, the Best of Creators".



## Stem Cell Research
### Therapeutic and Research Cloning in Islam

- **Ensoulment** (when God says, "thereafter We produced him as another creation") **120 days** after fertilization.
- The embryo even in the pre-ensoulment stages has **sanctity;** its **eradication** is a **sin** but its punishment (blood money) will be less than abortion after ensoulment.



**14.** Then We made the *Nuffah* into a clot (a piece of thick coagulated blood), then We made the clot into a little lump of flesh, then We made out of that little lump of flesh bones, then We clothed the bones with flesh, and then We brought it forth as another creation.[11] So Blessed is Allâh, the Best of creators.

**15.** After that, surely, you will die.

**16.** Then (again), surely, you will be resurrected on the Day of Resurrection.

ثُمَّ خَلَقْنَا النُّطْفَةَ عَلَقَةً فَخَلَقْنَا الْعَلَقَةَ مُضْغَةً فَخَلَقْنَا الْمُضْغَةَ عِظَٰمًا فَكَسَوْنَا الْعِظَٰمَ لَحْمًا ثُمَّ أَنشَأْنَٰهُ خَلْقًا ءَاخَرَ ۚ فَتَبَارَكَ اللَّهُ أَحْسَنُ الْخَٰلِقِينَ ﴿١٤﴾

ثُمَّ إِنَّكُم بَعْدَ ذَٰلِكَ لَيَّتُونَ ﴿١٥﴾

ثُمَّ إِنَّكُمْ يَوْمَ الْقِيَٰمَةِ تُبْعَثُونَ ﴿١٦﴾

*Surat 83*



**67.** It is He, Who has created you (Adam) from dust, then from a *Nuffah* [mixed semen drops of male and female sexual discharge (i.e. Adam's offspring)] then from a clot (a piece of coagulated blood), then brings you forth as an infant, then (makes you grow) to reach the age of full strength, and afterwards to be old (men and women) -- though some among you die before,-- and that you reach an appointed term in order that you may understand.[11]

هُوَ الَّذِى خَلَقَكُم مِّن تُرَابٍ ثُمَّ مِن نُّطْفَةٍ ثُمَّ مِنْ عَلَقَةٍ ثُمَّ يُخْرِجُكُمْ طِفْلًا ثُمَّ لِتَبْلُغُوٓا۟ أَشُدَّكُمْ ثُمَّ لِتَكُونُوا۟ شُيُوخًا ۚ وَمِنكُم مَّن يُتَوَفَّىٰ مِن قَبْلُ ۖ وَلِتَبْلُغُوٓا۟ أَجَلًا مُّسَمًّى وَلَعَلَّكُمْ تَعْقِلُونَ ﴿٦٧﴾

*Surat 40*



**5.** O mankind! If you are in doubt about the Resurrection, then verily We have created you (i.e. Adam) from dust, then from a *Nuffah* (mixed drops of male and female sexual discharge i.e. the offspring of Adam), then from a clot (a piece of thick coagulated blood) then from a little lump of flesh — some formed and some unformed (as in the case of miscarriage) — that We may make (it) clear to you (i.e. to show you Our Power and Ability to do what We will). And We cause whom We will to remain in the wombs for an appointed term, then We bring you out as infants,[10] then (give you growth) that you may reach your age of full strength. And among you there is he who dies (young), and among you there is he who is brought back to the miserable old age, so that he knows nothing after having known. And you see the earth barren, but when We send down water (rain) on it, it is stirred (to life), and it swells and puts forth every lovely kind (of growth).

يَٰٓأَيُّهَا النَّاسُ إِن كُنتُمْ فِى رَيْبٍ مِّنَ الْبَعْثِ فَإِنَّا خَلَقْنَٰكُم مِّن تُرَابٍ ثُمَّ مِن نُّطْفَةٍ ثُمَّ مِنْ عَلَقَةٍ ثُمَّ مِن مُّضْغَةٍ مُّخَلَّقَةٍ وَغَيْرِ مُخَلَّقَةٍ لِّنُبَيِّنَ لَكُمْ ۚ وَنُقِرُّ فِى الْأَرْحَامِ مَا نَشَآءُ إِلَىٰٓ أَجَلٍ مُّسَمًّى ثُمَّ نُخْرِجُكُمْ طِفْلًا ثُمَّ لِتَبْلُغُوٓا۟ أَشُدَّكُمْ ۖ وَمِنكُم مَّن يُتَوَفَّىٰ وَمِنكُم مَّن يُرَدُّ إِلَىٰٓ أَرْذَلِ الْعُمُرِ لِكَيْلَا يَعْلَمَ مِنۢ بَعْدِ عِلْمٍ شَيْـًٔا ۚ وَتَرَى الْأَرْضَ هَامِدَةً فَإِذَآ أَنزَلْنَا عَلَيْهَا الْمَآءَ اهْتَزَّتْ وَرَبَتْ وَأَنۢبَتَتْ مِن كُلِّ زَوْجٍۭ بَهِيجٍ ﴿٥﴾

*Surat 22*

**The Islamic Jurisprudence Council of the Islamic World League (28 June - 3 July 1997) Decree # 2/100D10: On Cloning**

- Human Cloning that lead to human reproduction is **forbidden.**
- It is **forbidden** in all cases to introduce a **third party into marriage,** be it an egg donor, a surrogate womb, a sperm donor, or a cloned cell.
- It is **permissible** to use genetic engineering and cloning in the fields of **germs, microorganisms, plants, and animals,** following legitimate rules which lead to benefits and prevent harm.

The Fatwa of the Islamic Jurisprudence Council of the Islamic World League (Organization of Islamic Countries) in Makkah Al-Mukarama in Its 17th Session (19 - 23.10.1424 H/ 13 - 17 December 2003G)

**Stem Cell Therapy**

- Stem cells are cells from which the fetus originates, which with the **permission from God, can differentiate** into all the various cells of the human body.
- Scientists have recently recognized, isolated and grown these cells with the aim of carrying out different scientific experiments and of **using them in therapy for some diseases.**
- They are expected to have a potential future effect in treating many diseases and congenital malformations (e.g., **cancer, diabetes mellitus, renal and hepatic failure, among other diseases).**

The Fatwa of the Islamic Jurisprudence Council of the Islamic World League (Organization of Islamic Countries) in Makkah Al-Mukarama in Its 17th Session (19 - 23.10.1424 H/ 13 - 17 December 2003G)

**Stem Cell Therapy**

- These cells could be produced from different sources:
  - The **embryo at the blastula stage** (the spherical mass of cells from which all human cells are produced); the main source is **zygotes remaining from in vitro fertilization,** though another sources could be through **fertilization of donated ovum and sperm to produce a blastula.**
  - **Aborted fetuses** at any stage of pregnancy.
  - Placenta or umbilical cord.
  - Children and adults.
  - **Therapeutic cloning;** where an adult somatic cell is taken from an adult, its nucleus is removed and inserted into an **enucleated egg,** which is then grown to the blastula stage.

**The Islamic Jurisprudence Council of the Islamic World League (13 - 17 December 2003) Decree # 3 on Stem Cell Therapy**

- **First:** It is **permissible** to use stem cells, if its **source is legitimate,** as for example:
  - **Adults** if they give permission, without inflicting harm on them.
  - **Children,** provided that their guardians allow it, for a legal benefit and without inflicting harm on the children.
  - The **placenta or the umbilical cord,** with the parents' permission.
  - A **fetus** if spontaneously aborted or when aborted for a therapeutic reason permitted by sharia'ha, with the parents' permission. **Left over zygotes** remaining from in vitro fertilization, if donated by the parents, when ascertained not using them in an illegal pregnancy.

**The Islamic Jurisprudence Council of the Islamic World League (13 - 17 December 2003) Decree # 3 on Stem Cell Therapy**

- **Second:** It is **forbidden** to use stem cells, if their source is **illegal.** As for example:
  - Intentionally aborted fetuses (that is, abortion without a legal medical reason).
  - Intentional fertilization between a donated ovum and sperm.
  - Therapeutic human cloning (just to create the embryo to be a stem cell donor).

## Stem Cell Research

**Therapeutic and Research Cloning in Islam**

- The **use of embryo for therapeutic** or research purposes may be acceptable under **necessity** if it takes place **before** the point at which the embryo is **ensouled.**
- Islamic Republic of Iran is one of the first countries that has produced human embryonic stem cells.

## Stem Cell Research in Islam

**Conclusions**

- No reproductive cloning.
- ESC research for therapeutic purposes is permissible with full consideration and all possible precautions, in pre-ensoulment stages of the fetus with informed consent of the concerned.

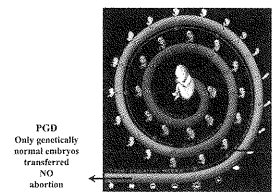
## Pre-implantation Genetic Diagnosis (PGD)

Was introduced at the **beginning of the 1990s** as an alternative to prenatal diagnosis, to prevent termination of pregnancy in couples with a high risk for offspring affected by **a sex-linked genetic disease.**

## Pre-implantation Genetic Diagnosis (PGD)

- The technique is used mainly in **two broad indication groups:**
  1. Individuals at high risk of having a child with a genetic disease, e.g. **carriers of a monogenic disease** or of **chromosomal structural aberrations,** such as translocations.
  2. Those being treated with in-vitro fertilization **(IVF),** who might have a low genetic risk but whose embryos are screened for chromosome aneuploidies to **enhance their change of an ongoing pregnancy**
  3. **Design Baby** ( HLA typing) ! ! !

## Prenatal vs Pre-implantation Diagnosis




## Overview on PGD - Principle

- PGD is a technique that allows the determination of genotype of embryo before implantation.
- It avoids the difficult decision of whether or not to terminate the pregnancy (Prenatal Diagnosis).

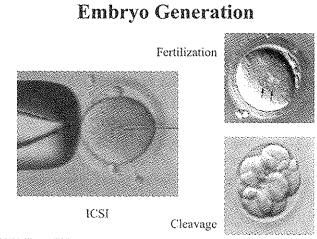
## Overview on PGD - Principle

- Embryo generation: Intracytoplasmic Sperm injection (ICSI).
- Embryo biopsy: Tyrode's Acid.
- Single cell diagnosis: PCR-FISH-CGH.

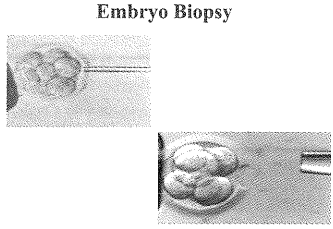
## Preparation of Patients

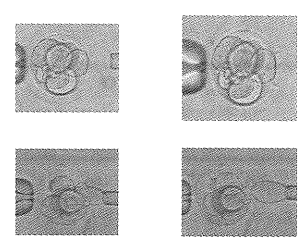
- Controlled ovarian hyper stimulation.
- GnRHa and gonadotropins.
- Ultrasonic scanning of ovaries for development of multiple follicles.
- hCG injection.
- Ultrasound guided transvaginal aspiration.

## Embryo Generation




## Embryo Biopsy





## Overview on PGD - Principle
### Single Cell Diagnosis

- Polymerase Chain Reaction (PCR).
- Fluorescent In Situ Hybridization (FISH).
- Modified Comparative Genome Hybridization (MCGH).

## Overview on PGD - Principle
### Single Cell Diagnosis
### PCR

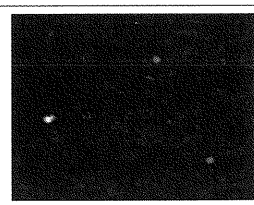
PCR in PGD is used for single gene disorders. Any disease with identified mutation could be avoided by PGD.

## Overview on PGD - Principle
### Single Cell Diagnosis
### FISH

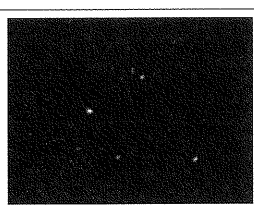
FISH is used for chromosomal abnormalities like translocations aneuploidies etc... Today technology can diagnose up to 13 - 15 chromosomes however with accuracy around 80%.

*Abdelhadi et al. Jan 2003*

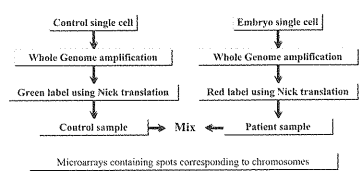
## Normal Male X, Y, 13, 18 and 21



## Male Trisomy X, Y, 13, 18 and 21



## Overview on PGD - Principle
### Single Cell Diagnosis
### MCGH




## Overview on PGD - Principle
### Advantages

- Alternative to prenatal diagnosis.
- Avoids transmission of genetic disorders (PCR).
- Importance of PGD on the outcome of IVF in term of pregnancy (FISH-MCGH).
- Lowered medical cost.

## Overview on PGD - Principle
### Disadvantages

- Single cell amplification problems:
  - Failure of amplification.
  - Allelic Drop Out.
  - Contamination.
- FISH Problems:
  - Limited number of chromosome diagnosed for aneuploidy.

## Risks of PGD

- Risks of embryo biopsy.
- Removal of cells from the embryo.
- Faulty results (misdiagnosis).

## King Faisal Experience

| Disease | Cycle | Pregnancy |
|---|---|---|
| Cystic fibrosis | 4 | 1 |
| Wiscot Aldrich | 2 | 1 |
| Hydroxylase | 1 | 0 |
| Morquios | 1 | 1 |
| Sickle cell | 3 | 1 |
| Thalassemia | 1 | 1 |
| Zellweger | 1 | 1 |
| Sanjad Sakati | 3 | 2 |
| Glutaric Aciduria | 1 | 0 |
| Hunter | 1 | 1 |
| Niemann Pick | 1 | 1 |
| PAH | 1 | 1 |
| CAH | 3 | 1 |
| SMA | 2 | 2 |
| Total | 30 | 16 |

## King Faisal SH & RC
### Single Gene Disorders

| Ataxia Talangectasia | MSUD |
|---|---|
| Arginosuccinicduria | MTHFR |
| Cystic fibrosis | Nieman Pick |
| CPT1 deficiency | Propionic acidauria |
| CAH | PKU |
| Canavan | Pompe disease |
| Fragile X | Protein B deficiency |
| Glutaric acidauria | SMA |
| Gaucher | Sanjad-Sakati |
| Homocystinuria | Sickle Cell |
| Hurler | Thalassemia |
| Hunter | Wiscott-Aldrich |
| JHF (Hyalinosis infertile) | Zellweger |
| Morquio | |

## King Faisal SH & RC - PGD
### 3 Years Experience
### FISH Cases

- Done cases:
  - Turner syndrome Mosaicism (X0).
  - Balanced Translocations (5).
  - Inversions: 8; 9.
  - Hunter disease (X-linked disease).
- Scheduled cases:
  - Balanced Translocations.
  - Inversions (2).
  - Prader-Willi syndrome.

## King Faisal SH & RC - PGD
### 3 Years Experience

Outcomes of PGD in our center are more encouraging using PCR than FISH mainly because of the patient age, number and quality of embryos.

## Pre-implantation Genetic Diagnosis (PGD)
### Ethically Difficult Indications

- In **non-disclosure PGD,** which has been described for **Huntington's** disease but could also be applied to other late-onset diseases, patients do not wish to know their carrier status but want to have **disease-free offspring's.**
  - The **ESHRE (European Society for Human Reproduction and Embryology)** ethics task force discourages non-disclosure testing, encouraging instead **exclusion testing.**

## Pre-implantation Genetic Diagnosis (PGD)
### Ethically Difficult Indications

- Another new indication for PGD involves the selection of embryos, according to their **HLA type,** so that a child born out of a PGD cycle can be **stem-cell donor** for a sick sibling.

## Pre-implantation Genetic Diagnosis (PGD)
### Ethically Difficult Indications

- The use of PGD to diagnose risk of **late-onset diseases** (such as Huntington's disease and Alzheimer's disease) and to search for genes that predispose for **cancer** (BRCA1, BRCA2, Li-Fraumeni, neurofibromatosis 1 and 2) is also ethically debatable.

### Pre-implantation Genetic Diagnosis (PGD) Ethically Difficult Indications

- Several reports have been published on the use of **sexing for social reasons** and have provoked mixed reactions.

### Pre-implantation Genetic Diagnosis (PGD) Ethically Difficult Indications

- A distinction should be made, however, between sex selection for convenience and for so-called **family balancing.**

### Pre-implantation Genetic Diagnosis (PGD) Ethically Difficult Indications

- In **family balancing,** the family should have at least one or two children of one sex before they can ask for a child of the opposite sex.
- The issues of **sex discrimination** and skewed sex ratios are **avoided,** giving the family an increased autonomy without conflicts with other ethical principles.

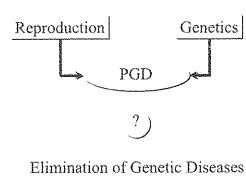
### Pre-implantation Genetics Diagnosis in Islam

- A workshop organized by **Al-Azhar University, Cairo** recognized the importance of PGD, but was guarded about its use on non medical grounds such as sex-selection or family balancing
- The same conclusion was drawn by the **Islamic Organization of Medical Sciences in Kuwait,** and also by the **Organization of Medical Sciences and Biotechnology in Jordan,** since PGD is done at pre ensolument stage.

### Conclusion

- PGD is one of the best option available so far as prevention tool for genetic disease in Islamic Countries.
- PGD could be used for patients suffering of recurrent abortion.
- PGD-PCR should be used with fluorescence detection system.
- MCGH should be used instead of FISH in order to diagnose all the cell chromosomes.

### Dream

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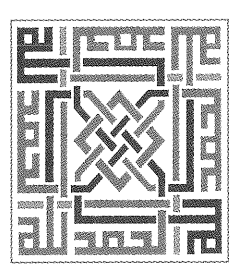
- Dr. Mohammed Al Bar, MD., FRCP., Consultant Islamic Medicine, King Abdulaziz University, Jeddah, Saudi Arabia.
- Miss Betty Weir, Department of Pediatrics, Riyadh Armed Forces Hospital, Saudi Arabia.



# CONTRIBUTIONS OF GENETIC ENGINEERING RESEARCH TO UNDERSTAND ISLAM AS BELIEVED WITH FACTS IN QURAN AND SUNNA

*Dr. rer nat. Abd-ElAziem Farouk Gad*

Malaysia

# Contributions of Genetic Engineering Research to Understand Islam as Believed with Facts in Quran and Sunna

*Dr.rer.nat. Abd-ElAziem Farouk Gad*

Malaysia

Human and animal cloning, gene therapy, diagnostic and drug discovery have very positive confirmation and explanation for the description of human creation in different Quranic verses. The creation of everything in our life from pairs have been explained and described from Prof. Zagloul Al Naggar in several articles and his home pages

The molecular evolution of life based on the intermediate adaptor RNA indicates that Allah SW is the creator and not the nature. The last research in molecular understanding of Sexual reproduction, benefit of sex and even choice of wife and their effect on children genetic performances have shown lot of similarities to Quranic verses and Hadith. The secret for the seed germination without any fertilizer or biofertilizer but only using water have been described very clearly in the Quran. Phytate molecules were the stored secret for the seed germination with water only. Phytate (inositol hexakisphosphate, $IP_6$) is a regulator of intracellular signaling, a highly abundant animal antinutrient, and a phosphate stored in plant seeds. The understanding of hydrolysis of this molecule in seeds is shared in the discovery of biofertilizers, animal feed and biopharmaceutical especially anticancer. The last 10 years of genetic engineering including my research in phytate biosynthesis and degradation enzymes confirmed and declared the following facts in the Quran:

1 - DNA is dead genetic material without transformation or be transferred to living host,

2 - The dominant enzymes will be activated in dead seeds by water only

3 - The nutrients secreted from the root of germinated seeds will

bring the life in the non fertile earth by activating selectively for soil microorganisms and transform soil from dead to life soil.

"It is Allah who causeth the seed-grain and the date-stone to split and sprout. He causeth the living to issue from the dead, and He is the one to cause the dead to issue from the living. That is Allah. Then how are ye deluded away from the truth?" (Al-An'am 6:95).

"And we send down from the sky rain charged with blessing, and we produce there with gardens and grain for harvests" (Qaf 50:9).

## 1. Cloning and genetic engineering of microorganisms, human and animals are different:

Cloning and molecular cloning are known and established since hundred years ago. Cloning and gene manipulations of bacteria showed the successful production of several therapeutic proteins such as *E. coli* insulin instead of using animal or human tissue. Cloning of plants was carried out since thousand years ago but the revolutions have been achieved between 1980 and 1990 through gene manipulation and gene transfer in plants with the hope to achieve and cover food and pharmaceuticals for the poor. I have produced bacterial enzymes [9, 10, 11, 12, 5] and antibiotic peptides [9, 10, 12,11] in our lab in Germany during the last 15 years [3]. From those previous experiences I noticed a lot of plants have been mutated not only from recombinant gene insertion but also from the cloning procedures, chemical and the transformation methods. Even plants can tolerate higher genetic loads than animals and human. Plant genomes can carry much greater load of mutations than animals before the phenotype is affected. For example, half of the maize (corn) genome appears to be made up of foreign DNA. Most of it is in the form of retroelements that resemble retroviruses. The maize plant appears to function quite well with this entire "hitchhiking" DNA. Animals also have a significant amount of foreign DNA, but aneuploidy and polyploidy can be developmentally harmful to them. When plants are aneuploid or polyploid, the consequences can be adaptive. Many flowers found in the florist shop and the wheat used for bread flour are examples of successful polyploids

Despite these major differences among many plants and animals, developmental genetic studies are revealing some commonalities between them in the regulation of basic molecular mechanisms of patterning, along with evolutionarily distinct solutions to the problem of creating three-dimensional form from a single cell. Human genome size according to the last updated paper in Nature estimated 2.85 billions of nucleotides (unit of DNA) per cell and the number of cells in a human body can be approximated to $10^{14}$ or one hundred trillion cells. The genetic materials in adult human body can be estimated to be 2.85 x $10^{23}$of DNA nucleotides. The deletion or addition (mutations) of one nucleotide of the human genome in any cell can lead to cancer or other genetic diseases and can even lead to death. The human genome sequence have shown that 99.9% of the whole human genomes are homologous and stable. The changes and molecular evolution of genome will not lead to changes in creation.

"So set (O Muhammad SAW) your face towards the religion of pure Islamic Monotheism *Hanifan* (worship none but Allah Alone) Allah's *Fitrah* (i.e. Allah's Islamic Monotheism), with which he has created mankind. No change let there be Khalq-illah (i.e. the Religion of Allah-Islamic monotheism), that is the straight religion, but most of men know not. (Arum, 30:30)

## 2. Pairs Creation:

The creation of everything in our life from pairs have been explained and described from Prof. Zagloul Al Naggar in several articles and his home pages. The life, sexual reproduction in plant, animal and human and DNA were created from pairs. The DNA paired in the process of DNA recombination as one of the important event in genetic engineering. The DNA was double stranded before pairing and during recombination the DNA shared only with a single stranded copy. The understanding of this process solves a lot scientific problems in molecular cloning and gene therapy. In the 1953, scientists began to unravel the chemistry of life when Watson and Crick proposed a model for DNA. Soon thereafter the genetic code was

broken, and the chemical mechanism behind evolution became clear. The hypothesis put forth is outlined below:

Sections of DNA called genes store the information needed to make proteins, and this information is passed from one generation to the next when genes are replicated during reproduction. The replication process is not perfect, and as such it may (by chance) introduce errors. Errors during replication (called mutations) have the potential to create new genes. Mutations may create new information or they may simply alter existing information. In either case, nature preserves beneficial mutations (through the process of natural selection) and other mutations survive by chance (genetic drift). Changes to existing genes over many millions of years yield new genes; therefore, animals continually evolve and adapt.

Soon after its proposal, this hypothesis became the framework for the theory of molecular evolution. While scientists have modified it over the years, the basic framework of the hypothesis remains intact with one important exception.

If an existing gene evolves into a new gene with a new function, then the original function will be lost, and natural selection will not allow this to happen. So Ohno suggested that existing genes do not evolve into new genes unless they are first duplicated. The duplicate copy is free to evolve a new function while the original maintains its current function. Others have refined the theory further by suggesting that pieces of existing genes may be duplicated and then rearranged to create new genes with new functions. With these modifications, the molecular theory certainly explains the origin of many genes.

But even with these improvements, the concern raised earlier remains the same - why not ask if evolution can happen? Science describes how it happens, but why not take the next step and investigate the probabilities associated with the required events. That is rather than assume that naturalistic laws are responsible, prove that these laws are responsible. This avoids the trap. Thus, experiments are needed to test whether or not evolution is possible.

A ten year experiment can hardly hope to model a billion years of evolution, but today there is a solution to this problem. Scientists

around the world are actively sequencing the DNA of many animals, plants and bacteria, and after more than three decades of characterization, this information is freely available in online databases. These databases allow science to ask for the very first time two important questions. Can mutations operating over billions of years and guided by natural selection create new genes? And perhaps more importantly, are naturalistic laws solely responsible?

"So set (O Muhammad SAW) your face towards the religion of pure Islamic Monotheism *Hanifan* (worship none but Allah Alone) Allah's *Fitrah* (i.e. Allah's Islamic Monotheism), with which he has created mankind. No change let there be Khalq-illah (i.e. the Religion of Allah-Islamic monotheism), that is the straight religion, but most of men know not. (Arum, 30:30)

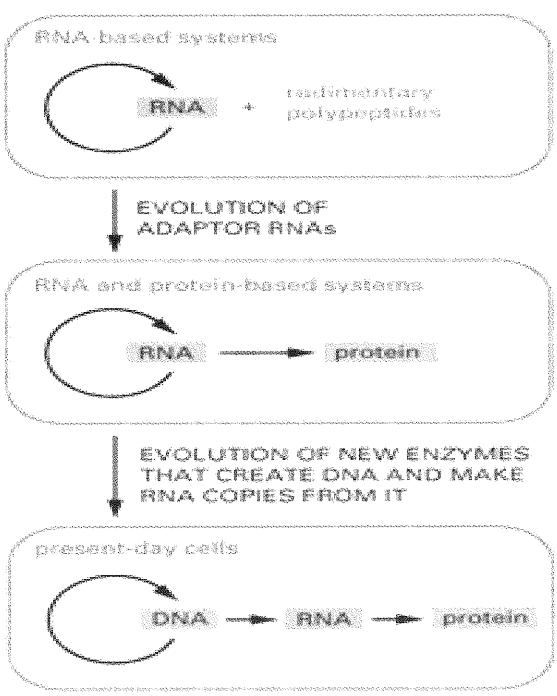



**Figure 1. Suggested stages of evolution from simple self-replicating systems of RNA molecules to present-day cells. Today, DNA is the repository of genetic information and RNA acts largely as a go-between to direct protein synthesis.**

## 3. DNA Pairing and their beneficial role in sexual reproduction:

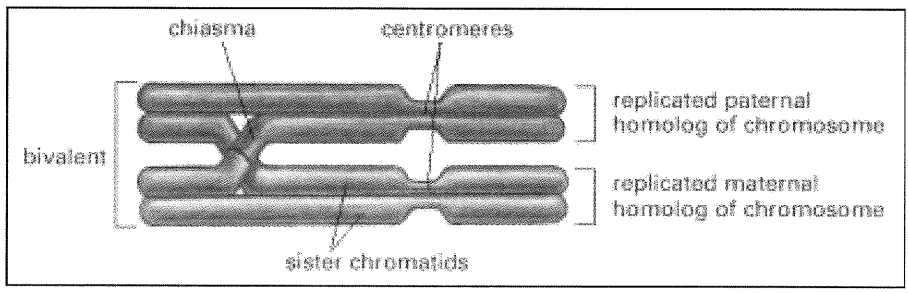



**Figure 2. Paired homologous chromosomes during the transition to metaphase of meiotic division I.**

A single crossover event has occurred earlier in prophase to create one chiasma. Note that the four chromatids are arranged as two distinct pairs of sister chromatids. As in mitosis, the sister chromatids in each pair are tightly connected along their entire lengths, as well as at their centromeres, by proteins called cohesins. The entire unit of four chromatids is referred to as a bivalent. The combination of the chiasma and the tight attachment of the sister chromatids holds the two duplicated homologs together.

Theoretical explanations for the evolution of recombination and hence some aspects of sexual reproduction tend to one of two standard classes: (1) that it enables the creation and spread of advantageous traits, and (2) that it permits the removal of deleterious genes.

The facts in molecular evolution based on DNA as genetic material and the molecular cloning and recombination events are all in pairs. The whole support the fact of Allah SW creation for everything in pairs and from pairs.

"And of everything we have created pairs, that you may remember (the Grace of Allah)". (Az-Zariyat 51:49).

## 3. Human cloning technique in the holy quran and laboratories:

O MEN! If you are in doubt as to the [truth of] resurrection, [remember that,] verily, We have created [every one of] you out of dust, then out of a drop of sperm, then out of a germ-cell, then out of

an embryonic lump complete [in itself] and yet incomplete so that We might make [your origin] clear unto you. And whatever We will [to be born] We cause to rest in the [mothers'] wombs for a term set [by Us], and then We bring you forth as infants and [allow you to live] so that [some of] you might attain to maturity: for among you are such as are caused to die [in childhood], just as many a one of you is reduced in old age to a most abject state, ceasing to know anything of what he once knew so well. And [if, O man, thou art still in doubt as to resurrection consider, this:] thou canst see the earth dry and lifeless - and [suddenly,] when We send down waters upon it, it stirs and swells and puts forth every kind of lovely plant!(Al-Hajj 22:5)

يَا أَيُّهَا النَّاسُ إِن كُنتُمْ فِي رَيْبٍ مِّنَ الْبَعْثِ فَإِنَّا خَلَقْنَاكُم مِّن تُرَابٍ ثُمَّ مِن نُّطْفَةٍ ثُمَّ مِنْ عَلَقَةٍ ثُمَّ مِن مُّضْغَةٍ مُّخَلَّقَةٍ وَغَيْرِ مُخَلَّقَةٍ لِّنُبَيِّنَ لَكُمْ وَنُقِرُّ فِي الْأَرْحَامِ مَا نَشَاء إِلَى أَجَلٍ مُّسَمًّى ثُمَّ نُخْرِجُكُمْ طِفْلًا ثُمَّ لِتَبْلُغُوا أَشُدَّكُمْ وَمِنكُم مَّن يُتَوَفَّى وَمِنكُم مَّن يُرَدُّ إِلَى أَرْذَلِ الْعُمُرِ لِكَيْلَا يَعْلَمَ مِن بَعْدِ عِلْمٍ شَيْئًا وَتَرَى الْأَرْضَ هَامِدَةً فَإِذَا أَنزَلْنَا عَلَيْهَا الْمَاء اهْتَزَّتْ وَرَبَتْ وَأَنبَتَتْ مِن كُلِّ زَوْجٍ بَهِيجٍ

"and then We create out of the drop of sperm a germ-cell, and then We create out of the germ-cell an embryonic lump, and then We create within the embryonic lump bones, and then We clothe the bones with flesh - and then We bring [all] this into being as a new creation: hallowed, therefore, is God, the best of artisans!" (Al-Mu'ninun 23:14)

ثُمَّ خَلَقْنَا النُّطْفَةَ عَلَقَةً فَخَلَقْنَا الْعَلَقَةَ مُضْغَةً فَخَلَقْنَا الْمُضْغَةَ عِظَامًا فَكَسَوْنَا الْعِظَامَ لَحْمًا ثُمَّ أَنشَأْنَاهُ خَلْقًا آخَرَ فَتَبَارَكَ اللَّهُ أَحْسَنُ الْخَالِقِينَ

'who creates [every thing], and thereupon forms it in accordance with what it is meant to be.' (Al-A'la 87:2). الَّذِي خَلَقَ فَسَوَّى

*How to Clone a Human? (Modified by Dr. Arthur Kerschen)*

This procedure is based upon the sheep cloning procedure and the most established animal cloning described in the table above. The mouse cloning procedure seems to have worked better. The two procedures are similar, but not identical.

*What are the Materials required to carry cloning of human?*

Human Tissue: Pure human cells of one tissue type, from the individual who will be cloned.

Human Tissue Culture Media: Media in which these human cells will grow and divide. (*The cells can be exposed to several mutations by the chemical in media or any infection*).

Minimal Human Tissue Culture Media: Media in which cells will stop dividing, and enter a state of "quiescence" without dying. (*The cells can be exposed to several stress and that will change the whole gene expression*)

Laboratory supplies: Incubator, Sterile Hood, petri dishes, microscopes, and tools capable of removing and implanting cellular organelles, such as the nucleus, from one cell to another.

Unfertilized human egg cells. (*Who is the donor?)*

Human Egg Cell growth media: Media where fertilized eggs will grow and divide. (*How egg cell will grow in vitro*?

***Procedures***

Grow the human cells to be cloned until you have a good supply.

Transfer the cells to minimal media. [For now, The Sheep Cloning Paper is a good reference for exactly how long.] This should allow the cells to live, but they should stop dividing and enter quiescence. This is likely the step in which the cells lose their differentiation, and revert to a more totipotent state.

When the cultured cells are in the quiescent state, get an unfertilized human egg cell. Remove the nucleus from this egg cell. Try to minimize damage done to this cell and discard the nucleus. (*How many time the damage take place to achieve one clone? How much the cost to achieve one cloning*?

Take one of the quiescent cells in it's entirely, and implant it inside the coat around the egg (known as the zona pellucida) next to the egg itself.

Electroshock the egg. [For now, The Sheep Cloning Paper is probably a good reference for how much and how long to electro-

shock.] The electroshock induces the fusion of the two cells, so you should be able to tell when you've electroshocked enough just by looking at the cells. (*Which doses of electric shock will be applied? How many cloned will be mutated during these optimization processes?*) The rebooting of the human genetic program is believed to be initiated by the replacement of donor cell protien signals by egg cell protien signals, but the electroshock might assist in moving those protien signals across the nuclear membrane as well. Electroporation is a common technique for moving DNA molecules through a cellular membrane.

Repeat the last three steps as necessary until you have enough clones. Expect a lot of them not to survive because of cellular damage and other mishaps. Allow the embryos to grow and divide a few times in Human Egg Cell growth media. (*What are the fates of damage dead clones? Which feature virus of infection or even genetically diseases will be developed).*

Implant the embryos in human mothers where they will be carried to term, and born normally. (*Who the mother will accept herself to be such experimental human trials and who will carry the risk for the mother?*)

Natural Selection and benefit of sexual reproduction

Natural Selection is nature's own form of genetic engineering regulated and monitored by the creator, Allah SW and the behaviors of the human being in the universe. The fit organisms survive through natural selection. The rate of evolution of new species through natural selection is incredibly slow, but methods have been discovered by which *Allah SW* has optimized the process. The whole genome organization is very complicated. The entire genome (all the genes) of higher animals and plants are broken up into functional components known as exons and separated by regions called introns. Special genes known as transposable elements serve to mix and match functional components of genes in an effort to maximize the likelihood of creating better genes and organisms. There are some evidence that bacteria, one of the simplest organisms, have introns and exons in some past era, but lost them in favor of efficiency and other means of

acquiring new DNA. The introns in human genome sequence are very long and represent most of the human genome sequence.

The Prophet Muhammad SAW gave the following advice on this topic:

Al-Nasa'i, Abu Dawud, Ibn Majah, and Ahmad narrated from Ma'qil ibn Yasar t:

A man came to the Prophet SAW and said, "I have set my eye on a woman of lineage and beauty except that she cannot [or will not] have children. Shall I marry her?" The Prophet SAW said no. The man came back a second time and the Prophet SAW forbade him again. When he came back a third time the Prophet said: "Marry the loving, child-bearing woman (al- wadud al-walud) for I will boast of you before the nations."

This advice applied to women also. Ibn Majah, Ibn Abi Shayba, al-Hakim, al-Diya' al-Maqdisi, Ibn 'Adi and others narrate from the mother of the Believers 'A'isha and from Anas that the Prophet SAW said:

Choose well where your seeds will go.

'A'isha's narration continues:

Marry suitable matches (akfa') and give your daughters away to suitable matches.

The Prophet Muhammad SAW revealed that chromosomes bear genes representative not only of each immediate parent and their siblings, but of ninety-nine strains for each parent, reaching back through the maternal and paternal family lines all the way to the first man and woman. The Prophet SAW even used language such as "threading" (salaka) - in the same way biogenetics describes DNA today.

Ibn Rajab said in his masterpiece Jami' al-'Ulum wal- Hikam that al-Tabarani and Ibn Mandah in al-Tawhid - among others - narrated with a good chain of transmission from Malik ibn al-Huwayrith that the Prophet said:

Truly, when Allah wants to create a servant, the man has intercourse with the woman and his water flies into every vein/strain ('irq) and nerve ('asab) of hers. When the seventh day comes, Allah

gathers it up and brings before it every strain between it and Adam: {Into whatsoever form He will, He casts you} (Q 82:8).

A rare mursal narration from the Tabi'i Ibn Burayda in Asl 148 of al-Hakeem al-Tirmidhi's Nawadir al-Usul specifies ninety-nine potential hereditary strains per parent:

The wife of a man from the Ansar bore him a black child. He took her by the hand and went to see the Messenger of Allah. She said: "I swear by the One that sent you with the truth! He married me a virgin and I never seated anyone in his place since!" The Prophet SAW said: "You speak the truth. You have ninety-nine strains and so does he. On the time of conception all those strains shudder and there is none but it asks Allah Most High to determine resemblance through it."

## 4. Adam and Eve were created by Cloning or Allah SW creation?

Eve was cloned from Adam, from one of his ribs, she was not conceived by the union of an spermatozoid with an ovule a difficult cloning to understand today, because from the cloning did not come another Adam, but Eve another impossible cloning to understand with the science of today is the cloning of Adam himself from clay, from the dust of the ground!... and still another cloning hard to understand with the science of today is the cloning of Jesus from Mary, without the intervention of any man.

Yes, *Allah SW* still keeps many mysteries from scientists, but the creation of Eve from a rib of Adam, since cloning, does not look anymore just a fairytale, but a real possibility made by God, by the Word!... and the conception of Jesus in Virgin Mary, without any man involved on it, looks now clearly a real possibility of Allah SW. Allah has a lot scientific secrets about the spirit, the secret of the spirit not even given to prophet Mohammad SAW.

"They ask thee concerning the spirit (of inspiration). Say: "The spirit (cometh) by command of my Lord: of knowledge it is only a little that is communicated to you, (O men!)" (Al-Isra 17:85). وَيَسْأَلُونَكَ عَنِ الرُّوحِ قُلِ الرُّوحُ مِنْ أَمْرِ رَبِّي وَمَا أُوتِيتُم مِّن الْعِلْمِ إِلَّا قَلِيلاً

"Verily, the likeness of Jesus in Allah's Sight is the likeness of Adam, He created him from dust, then (He) said unto him, "Be" - and he was". (Al-Imran 3:59).

إِنَّ مَثَلَ عِيسَى عِندَ اللَّهِ كَمَثَلِ آدَمَ خَلَقَهُ مِن تُرَابٍ ثُمَّ قَالَ لَهُ كُن فَيَكُونُ

"Today I will save your dead body so that you may be a sign for those who come after you. (Yoonus 10:92). فَالْيَوْمَ نُنَجِّيكَ بِبَدَنِكَ لِتَكُونَ لِمَنْ خَلْفَكَ آيَةً وَإِنَّ كَثِيرًا مِّنَ النَّاسِ عَنْ آيَاتِنَا لَغَافِلُونَ

"O men! Here is a parable set forth! listen to it! Those on whom, besides Allah, ye call, cannot create (even) a fly, if they all met together for the purpose! and if the fly should snatch away anything from them, they would have no power to release it from the fly. Feeble are those who petition and those whom they petition! "(Al-Hajj 22:73).

يَا أَيُّهَا النَّاسُ ضُرِبَ مَثَلٌ فَاسْتَمِعُوا لَهُ إِنَّ الَّذِينَ تَدْعُونَ مِن دُونِ اللَّهِ لَن يَخْلُقُوا ذُبَابًا وَلَوِ اجْتَمَعُوا لَهُ وَإِن يَسْلُبْهُمُ الذُّبَابُ شَيْئًا لَّا يَسْتَنقِذُوهُ مِنْهُ ضَعُفَ الطَّالِبُ وَالْمَطْلُوبُ

## 6. Genetic engineering techniques for detection of *Haram* (unlawful) Food and harmful components

The focus of genetic engineering next years recommended to cover the areas of diagnostic and drug discovery. The development of new biomarkers demonstrated the hot demands after human genome sequence completed and several gene functions discovered for understanding and discovery of diseases. In the last 20 years lots of new infection diseases have been appeared but the human being do not believe on Allah SW equation on lawful food and resources. In Islam the water and food are two important in respect to keep human beings healthy without severe diseases or infection diseases based on the following Quranic verses: "FORBIDDEN to you is carrion, and blood, and the flesh of swine, and that over which any name other than God's has been invoked, and the animal that has been strangled, or beaten to death, or killed by a fall, or gored to death, or savaged

by a beast of prey, save that which you [yourselves] may have slaughtered while it was still alive; and [forbidden to you is] all that has been slaughtered on idolatrous altars. And [you are forbidden] to seek to learn through divination what the future may hold in store for you: this is sinful conduct. Today, those who, are bent on denying the truth have lost all hope of [your ever forsaking] your religion: do not, then, hold them in awe, but stand in awe of Me! Today have I perfected your religious law for you, and have bestowed upon you the full measure of My blessings, and willed that self-surrender unto Me shall be your religion. As for him, however, who is driven [to what is forbidden] by dire necessity and not by an inclination to sinning - behold, God is much-forgiving, a dispenser of grace" (Al-Ma'idah 5:3). The development of biotechnology for food and pharmaceutical products is growing rapidly in most parts of the world. Unfortunately Muslim countries consume imported food and pharmaceutical products that may contain pork content and/or questionable ingredients. A food can be categorized as *Haram* if the food sample has been found to contain non-*Halal* ingredient, such as pork contamination, if a Polymerase Chain Reaction (PCR) product reveals such information using the pure isolated DNA information from food sample and designed biomarkers. Our innovative technology can be utilized using PCR and to identify the origin(s) of animal species used in processed foods as well as determination of slaughtered and non-slaughtered meat. This will solve and approve the novelty of Quran with help of genetic engineering and their innovations for saving the world from severe diseases. The employment of genetic engineering can be outlined our focus in human food and health based on religious high ethical and value.

## 7. Novel explanations seed germination using genetic engineering mutations and Quran:

Germination is a fascinating process. Seeing a tiny seedling emerges from a dry wrinkled seed and watching its growth and transformation,

is observing the mystery of life unfolding. The first sign of germination is the absorption of water lots of water. This activates an enzyme, respiration increases and plant cells are duplicated. Most of legumes and cereals seeds store IP6 (*myo*-inositol-1, 2, 3, 4, 5, 6-hexkisphosphate) (Tabel 1).

Nutrient reserves accumulate during seed development for remobilization during germination and early seedling growth. Phosphorus in seeds is stored primarily in the form of phytic acid (phytate, *myo*-inositol hexakisphosphate, $InsP_6$), which is a derivative of inositol. During seed development phytic acid is deposited in spherical inclusions known as globoids or as complexes with seed storage proteins in protein bodies [37, 31]. The stored phytate is hydrolyzed by the activity of phytase enzymes during germination to provide inorganic phosphate and *myo*-inositol to the growing seedling.

As a component of animal feed, phytate from seeds compromises the availability of dietary phosphorus because non-ruminants lack the digestive enzymes to hydrolyze phytic acid. The negatively charged phytic acid molecule also chelates other mineral nutrients, which lowers their bioavailablity. In addition to the nutritional effects of phytate in animal diets, there are also environmental consequences. Undigested phytic acid is excreted in manure, which leads to elevated soil phosphorus levels when manure is applied repeatedly as fertilizer in areas of livestock production. High soil phosphorus levels, coupled with the potential for run-off, can lead to environmental phosphorus pollution and eutrophication [44].

**Tabel 1: Phytase activity und Phytate contents in cereals before after germination (The data were pvided by Dr. Ralf Greiner, Centre for molecular biology, BFEL, Karlsruhe, Germany).**

| | non-germinated | | 4 days after germination | | |
|---|---|---|---|---|---|
| **Cereal** | **Phytase activity [U/g Cereal]** | **Phytate content [mg/g Cereal]** | **Phytase activity [U/g Cereal]** | **Phytat content [mg/g Cereal]** | **Phytate reduction [%]** |
| Wheat | 180 | 12.4 | 850 | 8.7 | 30 |
| spelt | 220 | 12.9 | 1100 | 7.8 | 40 |
| Triticale | 650 | 12.7 | 1840 | 8.1 | 36 |
| Rye | 2800 | 11.8 | 3200 | 7.1 | 40 |
| Barley | 350 | 11.9 | 1350 | 9.1 | 24 |
| Oat | 48 | 11.3 | 335 | 9.5 | 16 |
| Maize | 9 | 9.2 | 150 | 2.3 | 75 |

*Myo*-inositol is a precursor to compounds in plants that function not only in phosphorus storage, but also in signal transduction, stress protection, hormonal homeostasis, and cell wall biosynthesis (for review, see [36,30]). Production of the second messenger $InsP_3$, a derivative of inositol, leads to release of intracellular calcium in cellular signaling. Methylated forms of *myo*-inositol, ononitol and pinitol, accumulate in plants in response to salinity stress to function in osmotic adjustment. Plant cells contain a number of conjugates of indole-3-acetic acid, including indole-3-acetic acid-*myo*-inositol, which allow storage of excess amounts of auxin. Oxidation of *myo*-inositol to D-GlcUA plays a role in the biosynthesis of compounds that are constituents of plant cells walls.

The first step in the synthesis of *myo*-inositol is the conversion of D-Glc-6-P to D-*myo*-inositol-3-phosphate by the isomerase D-*myo*-inositol-3-phosphate synthase (MIPS). The proposed phytic acid biosynthetic pathway [30] also includes phosphorylation steps catalyzed

by one or more kinases that have not been well studied in plants (Fig. 1). The MIPS coding sequence has been cloned and characterized from a number of prokaryotic and eukaryotic sources. The first reported MIPS gene was isolated from *Saccharomyces cerevisiae* using a genetic complementation strategy [24]. A sequence similar to the yeast MIPS gene was identified in *Spirodela polyrrhiza*, an aquatic angiosperm [45]. MIPS sequences have been reported from Arabidopsis [22], *Citrus paradisii* [1], common ice plant [20], and tobacco [18], and are highly conserved at the nucleotide level.

MIPS sequences comprise gene families in some plant species. In maize, seven sequences hybridizing to a MIPS probe were mapped to different chromosomes [27]. In Arabidopsis, two distinct MIPS genes have been identified [22, 23, 25]. The existence of multiple MIPS genes in plants may permit differential MIPS expression for many different physiological functions; however, MIPS gene family expression has not been well characterized to date.

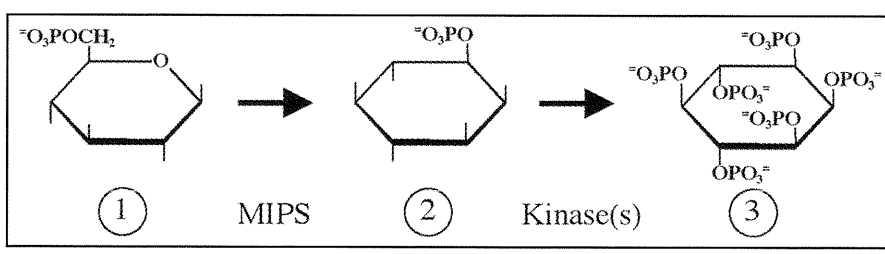



**Figure 3. Phytate biosynthesis. D-Glc-6-P (1) is converted to D-*myo*-inositol-3-phosphate (2) by the activity of MIPS. D-*myo*-inositol-3-phosphate is further phosphorylated to yield *myo*-inositol hexakisphosphate (3) by several kinase steps.**

Root exudates selectively influence the growth of bacteria and fungi that colonize the rhizosphere by altering the chemistry of soil in the vicinity of the plant roots and by serving as selective growth substrates for soil microorganisms. Microorganisms in turn influence the composition and quantity of various root exudate components through their effects on root cell leakage, cell metabolism, and plant nutrition. Based on differences in root exudation and rhizodeposition in different root zones, rhizosphere microbial communities can vary in

structure and species composition in different root locations or in relation to soil type, plant species, nutritional status, age, stress, disease, and other environmental factors (8, 16, 22, 23). During the growth of new roots, exudates secreted in the zone of elongation behind the root tips support the growth of primary root colonizers that utilize easily degradable sugars and organic acids. In the older root zones, carbon is deposited primarily as sloughed cells and consists of more recalcitrant materials, including lignified cellulose and hemicellulose, so that fungi and bacteria in these zones are presumably adapted to crowded, oligotrophic conditions. Other nutritionally distinct sites include the sites of lateral root emergence and the secondary, nongrowing root tips, which are relatively nutrientrich environments colonized by mature communities.

Soon the embryo becomes too large, the seed coat bursts open and the growing plant emerges. The tip of the root is the first thing to emerge and it's first for good reason. It will anchor the seed in place, and allow the embryo to absorb water and nutrients from the surrounding soil. Our last researches have demonstrated 90-99% of the microorganisms (especially bacteria) are uncultured. The molecular methods were based on the analysis of 16S rRNA of directed isolated DNA from soil. There are a lot of secret can be discovered using genetic engineering.

"It is Allah who causeth the seed-grain and the date-stone to split and sprout. He causeth the living to issue from the dead, and He is the one to cause the dead to issue from the living. That is Allah. Then how are ye deluded away from the truth?' (Al-An'am 6:95).

"And we send down from the sky rain charted with blessing, and we produce therewith gardens and grain for harvests" (Qaf 50:9).

## 8 - Acknowledgment

I have to thank Allah SW for awarding us the Quran and sending us, Prophet SAW. I have to thank Dr. El Gendy and his committee to have trust on me and invite me for the international conference. My thanks for Dr. Arthur Kerschen and *Arthur Kerschen and Dr. Amanda Mahnke* for their official permission to use their home pages.

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# DISCUSSION

# Seventh Session

**Chairman**: Dr. Ted Peters

**Rapporteur**: Mohd. Ali Al Barr

**Chairman**: I appreciated very much the informative presentations about the relevant areas of genetic and early embryo research. And, I appreciated very much applying the principles of Islamic ethics. Now, I do understand the argument regarding prohibitions against reproductive cloning, if it is important that each child come from a man and woman and nuclear transfer will bypass that. Let me ask you whether or not, there is any relationship between that and stem-cell research. Stem-cell research does not involve reproduction and many Muslims at least in North America are very strongly supportive of stem-cell research. So, perhaps, you could, any way, tell what you believe, for the proper step we should take, and I want to give the floor once again. Thank you. Yes, please...

*A Scholar*: Bismillah Hirrahma Nirrahim! To my surprise, no one referred to a very important point mentioned by Al Zindany who resorted to many scholars asking them about it. By this I mean the Prophetic Hadith about the baby growth in four months. This Hadith was propagated by Al Nawawy in his book "The Forty Hadiths of Imam Nawawi". Al Nawawi said that this Hadith is narrated by Al Bukhari though this is not correct. The Hadith narrated by Al Bukhari substantiates that all these developments are undergone by the fetus in 40 days, not 4 months. I was there when Al Zindani explained this to one of the great Muslim scholars, the late sheikh Abdul Aziz bin Baz. Sheikh Bin Baz was astonished and asked how the Muslim Jurists did not notice such a disparity. How could they build on this Hadith though it is not the sound one mentioned in Sahih Bukhari. One small point to Dr. Aqeel. You gave the impression that ALLAH Sub'hana Wata-Aala created the human person neutral between good and bad. HE told him this is good and this is bad, and you choose. But, in fact, the correct interpretation for which there is much evidence in the Quran and Hadith is that the human person is born good. This is the

basic thing. That is a deviation. This is in the verse itself that you mentioned "*Wa nafsiv wama sawwaha*" then "*anhamaha fujuraha wa taqwaha*". And a famous Hadith "*Kullu mouludin yuladu alal fitra*" and the aayah "*inna hadainahussabila imma shakiran*" to be grateful and follow this way "*Wa imma kafura*". So, the human person is born good, but he is given a choice whether to follow what ALLAH Sub'hana Wata-Aala has prescribed in Quran, and Hadith or not. I would say, perhaps, that in Islam there is no place for playing with GOD. Everything that happens in the world, is happening with the Will and Power of GOD. No human person can do anything without God's permission. So, there is no place for playing with GOD. The matter becomes worse when playing GOD is translated into Arabic as "*El Abd*". ALLAH does not play. Assalam Alaikum!

**Chairman**: Just quick interpretation, as I heard that there is no place for playing GOD. What I think and heard is that this has to do with God's omnipotence that we human beings are not really going to take away God's power. I found that interesting.

***A Scholar***: In Islam, there are two kinds of Will of GOD. The Will, many brothers explained here, is creative Will, and no one can go against that. Then, the second one is legislative, what HE prescribes. So, HE gives you the choice either to accept this or to go against this. But, you cannot do something in the world, even when you do something that HE doesn't like, you cannot do it without HIS permission.

**Chairman**: I love to listen this theological classification.

***Dr. Nahida Baqsami***:

My question is addressed to Dr. Akeel. In her speech about Pre-implantation Diagnosis, she talked about the state of a Muslim family as far as I can remember in Denmark. She narrated how this family tried to have another child to save their son who has Leukemia. So, they traveled to England and had what they wanted. The words of Dr. Akeel gave me the impression that it is alright to do this. But I do not know whether she meant that it is religiously alright to do so. What concerns me here is the humanitarian aspect. What Dr. Akeel meant is that this family did its utmost to have another child with the same

genetic characters so as to save their first child who is plagued with Leukemia. Nevertheless, with time this second child will be no more than a factory for human spare parts. The issue here is not confined to blood, cells and marrow. There is a possibility that the first child would not recover from the first time. Consequently, the parents would look at this second child as being merely there to save their older child. I pose this question because last semester I taught my students at the school of Medicine this topic. I was surprised to see the strong reaction of the Medical School students who thought this to be inhumane and unethical. This child came to this world only to save his sibling. Thus, it can turn into a factory of human spare parts. Lately, I came across an American novel about a 13-year-old girl who came to life to save her elder sister who suffers from Leukemia. No problem so far, but during these 13 years blood and marrow were sucked out of her more than once. Her life nearly hinges upon her elder sister. She even used to compromise many things and lots of her dreams as a result. Eventually, this younger sister had to sue her parents for their persistence in her giving one of her kidneys to her sick sister. Of course, this raised a question in my mind: to what extent can we use such medical procedures?

**Chairman**: Thank you. I want to take on two questions. The first one is the radical, what is the moral unit that should be dealing with the individual and with the family? And, certainly in the west, the individual is moral unit, and so there is a risk of violating the dignity of the second child. If the moral unit is female, then that would give us a different perspective, so that is the radical question. A practical one is, for those who are clinical physicians, what actually happens in those families? I suspect that they love their second child as much as they did the first one. Can we rely on that? Let us go to third speaker, Dr. Quigley.

***Dr. Muireann Quigley***: My first point is that I want to take the issue of designer baby. As I said, pre-implantation genetic diagnosis is not designing anything, it is choosing between designs. If we will try actually designing something, this will be involving the physical manipulation of the embryos, such as genes insertion or genes deletion.

You have to be extremely tight in your definitions in terminology, because it can lead to confusion and misunderstanding. The second is just a question to any religious scholar, and I guess, directed at first and last speakers, because, it is to do with the interpretation of the text. They can read interpretations from text. We saw diverse opinions in interpretation of the Qur'an over the past few days. And, the last gentleman is interpreting it as actually permissible to use these technologies, others interpreting differently. I am just wondering, did the different faiths ask for interpretation of the text? Thank you.

**Chairman**: Those are very helpful. I know Dr. Lehmann, who is next to Dr. El-Gendy, spoke to the first one repeatedly, as today. The second one, I think, another day.

***Dr. Issam Ghannam***: Thank you very much for very stimulating and heavily loaded comments with science and technology. And my basic question actually, I will read in Arabic the aayah **in Suratul Hajj "*Bismillah Hirrahma Nirrahim! Yaa aiuhannas in kuntum fee raiba minal ba'si inna khalaqnakum min turab, summa min nutfah, summa min alaqah, summa min nudgah, mukhallaqatin wa khyri mukhallaqa linu bai'ena lakum*"** the translation, the meaning of that, most of the *tafseers* say, Ibn Kaseer, Kurtubi, said, "*khyri mukhallaqa*" which is not much sure to become a child and miscarriage, which is not really in coping with the state of knowledge now, and I checked with Sheikh Ali Guma on the first day. To my understanding, to current state of knowledge, "*Mukhallaqa*" is differentiated and "*khyri Mukhallaqa*" is undifferentiated. So, "*linu bai'ena lakum*" again to show you what you can do with this? So, it doesn't loss, it doesn't mean stem-cell here, which is the way "*Khyri Mukhallaqa*" undifferentiated, which is like a part producing a mechanism left in human as the early days, so that we can use it in later stages. And, a different question, which probably is not related to today, but it has something I am searching in all the Hadiths. The Muslims have mistakenly taken that "*Hawwa khulikat mindala Adam*". The word Adam, I search the whole of the Hadith that eve was created from the rib of Adam. The whole of the Hadiths, none of them actually mentioned Adam is created from "*dola*", and "*dola*" could be a branch, a name it has many meanings. So, also

again that ALLAH said "**Khalaqnakum min nafisn wahidah wa khalaqa min'ha zoujaha**". So, ALLAH has created you from single soul, created from its type, not from it. Because of that, we put Islam in the wrong that eve is a cloning from Adam, while it is actually from the rib. I asked Dr. Sadiqa yesterday to check for me, if this lump, or branch, or rib, the extra bit in X chromosome which is missing, why?

**Chairman**: Dr. David Rabbi

***Dr. David R. Bleich***: In light of the comments that he made yesterday with regard to the inviolability of the fetus from the earliest stages of gestation it must be remembered that the sole purpose of PGD is to discard and to destroy defective classes. In light of the fact that the purpose is destruction of developing fetus in the early stages of pregnancy, is it something that Sheikh Al-Salami find it compatible with the teachings of Islam or is this contrary to the position?

**Chairman**: Dr. Lehmann, please.

***Dr. Lisa Lehmann***: I just want to take the issue with previous comment that the purpose of PGD is to destroy a fetus, is quietly opposite I would say. It is to select an embryo which will meet the healthy baby. One of the byproducts of that is the destruction of embryos which is not the fetus. Again, we need to be clear on that terminology here. My question actually, we forgot to an embryonic stem cell and we forgot to the clarification regarding the use of the embryo from Islamic perspective is distinction with regard to the use of discarded embryos from embryonic stem cell research versus the creation of embryos for the specific research. Does Islam views this differently?

**Chairman**: Who is next? Dr. Refai

***Dr. Abdul Rahman Al-Refai***:

I'd like to comment on a concept frequently used in the analyses of cloning and was mentioned in the presentation of Dr. AidaAkeel. By this I mean the concept of "the person". This concept was unknown to the Arabic language. It was introduced to it. The Islamic perspective of the fetus and the possibility of cloning closes many doors in this regard. First, "the person" in Arabic denotes anything

that is visible whether a stone, a tree or a human being. So, the "person" as a notion differs in Arabic from its meaning in English. For Christians, the person is the ethical being which if translated into Arabic would be "Al Mar'" and not "Shakhs". Hence, the problems faced by the western peple who talked of the fetus as an ethical being. These problems exist not in the Arabic language. Islam only used the concept of "human being". Thus, the question is "Is the clot considered to be a human being? Is the foetus lump deemed a human being? Is the sperm held to be a human being?" considering the issue from this facet, the meaning of these words consist of an adjective and a noun.: a human clot, a human foetus lump and a human sperm. But is this adjective "human" inseparable from the noun or is it a circumstantial adjective? In other words, can we say that it is a clot though it is not human (circumstantial adj.) or denying the adjective means the denial of the noun along with it? This opens the door for limited cloning. The adjective "human" here is merely circumstantial; for it can be an animal clot or an animal foetus lump. Yet, man is one of the phases. The verse reads, "... then We developed out of it another creature." (Al Mu'minun: 14). This means that the adjective humanity is not attributed to the phases before that other creation. Thus, "human" here is a circumstantial adjective. Thus, the fetus does not become a human being till he develops into "another creation". Before that, it is merely an animal or one of the shapes of life inferior to "human being". Thank you.

**Chairman**: Dr. Iqbal.

***Dr. Muzaffar Iqbal***: A chemist in UK is a pharmacist in USA. I would say during the last 25 years or so, Muslims have been taking the Quranic vocabulary and bringing it into Biology, Chemistry, Physics, Mathematics and thereby transforming the entire context of the Qur'anic Arabic. We saw a very good example in Dr. Farouk's example here. It is not really clear to me how can we do that to the Quran that is to take it or it's vocabulary totally out of context and put it in genetic science and biology and say this what it means? I feel we have to be extremely careful by not making the vocabulary of the Quran subject to this kind of mutation.

**Chairman**: Dr. Winslow.

***Dr. Gerald Winslow***: I appreciate the discussion in Dr. Al-Aqeel's paper about somatic cell nuclear transfer. In my home culture, this has been a source of great deal of controversy. I would like to ask the scholars of Islam, Judaism and those from Christianity, is the embryo, the result from somatic cell nuclear transfer, deserving ethical protection? How is its status different from the status of an embryo produced in another way? Is it because the intention is different in producing the embryo?

**Chairman**: We are going to allow one more brief remark. Dr. Hathout, take the floor, please.

***Dr. Hassan Hathout***: I want to warn ourselves against the excessive involvement in the use of semantics, because the same word may have very different meanings. When I was a school boy, we used to sing early to bed and early to rise, this is the way to be happy and gay. Now, I cannot use the word and say I am gay. It imparts a very different meaning. It is the one word. Also, the word "Atom" "*Zarra*", that is mentioned in the Quran, I cannot imagine that we can apply it to the chemical "Atom" as known in chemical science. The one word can have different meanings under different contexts. So, it is my advice that this conference should not get involved in word definitions in various cultures, times, and places. Because, I see there is too much confusion. As to the word "*shakhs*" "personhood", this is mentioned in Islam, but not using the word "shakhs", because the Islamic *Sharia* gives the fetus or embryo from its earliest stage what we call "*Ahliat Wujub*". I cannot translate it into English. May be, personhood, it might be. And again, Islam divides "*Ahliat Al-Wujub*" into incomplete and complete. From the beginning of conception to 120 days the fetus has "*Ahliatu wujubin naqisa*" incomplete personhood. After 120 days, it is "*Ahliatu wujubin kamila*". And if we, Arabic speaking Muslims, find it difficult to convey what we mean, using the Arabic language, then imagine what happens when we try to convey them to non-Arabic speaking people.

**Chairman**: Thank you Dr. Hathout. Dr. Badri.

***Dr. Malik Badri***: Yes, I will make only one point, which is very

quickly done by Quigley. I think, that there are two extremes. One extreme is to try to, as Dr. Quigley said, change the meanings of the verse of Quran to go along with what we know. This is one extreme. The other extreme is to say that we do not bring the Quran to this, as Dr. Iqbal said. How can we stop bringing the Quran in to this, if the Quran speaks about details of things that are concerning about scientific issues? I think that this can be an extreme. I attended the conference, it was on reproductive biology and other aspects in which Zindani himself gave a speech and he read the translation of Quran. Because the Quran speaks very clearly about the steps of embryonic development from its conception and till it becomes a fetus before its birth. Now, it says it in clear Arabic language as how these step take place. One lecturer from US, he was there, said this impossible. He took the translation of the Quran, I was there, he read it, then he took another copy from a different publisher to be sure that this is so. He read it and then he said there are only two possibilities. The first possibility is that your prophet Muhammad (PBUH) had electro-microscope and used to look and to write until he made this verse. Or the other possibility is that there is a GOD, and GOD told him how could HE create man. And, I want to tell you now that I have converted to Islam, because of this. I think, there are certain *aayahs* and Hadiths that are clear, we cannot run away from. I think, the way that brother Iqbal mentioned is quite irrelevant. Thank you.

**Chairman**: Dr. Al-Aqeel.

***Dr. Aida Al-Aqeel***: Thank you very much Mr. Chairman! I would like to apologize to the audience for not elaborating a lot in my talk because of time. And, probably some of the misunderstandings, which came out are because of that. I will take few points. Now, about the personhood considered in embryo, Dr. Hathout has already spoken about this personhood that we consider an embryo as an embryo after 120 days. Since we are doing the somatic cell nuclear transfer at the very early stages, which is 3-4 days after fertilization, I don't think that embryo will have a personhood. Concerning the design baby, which we are talking about, I didn't talk about design baby in the context of pre-implantation genetic diagnosis in general. But, I just

talked about it in the context of the couple, who needed that baby for them to be for transplantation.

For Dr. Baqsemi's question about design baby from Islamic point of view. In my opinion, I have said about using that baby, HLA typing and then planting the baby, then having the child, using his umbilical cord or blood as a treatment for another child. In Islam, saving life is utmost important. However, that baby if we needed some thing major to be taken from him to be given to his child, for example kidney, liver or whatever, the parents don't have right to do this. Is there difference between pre-implantation genetic diagnosis research on discarded embryos and created embryos for the pre-implantation diagnosis or even for the stem cell research? It is important to know that stem cell research has to be done when the source is legitimate. So, in Islam we cannot use really, as I said, if the source is illegitimate, you cannot do this stem cell research. For example, somatic cell nuclear transfer although thinking scientifically it could be a good source for the stem-cell research, but still it is considered in Islam illegitimate from the *Fatwa*. Because, it could open door for reproductive cloning. However, in Iran, as I said, they are doing this, they are establishing stem cell research. The relationship between stem cell research and reproductive cloning probably, I was not very clear about it because of time.

Now, reproductive cloning could be done in two ways, either in a normal process, for example, having twins is a normal reproductive cloning. However, the somatic cell nuclear transfer could do things as cloning, and cloning from that is not normal, and this is something created by human beings.

**Chairman**: Thank you very much. Dr. Farouk Gad.

***Dr. Farouk Gad***: Thank you very much. I agree completely with Dr. Quigley, Dr. Al-Bar and Dr. Hathout. The vision of my talk is not that I have discovered this because you cannot do this easily. I can understand well, the Quran in Arabic, German and in English. I give you some secret, which is personal, which I don't like to expose, but I have to expose it today. Before I began my career 20 years ago, 5 of the ayahs and 2 of the Hadiths in this text were haunting issues

for one or two seculars in Egypt. They were talking against Quran and against the people in Arabic countries, Muslim countries. I am an Egyptian origin European. I worked 17 years in genetic engineering DNA. From that text, I worked very hardly. I discussed with a lot of scholars and they have my discoveries till now. Before cloning, I discussed with one of the Muslim scholars 15 years ago, before they published the baby dolly in 1993. I expect what will happen until today. But, I don't trust myself to publish, because my work concerned with scientific work, and I am not a Muslim scholar. Qur'anic verses are very difficult to interpret. I will give you examples what Dr. Hathout exposed. "*Miskala zarra*", this is weight of one atom, it can be a "*im balaga*" in Arabic "*Tauria*", it can have different meaning.

**Chairman**: Finally, the last word Dr. Al-Bar.

***Dr. Mohd. Ali Al-Bar***: Assalam Alaikum! I was working with Sheikh Zindani since we were students here in Cairo. He was in Pharmacy College and I was in Medical College in 1962. We have been collaborating all the time. In fact, it is very important that we started an organization of studying the Quran in Makkah, to bring up those who are well learned in Arabic language, those who are well-versed in *tafseer* of Quran, those who are well-versed in Islamic law and Hadith, and scientists. It will not be accepted unless all of them agreed. If it is according to these limitations, then the meaning will be clear. I think, that approach limits the mistakes that can occur. I am sure still mistakes can occur. Thanks.

**Chairman**: Sheikh Al-Salami

***Sheikh Mohd. Mokhtar Al-Salami***:

In the Name of Allah, Most Gracious, Most Merciful. What I understand from the Holy Qur'an is that man is created from a man and a woman. It follows that "humanity" exists in the first sperm and this humanity continues to exist till the time of delivery. Thus, from day two when the fertilized egg sticks to the uterus wall till the day of delivery, the fetus is a human fetus. In other words, he has all the due rights. For example, if the father writes a will for his children, the properties are not to be divided until the delivery. Then, it will be

known whether the fetus is dead or alive and whether it is male or female. In the case of a written will, the fetus is to be given its due share mentioned in the will. As for the differentiation between the fetus in the first four months and after them, as far as I know there is no such differentiation in Islam. From day one till the delivery day, the fetus life is a peculiar one in which it cannot be independent. The fetus rather depends in its food and everything on the umbilical cord. On delivery, the fetus becomes a whole man breathing, eating and independent. In brief, I do not know a religious text setting this difference between the first four months and the following ones in pregnancy. The only text I know is the Hadith about blowing the spirit unto the baby on the fourth month. But the phrase "to blow a spirit" is one of the vaguest phrases, on which no passing of judgments can depend. Allah, the Glorious, created Adam and blew from His Spirit unto him. What is a spirit? The Qur'an answers this question saying, "The Spirit (cometh) by command of my Lord: of knowledge it is only a little that is communicated to you, (O men!)" (Al Isra': 85).

# Topic III:
# Social Impacts of Genetic and Reproductive Technologies

## Eighth Session
## Wednesday, 8 February 2006

## Genetics and Reproductive Technology - Islamic, Jewish and Secular Perspectives

**Chairman** : Dr. Mamduh Gabr
**Rapporteur** : Dr. Salah Al-Ateeqi

***Speakers:***

*1 - Dr. Shahid Athar*
*2 - Dr. Vardit Ravitsky*
*3 - Dr. Hamid K. Ahmed*

# HUMAN GENETIC AND REPRODUCTIVE TECHNOLOGIES – A MUSLIM'S UNDERSTANDING OF THE SECULAR PERSPECTIVE

*Shahid Athar*

U.S.A.

# Human Genetic and Reproductive Technologies - A Muslim's understanding of the Secular Perspective

***Shahid Athar***
U.S.A.

Physically and intellectually, man is not the same as he was a million years ago. These "improvements in humans have come from within over a period of time by the process of adaptation, new learning and out of a need, and not as a result of any outside biotechnical intervention. So, the question is what is the need now? The fine line between what can be done technically and what should be done morally is the reason for the role of bio-medical ethics in the area of human genetic technologies. What are the relationship between the individual and society and whose interests we the scientists and physicians are to serve needs to be defined? Where does the government fit in between the needs of the individual patient and duties of his or her physician? Are social justice, human dignity and human rights to be considered in genetic modification? While it may be appropriate and desirable to seek treatment for a disease such as infertility. We have moved beyond treating infertility to the quest of making a super healthy super human. As a result, are we embarking on a path of ethnic cleansing of humans of lesser abilities and is it appropriate to discriminate them? In this paper, such concerns and questions are discussed from a *secular perspective.*

**Key words:** Human Genetics, ART, Cloning, Ethics

I have been a Muslim throughout my life and for the past several years, I have written and spoken on medical ethics from a religious (Islamic) perspective (1-4). However, in this paper, I will be discussing human genetics and reproductive technology from a secular perspective. I have chosen to do so as I strongly feel that there are common grounds in medical ethics between religious and secular camps. My aim is not to promote secularism but for the religious group to understand the secular view. Both groups, in my opinion support core

principles of biomedical ethics such as autonomy of the patient, beneficence, non malefecience and distributive justice. The main difference between the two camps is these:

A - The religious group, whether we like it or don't, have taken it upon itself to speak and act on behalf of God. It sees itself as an extension of God's healing powers. It has a self appointed role of carrying on God's injunction for the benefit of mankind.

B - The secular camp, on the other hand, also works toward the goal of protecting human values and human rights. It sees God as a creation of human mind. For this group, this life is the only life. It empowers man to the best of its potential. What is good for man is good for humanity. The aim justifies the mean.

However, in spite of their commonality, both groups have very different opinions on the needs of the individual versus the needs of society in the areas of human dignity, human rights (rights of God supercede the rights of man in the religious group) and the role of physicians (scientists). In religious group, for example, the physician and the scientist are subservient to God, while in the secular group, he (she) is subservient to the individual.

Thus, in the pursuit of scientific knowledge and its effects on the future of the human race, we are sailing in uncharted seas and havc created areas of concern that are still being debated.

In reviewing the current literature on ART and biogenetics, some controversies are very obvious. Commenting on the relationship between science and morality, Surbone (5) argues that "the role of genetic knowledge is over estimated and may either enhance the control that individuals have on their lives or finalize the decision process of the individual who may feel predisposed to a serious disease". On the other hand, Cohen (6) feels that "the opposing camp in bioethics about the reproductive human cloning are not wholly opposed to each other. In fact, they hold certain beliefs and values which are common concerns and they have reconciled their world views on several issues in human reproductive cloning". While discussing the respect for human embryo, Gomez-Lobo (7), feels that "since they have potential to become adult persons, they are already persons

deserving the same rights as adult persons". Reviewing and commenting on creation and sacrificing embryos for stem cells, Devolder (8) feels that "creation and destruction of embryos is at the same plane, i.e. one can not accept the creation and sacrifice of embryos for infertility but condemn the same for the benefit of injured people".

There is much controversy about the use of discarded embryos for human research (Devolder, 9). It is also a question, when does an embryo become a moral person. According to Ken Hilma, "this happens when brain activity starts. So, it is postulated, that a human being is a human person by nature and a human embryo is a human person by nature and should be treated as such".

On ethics of human stem cell research, worth reading articles are by Outka (10) from Yale and Heineman (11). Mahowald (12) argues that "cloning is necessary to preserve bodily integrity or life of an individual. She suggests that scientists and clinicians may respect the negative right to moral integrity with whom they disagree". On the other hand, Lee (13) suggests that "choice of reproductive means is human right". He feels that "a balance approach be adopted to benefit human society while protecting human dignity". He is of opinion that "a temporary ban on human cloning is appropriate but the ban on relevant scientific research and animal experimentation is inappropriate as it denies the sprit of freedom of scientific inquiry and hinders making the benefits of scientific advancement available to human society as whole".

Paul Lauritzen in a thought provoking article (14) writes "If stem cell research led to therapies that changed the contour of human life, it would unsettle our ethical commitments, including the very notion of a human right, and encourage us to see the entire natural world, the human body along with it as having the status only of material to be manipulated". He quotes Lewis (15) "... the final stage is come when man by eugenics, by prenatal conditioning and by education and propaganda based on perfect applied psychology, has obtained full control over himself. Human nature will be the last part of nature to surrender to man". He goes on to quote Jonathan Clover (16) "Human responses are the core of humanity which contrasts with

humanity. Morality must be rooted in human needs and values which are rooted in human nature and grounded in human aspirations".

## The Stem Cell Research: The Endocrine Society's Position (17)

The Endocrine Society is of the opinion that Stem cell research holds promise for 128 million Americans suffering from diseases such as Diabetes Mellitus, Alzheimer's disease, Parkinson's disease, Spinal cord injury, Stroke, Muscular Dystrophy, Lou Gehrig's disease, heart diseases, lung diseases, kidney diseases, AIDS, liver disease, arthritis, anemia and leukemia. While the ongoing research on adult stem cell is promising, they don't have the same potential for pluripotency as embryonic cells. It is for this reason, the society supports the funding for further stem cell research as society's members have witnessed that transplantation of human tissues such as kidney, heart and bone marrow cells has given improved quality of life to many patients. The society supports the collection of stem cells through voluntary donation only without monetary incentives and after thorough informed consent. Furthermore, the society agrees with National Academy of Science report, which recommends that biomedical research using nuclear transplantation to produce stem cells be permitted and a ban on reproductive cloning be imposed.

## The Status of Frozen Embryo (18)

The future and status of surplus or unused frozen embryo, nearly 400,000 in USA remain a controversy between religious and secular forces. While the pro life Republican administration is in favor of promoting embryo adoption while other groups are in favor of donating for stem cell research. This has opened a "Pandora's Box" of ethical and legal concerns. As I pointed out in the abstract, the difference between *what can be done and what should be done is the reason for ethics*. This is highlighted by the current controversy the cloning experiment of Korean scientist Dr. Hwang Woo Suk who is accused of fabricating the data on human cloning and compensating the donors. (19)

Thus we see that much has been written already and published in

this area by many organizations including IOMS and American Society for Reproductive Medicine.

Now, I will give my personal thoughts on secular perspective, as posed to me.

**"Social Impacts of Genetic and Reproductive Technology - the Secular Perspective."**

**Question 1:** What is in secular tradition is the vision of good society and the relationship between individuals and society? How does it differ from the Western secular liberal vision of a society composed of rational, self interested and autonomous individuals which emphasizes the importance of individual freedom? To what extent, the questions of social justice who benefits and who loses is relevant in clinical consideration in secular society.

**Answer 1:** The secular vision of a good society is a society which is based on human rights and human freedom, caring for everyone who lives in that society, irrespective of color, gender, social status, political or religious affiliation. It emphasizes the importance of individual freedom and choices in the interest of the individual. All programs in this society are geared toward empowering individuals and the community. It sees the practice of religion is a private and a personal matter. Religion in a secular society is allowed but coercion of others on the basis of religion is not. Social justice is a distributive justice and ideally, everyone is an equal loser or beneficiary. Ethics is not morality but a sum of values.

**Question 2:** How are the genetic and reproductive technologies affecting the relationship between individuals and society? Is it fair to say that they tend to encourage greater emphasis on individuals' inherent characteristics and competition and therefore greater inequality and less social solidarity.

**Answer 2:** While it is true that in a secular society there is more emphasis on individuals than at the society large. However, since the society is made mostly of secular individuals, the society itself is not at the cost of individuals. There is a possibility of some equality but that is related to availability of resources more than the intent. On the

other hand, in a religious or ethnic society, the majority is more beneficiary of the available benefits while secularists and minorities are treated as second class citizens in terms of the ethical rights.

**Question 3:** If it is true that selection and design of babies undermines human dignity, does that potentially also undermine human rights?

**Answer 3:** Yes it is true to some extent that designing a baby undermines human dignity to some degree. However, it is a matter of choice. If the individual, for example the mother or the couple, has a right to make the choice that they feel appropriate and live with that choice and can afford to do so. They also have a choice not to do so. While it may be appropriate for a certain couple to want all healthy, fair skinned, blue eyed babies, it may not be appropriate to want babies of the same sex for social reasons. Human rights will be infringed upon if society declares that all children be born in the whole society of the same genotype.

**Question 4:** Is there a philosophical basis within a secular tradition for concerns about social discrimination on the basis of genes, for example in insurance and employment.

**Answer 4:** Social discrimination in employment and insurance health care is prevalent in all societies, secular or not. Women and blacks get less salary, less bypass procedures, less dialysis, less heart and kidney transplants in the USA compared to men. In my opinion, such discrimination will still be seen in secular societies based on the socioeconomic status of the individual but less. A religious society (unless a religion is practiced 100% in its purest form) in my opinion is more discriminating. Religion is not an employer but the secular government is. Therefore, a secular government will have more obligation than the religious government.

**Question 5:** To what extent can arguments about the appropriate use of limited resources be made within the secular tradition?

**Answer 5:** In a true secular society, theoretically, since there are no discrimination religious factions, the usage of resources will be appropriate and only the only limitation will be the availability of the

program. If a heart or kidney transplant, for example, is needed, it will be on a first come first serve basis not on the basis of who can pay more. The question is will a secular society give preference to secular over non-secular citizens. It is possible, but most likely will not happen.

**Question 6:** Are genetic and reproductive technologies leading to a new form of eugenics in which disabled people and others who have less of the abilities that society values are gradually eliminated from society? If so, what is the argument against this?

**Answer 6:** This is a very touchy subject. Yes it is possible to some degree that there will always be survival of the fittest. However since the secular society, or as a matter of fact, in a true religious society, all components will have equal rights, it will not happen. There will always be forces who will advocate the rights of the disabled. This will include not only the disabled individual but also the unborn. Thus, total elimination or discrimination or ethnic cleansing of the weak and disabled, will never happen no matter how oppressive or how fair the establishment is, secular or religious.

My request to both groups is as under;

1 - Continue to interact and communicate with the each other.. They need each other's input and suggestions.

2 - Religious scholars should keep up with the changing scientific knowledge and technologies.They should not accuse scientists of playing God as we all try to do the same at times.

3 - We do not know what the future of stem cell and cloning research hold for humanity. Thus it will be premature to foretell. As Ted Peters pointed "If a primitive man had said now I have discovered Fire that we can use for cooking and keep ourselves warm, the holy men would have objected saying the this fire will burn our huts and trees,thus it is bad for humanity. Well, such objections did not prevent progress of science"

My Parting Thoughts:

***Given a choice, one may prefer to live in a religious society where the religion is practiced in its purest form and the citizens of non-ruling***

***religions and secularists are treated with equal human rights and human dignity. However, in the absence of such utopian society, one may accept to live in a secular society holding on to the above the values to the maximum.***

I end this article with my thanks to Dr. Robert Cleary, Professor Emeritus of Reproductive Endocrinology at Indiana University School of Medicine for his help and to my friend Dr. Gary Wright, anesthesiologist and Chair of Medical Ethics at the Catholic Hospital where I have practiced Endocrinology for last 30 years. He wrote to me (20), "The Late Pope John Paul has taught me much about human dignity. Commodifying new biotechnology will be both wonderful as we discover cures for chronic illness and human enhancement and the same time worrisome. Social hierarchies are the greatest barrier to compassion as they intertwine attitudes of superiority and entitlement. Social hierarchies define access to advantageous biotechnologies. Genetic Biotechnologies will provide more opportunities for the privileged to ensure that the advantages they buy will become permanent part of their bodies and their heirs. Equitable access and truc uscfulness should be litmus test for new biotechnologies. Compassion too easily gives way to personal profit, unfortunately, a stable part of human nature". On this point both secularists and religious ethicists agree.

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# REPRODUCTIVE TECHNOLOGIES: JEWISH VALUES AND THEIR IMPACT ON PUBLIC POLICY AND SOCIAL STRUCTURE IN ISRAEL

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# Reproductive Technologies: Jewish Values and their Impact on Public Policy and Social Structure in Israel

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## Introduction

Due to a combination of religious and historical factors, issues surrounding reproduction and fertility are very salient in Jewish culture. "Be fruitful and multiply" is a fundamental imperative of the Jewish religion. Female barrenness is a consistent motif in the Bible and the desire for biological offspring is a profound element of the Jewish tradition. The two matriarchs of the book of Genesis - Sarah and Rachel - were infertile, at least at first and Jewish tradition echoes the plea of Rachel to Jacob: "Give me sons, or else I die", a plea that captures the tragedy of infertility.

Furthermore, the genetic component of parenthood is strongly emphasized in Jewish law ("*Halakha*"). Even though in some instances the rabbis acknowledged the social and emotional reality of children being raised by non-genetic parents, the prevalent *Halakhic* position perceives parenthood as a natural given.(1) According to *Halakha* a male is under a religious obligation to have at least one child of each sex and has the right to divorce his wife if the marriage has failed to produce children over a period of 10 years.(2)

(1) Gold, M. 1988. *And Hannah Wept: Infertility, Adoption, and the Jewish Couple.* Philadelphia: Jewish Publication Society.
Zohar, Noam. 1997. *Alternatives in Jewish Bioethics.* New York: State Univeristy of New York Press.

(2) Jewish law governs the laws of marriage and divorce in Israel, even though the rest of the legal system is secular.

Israel defines itself as a "Jewish and democratic state" and seeks a cultural fusion of Jewish and democratic values. The ancient perception of infertility as a 'curse' and of fertility as a 'blessing' pervades Israeli culture where community life is centered on children.(1) The Israeli cultural emphasis on parenthood is not exclusive to the religious population. Although ultra-orthodox families tend to be larger, the secular population has similar attitudes regarding the necessity of reproduction. The average fertility rate of about 2.9 children per woman is high in comparison to other countries with similar financial and social features.(2)

In addition, a sense of threat regarding the future existence of the Jewish people after the extermination of 6 million Jews in the Holocaust, combined with a feeling of a "demographic duty" to the nation, create a culture that encourages reproduction and an official pronatalist population policy. In 1962 Ben Gurion appointed a commission whose recommendations resulted in the establishment (in 1967) of a "Center for Demography" and the release of the following resolution: "The Government finds it necessary to act systematically to realize a demographic policy, that is directed to create an atmosphere which encourages birth, taking into consideration that it is vital to the future of the Jewish people."

Israel's pronatalist policy is evident in every aspect of its legal and regulatory framework. Obstacles to fertility are systematically removed so that almost every individual has access to reproductive technology, if required, and a chance to become a genetic or a biological parent. This paper will describe the legal and the regulatory mechanisms that have been developed in order to remove different obstacles. It will offer a brief glimpse into the prevailing cultural values that underlie the social choice to support the use of reproductive technologies to

(1) Fogiel-Bijaoui S. Families in Israel. In: Izraeli D. et al. *Sex Gender Politics: Women in Israel.* Tel Aviv: Hakibbutz Hameuchad Publishing House Ltd. 1999: 107-166. (In Hebrew)

(2) Birth rate in Israel: 28.6 / 1000 in the 80'. 18.4 / 1000 in the 90'. Still, double the average of European countries. *Statistical Abstract of Israel* 2000, No. 51. Central Bureau of Statistics.

such a degree. Finally, it will mention some ethical concerns raised by the social reality that is the outcome of these cultural values.

## Removing obstacles to access

The Israeli legal and regulatory systems support and encourage motherhood and large families since the 1950's through incremental social security benefits which are awarded for each child and through protective labor laws that prevent dismissal of pregnant working woman and provide paid maternity leave. Pregnancy and birth-related expenses are covered by social security insurance. Yet, there is no coverage for contraception.

Moreover, since the 90's compensation is also paid to working women for absence related to infertility treatment. Legislation demonstrates a strong bias in favor of reproduction by declaring as invalid restrictions on access to reproductive technology and by finding solutions to situations which impede access to reproductive technologies.

### A. Funding

Israel's National Health Insurance Law of 1994 provides every Israeli resident with a "basic basket" of health services. This basket covers "infertility diagnosis and therapy" and "artificial fertilization" for the purpose of "bearing a first and second child, for couples who do not have children from their current marriage, and also for a childless woman who wishes to establish a single parent family".(1) This level of public funding is unparalleled in any other country in the world. Moreover, labor laws compensate working women for absences resulting from infertility treatment. This policy may provide partial explanation to the fact that Israel has the highest rate of per-capita-consumption of IVF in the world.(2)

Health Funds are thus legally required to provide IVF treatment without limitation of treatment cycles, unless medical grounds justify

(1) Second Addendum to the National Health Insurance Law. (In Hebrew)

(2) 1,800 cycles per million population, compared to 240 in the USA and 416 in the UK. (Israeli Ministry of Health data)

restrictions. Since 1999, certain restrictions apply for the purpose of preventing medical futility in infertility treatment. These restrictions relate to the woman's age (45 when using her own egg, 51 when using a donor egg); to the maximum number of cycles per year (6); and to the minimal time between successive egg retrievals (45 days). However, under these restrictions, there is no limit to the total number of cycle that a woman can go through.

**B. A partner**

In some countries single women are not allowed to use reproductive technologies to conceive a child in order to become single mothers. In Israel, however, they are not only allowed access to reproductive technology, but will also be fully funded by National Health Insurance, which covers - as mentioned above - "infertility diagnosis and therapy (...) for a childless woman who wishes to establish a single parent family".

Moreover, in 1997 the Israeli Supreme Court found a screening procedure (mainly psychiatric evaluation) for single women seeking IVF with donor sperm to be an unlawful restriction on their reproductive freedom. It ordered the Minister of Health to publish new rules that will guarantee that the procedure is performed "in an equal manner", meaning universal access. Since motherhood is so highly valued in Israeli culture, single motherhood is considered to be a better option than childlessness and in some cases encouraged even by the orthodox community.(1)

Last but not least, the Ministry of Justice recently admitted requests by widows for posthumous use of their deceased husband's sperm. In 2003, following a series of discussions held at the Ministry of Justice that involved medical, legal, bioethics, and Jewish law experts, the attorney general published guidelines that will generally allow courts to permit the practice.(2) The guidelines are based on the

(1) Kahn, S.M. 2000. *Reproducing Jews: A Cultural Account of Assisted Conception in Israel.* Durham, NC: Duke University Press.

(2) "Posthumous Reproduction Guidelines in Israel" *Hastings Center Report* Vol. 34 No. 2, 2004.

assumption that a man who lived in a loving relationship with a woman, would want her to have his genetic child after his death even if he never had the opportunity to formally express such a desire. Legal marriage is not perceived as a necessary condition for such a presumption.

### C. A partner's consent

What should happen if a couple begins to use reproductive technology in order to conceive a child but becomes estranged in the process? Is the consent of both partners to the use of their embryos necessary throughout the process? The Israeli legal system provided an unusual answer to these questions. In the precedent-setting *Nakhmani* case,[1] an estranged couple that had previously undergone IVF, fought over the disposition of the frozen embryos. The woman wanted to implant the embryos in a surrogate to have a genetic child of her own but the hospital refused to release the embryos without the genetic father's consent.[2]

The woman argued before the court that "just as her husband would not have been able to force her to abort if the pre-embryos were already in her womb, he cannot request their destruction outside the womb". In other words, she argued that she should not be discriminated against on the basis that she does not have a uterus, since if she had one, she would have been pregnant and her husband could not have objected to the pregnancy. She further argued that the fact that she has gone through pain and suffering during IVF treatments to obtain the eggs and create the pre-embryos, combined with the fact that her partner's behavior led her to believe that they had a common goal, makes her claim to use the pre-embryos stronger than his claim to not use them.

After a few appeals the case reached the Supreme Court of Israel. Construing the case as a conflict between a woman's 'right to

(1) F.H 2401/95 *Nakhmani v. Nakhmani*, 50(4) P.D.661 (Hebrew).

(2) In accordance with U.S. cases such as *Davis v Davis*, 842 S.W. 2d 588 (1992) and *Kass v Kass*, 91 N.Y. 2d 554 (1998). Here the courts ruled that any use of frozen embryos requires the consent of both parties.

motherhood' and a man's 'right to non-fatherhood," the Supreme Court ruled 7:4 in favor of motherhood thus acknowledging a right, which imposes a correlative duty on the father to refrain from obstructing its realization.

### D. Surrogacy

What happens if both partners are interested in having a genetic child but the woman is unable to carry the pregnancy? A surrogacy agreement in which another woman would carry the couple's genetic child to term would be a possible solution, but in many jurisdictions around the world such agreements are unlawful. In 1996 Israel was the first country in the world to enact a law to regulate and give legal validity to surrogacy agreements.(1) The law requires approval of all surrogacy agreements by a special statutory committee.

According to the law, a surrogacy agreement can only occur if the sperm is that of the commissioning father and the egg is not that of the surrogate mother. The surrogate should not be a relative of the commissioning couple. She should be a single woman (although a special request can be made to approve a married woman as a surrogate if no single woman could be found) between the age of 22 and 40. She must have children of her own but must have undergone no more than 5 births or 2 caesarean sections in the past.

The law carefully delineates the status of the future child, giving the "intended parents" custody at birth and guaranteeing their status as the "exclusive parents and guardians of the child." The surrogate mother's wish to withdraw from the agreement and/or gain custody require court approval based on a justifying change in circumstance and a reasonable expectation that the child's best interest will not be harmed. As of March 2002, 104 agreements were approved (of 150 requests) and 44 children were born of 33 deliveries.

### E. Egg donation

With nearly 2000 women awaiting donation in Israel, another

(1) "Surrogate Mother Agreements (Approval of the Agreement and Status of the Child) Law, 1996" SH 1577, p. 176. (In Hebrew)

impediment to fertility is a severe shortage of donor eggs. Until recently only women undergoing fertility treatments could donate their excess eggs. In 2001, a new law has been proposed, based on the recommendations of a special committee, with the purpose of expanding the possible circle of donors by allowing altruistic donations by women how are not going through IVF themselves.

According to this proposal the donor should be compensated for any harm or suffering and for less of time, income or ability to work. If a donor is undergoing fertility treatment herself and donating her excess eggs, she is entitled to half the compensation of a volunteer donor who is not being treated.

**Ethical concerns**

In Israel, the realization of motherhood is a societal expectation as well as an emotional imperative. Researchers describe a social reality in which women are socially constructed as a mothers, rather than an individuals, and in which parenthood is the main way of self-realization for women.(1) A childless woman is often conceived - by society and in her own eyes - as 'flawed'. Infertile women talk about feeling worthless and lonely, and about their lives as meaningless. Nurses in IVF clinics talk about "an addiction" to treatment. They describe situations in which women keep attempting to conceive through IVF even after many cycles have failed, because they cannot accept the idea of remaining childless. Some have even argued that this is an expression of culturally obsessive behavior.(2)

While the strong pronatalist atmosphere in Israel explains free and unimpeded access to generous fertility treatment, it also raises serious ethical difficulties. Some bioethicists claim that this cultural atmosphere imbued with pronatalism encourages individuals to over-consume reproductive technologies, creates a national obsession with

(1) Fogiel-Bijaoui S. Families in Israel. In: Izraeli D. et al. *Sex Gender Politics: Women in Israel.* Tel Aviv: Hakibbutz Hameuchad Publishing House Ltd. 1999: 107-166. (In Hebrew)

(2) Carmel Shalev in "Where is the Child?" *Ha'aretz*, Independence Day Supplement, 9.5.2000. (In Hebrew)

biological parenthood, and raises questions about the indoctrination of women towards motherhood at all costs.

On one hand, the reality of unlimited public funding for IVF creates a paradise of reproductive freedom. On the other, it raises concerns about the way in which social and cultural pressures influence the construction of 'free will'. Can rights be socially or emotionally interpreted as obligations? In Israel, women consume reproductive technologies to an unprecedented degree in ways that seriously impact their physical and mental well being. In most cases the healthcare system does not provide support systems for failed treatment or for discussion of alternatives such as adoption or voluntary childlessness, an option that is virtually unheard of in Israel.

Moreover, public funding of fertility treatment raises some difficult questions regarding priority setting in resource allocation, as economic constraints force Israelis to consider the urgency of rationing even basic and life-saving services. These ethical concerns deserve serious consideration and reflection in the future.

# HUMAN GENOME: SOCIAL AND ETHICAL IMPLICATIONS – AN ISLAMIC INTERPRETATIONS

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# Human Genome: Social and Ethical implications - An Islamic Interpretations

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## 1 - Introduction:

The speed of innovation in biology and in particular genetic engineering research is so fast that it will outrun peoples' ability to grasp, adapt and adjust to it in a sensible and rational way. The world lacks the mechanisms to come to term with these sophisticated discoveries. This explains the setting of a wide spectrum of committees, authorities and institutions to deal with different bioethical questions that resulted from the development in this research.

The people of faith should indulge and participate effectively in the current scientific research on the one hand, and be in a position to offer a moral, ethical code of practice based on wisdom and faith on the other hand (Ahmed, 1997 a & b).

This humble paper is to raise awareness among our people to this new genomic era and its ethical, legal, social and religious implications.

## 2. Scientific background:

The Human Genome Project (HGP) is really inspirational Human achievement. It is also a technological victory, and many described it as more significant than landing the man on the moon. This code "Human Genome" is the essences of mankind's life and as long as human exist, this information is going to be important and will be utilised on a large scale.

46 chromosomes constitute the Human Genome. This Genome contains about 30.000-40.000 genes (functional genes), which make up

only about 3% of the total genetic material, as recently discovered (Ventor, et al 2001; International Human Genome Consortium, 2001). The rest referred to as junk genes.

The first aim of the HGP was to determine the location of all 40.000 genes on the 46 chromosomes. The second aim, which follows from the first one, is the determination of the base sequence of the Genome to identify the function of the genes. To find the location of the gene, a process known as mapping is adopted, and sequencing is to determine the base sequence of the gene.

The dimensions of the project are difficult to imagine due to delicate and sophisticated processes involved. This is mainly due to the huge size of DNA molecule. It is estimated that the length of DNA molecule in each cell in our body is around 2 meter. Given the fact that Human body has an average of 100 trillion cells, thus if all the DNA in our body are attached to each other and stretched, it will reach the moon and back to earth eight thousand times.

To simplify the ethos of Human Genome Project (HGP), it will help to draw the following analogy:

If we magnify the size of the nucleus of the Human cell to the circumference of the earth, then one chromosome would have the dimension of a country. A gene would have the dimension of a city. The base pairs would have the equivalent of the population of that city. In this "world of the cell" scientists are looking for round 30.000-40.000 genes (cities) to locate them on the 46 chromosomes (countries) and ultimately to find out the sequence of a line of 3 billion bases (inhabitants).

### 2.1 DNA Molecule:

The DNA molecule which the world celebrate it's $50^{th}$ Anniversary last week, form the basis of Human genome project. The DNA structure is composed of:

Sugar dexoyribose

Phosphate

Nitrogen (nucleoside) bases of which there are 4 kinds - Adenine complement Thymine and Guanine complement Cytosine (A-T and G-C).

The structure resembles a twisted spiral staircase usually referred to as double helix, with sugar-phosphate backbone to the outside and are held together by hydrogen bonds between complementary bases resembling the steps.

The main functions of DNA molecule are:

1 - Storage of genetic information, where all the information required to produce and maintain a unique organism are contained within DNA.

2 - Inheritance, The information stored in DNA is transmitted to all descendent.

3 - Expression of genetic message, the information stored in DNA molecule is transcribed and translated into specific proteins that are required by the cell.

The way in which genetic information is stored, inherited and expressed is basically the same in all-living organism. **This explains the uniformity of creation and uniqueness of creator.**

Since we dealing with lettering system we might draw this analogy used by (Moses, 1995), to make it simple for people not familiar with biochemistry.

A simple "message" in English encoded in a linear sequence might be:

TTHECATSATANDATETHERATANDRANOFF

It become more intelligible if a "reading frame" of three letters to each word is imposed upon the linear message as in Fig (1). You will get a complete sentence, which have a meaning and could be compared to a normal protein (Fig 1. A).

If a single error (italic letter) is introduced into the message as in (B), which we refer to in genetic as mutation. Then after segregation into three-letter frame, the sentence lost its meaning. This illustrates the delicate and the sophisticated manner that the DNA molecule works within. Giving the fact that each Human cell contain 3 billions of genetic letter any error in any single letter will lead to mutation which sometime could be fatal and most times lead to different genetic diseases as in sickle cell anaemia.

Currently there are more than 4000 genetic disease resulted from changes to a single gene. Most of these changes are rare, but many causes severe suffering and often lead to early death.

The number of people affected by genetic diseases world wide is roughly 2% of all live births every year (Garvin, 1995). Most of the genetic mutations are maintained in the population by the passage of the genes from parents to offspring, or by steady input of new mutations. Not all the genetic anomalies run in families, some may result during the formation of gametes (sex cells), or in the early development of foetus or even exposure to radiation or other chemical agents.

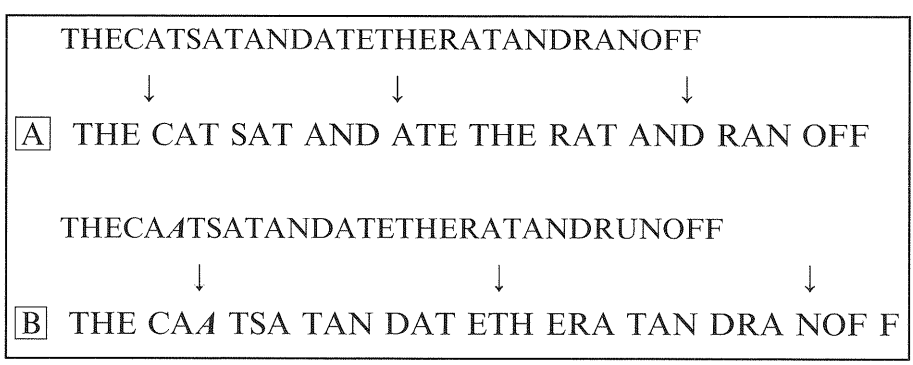


**Fig (1) Analogy of gene language**

Steve Jones in his brilliant book "The language of the Gene", the winner of the Rhone-poulence prize of 1994 described genetics as follow: "*genetics as a language, a set of inherited instructions passed from generation to generation. It has a vocabulary -the genes themselves- a grammar, the way in which the inherited information is arranged, and a literature, the thousands of instructions needed to make a Human being. The language is based on the DNA molecule*" (Jones, 1993)

Bill Clinton President of the United States joined Tony Blair the Prime Minister of Britain in praising the feat at a satellite-linked press conference on 6/6/00. He announced " ***Today we are learning the language in which God created life. We are gaining ever more awe for the complexity, the beauty, the wonder of God's most divine and sacred gift***". (The Daily Telegraph, 7/6/00).

## 3 - Application of HG in Health and Medicine

The following is only bullet points to highlight the huge benefit of Human genome application in health and medicine:

- Preventative measure
- Develop new diagnostic test
- Develop better treatment or personalised Medicine
- Correcting the faulty Gene by Gene therapy

## 4. Ethical, Legal and social dimensions of the Human Genome:

Ethics is the way to deal with extremely difficult questions of right and wrong. It is the study of moral value of Human conduct and of the rules and principles that govern that conduct. It is often referred to as moral Philosophy.

Basic categories of ethical concern fall into two classes:

1 - Intrinsic Concern that deals with things that is thought to be wrong in themselves such as nuclear weapon or Human cloning.

2 - Extrinsic Concern which involve the application of the technologies.

They are neutral in themselves, but open to misuse or cause harm to others, such as genetic engineering that can be used to treat disease or it could be misused to create biological weapon. Though other scientists believe that genetic engineering is also intrinsically wrong (Wan Ho, 1998).

Islamic jurists vary in their verdict towards recent developments in genetic research and in particular cloning, ranging from total rejection to giving cautious and conditional acceptance (Ahmed, 2000).

As regard to the human genome project, the Department of Energy and the National Institutes of Health have allocated 3-5%, which is around £120 million dollars of their budget to study, analyse and address the ethical, legal and social implications surrounding the availability of the genetic information.

To discuss these important issues, the following topics will be covered in very little details as the paper permit:

1 - Historical and Political background to Human Genome

2 - Privacy, Confidentiality and fairness in dealing with genetic information

3 - Reproductive implications

4 - Psychological implications

5 - Philosophical and conceptual implications

### 4.1. Historical and Political background to Human Genome

Large numbers of people from scientific and non scientific circles are very concerned with the great development in genetic sciences and are afraid of the memory of eugenic movements in Nazi Germany, rest of Europe and United State during the first half of last Century. If the development in modern knowledge of Human Genome is aimed to benefit Human being rather than harm them, there must be an awareness and understanding of the lessons of history among the scientific circles and society at large. Those lessons of Eugenics movement, which used some, distorted scientific data to justify its ideology and inflicted misery among wide spectrum of people across the civilised world!

### 4.2. Privacy, Confidentiality and fairness in dealing with Genetic Information:

The most critical issue of social implications of the Human Genome is the privacy, confidentiality and the fairness in the use of the genetic information.

Rothstein of the University of Houston, Law centre define "Privacy" as the limited access to a person, the right to be alone, and the right to keep certain information from disclosure to other individuals.

Confidentiality, on the other hand, is the right of an individual to prevent the redisclosure of certain sensitive information that was originally disclosed in the confines of a confidential relationship. Protecting confidentiality can be difficult because others think they should have the right to see an individual's information (Rothstein, 1999). In Hippocratic oath, first mentioned the "duty of confidenti-

ality". The need to maintain the confidentiality is considered as an ethical obligation in the relationship between the patient and his doctor. This obligation facilitates the openness and frank communication between the two parties. This help immensely in the diagnosis and treatment of the patient. The patient is reassured that his dialogue with his doctor would remain confidential and any documented information would remain secret. This is in legal term, may be considered as an aspect of patient's right to privacy (Weiss, 1998).

Unless safeguards are established, we all run the risk of being victims of genetic discriminations on various levels, employment, insurance, ethnicity, education, courts, military and many others. American president Clinton acknowledged the benefits of the Human Genome project, but warns against the misuse of genetic information, in his announcement in 1997 for the support of legislation to provide comprehensive solution to the problem of genetic discrimination. He said, "*Genetic discrimination is more than wrong. It is a life -threatening abuse of a potentially life-saving discovery*".

### 4.3. Reproductive Implications:

The implications of Human Genome Project on reproduction arise from the highly probable alliance of Medically Assisted Reproduction (MAR) with Diagnostic Genetics (DG). This alliance was referred to nicely by new term used by (Sliver, 1997) as Reprogenetics. This term comes from the merging of remarkable scientific and technological advances in two fields- Reproductive Biology and Genetics. This new field will turn science fiction into reality from cloning to embryo selection to genetic engineering and beyond. It also raises serious ethical and legal questions (Ahmed, 1998)

Currently the medically assisted reproduction aims to help infertile couples through different techniques to have children.

### 4.4. Psychological implications:

The genetic information will be accumulated as a result of Human Genome project and consequently result in expansion of genetic testing. The genetic testing will expand beyond single gene disorders,

to testing for genes associated with common disorders, thus it is very crucial to take into consideration what impacts this will have on the psychology of the individuals, their families and the society as a whole. The psychological implications of genetic screening for genes associated with increased risk of certain diseases has been well studied and researched (Croyle, 1995). Currently most of the genetic screening is carried out in prenatal or preimplantation stage to ensure the safety of the future children, but predictive tests, which allow people to know their possible predisposition to certain diseases are increasing frequently as genetic information accumulated.

The completion of Human Genome sequence will facilitate the identification of all the genes that contribute to diseases. The functional classification of disease gene and their products will reveal general principles of Human diseases.

Many in the medical establishment believe that uncertainties surrounding test interpretation, the current lack of available medical options for these diseases, the tests' potential for provoking anxiety and the risks for discrimination and social stigmatisation could outweigh the benefit of testing.

### 4.5. Philosophical and conceptual implications:

Since the dawn of history, the argument of Human responsibility, free will Vs genetic determinism is occupying a large area in Human thinking. If the theologians and philosophers discuss this issue logically, the Geneticists and in particular behaviour geneticists are tackling this vital issue experimentally. They are trying to proof whether people's genes make them behave in a particular way? Or can people always control their behaviour? And what is considered acceptable diversity? In answering these questions the scientist do differ, some proof it this way and others believe it the other way. Some believe that the gene makes us Human and the notion of "genes are us" provides a sensational media items these days. We heard on a daily basis that they found a gene for aggressiveness, homosexuality, alcoholism and even promiscuity (Ahmed, 1995)! We heard that the genes make some musicians, Olympic athletes, or genius and make others schizophrenics, manic-depressives, even drug

addicts. Moving in this slippery road will inevitably led us to the memory of Eugenic movements in first half of 20th century. Where the reliance on a distorted scientific data and promoted it as an ideology caused tremendous misery among wide spectrum of people across the civilised world!

Single genes do not determine most Human behaviour. Only certain rare disorders such as Huntington's disease have a simple mode of transmission in which a specific mutation confers the certainty of developing the disorder. Most behavioural traits have a more complex aetiology, known as complex traits.

Behaviour is a sophisticated aspect of Human attributes because it is the product of the most complicated organ in the Human body, the brain.

The genetic basis of many aspects of Human behaviour is very difficult to assess due to the fact that a human's behaviour is not a constant physical entity, but rather extremely dynamic and continually changing all the time. This changing potential gives the Human being an immense capability to adapt to divers environment and increased his survival opportunities. Thus, no wonder the genetic basis of Human behaviour is still poorly understood.

## 5. Muslim Scholar's views on Human Genome Implications:

I put forward a number of questions relating to the implications of Human Genome to a number of scholars in the Arab world. I first explained to them preliminary information as background to help them in formulating informed views. My questions were grouped under the following headings:

- Privacy of genetic materials
- Psychological implications
- Pre implantation genetic test
- Gene patenting
- Human will vs genetic determinism

I received quite a thoughtful response form some of the scholars

(at the time of writing this manuscript) who are kind enough to spare some of their precious time to respond to my quires.

All the scholars who responded encourage the genetic research, which facilitate the diagnosis and the treatment of the diseases.

Fazlullah of Lebanon responded to the questions as follows:

**(1)** The genetic substance is a formative peculiarity for its bearer as part of his formation, fundamentally the others should not be informed about this peculiarity if it represents a formative defect which its bearer does not want the others to know about, unless in cases of relieving harm from him or advising others. If it is not a defect (*however*), then there is no prohibition on talking about it without his permission. This view also shared by other scholars.

**(2)** It is not obligatory to inform him about what the substance leads to of future psychological illness. In fact it (*becomes*) prohibited if this puts him in the negative psychological effects at the present (*i.e. the negative frame of mind*), as a result of the reaction to this knowledge with his self/personal feelings. (*However*), if informing him about these (*consequences*) conforms to the possibilities of carrying out a preventive measure, which will protect him from future harm, then there is no prohibition.

**(3)** It is prohibited to carry out abortion simply because it has become known that the foetus suffers from a dangerous illness, especially if after the soul has been infused into its body after the foetus attains 120 days. Abortion is prohibited once this stage is attained, except in extreme condition when the life of a mother is at high risk. Before 120 days abortion may be tolerated - according to reasonable number of scholars - for a reason acceptable to the sharia, such as the case of untreatable sever congenital anomalies and only with the consent of parents. This is shared by many other scholars (Al- Qardawi, 1993) and (Al Muhammedi, 1993). Though others believe that abortion is prohibited before and after 120 days, and only permitted if the mother life is at high risk.

**(4)** The mere knowledge of the company about the gene does not give it the patent so as to have this knowledge (*as a knowledge*)

possession to the extent that the owner who himself owns the gene is prohibited from acting freely with.

**(5)** Genetic peculiarities, exactly like all living elements within the body, can leave their negative or positive effects on man by preparing the psychological, mental and practical circumstances to move in their direction.? But they are not outside the preparation for that - this preparation which may clash with the Human will power, which may be affected by the peculiarities of the knowledge coming from outside or the objective circumstances which is surrounding the self - which may lead to some practical activities that may change some of these effects. At any rate, choice is not distant from personal effects within the Human formative peculiarities, but it has something else of the Human nature, in the depth of the instinct that Allah, the Most High, amassed in it. **This means that whatever effect the genes have, they do not represent the causative inevitability in the consequences so as man loses choice;**. All the Scholars agree that genes have no overriding power over the Human will, and Allah the Most High is the Knowing.

## 6 - Conclusion:

I believe that the above-mentioned views still need to be debated and discussed further across the scholars of different faiths and scientists to provide a solid and reliable background to refer to in this very fast advancing field of genetic research. I also believe that there should be a consultative body within the Muslim/Arab countries with diverse expertise (social, science, law, and religious scholars) to debate these crucial issues and put recommendations to decision-making bodies concerning this research within the spirit and purity of faith.

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# DISCUSSION

# Eighth Session

**Chairman**: Dr. Mamduh Gabr

**Rapporteur**: Dr. Salah Al 'Atiqi

**Chairman**: Dr. Ajeel Al-Nashmi

***Dr. Ajeel Al-Nashmi***:

I have two questions. The first is directed to Dr. Vardit. She said that it is lawful for sterile married women and widowed women to take from the bank of fertilized eggs. Is this also lawful for women who did not get married? Does this contradict the Jewish Halakha or not? The Jewish Law is known for its keenness on that the parents should be Jewish. The second question is about the surrogate uterus. She said that this practice already exists. The question is are the legal problems concerning the baby between the three parties; the man, the wife and the surrogate mother; solved yet?

***Dr. Farhat Moazam***: Just two very quick comments. First one is for Dr. Athar. He made some very important points. At the end, he mentioned that it was requested by Rabbis and Christian scholars, present amongst us here today, to disseminate knowledge about Islam. That is very much our responsibility as Muslims to disseminate this information and, in my opinion, we have not done a very good job for that.

The second comment I have for Dr. Vardit. I really enjoyed your paper. It brings in the social realities of life and the important point you made is the way sociological impacts on the direction in which religions have taken us. Thank your for doing that.

**Chairman**: Dr. Ezzeddin

***Dr. Ezzeddin Ibrahim***: I would like to commend very highly on the presentation of Dr. Ravitsky for its absolute clarity. I have a short, equally clear, but a blunt question to her. We understood the religious justification for increasing the population, and the justifications from traditions. Am I justified to assume that Israel is trying all types of means to increase the population at any price? If you think, that the

justification is social or probably political and the answer will be too sensitive, please don't answer it. But, answer it privately to me just for my personal knowledge. But if you think, you can say it without raising any sensitivity on the floor, please do so. Thank you very much.

**Chairman**: Dr. Taqi

***Dr. Taqi Usman***: I have a very short comment on the presentation of Dr. Shahid Athar, and two questions for Dr. Vardit Ravitsky. For Dr. Athar, when he said comparing between secular and religious societies, that the people who belong to other religions are treated as second grade citizens and not as first grade citizens. Speaking from Islamic point of view, as I understand from Holy Quran, Sunna of our prophet Muhammad (PBUH), it is a pure, an ideal state, that all the non-Muslims, citizens of that state, are a part, so long as the human rights are concerned. So, this statement is not as a whole true about Islamic state.

My two questions to Dr. Vardit Ravitsky, after paying my gratitude for her clear presentation. First is, she has referred to the right of single parenthood for a woman. So, my question is whether single parenthood covers or justifies extra-marital sexual intercourse also or is it beyond that? My Second question is, whether the rules explained by her, the rules adopted by Israeli government or Israeli state, are the rules or regulations according to the Rabbis and the religious scholars? Do they conform to the religious norms of the Jewish religion or they are violative of the original Jews? Thank you very much.

**Chairman**: Dr. Bruce

***Dr. Bruce Foltz***: I have concerns with generous paper by Dr. Athar. I think he overestimates the similarities between secular and religious points of view. He said about the sanctity of human life. In fact, it is really false. As a case implies, Prof. Peter Singer, who is probably the most leading bioethicists in English, has written several books attacking the notion of the sanctity of human life. Because, it prevents people from doing what they want. Having abortions, giving euthanasia all the things that would relieve sufferings. Dr. Singer says

essentially human beings are animals, some human beings are less than some animals because they believe in the notion of human soul, GOD created, GOD given in fact, brings about sufferings unnecessarily.

A very quick point to Dr. Ravitsky, she talked about parental rights. I have a question about the rights of children. Studies in US, the children's of single parent, almost in every aspect are less well off than two parents, educationally, medically, psychologically and in terms of family income, is that somehow not the case in Israel as well?

**Chairman**: Dr. Quigely.

***Dr. Muireann Quigely***: I just want to make one comment. Probably, I have problems' with Dr. Foltz's interpretation of single rights, but I will discuss that with him privately. My question is directed at Dr. Ravitsky. I was very interested in the challenge that happened in the Supreme Court, let we change the law, talking about the infringements of a person's human rights, and a person's rights to be reproduced, also woman and man. So, considering the terminology, I am wondering, she could comment on what she thinks of the courts, if they receive the petition from a man, she has his fertilized and a donated ovum, and then have thus the resulting embryo implanted into surrogate mother, so he becomes a single father and they endorse his right to parenthood by the same means. Thank you!

**Chairman**: Sheikh Salami

***Sheikh Mokhtar Al-Salami***:

In the Name of Allah, Most Gracious, Most Merciful. In the beginning, I'd like to extend my thanks to the three speakers. What I heard today was far from any ambiguity. This clarity is the result of faith in and understanding of the speakers' words. Yet, I find some problems concerning parts of the addresses I heard. First, Mr. Shahid said that he is secular and enumerated 7 of the foundations of secularism. He introduced himself this way as if these foundations are exclusive to secularism. All the same, I am a Muslim and I believe in all the foundations he mentioned. Yet, Mr. Shahid should have been more precise and detailed on stating freedom as one of these foundations. What is freedom? I believe in freedom. For Muslim, there is the

freedom of belief. Allah says, "Let there be no compulsion in religion..." (Al Baqarah: 256) Freedom is available for man who cannot be responsible in the absence of freedom. However, is freedom - as I mentioned yesterday- subject to rules? Is Mr. Shahid for or against the sexual freedom? Is he for or against homosexual marriages which has associations now? Thus, all what Mr. Shahid mentioned is accepted by Muslims in general. But when detailed, Muslims find it unacceptable. The second point concerns the advice he gave to scientists on wrapping up his address. Each and every Muslim accepts advice. Yet, it is next to impossible to create what already exists. Thus, this piece of advice did not struck the scientists' minds before. We are waiting from him to present us with it. As for his call for the incessant pursuit of knowledge, this conforms to the Qur'anic teachings. Qur'an urges Muslims to seek knowledge and be pioneers in this field; for Allah Almighty says, "... but say, "O my Lord! Advance me in knowledge." (Ta Ha: 114). This was not conditioned by the person's faith or corruption. This verse urges the pursuit of knowledge in general and understanding what scientists say. That is the purpose of our existence. At the beginning, I said that I benefited much and my personality now incorporates what is mentioned in the sessions I attended with the IOMS. May Allah reward it for its efforts! How can I be asked to create what is already there? This is originally the job of the media. In fact, as scholars, we have no influence on the media. This is out of our hand. We merely write and these writings do not reach the others. For any writing to reach the other, they should be in the other's language; a responsibility to be shouldered by Muslims. I believe that Dr. Hassan Hathout- may Allah cure him and render him even stronger- is one of the scholars that made the voice of Islam heard in U.S.A. besides many other of his brother colleagues who made it heard through the mass media in many societies. As for the second address which I lauded for clarity, its content is well understood by me. On writing his diaries, General Charles de Gaulle wrote what happened between him and the first president of Israel. To the question, "What do you want of us?", the then Israeli President gave what De Gaulle described as the strangest answer ever, "I want immigration, immigration and immigration. I want nothing else.

Enable the Jews to immigrate to Israel!" then, it is a basic policy in Israel to increase the number of its population. Secondly, all that she said was understood. The Israeli state or the Israeli are the only ones to base genealogy on the basis of the mother. Therefore, all the courts judgments and the demands forwarded stem from this principle: the mother is the basis of genealogy. Yet, I want to pose a question. What I understood from the lecture is that womb surrogacy was permitted. Can the rich woman who does not want to shoulder the burdens of pregnancy rent a poor woman and have as much children as she wants and maintain her health at the same time? As I understood, the law there allows this woman to rent wombs and be with her husband the biological parents. But would eggs of non-Jewish women be accepted? My question is can the eggs of non-Jewish women be used and then the genealogy be back to the Israelites? I pay tribute to Dr. Hamed Abu Ahmed and thank him for his clarity and basing his lecture on the basis of faith. He raised the issue of privacy. The physician gets to know some of the private secrets of his patients through the Genome and so does the lawyer. In Islam, these secrets are forbidden to be disclosed. By virtue of his profession, each man gets to know the personal secrets of some people. But this constitutes no problem in Islam that prohibits divulging personal secrets. Thank you and peace be with you.

**Chairman**: Sheikh Taskhiri! Please abide by the time limit!

***Sheikh Mohd. Ali Al-Taskhiri***:

Thank you, Mr. Chairman. I'd like to mention three points. Dr. Shahid made it obvious that he is a Muslim and not a secular scientist. I do not know how he gave himself the right to answer the six questions on behalf of secular scientists without referring to secular authorities! In fact, secularism is not a creed, it is a social trend that separates between religion, facts and social life without having the intellectual bases that defines its stance towards existence, history, man and society. Some attempted to talk about the secular philosophical bases, yet they actually had nothing to say. My dear speaker, the truth remains that man is valued by his creed, concepts, emotions and behavior as a whole. These elements of personality cannot be judged

separately. Dr. Ravitsky, I fully understand the Israeli yearning for procreation. Yet, Israel compensates the small number of the Israeli people by the procreation of the genuine people of Palestine. Nonetheless, I do not understand this method of borrowing the means to procreation from a stranger with all the Jewish emphasis on the purity of the Jewish blood and that all the other bloods are inferior. In Islam, as I understand, any spouse of the married couple can demand having children from the other spouse. They can even agree verbally on it as one of the conditions of the marriage contract. Beyond this conventional implicit or explicit agreement, Islam deos not allow any of the spouses to force the other to have children. Finally, I'd like to thank Dr. Hamed for his valuable lecture. In fact, I benefited a lot from it. But I think that if he delivered it in English, the difficult English terminology he used would be translated. That would be better; for we as Arab did not understand many of the terminology mentioned in the course of the lecture. Thank you.

**Chairman**: Dr. Jaafar Sheikh Idris

***Dr. Jaafar Sheikh Idris***: It seems to me that we have to be very careful about seculars. Secular is a negative term. It only means non-religious. I don't think that there is anything of importance on which whole secular people are agreed. So, when you talk about secular people, you have to define to what group you are pointing. Secular philosophers don't believe in something called human nature. Because for them this is like a religious view. Some of them don't believe in human rights, some of them don't believe in, of course, human sanctity. Again for them, this is a religious view. So, it is not accurate to talk about secularism in general.

Second point, not everything that a secular person believes in is part of secularism. Because he is free, he can take anything from religion, his origin was Jewish also, that doesn't make what he believes in secular. For secular, it has to be justified within the framework of secularism. Thank you.

**Chairman**: Dr. Abdullah Basalamah.

**Dr. Abdullah Basalamah**: I have two questions. First for Dr. Ravitsky. The things which have been discussed in Islamic meetings

regarding surrogacy, donor of sperm, ovum etc., have been based on Islamic view. That's why the Quran and Hadith and the scientific people, doctors, jurists and so on, discuss the Islamic view on that point. Now, the point you have mentioned there, is a rule laid down by the court. Have any of those rules considered the point of Taurat or the holy book in that view?

Another question to Dr. Hamid. May Allah reward you! I heard that scientists came to discover the gene that defines the belief or disbelief of man. This means that man's faith is based on genetics. Does this gene really exist? Thank you.

**Chairman**: Dr. Gamal Badawi

***Dr. Gamal Badawi***: I have a question to Dr. Ravitsky. About this law, the woman who doesn't give birth after 10 years can be divorced. I wonder whether within the Jewish law polygamy was practiced. I just like to indicate that within the Muslim community, there have been a range of interpretations, there are those who have been very conservative using these arguments, not to speak about the scriptures as some people suggested that the scripture is basically intended for guidance not for science. Secondly, that you should keep away from the variations and changes, science doesn't tie scripture to that. And thirdly, the temptation for proof in the text. I like to clarify the fact that the scriptures with the Bible or Quran are essentially books of guidance and science, there is no dispute on that. However, we find the same Quran also makes reference to the fact that, incidentally, be also science for people to realize the divine origin of the Quran.

**Chairman**: Dr. Issam Ghannam

***Dr. Issam Ghannam***: I think most of the questions have been asked by other scholars. So, I am going only to suggest one thing. This is the first time for me to attend such a beautiful meeting. It's a duty of Muslim scholars to really demand from the Arab TVs and satellites to project all this topics to the mainstream Muslims because, most Muslims are in the dark.

**Chairman**: Dr. Sageer

***Dr. Sageer:***

In light of the main topic of these presentations, a point has to be highlighted. There is a great difference between linking values to the religion of Allah Almighty and linking values with what is called secularism that ignores the religious values. What would be the result of rendering the values void of the legal religious character? The immediate result is falling in the abyss of the Absolute relativity and extreme individualism. Perhaps, this explains the introduction of a set of individual manners and personal attitudes to the values of modernism by modern and contemporary secularism in the name of human rights. All the same, these introduced values are no more than acts based on sheer individual whims and bestial motivations. These so-called values are not only relative, but also represent behavioral patterns antagonist to the system of nature itself. In light of this absolute relativity, the concept of values is a confusing notion that contradicts each and every value supposed to be human and is not so but through conforming to logic and consistency. Deviations in the individual acts or some scientific applications may not exist because society itself can prevent the prevalence of some moral viruses that aim at creating a balance of power. But if a spokesman of the political or legislative authority in a given society gives a writ or verbal approval of some of the actions inconsistent with the human values, this is considered an encroachment on society, a deviation from human values and an abuse of his position. By this I mean to express my condemnation of the British PM's insistence on attending and blessing a wedding party of two men broadcast on TV last month. This kind of behavior may be mistakenly thought to render legitimacy to an immoral act. Yet, it does not create new values but forebodes the death of man. Thank you.

**Chairman**: Dr. Refai

***Dr. Abdul Rahman Al-Refai***:

In the Name of Allah, Most Gracious, Most Merciful. In this blessed session, uterus rental was talked about a lot. Surrogate wombs and blood relations in Islam have three bases: genealogy, breastfeeding and marriage. It is known that breastfeeding creates new bonds of kinship. The foster mother is considered a mother of the suckling

baby. Her husband is considered the baby's foster father. Thus, if this father has another wife, his children from this wife will be the siblings of the foster son. But why is man considered a foster father? This makes new bonds of kinship because the husband has a right to his wife's milk that was given away to the baby. The Prophet (PBUH) said, "Foster breastfeeding is due to starvation." On being asked about the number of the times of suckling that makes the baby a foster child, he (PBUH) said 3, 4 or 5. It was narrated that the Prophet (PBUH) said that the number that makes the baby's bones and flesh grow. Thus, woman is not merely a container or test tube in which another woman's egg is put. The implanted egg carries half the genetic characters of that stranger woman and the sperm carries half the genetic characters of the stranger man. This egg further grows flesh from the surrogate woman. Thus, this fetus implanted in the surrogate womb feeds on her flesh. It follows that the fetus that grows in a surrogate womb is part of the three parties.

**Chairman**: Thank you. Your viewpoint is clear. Now we move to brother speakers. Dr. Shahid Athar.

***Dr. Shahid Athar***: *Bismillah Hirrahma Nirrahim.* It was not my decision to include secularism, or secular perspective in this seminar. This goes to Dr. El-Gendy and to Dr. Al-Awadi. It would have been nice, if I had to programme this, I would have just called ART in Abrahamic faith, and that would have been very reasonable. But, it was their wisdom to do so. It is my courage to come here all the way to give you not my personal conviction, which is in my *Kalima*, but to inform you that we Muslims need to learn about what the secularists are saying and what their opinions are because they are controlling not only the agenda in western countries but also in many Muslim countries.

To my classmate Dr. Farhat Moazam, yes, it is true that we Muslims have a responsibility to disseminate the knowledge, but we are not doing a good job. So, my reverend Rabbi, a Jewish scholar, Christian scholars who took pain to come to learn Islam, when they go back, they will be talking about Islam.

Now to Dr. Taqi, my mention of second grade citizens was not

related to a theological defense. Yes, in a religious society, every one should be equal if the society is in purest form so that the rights of the minorities are protected. An Indian judge who by himself was a Hindu, a Supreme Court Judge, in the defense of a Muslim, said that it is the minority which needs the protection of the state, the majority can protect itself.

Now, to Dr. Bruce, yes, there is a difference in sanctity of human life between the two groups. But, it will be erroneous to base on one secular person opinion, that all secularists do not value human life. This is not true. I am not here to defend secularism, I am here just to project what they are saying, we Muslims should know.

To Dr. Salami, about the freedom, yes, there is freedom in both the groups. The difference in the freedom is that in Secular group it is unlimited and in religious group there is a limited freedom, the freedom that has been granted by our creator.

Finally, about the word advise, it was my mistake to use the word "advise" the word should be "request".

So, with these, I agree that secularism is not one religion, there are many levels of secularisms and many groups. But, we must understand what they are thinking about the values, and interact and give them our, I mean, Muslims' opinions. Thank you.

**Chairman**: Now, Dr. Ravitsky. I hope within 3 minutes you can respond to the questions.

***Dr. Vardit Ravitsky***: I would like to say that I am aware of the fact that I presented controversial positions and I am aware of the political sensitivity. I would first of all like to thank all the speakers for the respectful manner in which they raised the issues. Four major issues have been raised and I'll take up the more general ones first.

Is it about individual reproductive freedom or is it a political agenda? I think, there are two layers here. If you look at each law, each regulation, the rational is always that of reproductive freedom allowing the most individuals the greatest degree of possible freedom in achieving the reproductive goals and having children in the way that they want. At the same time, we have to take knowledge of

another layer when we look at the entire body of legislation and regulation combined with historical background and the cultural values. We see a pronatalist policy that is very explicit. And, of course, the history of the people of Israel and history of the state of Israel is that of the minority in certain geographic location. If a state wants to define as Jewish and Democratic, the demographic issue is obvious. You cannot be a democracy, if you are a minority. So, we have to distinguish the modulation of individuals for demographic reasons. They have lot of families because they love to have children and they live in a culture that is essential on children. The cumulative effect of the values and the laws created a certain atmosphere and certain policies, i.e. obviously linked to the political reality.

The other general question is very complex. All the policies that I described, are they religious or not? Though, rules and laws that I described are the outcome of the democratic secular pulses of a majority built. However, what makes the Israeli reality special is that there is an attempt to allow religious values and physicians to have input and influence within the democratic process. For example, when the surrogacy law was written, issues of lineage and the religion of the child in the source of the egg was discussed from religious perspective, so that the surrogacy law, if possible, does not contradict the Jewish orthodox law. I am not saying surrogacy law is religious, I am saying there was religious input into the legislation.

May be Rabbi will correct me, if I am wrong that some Rabbinic authorities do acknowledge surrogacy as a legitimate way of having children.

***Dr. David Rabbi Bleich***: I thank very much that you used the word "legitimate". Regarding the problems with surrogacy, there are not many problems with regard to the gestation of the child including the issue of genetic identity. The issue itself is sufficient to raise serious religious problems. Those of very complicated questions, is you seek to resolve them from the perspective of A) Jewish Religion B) Jewish Jurisprudence which is not essentially religious but is part of Jewish law. Apart from the problem of genetic identity, or the very real problems arise in contemplation of enforcing a surrogacy contract in

sofar as other social policies, the state of Israel are concerned. I think that the political forces within the state are well aware the fact that approximately 18% of the electorate identify themselves as religious and that those are voters whose votes must be counted as is the case within any democratic country. That means that consideration must be given to their concerns and then balance them out with other considerations including the potential votes of other people within the society.

***Dr. Vardit Ravitsky***: Two questions asked about surrogacy and single mother. Does the surrogacy law resolves the issues? Reality is that since the law is passed and committee approved agreements, there was no case of a surrogate mother changing her mind and wanting custody of her child.

However, single women challenged the law committee that was appointed. It examined the question and decided not to change the law at this point. The issue of the single man is a donated egg and the surrogate to become a single father is not addressed by that committee. I think, one step removed.

With regard to unmarried women, there is a question about pregnancy achieved by sexual intercourse. There is no law against extra-marital intercourse. My point was that socially when a woman does become pregnant outside of marriage, there is a degree of social acceptance because motherhood is valid. Is surrogacy allowed when the woman is well, because she is rich and does not want to carry child? No, it is not allowed for non-medical reasons, there is a special committee that examines each request, surrogacy is only allowed when the woman is unable for medical reasons to carry the pregnancy. Eggs from a non-Jewish woman, it is my understanding that, according to some Rabbinic authorities, the lineage can go through the birth mother, not necessarily through the genetic mother, which helped to accept that regulation.

**Chairman**: Thank you very much for the clear replies. Now, Dr. Hamid Ahmed only 3 minutes.

***Dr. Hamid Ahmed***:

Thanks a lot for the brother colleagues who posed questions. Sheikh Taskhiri, it is prohibited to divulge personal secrets in religion. Yet, I referred to some of the Muslim jurists who agreed with you on this opinion. Yet, if there are reasons related to the welfare of the family without disclosing the Genome, it will not be a problem. Sheikh Taskhiri,.....No, I am sorry. As for the brother who asked about the faith-defining gene, I have reservations concerning some of the research papers referred to by Dr. Hathout. We cannot but have reservations in this respect. In 2003, this proposition came into existence and I heard about it while attending a lecture in London. This proposition attributes every aspect of faith to science. The Qur'an says, "When thy Lord drew forth from the Children of Adam from their loins- their descendants, and made them testify concerning themselves, (saying): "Am I not your Lord (Who cherishes and sustains you)?" (Al A'raf: 172). Thank you.

**Chairman**: Thank you so much for bearing with us, although we didn't exceed the time allotted to us.

# Topic III:
# Social Impacts of Genetic and Reporductive Technologies

## Ninth Session
## Wednesday, 8 February 2006

## A Right to Reproduce, Designing Children and Genetic Counseling - Islamic, Jewish and Secular Perspectives

**Chairman** : Dr. Gerald Winslow
**Rapporteur** : Dr. Abdulla Basalam

***Speakers:***

*1 - Dr. Aly A. Mishal*
*2 - Dr. Hanan Hamamy*
*3 - Dr. Muiream Quigley*

# REPROGENETICS AND GENETIC COUNSELING SCIENTIFIC AND ETHICAL PERSPECTIVES

*Dr. Aly A. Mishal*
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# Reprogenetics and Genetic Counseling Scientific and Ethical Perspectives

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## ABSTRACT

Genetic research and knowledge has grown to unprecedented dimensions in the past decade. The Human Genome Project (HGP) has significant implications in many areas, including reprogenetics.

The traditional prenatal diagnosis of genetic abnormalities was utilized for years to identify genetic, and other disorders, during pregnancy.

The more advanced: Pre-implantation genetic diagnosis (PGD) has been developed to identify genetic diseases in human embryos or pre-embryos prior to transferring to human uterus. Only embryos not affected by certain genetic disorders could be transferred.

Identification of serious and life threatening genetic disorders, and reaching to clinical decisions, as to how to deal with them, continues to stirr ethical concerns. The major dilemmas arise in situations such as:

1 - Non-pathological conditions, physical or intellectual, or gender selection.

2 - Late-onset genetic disorders, which may appear many years later.

3 - Who has the right to decide on prevention or termination of pregnancies.

4 - Who has the right to inform the patient about the existence of genetic predisposition to certain disorders.

5 - Does the society at large need to undergo genetic screening.

6 - The sensitive issues of privacy and confidentiality of genetic information: How to safeguard against stigmatization and discrimination.

7 - Human rights aspects and the issue of Eugenics.

The paper will address these issues scientifically, and deliniate available Islamic jurisprudence opinion towards each of them.

## The Human Genome Project (HGP):

Genetic research and knowledge has grown to unsurpassed dimensions over the past decade. The Human Genome Project (HGP) revealed that humans are made up of about 30.000 to 40.000 genes[1-4].

The genetic background of many diseases and conditions could now be elucidated. At the current state of knowledge, not all hereditary gene defects can be detected. More and more monogenic diseases may now be diagnosed by polymerase chain reaction (PCR) or other molecular genetic techniques. Given that involved examinations and interventions are very costly, it is generally accepted that, if a disease in question is serious enough, every effort is morally justifiable to bring the family under genetic scrutiny to establish prenatal diagnosis.

A widc array of considerations play significant roles in dealing with the various ramifications of these new genetic breakthroughs, including ethico-religious, legal, psychosocial, economic, as well as medical and scientific dimensions.

The ever-expanding discoveries derived from the HGP reveal that more "conditions", which may be pathological or nonpathological, could be examined and elucidated. This lead humanity to face complex ethico-religious and psychosocial challenges.

The following overview of possible future utilization of HGP may help in outlining these challenges.

1 - Severe pathological impairments, that affect the fetus-newborn: Examples include, but not limited to, thalassemia, sickle cell disease, cystic fibrosis, hemophilia... etc.

2 - Presymptomatic diagnosis: Disease conditions that may appear late in life (late-onset diseases)[5]: Depression, schizophrenia, certain malignancies, autoimmune diseases, heart disease, Alzheimer's disease and Huntinglon's disease... etc. Many details of such

diseases are variable, and may significantly affect judgments as to how to deal with them. A known example of this variability is presented here.

The term (penetrance) pertains to the capability of a certain genes to cause disease. The cancer "Medullary thyroid carcinoma" has very strong penetrance, to the extent that a newborn with the specific gene will definitely develop this lethal cancer, sooner or later in life. Many medical authorities currently recommend prophylactic total thyroidectomy in early childhood or during adolescence.

This feature does not apply to some other cancers, such as breast cancer, which has limited penetrance. The current recommendation, therefore, is quite different.

Disadvantages of screening for late-onset diseases could impose heavy burden on people's well-being. Living with knowledge that one has real danger of harboring a serious disease may be unbearable, and may induce changes in personality or psychological derangements.

On the other side, some serious future illnesses may be amenable for prevention, amelioration or modification, by timely lifestyle, environmental modification, or proper prophylactic intervention. Examples are: Diabetes, atherosclerosis and certain cancers.

3 - Physical or intellectual features: Such as height, color of skin or eyes, and intelligence[6].

With these possible applications, humanity may be endangered by stepping into the issue of (Eugenics)![7]. People, because of their financial privileges, will be capable to use costly scientific breakthroughs, to acquire favorable physical or intellectual status, even before birth!

This may widen social differences between classes and nations. Privileged people may add the fruits of science, to their already acquired wealth and social advantages.

There is universal understanding that priorities should be carefully set and addressed. The real needs of the wide social classes must be addressed.

Such real and wider needs should never be sacrificed for the sake of narrow classes. Efficient screening, diagnosis and management of genetic disorders, are extremely costly. Proper selection of significant genetic disease entities that benefit the society at large should be regulated and prioritized.

## Pre-implantation genetic diagnosis (PGD):

A technique for diagnosis of genetic disorders by testing one or two cells from a fertilized ovum at the 6 to 8 cell stage (blastomere). It allows avoidance of intrauterine transfer of embryos affected by certain genetic disorders. This technique has an advantage over the conventional (prenatal diagnosis) in which, amniocentesis or choriomic villous sampling is used. Another advantage, with significant ethical implication, is the avoidance of pregnancy termination[8,9].

PGD detects cytogenetic and mendelian disorders, but can not detect fetal structural anomalies.

Other unique applications of PGD includes:

1 - Preselection of HLA Type: Human leukocyte antigens (HLA) typing offers preventive technology to help avoiding implantation of embryos affected with significant genetic disorders. Further applications have been recently undertaken in the treatment of an (older) affected sibling suffering from congenital or acquired bone marrow disease[10]. Compatible cord blood from HLA-matched unaffected embryo (otherwise to be discarded) was used as a source for stem cell transplantation in affected siblings with congenital or acquired bone marrow disease or cancers[6,8].
PGD is now becoming an established clinical option in reproductive medicine. Over 1000 apparently healthy children were born worldwide using this technique[6].

2 - Gender identification and selection: This technique enables transfer of only female embryos in couples with sex-linked diseases[1,11].
PGD could identify unaffected males as well as noncarrier female embryos, that could be transferred to the mother's uterus.
Sex determination, to allow parents to choose the sex of their off

spring, could be easily achieved by PGD, but has significant ethical considerations.

3 - Possible future use of PGD for gene therapy, whereby a pathological gene in embryos could be substituted by a healthy one. Research in this area is still in its early stages.

## Specific Applications and available Islamic Jurisprudence: Gender selection and determination

This issue was thoroughly discussed in several medical-jurisprudence forums[12,14]. Shariah consensus could be summarized as follows:

1 - Laboratory identification of gender of fertilized ova (pre-embryos) is not prohibited.

2 - Selection of gender of embryos:

A - If applied for the society of large: All jurists ruled to prohibit it, in view of harms including break down of the long standing balance between the two genders in human societies.

B - Some jurists allowed it in individual cases for a specific need.

C - Some jurists have the opinion that each case should be studied individually, by committed medical and Fatwa councils.

3 - There was consensus to approve gender selection, by applying the rule of necessity, when an embryo of a certain gender would definitely suffer from serious genetic disease.

## Pre-implantation diagnosis, Genetic counseling and selectivity of pregnancy

These issues were subjects to several forums, discussions and publications in the Islamic world, in which both Muslim jurists and specialists in medical sciences participated[12,14].

The last was a series of seminars held at the Islamic Hospital in Amman - Jordan, by the Jordan Society of Islamic Medical Studies[12].

In this series of seminars, outcomes of Jurisprudence rulings by other Muslim scholars was taken in consideration.

The following are the main Shariah guidelines adopted:

1 - Scientific research, including testing to diagnose genetic disorders, is allowed on sperms, and ova. Islamic ethical standards must be observed through ethical committees in which medical experts and Muslim scholars participate. Such standards include prohibition of use of unapproved fertilization procedures. Obtaining ova for such research should have ethically approved purpose, in a subject with significant personal or family history of fetal disorders (recurrent abortions, fetal malformations, specific genetic disorders...etc). The practicing medical team should weigh the hazards and frequency of fetal disorders, against the hazards of the procedure to establish prenatal diagnosis.

2 - Fertilized ova in the IVF laboratories:

- They do not acquire consideration as human fetuses, unless restored to the mother's uterus.
- Experimentation on them is permissible to diagnose genetic disorder, within the above mentioned Shariah guidelines. This includes surplus fertilized ova in IVF laboratories.
- Practitioners are allowed to avoid restoring to the uterus, any fertilized ova, if they realized that such ova carry certain genetic disorders.

3 - Administration of specific genetic materials to the fertilized ovum, with the aim at substitution of abnormal genes by normal ones, to prevent development of genetic disorder, is permissible, provided no interference is undertaken in the other genetic composition, including the usual, non pathologic features, such as color of eyes, height, color of skin....etc.

4 - Experiments on fertilized ova in the lab, to recognize the sex of fetus, is allowed, and can be used to determine whether to restore a fetus, of certain sex if that sex significantly predisposes it to have certain heritable disorders.

Experimentation on fertilized ova in the lab, with the purpose of choosing certain fetal sex: The consensus was that is not permissible.

## Genetic disorders and Termination of pregnancy

Genetic disorders, premarital carrier detection, premarital counseling, and termination of pregnancies:

These issues were subjects to several seminars and publications[15,19].

In countries where autosomal recessive disorders are common, such as hemoglobinopathies, thalassemias, enzymopathies and other inborn metabolic disorders, and especially where consanguinity is prevalent, the issue of premarital counseling, public education, and reproductive alternatives should be duely considered and promoted.

A current application adopted in Saudi Arabia since January 2004 is worth outlining:

Premarital carrier detection is undertaken prior, to marriage. In case they are found carrying the same autosomal recessive gene, then genetic counseling is provided, with explanation of all pertinent facts, risks and alternatives. If the couple insist on marriage, the decision is theirs, but the reproductive alternatives should be discussed with them. These options include:

1 - Pre-implantation diagnosis, in IVF centers.

2 - Prenatal diagnosis: Specific tests for the mother, and special testing of fetal cells, by chorian villous sampling (CVS), or amniocentesis or blood sampling from the fetus to identify and confirm diagnosis. Depending on the seriousness of the genetic anomaly, abortion could be discussed (according to the Shariah approved standards).

## Privacy, confidentiality and Human rights issues:

Exposing information derived from the human genome discoveries, prenatal or pre-implantation diagnosis, has significant ethical and moral ramifications. Society tends to consider predictable health defects as serious drawbacks and may stigmatize them. Employers, insurance companies, government administrations and schools are prone to fall into stigmatization and discrimination in case sensitive health information is expose[20,21]. It is conceivable to expect the

behavior of a profit-oriented firm towards an individual whose pre-symptomatic and susceptibility tests predict that he/she will have to face a serious disease in his/her forties. Would a health insurer be willing to do business with this individual?

On the other hand, affected individuals may also misuse genetic information in choosing timing and value of health insurance. People not expecting to develop a major disease might opt not to seek a health policy in the first place. One could imagine collapse of the insurance system! It is imperative, therefore, to safeguard this sensitive genetic information. Governments and institutions should adopt detailed regulations and legislations to safeguard individuals and families' rights of confidentiality. Proper consents must be strictly observed when genetic information is ever considered to become public.

In Islamic heritage, confidentiality of information is guaranteed[22,24]. Exceptional situations in which such information could be exposed are limited, and governed by sound Shariah rules of necessity, inflecting the lesser of two evils and prevention of harm.

The right of individuals to be informed, or not, about their medical situations should be safeguarded.

Results of genetic testing should be kept strictly confidential, and should not be exposed except by individual consent, or where specific Shariah guidelines permit such exposure.

## Concluding remarks:

Reprogenetics is an emerging biomedical achievement with unlimited potential for health care of mankind. Many health dilemmas that plagued humanity may find cure or amelioration.

The many complex ethico-religious, social, economic, safety and scientific concerns should be properly addressed.

Public education about principles of reprogenetics, and genetics in general, should receive the attention it deserves from health care policy makers & the medical profession.

Combined jurisprudence-medical-scientific forums should be the cornerstone in addressing the various ramifications of this issue, to

reach to outcomes that guarantee compliance with ethico-religions principles, without obstruction of scientific progress.

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# PRENATAL GENETIC DIAGNOSIS: SCOPE, APPLICATIONS AND LIMITATIONS IN ARAB COUNTRIES

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# Prenatal Genetic Diagnosis: Scope, Applications and Limitations in Arab countries

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## Introduction:

Prenatal diagnosis is recognized as an important option for the prevention of serious genetic diseases for couples with an increased genetic risk in most industrialized countries. Advancing technology in the field of prenatal genetic diagnosis is expanding the capability of detecting specific genetic and congenital disorders in the fetus. The detection of fetal abnormality during pregnancy causes shock and grief for the parents and distress for medical staff and the decision of whether or not to terminate an affected pregnancy is never taken lightly. Selective abortion is a decision taken by the parents and regarded as the heavy cost for their desire to have a healthy child. There are several ethical, legal, social and religious implications regarding pregnancy termination of an affected fetus. Some of these implications are unique to Arab countries. National, Arab and Islamic Guidelines on selective termination of an affected fetus following prenatal diagnosis need to be formulated to guide both the concerned families and the health care sector.

## Methods for prenatal genetic diagnosis

Prenatal diagnostic techniques are generally divided into non-invasive and invasive techniques. The invasive procedures involve obtaining a sample of fetal tissue for analysis. Such procedures include the traditional methods of obtaining fetal cells by amniocentesis and chorionic villus sampling, as well as other invasive techniques that can be used to obtain fetal blood, skin and muscle. Non invasive screening methods for prenatal genetic diagnoses include the assessment of maternal serum markers, ultrasonography and other more recent techniques for visualization of the fetus and diagnosing internal organ

abnormalities. An attractive new approach to noninvasive prenatal screening and diagnosis is the isolation and analysis of fetal cells in maternal blood. Preimplantation genetic diagnosis is an alternative reproductive option for couples at risk of having a child affected with a genetic disorder. Despite its novelty, it has already become an alternative to traditional prenatal diagnosis, allowing implantation of unaffected pregnancies and thus avoiding the risk for pregnancy termination. The fact that more than 1,000 apparently healthy unaffected children have been born following this technique suggests its accuracy, reliability, and safety.

Prenatal screening for neural tube defects and aneuploidy is an established part of prenatal care in many countries. The primary screening tests for neural tube defects include maternal serum alpha-fetoprotein testing and ultrasonography. Screening for chromosome abnormalities uses a combination of ultrasound measurement of fetal nuchal translucency at 11-13 weeks gestation and the analysis of the maternal serum markers free beta human chorionic gonadotrophin and pregnancy associated plasma protein A. This provides detection rates of 90% for the most important chromosomal anomalies. Screening tests identify women at high risk who can then be offered a specific diagnostic test to confirm or exclude affection in the fetus.

## Availability of prenatal screening tests in Arab countries

Ultrasound fetal scanning is routinely performed for any pregnant woman during her first antenatal visit in most Arab countries. This technique that can diagnose major congenital malformations and some chromosome aneuploidies is usually done without providing any pretest information to the couple of the possibility of finding an abnormality and with no explanation of the consequences.

Maternal serum markers' testing is another screening test that can diagnose certain congenital malformations and chromosome aberrations. Some Arab countries are now recommending to introduce community genetic services at the primary health care level and to perform maternal serum markers screening in the first trimester as part of the antenatal care. If the results of the test suggest an abnormality,

then for the screening test to be effective as a preventive measure, it should be followed by further invasive techniques such as amniocentesis, with the end result that the couple will have to face the major decision of selective termination of a fetus affected by a severe genetic or congenital disorder.

## Amniocentesis, chorionic villus sampling and genetic diagnosis in Arab countries

Amniocentesis and chorionic villus sampling for obtaining fetal cells can be performed by skilled and experienced obstetricians. Fetal cells can be cultured and subsequently used to diagnose chromosome aberrations and a large number of single gene defects for which molecular diagnosis is feasible. Many cytogenetic laboratories in Arab countries are capable of diagnosing chromosome aberrations in fetal cell cultures whether obtained through amniocentesis or chorionic villus sampling. The diagnosis of single gene disorders in fetal cells is more difficult and requires specialized laboratories and advanced technology.

Many couples present to a genetic counseling clinic in Jordan with the primary request of prenatal diagnosis for the condition already present in their child or children, alive or deceased. The main problem that we initially have to solve is to reach the diagnosis of the condition at the molecular level, when DNA analysis is the sole method for fetal diagnosis. Our molecular laboratories at present are capable of performing molecular diagnosis for the disorders that are common in the country such as beta thalassemia, familial Mediterranean fever, cystic fibrosis and few other conditions. We need to send samples to specialized laboratories in Europe or North America for the diagnosis of less common and rare disorders. This procedure requires a high cost, lengthy time and the availability of samples from the affected. Sometimes a molecular diagnosis is never reached because all affected offspring are dead and many couples with autosomal recessive disorders feel extremely disappointed that they cannot use prenatal genetic testing. The difficulty in diagnosing the DNA defect makes the

couple so eager to undertake testing that the choice of pregnancy termination becomes a minor matter to them.

## Attitudes of couples to prenatal genetic diagnosis in Jordan

Many couples have no reservations in deciding to undertake prenatal genetic testing as a procedure. Their questions about the safety of the procedures for the mother and fetus are answered according to available scientific data. They know that the main problem that they will have to face is what to do if the results of the test indicate that the fetus is affected. Selective termination of the affected fetus is a very difficult decision for the couple and depends on many factors.

Couples who already have infants or children affected by a certain genetic disease or congenital abnormality know exactly how it feels to have another affected and are continuously experiencing the difficulties associated with having an affected child. At the time they come seeking prenatal diagnosis, they have already decided about their option, especially if they are well informed of the risks of recurrence, and the prognosis of the disorder. Prenatal diagnosis of a genetic disease with termination of the affected fetus is an option that is sought by families who have decided that they want further children and that they want unaffected children.

The decision is more difficult for couples who learn about the particulars of the disorder in their child for the first time, and they are informed that the disorder is inherited, that it carries a high risk of recurrence, that management is not feasible, and that prognosis is not favorable. They try to cling to their hopes that the condition will not recur, that there is effective treatment for the child or for the parents, and that there is effective primary prevention. They need several visits and more time to understand their options and to reach the decision of their choice which is comfortable and suitable to them.

Among all families seen at the genetic clinic of the National Center for Diabetes, Endocrinology and Genetics in Amman, around 10% come specifically asking for the feasibility of prenatal genetic diagnosis for the genetic disease in the family. Among all disorders for which

prenatal diagnosis was sought, autosomal recessive conditions comprised 75%, with examples including severe inborn errors of metabolism leading to death in infancy or leading to severe mental and physical disability, beta thalassemia, Werdnig-Hoffmann, infantile osteopetrosis and severe epidermolysis bullosa. Couples sought prenatal genetic diagnosis for other categories of genetic diseases such as the X-linked recessive diseases hemophilia, Duchenne muscular dystrophy, and adrenoleukodystrophy, and chromosomal disorders where one of the parents proved to be a carrier of a structural aberration. Birth of a previous child with neural tube defect prompted some couples to seek prenatal diagnosis for future pregnancies.

Families with genetic diseases are hearing more and more about preimplantation diagnosis. It is welcomed in Arab countries since it does not involve the much dreaded decision of pregnancy termination. The procedure is however still in its early stages, with many limitations. Preimplantation diagnosis involves assisted-reproductive technology. It is a complex and time-consuming procedure that is only available at a small number of centers and for a limited number of genetic conditions, although the list is lengthening with time. The diagnostic techniques whether cytogenetic or molecular require the availability of laboratories that are highly equipped in technology and manpower. Probably the first diagnostic technique that can be introduced in Jordan at present is the FISH technique for diagnosis of some numerical chromosome aberrations such as trisomy 21, 13, 18, and sex chromosome aneuploidies. A future aim should be the introduction of preimplantation genetic diagnosis for the common disorders in the country such as beta thalassemia.

## Why families with affected children chose prenatal diagnosis with its option of selective termination of the affected fetus?

The difficulties of having a severely affected, chronically disabled child, or the difficulties of having several infant deaths due to genetic diseases are manifold. In the Arab world these difficulties would include:

- The financial difficulty of caring for a sick child who needs continuous medical attention and hospitalization
- The emotional impact on the parents, sibs and other family members living with the affected
- The mother would spend much of her time caring for the affected, and this impinges on the quality and quantity of care given to the other siblings
- The husband could be caring for the child and mother or he could be non-understanding and threatens that he would re-marry or decide to divorce his wife
- Other family members could lay the blame on the mother and stigmatize her for the birth of affected children
- The mother faces a huge psychological burden involving feelings of guilt, fear of the future and depression. She fears being abandoned by her husband, and fears that if she dies or cannot take care of the affected child, no one else would. She seeks to have normal children especially if she only has daughters, in the hope that a son would share in the responsibility of caring for the affected in the future. To have another affected child would be disastrous to her.
- Care centers for the physically and mentally handicapped children are scanty and/or high in cost for the family. There are very few specialists or comprehensive centers where the family can reach for help in the management of a mentally handicapped child as for example for children with Down syndrome and fragile-X syndrome.

## Role of the genetic counselor

The duty of the genetic counselor is to deliver all the relevant scientific information to the couple in a non-directive, clear and understandable way, so that the couple can take an informed decision regarding their reproductive options and choices. Families seen at the genetic counseling clinic have different problems, different back-grounds, different beliefs and variable financial resources. Each family is thus considered a separate unique entity and counseled on scientific grounds taking into consideration their needs and limitations

At present genetic counselors satisfy themselves by saying that we

give all options and leave the decision to the couple. This is scientifically sound, but the problem is that the options are limited due to the lack of DNA technology needed for diagnosis, the vague legal, social and religious criteria related to pregnancy termination, and the absence of solid guidelines on prenatal genetic diagnosis and selective pregnancy termination of an affected fetus on the national level.

## Who should formulate guidelines on prenatal diagnosis and selective abortion of affected fetus?

The duty is a joint duty of health policy-makers, religious authorities and the specialized medical personnel to establish guidelines of how to deal with the issue of prenatal diagnosis and selective termination of a fetus affected by a serious or severe genetic or congenital disorder. The guidelines should address the genetic and congenital disorders encountered in the community.

The guidelines should take into consideration primarily the severity and the prognosis of the condition. The perception of severity differs between clinicians, patients, religious authorities and policy-makers.

Grading of severity could rely on clinical criteria such as life expectancy, and the degree of physical and mental handicap. Grading of severity according to population perception of the disorder may differ from clinical grading leading to inflation of severity due to cultural stigmatization of certain conditions as for example Down syndrome and dwarfism. Grading can sometimes take into account the prevalence of the condition and the costs it entails on the government. For example, beta thalassemia, a severe but relatively manageable condition, was one of the first genetic conditions for which pregnancy termination became legally allowed in some Islamic countries

Genetic counseling should be non-directive, non-judgmental, and should not include any personal advice from the counselor regarding the reproductive options of the couple. This is usually easier when the condition is severe and the counselor could easily leave the decision to the couple of whether or not they want to go through prenatal diagnosis and selective abortion. When the disorder is considered devastating by the family, but is considered relatively mild by the

counselor who feels that abortion is not justified, it becomes more difficult for the counselor not to influence the decision of the couple.

Clear guidelines are at present needed for prenatal genetic diagnosis and selective termination of the affected fetus in order to help counselors and health care providers in advising families regarding available options. These guidelines should clearly address specific genetic disorders. Guidelines should also consider the importance of screening tests for the prevention of genetic disorders in the community and should include clear criteria of how to proceed if the screening test suggests that the fetus is abnormal. Ultrasound scanning is firmly embedded in antenatal maternity care in the Arab world. The clinician and the couple should know what to do if an abnormality is detected.

Committees for formulating guidelines on prenatal genetic diagnosis and selective termination of affected fetus should include

- Health policymakers
- Health care providers and specialists
- Religious authorities
- Legal authorities
- Families of patients or patients

Guidelines could be initially formulated for the most prevalent and serious genetic disorders and congenital malformations including

- Beta Thalassemia
- Sickle cell anemia
- Neural tube defects
- Down syndrome
- Congenital Rubella

Other genetic disorders causing considerable physical or mental handicap or are fatal in infancy that are seen repeatedly in genetic clinics in our area include

- Fragile-X syndrome
- Duchenne muscular dystrophy
- Adrenal leukodystrophy

- Bardet Biedl syndrome
- Severe epidermolysis bullosa
- Brain anomalies and neurodegenerative conditions
- Werdnig Hoffmann
- Alport nephritis
- Galactosemia
- Infantile polycystic kidneys
- Infantile osteopetrosis
- Severe inborn errors of metabolism not amenable to postnatal treatment
- Congenital adrenal hyperplasia (prenatal diagnosis and proper prenatal management of this relatively common condition in our area could minimize the severity of malformations in affected females).

## Prospects for the role of prenatal diagnosis in the future

Over the past few years, considerable progress has been achieved in prenatal diagnosis and surgery for the correction of certain congenital anomalies such as cardiac and renal defects. In utero gene therapy could become a practical therapeutic option in the future for the treatment of serious monogenetic diseases. Prenatal diagnosis with in-utero transplantation offers the potential to treat a large number of diseases by transplantation of healthy cells into a fetus with a genetic or congenital disorder. The number of genetic disorders that can be diagnosed in the preimplantation period is progressively increasing.

## Conclusions

People differ in their beliefs and in their ability to endure stressful condition. There is a need for Arab and Islamic countries to develop clear strategies on prenatal diagnosis that is consistent with their social, ethical and religious beliefs and responsive to the needs of families with genetic disorders and the needs of the population in general when community genetic services are implemented.

# THE RIGHT TO REPRODUCE: EQUALITY NOT LIBERTY

*Dr. Muireann Quigley*
U.K.

# The Right to Reproduce: Equality Not Liberty

*Dr. Muireann Quigley*
U.K.

## Introduction

The assisted reproductive technologies (ARTs) has thrust the issue of reproductive liberty into a whole new dimension of debate. In this paper I am not going to discuss the moral rightness or wrongness of this technology but am going to investigate the idea of reproductive liberty itself. I specifically want to discuss the so-called *right* to reproduce as a part of the right to reproductive liberty, which, itself, is usually seen as deriving from a more general right to liberty. It is claimed that certain practices or policies interfere with a person's reproductive liberty. The denial of treatment using ARTs, such as *in vitro* fertilisation (IVF), is an example of this. In such cases, in addition to a right against interference with reproductive matters, there is purported to be a positive right to procreation or to raise children, and to assistance therein.

Conventional candidates for the foundation of rights in general, and a right to reproduce more specifically, are justified on the grounds of either overriding interests or the necessity for protected choices; that is the protection of autonomy. These are respectively called the interest theory and choice theory of rights. I want to look at how interests or autonomy might ground a right to reproduce, and will do this by looking at each one in turn. I will outline what I perceive to be a couple of the defects in these theories before offering my own suggestion for a basis of a right to reproduce. Let me turn first of all to the proposal of interests as the source of this right.

## Interests

In accordance with the father of the interest theory of rights I define an 'interest' as something that promotes "an aspect of my well-being"[(1)]. I can be said to have a right when this interest "is a

(1) Raz, J., 'On the Nature of Rights' in *Mind XCIII* (1984) 195.

sufficient reason for holding some other person(s) to be under a duty"[1]. Although there are undoubtedly interests which could arguably ground a right to reproduce the two most likely candidates are (1) an interest in passing on one's genes and, (2) an interest in raising a child.[2] These are undeniably interests but question is do they constitute 'sufficient reason' to ground a right.

The first proposal proposition was that one's interests might lie in genetic reproduction. This is a suggestion that put forward by the philosopher John Robertson in his book *Children of Choice*[3] It is, however, rejected by another pre-eminent philosopher Bonnie Steinbock. She maintains that a desire to pass on one's genetic information constitutes sufficient grounding for a right to reproduce. She does this because, in her opinion, the primary aim of reproduction is not to create a genetically similar being. She argues that:

> "[P]rocreation is valuable because of its connection with the raising of children."[4]

To accept a *de facto* right to pass on one's genes would be, she thinks, to accept a right to create children but with no responsibility for bringing them up and taking care of them. However, I do not think that Robertson was sanctioning an unrestrained licence to breed without the intent of rearing as Steinbock seems to suggest. His endorsement is not so much for the right to genetic reproduction as it is for the liberty to engage in certain reproduction related activities. He was simply stating that, in cases such as sperm or ova donation, or in the case of surrogacy, if people wished to give their genetic material or the use of their bodies in the aid of others (and for their own purposes) then they should have the right to do so. He says:

> Recognition of the primacy of procreation does not mean that all reproduction is morally blameless, much less that

(1) *Ibid.*

(2) Steinbock, B., 'A Philosopher looks at Assisted Reproduction' in *Journal of Assisted Reproduction and Genetics* **12** (8), (1995) 543-51, p.548.

(3) Robertson, J., *Children of Choice* (Princeton University Press: Princeton, 1994).

(4) Steinbock, *op. cit.*, p.549.

> reproduction is always responsible and praiseworthy and can never be limited.(1)

He simply maintains that the importance of freedom in reproductive matters is such that a high threshold is required for the denial of that freedom. Although I agree with him I do have a problem with his justification of this genetic right. His justification is based on his belief that "whether one reproduces or not is central to personal identity, to dignity, and to the meaning of one's life."(2) Although this may contain a large element of truth, to say that passing on one's genetic material may be to overstate the case. For example, if a man were to say that passing on his genetic material was what gave him identity, dignity and meaning in his life, we would find it highly questionable for him to claim a right to the unfettered distribution of his sperm.

The next contender for an interest that is sufficient to ground a right to reproduce is an interest in raising a child. If any interest is strong enough then this one surely is. An interest in the actual rearing of one's own child offsets, to some extent, the conflicting considerations mentioned earlier. Nonetheless Steinbock asserts that a right to reproduce founded on an interest in child-rearing cannot be the whole story and that any such right ought to be restricted to those with an interest and the *ability* to raise the child.(3) If one is to have an interest in reproducing that that person should have the capacity to understand "the meanings associated with reproduction"(4) and, if the intent is rearing, they should also possess the ability to do so. So on the surface, there does appear to be a perceptible argument for the right to reproduce grounded in an interest in raising children. The problem, however, becomes a question of how we can possibly assess parental ability.

Guidelines in the United Kingdom appear to suggest that there are people who not only think such an assessment to be possible but that

(1) Robertson, op. cit., p.30.

(2) Robertson, *op. cit.*, p.24.

(3) Steinbock, *op. cit.*, p.549.

(4) *Ibid.*

it is also ethical. These are the 1995 Human Fertilisation and Embryology Authorities guidelines for assessing the welfare of the child. The guidelines state:

Where people seek licensed treatment, centres should bear in mind the following factors:

a - their commitment to having and bringing up a child or children.

b - their ability to provide a stable and supportive environment for any child produced as a result of their treatment

c - their medical histories and the medical histories of their families;

d - their ages and likely future ability to look after or provide for a child's needs;

e - their ability to meet the needs of any child or children who may be born as a result of treatment, including the implications of possible multiple births;

f - any risk of harm to the child or children who may be born, including the risk of inherited disorders, problems during pregnancy and of neglect or abuse; and

g - the effect of a new baby or babies upon any existing child of the family.(1)

I will not go through each one of these comprehensively but merely wish to say why I think that, collectively, they demonstrate an inherent injustice. The guidelines seem to be based on value judgements of the lives of the potential parents. They involve some sort of moral evaluation of persons. The problem with this is twofold. Firstly, how do we know what makes a 'good' parent? The answer is that although we each may have some idea regarding this, it is not something that is easily analysable or quantifiable. Even if we could analyse and quantify parenthood it is unlikely that we could (a) know what information is relevant to our assessment, or (b) adequately gather all the relevant information.

The guidelines impose restrictions on those who, either cannot or choose not to reproduce in the normal manner. Whatever the injustice inherent in these guidelines, it is redoubled by the lack of restrictions

(1) *HFEA Code of Practice* (1995) Section 3 (17).

on those who do not need this kind of treatment.(1) This is tantamount to licensing those parents, and only those, who do not reproduce in the normal manner. It is unjust to screen only one portion of society, and this is especially so when the criteria by which they are screened are also unjust. This injustice could be corrected in one of two ways: (1) by having no restrictions on reproduction (including access to reproductive technologies such as in Israel)(2), or (2) by screening all of those who wish to have children (and as far as I am aware this approach has not been tested in any jurisdiction). If we elect to screen all potential parents we would need to find a screening method that is just and fair, and not simply use the current value laden system used for those treated via *IVF*. However in all practicality, we do not, at the moment, have a test that could satisfy sufficient parameters for reliability and accuracy that such screening would require.

We also have to ask what counts as *sufficient reason*. If I want a car really, really badly...

## Choices

The next candidate for the foundation of a right to reproduce is based in the choice theory of rights which holds as paramount the protection of a person's autonomy and liberty. The advancement of this autonomy or liberty necessarily involves freedom of choice and, for that reason, John Robertson maintains that the right to reproduce or procreate is part of a larger right the right to procreative liberty. He says that in its simplest terms:

> [P] rocreative liberty is the freedom to either have children or to avoid having them.(3)

The freedom to avoid reproduction will involve such issues as "sexual abstinence, contraceptive use, refusal to seek treatment for infertility"(4). Conversely the freedom to reproduce will include other freedoms, such as being "able to marry or find a willing partner,

(1) Harris, J., *The Value of Life* (Routledge & Keegan Paul: London, 1985), pp.152-3.

(2) Thank you to Dr. Ravitsky for elucidation on this point of Israeli jurisdiction.

(3) Robertson, *op. cit.*, p.22.

(4) *Ibid.*, p.26.

engage in sexual intercourse, achieve conception and carry a pregnancy to term, and rear offspring."[1] He also argues that any right to reproductive liberty can be interpreted in its broadest terms to also include "a right to engage in collaborative reproduction",[2] that is, the process of gamete donation and of surrogacy.

Leaving aside the freedom to avoid having children we are left with two possible interpretations of the liberty or right to choose have children, hereafter referred to as the right to reproduce. Firstly, one could see it as a right to non-interference with one's choice once it has been made. This formulation is that of a negative right[3] and will impose a correlative negative duty on other people. It is so-called because it requires nothing more than restraint or 'negative action' from others.[4] The second interpretation is as a right to assistance in order to have a child. This version is that of a positive right because it requires the intervention of others in order to fulfil the right.

In the negative account our right to non-interference in the begetting of a child imposes a duty on others to refrain from interfering with or preventing a person from having a child. This right, for example, would militate against the use of compulsory contraceptives and against enforced abortions. It is a right that is best articulated as a 'freedom *from*' right. It is clear that any breach of this duty of this non-interference represents an infringement of a person's autonomy and liberty. This right does not entitle a person to resources or opportunities, only a freedom from coercion.[5]

This negative version sounds like a good, succinct, and easily understandable formulation of the right to reproduce, however, as Copeland asserts that:

(1) *Ibid.*, p.30.

(2) Steinbock, *op. cit.*, p.548.

(3) This is the type of right described by Nozick, R. in *Anarchy, State and Utopia* (Basil Blackwell: Oxford, 1974).

(4) Jones, P., Rights (MacMillan: Basingstoke, 1994), p.15.

(5) Plant, R., 'Needs, Agency and Rights' in Galligan, D.J. and Sampford, C.J.G., Eds., *Law, Rights and the Welfare State* (Croom Helm: London, 1986) pp.22-48, p.p.26.

> The negative theory of privacy is... profoundly inadequate as a basis for reproductive and sexual freedom because it perpetuates the myth that the ability to effectuate one's choices rests exclusively on the individual, rather than acknowledging that choices are facilitated, hindered or entirely frustrated by social conditions. In doing so negative privacy theory exempts the state from responsibility for contributing to the material conditions and social relations that impede, and conversely, could encourage autonomous decision-making.(1)

Conversely the positive account of rights, best expressed as a 'freedom to' right, recognises that factors external to oneself can influence our ability to make and carry out our decisions. A positive right would, therefore, enforce a positive duty upon people to provide you with the services and support required to have a child. This kind of right would, therefore, necessarily include a right to treatment with reproductive technologies such as *IVF*. The duty imposed by a positive right would fall with a particular person or a particular group. In the United Kingdom the group targeted to provide the requisite services would the government, or more specifically the National Health Service.

Assuming that in order to exercise their right to reproduce a person requires IVF, denial of the relevant treatment would result in the imposition of restrictions on, and the limiting of, the decisions that a person can make within the confines of their reproductive liberty and regarding their life-plan. This could be as much construed as an infringement of a person's autonomy and liberty as any breach of the duty of non-interference. The person would effectively be prevented from exercising their right to choose because the relevant choice has been taken away from them.(2)

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(1) Copeland, R., 'Losing the Negative Right of Privacy: Building Sexual and reproductive Freedom' in *New York University Review of Law and Social Change* **18** (1991) 46, as cited in Robertson, *op. cit.*, p.225.

(2) Of course one could just as easily take these positive and negative rights to be only one right, which generates both positive and negative duties.

Again it seems that we have a plausible contender for the grounding of a right to reproduce, however, it is not that simple. To endorse a general right to liberty in its positive sense can lead to absurdity. Where would our claims end? For example, just because I am free as part of my life-plan to pursue academic success, a large salary, and a nice house does not mean, *a priori*, that I have a right to those things; and it certainly does not mean that I can impose a duty upon other people to help me obtain them. Therefore, a theory of rights in which we could make claims to any and all resources we require is not sustainable. What then is the alternative?

## Equality

John Rawls believes that what we are entitled to is not simply a right to liberty but an *equal* right to liberty.(1) He says:

> Freedom as equal liberty is the same for all; the question of compensating for a lesser than equal liberty does not arise. But the worth of liberty is not the same for everyone. Some have greater authority and wealth, and therefore greater means to achieve their aims.(2)

This equal right to liberty, for him, entails not only a freedom from interference but also:

> [A]n equal right to those basic resources which are necessary for individual agency and which will secure an equal basic value for liberty between individuals.(3)

Similarly Ronald Dworkin rejects a more general view of liberty(4) in favour of a theory of "equal concern and respect"(5). This is because:

(1) Rawls, J., A Theory of Justice (Oxford University Press: Oxford, 1999), p.171-227.

(2) *Ibid.*, p.179.

(3) Plant, *op. cit.*, p.28.

(4) Berlin, I., 'Two Concepts of Liberty' in *Four essays on Liberty* (Oxford University Press: Oxford, 1958) pp.6-16.

(5) Dworkin, R., *Taking Rights Seriously* (Duckworth: London, 2000), p.273.

> ... a general right to liberty... cannot explain or justify the discriminations we want between legitimate and illegitimate restrictions of freedom.(1)

He maintains that equality between people necessitates some restriction on the liberty of those people. This is because any right to liberty in other people necessarily limits any right to liberty that I possess. Therefore, what we can say is that everybody has *equal* rights to certain liberties.

Bearing this in mind it seems that we can only maintain the contention of a general right to liberty itself "by so watering down the idea of a right that the right to liberty is something hardly worth having at all."(2) Thus it seems that we have a much stronger claim on a right to equality.

To this end, Dworkin proposes that:

> Government must not only treat people with concern and respect, but with *equal* concern and respect. It must not distribute goods or opportunities unequally on the ground that some citizens are entitled to more because they are more worthy of concern. It must not constrain liberty on the ground that one citizen's conception of the good life of one group is nobler or superior to another's.(3) [My Emphasis]

He holds that we can have rights to *distinct* liberties but only when the right to equality demands these rights. This removes the conflict between liberty and equality. Thus an individual will have a right to distinct liberties that is equal to the same right in other people. An example of this is "the liberty of free expression."(4) We can only exercise these rights so long as we are not unequally or unjustifiably limiting the same rights in others by doing so. Thus it is within this

(1) Mackie, J.L., 'Can there be a Right-based Moral Theory?' in Waldron, J., Ed., *Theories of Rights* (Oxford University Press: Oxford, 1984) pp.129-42, p.138.

(2) *Ibid.*, p.268.

(3) *Ibid.*, pp.272-3.

(4) *Ibid.*, p.277.

theory of equality, and not liberty, that I offer grounds for the right to procreate.

## The Right to Beget Equally

We have now established that in a society based on equality all citizens must be given 'equal concern and respect'. This is going to be my basic premise. This equality consists of two aspects:

> The first is the right to equal treatment, that is, to the same distribution of goods or opportunities as anyone else has or is given... The second is the right to treatment as an equal. This is the right, not to an equal distribution of some good or opportunity, but the right to equal concern and respect in the political decision about how these goods and opportunities are to be distributed.(1)

I think it is uncontentious for me to say that the experience of having children and bringing them up according to one's own beliefs is part of the definition of a good life for many people. Consequently if as a society we value the freedom to have and rear children then this freedom must be ascribed to everyone equally. This means that everyone has an equal right to non-interference in the choice of whether or not to have children. If people choose to have children it then follows that all people have an equal right to the 'goods and opportunities' that a society has to offer regarding this. These 'goods and opportunities' will not only include access to pre-natal care and labour facilities but, in a society that can offer such treatment, the Assisted Reproductive Technologies are also included.

This kind of thesis will also necessarily involve another premise; that is, in different social situations there are different rights. This is so because rights are a function of our social situation. As society advances new rights will be created and old one's will become redundant. For example, before Steptoe's research it would have been ridiculous to talk of infertile women having an equal right to give birth to a child. However, they would have had an equal right to

(1) *Ibid.*, p.273.

utilise the adoption services. It is thus my contention that in our society any policies that are made regarding reproduction and the rearing of children must be extended to all, giving them an equal chance at access to the 'goods and opportunities' that society has to offer.(1)

## Conclusion

Thus I conclude that if a right to reproduce exists at all then it is based in a concept of equality and not in one of interests or general liberty. This equality must extend to include access to the services of assisted reproduction. In a society where there is a scarcity of resources we need to devise a more just system of access than the one currently operating in the United Kingdom. If we can do this we will be sure that with regards to peoples' right to reproduce we will be treating them all with 'equal concern and respect'.

(1) When I say all I mean all of those who qualify as right-holders on the choice conception of rights.

# DISCUSSION

# Ninth Session

**Chairman**: Dr. Gerald Winslow

**Rapporteur**: Dr. Abdullah Buslamah

**Chairman**: Dr. Gerald Winslow

***Dr. Gerald Winslow***: I want to thank all of the speakers for their very interesting presentations. I address a question to Dr. Quigely. Putting together your talk, when we heard earlier today from Dr. Ravitsky, we see apparently immense differences from one nation/state to another in the availability of ART. I am also interested in the constituency of justice. You have to establish with the border of justice. So, how do you establish with the constituency of justice? And, why would it privilege national states?

**Chairman**: Dr. Aida

***Dr. Aida Al-Aqeel***: I would like to thank Dr. Hanan Hamamy for her excellent talk. Just a point of clarification. When we do prenatal diagnosis, we could do it as Dr. Hanan mentioned by either chorionic fluid analysis or by chorionic villa sampling. By either method, we could diagnose baby's genetic defects either by chromosome analysis or by enzyme studies. Being a Metabolist, I could tell you, I could diagnose so many metabolic disorders by having samples from the fetus, either the fluid or chorionic villi, and looking to the enzymes. The importance of that method is because some times it could even prevent some of the metabolic disorders by asking the mother, for example, to be on a certain diet. So, it is important for us to know the various methods, and if there is any treatment.

**Chairman**: Thank you Dr. Aida. Because most of the talk yesterday was about how to reach diagnosis about that person inside, but now we have to focus also that there are other methods or methodology to help that person, when we reach to a diagnosis.

**Chairman**: Dr. Issam Ghannam.

***Dr. Issam Ghannam***: My question is to Dr. Hammami. Dr. Ali Mishal and I agree with Dr. Hammami and the Muslim scholars on

that the body is but a means. There are many religious texts on this topic. The Prophetic Hadith states that man should give his body its due right. The Qur'anic verse reads, "That Day shall We set a seal on their mouths. But their hands will speak to Us, and their feet bear witness, to all that they did." (Ya Sin: 65). Another Qur'anic verse reads, "They will say to their skins: "Why bear ye witness against us?" (Fussilat: 21) So, Islam gives impression that it is a soul in the body. So, why don't we take it, as Muslims, that souls are in the body. We should choose the best body for the soul. So, we actually allow pre-genetic screening, choice of the right body, which you are going to use as a human being. So, you could achieve more worships and obeying of ALLAH. So, we need the answers. Jazakumullah Khair.

**Chairman**: Dr. Gamal Badawi

***Dr. Gamal Badawi***: I have two questions. One is to Dr. Aly Mishal. You described one of the possible suggestions for dealing with diagnosing genetic disorders or even intervention could be a committee for suggestions from scholars of sharia, I wonder if that does not become very cumbersome dealing with each case and that it might be a better idea, perhaps, to have basic guidelines.

Similar question also to Dr. Hanan. Two things actually. One, if I understood you right, you are talking about not telling mother about the results of the early diagnosis of any abnormality. I wonder again whether there is any good rational for that, would it not be psychologically even more devastating for the mothers to learn about that in later time of pregnancy without being prepared psychologically for it? Second question concerning the determination of what is severe? You mentioned a number of possible grounds to the term of what is severe abnormality or malformation. But, I wonder again whether this would be a topic for physicians and Islamic scholars, so that physicians can teach the scholars about what it exactly means.

**Chairman**: Dr. Maher Hathout

***Dr. Maher Hathout***: Just I want to volunteer translation that was missed for the word "*Ihtisab*", and I suggest that it is to accept the undesirable reality for the sake of pleasing GOD. But, the most

important thing is that we cannot legislate or legalize "*Ihtisab*". This is completely personal.

**Chairman**: Dr. Omer Sulaiman

***Dr. Omer Sulaiman***: I have two questions. Is genetic reproductive technology mature enough that at least theoretically we cannot disagree that there will be no future complications and that changes will not happen because of its use?

Does genetic reproductive technology carry any possibility of military use?

**Chairman**: Thank you Dr. Abu Ghuddah.

***Dr. Abdul Sattar Abu Ghuddah***:

Speaking of the equal right of procreation, I wanted to ask "is this a right for man or for woman alone?". It is a common belief amongst people that man is more attached to and demanding of procreation because it ensures the continuity of mentioning his name. Yet, women have equal right to procreation. Thus, there must be an agreement between the spouses before any of them decides to abstain from having children. Another religious issue is relevant in this respect. By this I mean the issue of the prohibited coitus interruptus. This was the available method for preventing reproduction at that time. It involves the man's withdrawal before discharge. Thus, the couple evades the possibility of pregnancy. Yet, Islam holds it prohibited for man to do so without the permission of his wife. Thus, jurists deduced that women have an equal right to procreation. Thus, it is a collateral right in which both men and women are equal. Thank you.

**Chairman**: Dr. Aly Mishal

***Dr. Aly A. Mishal***: For Dr. Gamal about the medical jurisprudence committee. Every medical institution has to have an ethical committee. It is by law.

**Chairman**: Dr. Hanan

***Dr. Hanan Hamamy***: Thank you. Regarding Dr. Aida about the management or treatment of fetuses after prenatal diagnosis. Of course, this is very important topic and it is under research all the time. This is what we hope and wish that the management of fetuses

once they are diagnosed before birth to be treated in due time, so that they are born healthy and in good condition.

Thank you for the intervention Dr. Gamal, when you said that we really need committees between medical personal and religious authorities to help patients in knowing what to do in such situations. Our aim in medicine always is directed towards patient. My job is just to help what I have gained from science. So, we really need these committees. This is my call that we need to have some guidelines based on religious beliefs on this issue.

Your other comment about not telling mother. Actually, may be, I did not explain it in the right way. This is not what I meant. I meant that now pregnant females go through ultrasound, whenever they get pregnant they will go to gynecologist. He doesn't tell her that ultrasound beforehand will show any abnormality. I am not talking about after, I am talking about before.

For Dr. Issam, I don't know how to respond to you. I leave it to my colleague. I don't think it is for me to agree or not, because we always depend on the experiences of people. Wc cannot decide for people. Thank you.

**Chairman**: Dr. Muireann

***Dr. Muireann Quigley***: I am trying to do Dr. Winslow's question first. I think, there is a gap between moral and philosophical reasoning of implementation of the legal statutes. My personal view of justice, I subscribe to the political and legal philosopher John Roses School of Thoughts. He describes justice is fairness. His basic idea would agree with what I say about equality. Regarding the international distribution of the reproductive technology, I personally feel that people should not be prevented from traveling to make use of those known countries if they wish to do.

Dr. Tennant's comment about scarcity of resources, this is obviously an issue. The economic way may be the one, which has been adopted in Britain. They have taken in to account the cost of a person's life as to how many years he is expected to live and then based on that they will allocate resources in that manner. All of these

have been argued for in philosophical literature and I agree with none of them. I actually have to subscribe to John Harris's view who is the boss in my department. And, he says that these things should be described on 'First Come First Serve Basis'. And, I would go along with that. So, it is open to debate about how it should actually be done. I advocate 'First Come First Serve Basis'. Thank you.

**Chairman**: Thank you very much! On your and my behalf, I would like to thank all the speakers. And, we end this session.

# Topic III: Social Impacts of Genetics and Reproductive Technologies

## Tenth Session
## Wednesday, 8 February 2006

## Cloning, Immortality and Genetic Engineering - Islamic and Secular Perspectives

**Chairman** : Dr. Abdel Aziz Saleh
**Rapporteur** : Dr. Abdulfadl Morsin Ebrahim

***Speakers:***

*1 - Dr. Farhat Moazam*
*2 - Dr. Omar Alfi*
*3 - Dr. S.M. Mohaghegh Damad*

# GENETIC ENGINEERING, SOCIAL JUSTICE, AND THE FUTURE OF HUMANITY: CONFLUENCE OF RELIGIOUS AND SECULAR CONCERNS

*Dr. Farhat Moazam*

Pakistan

# Genetic Engineering, Social Justice, and the Future of Humanity: Confluence of Religious and Secular Concerns

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First, I would like to express my gratitude to Drs. Al-Awadi and El-Gendy for once again providing me an opportunity to be here today among so many renowned *ulema* and scholars. It is indeed an honor and a privilege for me to be part of this conference.

When Dr. El-Gendy's office first wrote to invite me to this conference I was requested to provide the title of my paper, and also declare which category I would like to be listed in as a speaker - whether as a religious scholar or a secular scholar. I emailed them my title but chose not to assign myself a category. I soon received an email from Dr. El-Gendy's office stating that I had been categorized as a secular scholar. To which I did not respond. A week later came another email informing me that I had been reassigned as a Muslim scholar.

I realize the quandary in which I had placed the organizing committee, although I must admit that I was not entirely unhappy with the confusion I had created. It probably stems from the sub-title I have chosen for my talk, namely, the "*confluence* of religious and secular concerns" even though this is a conference in which the theme is that of "*comparing* religious and secular perspectives." I have chosen my title carefully; it reflects my humble opinion that we need to shift from comparison to a confluence of some broad humane values, that it is sometimes good to "think outside the box" even though this is not an easy task.

I have found that the direction which certain aspects of genetic technology are taking are equally troubling to those who seek moral guidance through religious values as it is for some of our colleagues who rely on human reason alone to arrive at ethical conclusions.

The essence of my talk today is to make the case that for the future of *bani Adama*, the human race which the Qur'an speaks of rather than any one exclusive group, it is necessary that we begin to move towards finding common ground in our discourse. Without this we cannot hold a dialogue. I see conferences such as this one organized by IOMS as a step in that direction.

## Objective of Presentation

1 - I will provide an overview of **the science of therapeutic cloning** or **somatic cell nuclear transfer (SCNT)** that forms the basis for much of the progress in human genetic engineering. I will also touch but only very briefly on my understanding of the secular and religious positions related to stem cell research and therapeutic cloning, as these have already been spoken off at length by several scholars already.

2 - I will then turn to the main focus of my presentation today. This is one of the most rapidly developing areas within the science of therapeutic cloning that makes it possible to mix cells and genetic material between humans and animals. By this I refer to increasing success in developing **human-animal chimeras and hybrid embryos.** This is an issue that has received attention in secular, philosophical circles but relatively little within religious traditions.

3 - I will end by suggesting that in our fascination with the promise of what science may have to offer to individuals, we are ignoring larger issues of welfare and justice in our societies. In Islam, scientific progress is seen as *fard kifaya*, collective responsibility, but the foundations of this religion rest on the principles of social justice and equity in this world, on principles of *'adl* and *qist*. And let me state that justice and social welfare are concepts shared not only by our Christian and Jewish brothers and sisters but also by many of our secular colleagues. So here too I see opportunities for the meeting of minds.

## The Science

In December 2004 I came across a *fatwa* by Mufti Dr. Ali Al-Qara Daaghi in response to a question posed to him about genetic engineering. He states that "awareness and deep knowledge of the background of a certain issue is a necessary prerequisite to explain the Islamic ruling about it." This is an extremely important point. Scientific progress is occurring at a phenomenal speed especially in the area of genetic engineering that includes cloning or somatic cell nuclear transfer (SCNT). If we are to offer guidelines about what is, or is not, ethically and religiously acceptable in this field then we must first familiarize ourselves with the complexities of different aspects of this science. So please bear with me as I spend a few minutes on a brief overview of some of the basics of this science which is relevant to the main thrust of this paper, human-animal chimeras.

Sexual fertilization is the age old form of fertilization that leads to the production of offspring. The embryo is formed by the genetic material from the nucleus of the sperm that combines with the genetic material present in the nucleus of the egg. But in addition, all embryos also contain about 1% of genetic material that is only provided by the mitochondria present in the egg. This is an important fact to keep in mind as I proceed to the main focus of my talk.

Following the fusion of sperm and egg, the embryo begins to divide. After about 4 to 5 days the embryo is called a blastocyst and can be frozen at this stage. The blastocyst consists of a mass of inner cells that are called embryonic stem cells; it is these totipotent cells that have the capability of differentiating into any of the tissues that form the body of the new human or animal. At this stage, stem cells can only be harvested for research by destroying the embryo.

Somatic cell nuclear transfer (SCNT) which is also called cloning is a new technology that relies on asexual fertilization - it needs an egg but does not require a sperm.

This process produces an embryo that begins with only one nucleus which can be obtained from a somatic cell from any part of the body, such as one from the skin. In a laboratory, this is introduced into an

egg whose nucleus has been removed. This newly introduced nucleus of the somatic cell is then given an electric shock to revert it to a state in which it begins to divide and form a blastocyst or embryo from which stem cells can be obtained for research. This is called **therapeutic cloning**.

If this embryo is implanted in a uterus, it has the potential of growing into a new individual. This process is called **reproductive cloning**.

The offspring resulting from reproductive cloning will have most of its genes (almost 99%) from the nucleus but as I have stated, the rest of its genetic material will come from the mitochondria present in the cytoplasm of the host egg. The clone is therefore not a true clone of the individual from whom the nucleus is obtained.

In the late 1990s, for the first time in Edinburgh Ian Welmut was successful in using this method to create a mammal, Dolly the sheep.

## Cloning and SCNT

At this day in time, the unanimous opinion of secular and religious thinkers is that human **Reproductive Cloning** should not be permitted, namely cloning that results in an offspring. The important point to note is that although the 2 groups use different moral sources (revelation and reason by the *ulema* and religious scholars, reason alone by secularists) and methodology of argument, yet they arrive at the same conclusion. Reproductive cloning is not permissible as it has negative implications for family life, inheritance laws, religious values and societal norms, as well as potential for psychological and physical risks to the clone itself.

All Muslim *mufti* and *ulema* including renowned Sheikh Yusuf Al-Qaradawi oppose reproductive cloning. This is also the opinion of Dr. Muzammil Siddiqi, Chairman of the Islamic Law Council of North America.

There appears to be less unanimity when it comes to **Therapeutic Cloning** in which the embryo is used only to obtain stem cells for research.

* As we have heard over the last 2 days, there is greater acceptance of using embryos "left over" from IVF to obtain stem cells for research, provided there are clear controls against abuse of this practice. These include necessity for informed and voluntary permission from the couple, prohibition of monetary incentives to couples donating the left over embryos, and impermissibility for physicians to make "extra" IVF embryos for the sake of research.

* Developing embryos *specifically* for research purposes has support from some secular thinkers and a few religious scholars within Christianity and Judaism as it is seen as a way to progress in understanding and treatment of human ailments. Opposition to this can be found among both religious and secular scholars based on a belief that this devalues human life, negates the dignity of human beings, and is contrary to God's plans/natural law. Their epistemology may be different but they arrive at the same conclusions.

Another reason for concern about this procedure is the risk and harm to women who donate the eggs. The donating woman requires multiple hormonal injections, which may increase risk of developing cancer later in life, and she must also undergo surgical intervention to retrieve the eggs. There is also the potential for exploitation of poor women whose circumstances may force them to sell their eggs for research, research the benefits of which would be beyond their reach.

I have not seen this particular aspect highlighted in discussions by Muslim *ulema* and *fuqaha* but this may merely reflect inadequacy of my research on this topic.

## Human-animal Chimeras

Let me now turn to the main focus of my talk. This is to introduce you to an aspect of genetic engineering that is moving forwards at a rapid pace, yet has only recently received attention from a few bioethicists and sociologists *viz a viz* concerns about its repercussions to society. I refer to scientific advances in producing **cross-species chimeras** that allow mixing of cells and genetic material of different animal species, something that that does not occur in nature.

The term chimera comes to us from Greek literature, and is used

for mythical creatures with a mixture of parts from two or more animals. As an example, a famous chimera in Greek stories is a creature with the head of a lion, the body of a goat, and the tail of a serpent, a ferocious fire breathing beast that destroyed humans.

There is also a description of creatures in Greek mythology that are part human and part animal, in other words, human-animal chimeras. The best known example of such a creature is the imaginary half human/half horse creature called a Centaur. Greek myths describe some Centaurs as bad-tempered and evil, and others as quite civilized and skilled in hunting, the arts, and even experts in medicine.

A famous example of a human-animal chimera known to us today is the mythical Sphinx depicted with the body of a lion and the upper part of a woman. In fact, the statue of a world famous Sphinx, the Egyptian Sphinx, can be seen in Cairo next to the Great Pyramids of Gaza.

So what is the relevance to 21st century lives of these imaginary, magical creatures that are neither clearly human nor entirely animal?

The relevance is that what was once considered imaginary is moving rapidly towards becoming a reality through the science of cloning or SCNT. Over the last decade science has made it possible to mix cells and genetic material from two different species of animals into one. This falls under the broad rubric of animal genetic engineering. There have been several successful attempts to combine not only somatic (mature) cells but also embryonic stem cells and genetic material from humans with that of animal species. Much of this research is occurring using mice but in some cases human cells have also been successfully introduced into higher primates such as monkeys.

A chimera that occasionally occurs in nature, and is also produced by humans deliberately, is the mule that results from the mating of a horse and a donkey. But the deliberate intermixing of two different species that do not mate in nature became an area of intense research towards the end of the last century. In 1987, scientists in Edinburgh successfully fused the embryos of a goat and a sheep in the laboratory. The resulting offspring was named the "Geep". The Geep has the

head of a goat with a sheep-like body covered in patches of goat hair. All its organs, including the sex organs, are made up of both goat and sheep cells. A Geep is therefore, at least theoretically, capable of producing both sheep and goat sperm.

This science is now being extended to allow a capability of introducing genetic material and cells of humans into animals. In my opinion this particular aspect of research raises profound moral and ethical challenges that have yet to receive sufficient attention in secular and religious discussions including those among Muslim *ulema* and Muslim physicians.

It is a science that raises questions about our biological definition of a "human being" and the future of human society as we know it today. Whether we are religious or secular in our orientation, it challenges human and societal values, ideas of what constitutes the human race, as well as the nature of our relationship to animals.

Let me provide a few examples of the research underway in the intermixing of human cells and genetic material with those of animals. In the last 5 years, Irving Weissman and his colleagues in Stanford University have succeeded in transplanting human neural stem cells into the brains of newborn mice to produce a model for neurological research to understand and eventually address diseases such as Parkinsonism. About 1% of the brain tissue in these mice is human. This year, another group of researchers in California have obtained permission to inject human embryonic stem cells into mouse fetuses that will be born and allowed to grow normally. The objective is to develop a species of mice that will be born with a fully "humanized" brain. In other words, the brains of this species of mice will be composed entirely of human brain cells in order to study human neurological illnesses.

Several questions emerge, questions that are novel in nature and must be addressed. What will be the status of this new breed of mice with brains composed entirely of human neuron cells? How will we deal with them if they demonstrate any aspects of human sensibilities or behavior? If any of the human stem cells migrate into the sex

organs of these mice and if they are allowed to breed, will the mice embryos that result include components of human genetic material?

Far more troubling is research being conducted to produce human-animal "hybrid embryos" that will possess both human and animal genetic material within the same embryo. This too is being seen as a step forwards in developing and harvesting stem cells to understand various human diseases and search for their cures.

In 1998, scientists in a private company called American Advanced Cell Technology (ACT) reported for the first time the creation of a human-animal embryo hybrid. They did this by using the technique of therapeutic cloning or SCNT (the same as used for Dolly). They were successful in transferring a human cell nucleus into the enucleated egg cell (oocyte) of a cow and allowing it to grow for a few days in a Petri dish in the laboratory. Their reason for using cow oocytes instead of human ova was that it is difficult to obtain a sufficient number of eggs from human females, whereas those from cows are easily accessible and raise no ethical concerns. If this technology is perfected, and if the embryos were allowed to grow, the resulting fetus would have 99% human DNA, and about 1% cow DNA derived from the mitochondria in the cow egg cell.

In 2003, Chinese scientists from Shanghai Second Medical University successfully fused human cells with rabbit eggs. These embryos grew in the laboratory for a few days until they were destroyed to obtain stem cells. The same technology is now being developed in UK.

Experiments are also underway in which human cells have been introduced into higher primates such as apes. Human brain cells have already been successfully incorporated into the brains of monkeys. There is talk of the possibility of introducing human embryonic stem cells into higher primates such as chimpanzees and apes who share 98% of human genetic material. The argument given in support of such research is that the hybrid of a human and chimpanzee, a "humanzee," would be a more "humanized" chimera, and therefore far more suitable for study of human diseases, trial of new drugs, and for growing organs that can be transplanted into humans.

Even as I was pulling together my thoughts for this presentation I

came across a news item from Australia. A government appointed committee in that country has proposed that current legislation be amended to allow therapeutic cloning, the creation of hybrid embryos from different species, and the import and export of such embryos. The Australian committee takes the utilitarian approach that any scientific activity that has potential benefit for humans must not be prohibited.

Arguments in Favor: Stem cell science and human and animal genetic engineering are being hailed by many as the new "golden age" of medical science. One of the arguments in favor of producing human-animal chimeras is that the more genetically "humanized" a research animal we can develop the greater our chances of success in understanding and tackling diseases. Such humanized animals would also be better suited for testing drugs and making spare parts such as livers and kidneys for human use. The objective is to eventually produce animals for the sole purpose of supplying organs for human use.

Arguments Against: Underlying genetic engineering is an ideology that all living creatures are no more than vehicles of their genes. It challenges the shared belief of Abrahamic religions, and the conviction of many secular thinkers, that humans form a race that is biologically distinct from other animal species. However, the alternative view of scientists such as Barrow and Tipler is that (*The Anthropic Cosmological Principle*, Oxford University Press, 1986) "a human being is a program designed to run on a particular hardware called a human body."

In this worldview, if all living creatures, including humans, are akin to genetic computer programs then there can be no rational reason why different programs cannot be mixed or modified or restructured to the benefit of the superior program, the humans. In this ideology, the important thing in life is not to understand the world as it is but to conquer and change it. There are no spiritual or metaphysical mysteries left - human existence is temporal not transcendental, and its entirety is graspable through the senses and the intellect.

This is a starkly utilitarian worldview of research that focuses on the ends without due consideration of the means to achieve it. It asks - if it is possible to do it, then why not do it? As the critic Midgely (*Hastings Center Report*, September-October, 2000) notes, in this mechanistic view God the designer of the world is made to "gradually withdraw from the scene" and man takes over to make the world intelligible. To its critics, this science challenges the dignity of humankind, ignores the essence of what it means to be human, and muddies the diversity of species on earth, and indeed sets aside the responsibility humans owe to animals that are also creatures of God.

We also need to reflect on questions about genetic engineering of animals that may sound fantastical but are real nevertheless. What ratio of human genetic material in an animal makes it perhaps not quite an animal? What status should be accorded to mice whose brains are composed of 100% human brain cells? What will be our responsibilities towards higher primates such as apes if they are genetically "humanized" as sources of organs compatible with humans? Will they be half-human or half-animal or something in-between?

I was pleased to learn from Dr. Albar's talk yesterday about the meeting of the Islamic Fiqh Academy on genetic engineering held in 1998. Unfortunately, the recommendations of the Academy were in Arabic and thus inaccessible to a majority of Muslims who neither speak nor understand Arabic. We were informed that the Academy declared genetic engineering in animal breeding as permissible "provided necessary precautions are taken to avoid any harm (even long term) to man, animal and environment." With apologies, in my opinion, this is too general a statement to provide practical guidance on a very complex matter. Plants, animals and humans are interdependent in many ways; to change one, even if this be plants or animals, can unbalance the environmental equilibrium. Studies are now beginning to appear that point to potential for long term repercussions of genetic modification of plants and the food they provide for humans. What is the level of harm to plant and animal species which should be considered permissible? Is it permissible to modify plants so that they

are resistant to certain diseases but can no longer seed themselves naturally making it necessary for farmers to have to buy seeds every year?

What are the moral implications of genetic modifications of animal species so that they are produced *solely* to serve as factories of organs for humans? We have heard a great deal in these last 2 days about humans being the "trustees" of God's creations on this earth. At what point should we as trustees draw the line against tampering with God's non-human creations? These are serious questions that require deeper reflections and cannot be answered through broad general statements.

In the case of stem cells the Academy following its 1998 deliberations allowed the permissibility of obtaining stem cells "to be grown and used for therapy if the sources were legitimate." But as I have just shown, science has progressed at a phenomenal rate since 1998 to include research to obtain stem cells from human-animal hybrid embryos. With novel methodologies being developed to obtain stem cells comprehension of the intricacies of this science is essential in order to offer recommendations whether these are drawn from secular reasoning or religious teachings.

**Current Situation:** At present there are neither universally agreed ethical guidelines, nor any national or international regulations, addressing research that mixes human and animal DNA to form chimeras for potential human benefit. In fact I am not aware whether this *specific* issue has been addressed by Muslim *ulema* and *muftis* in any of the many discussions that have taken place on genetics and therapeutic human cloning.

Among the first attempts to develop guidelines specific to human-animal genetic mixing is a recent *secular* document from the US. In April 2005, some of the troubling issues connected to the production of human-animal chimeras were addressed in a set of ethics guidelines on embryonic stem cell research. These recommendations, offered as ethical guidelines and not enforceable rules, were compiled by a committee of the US National Academy of Sciences. The committee, composed of scientists and philosophers, felt it important to continue

embryonic stem cell research, but at the same time expressed discomfort at the unregulated mixing of human and animal genetic material.

They recommended that if chimeras are made using human embryonic stem cells then such animals must not be allowed to breed in order to prevent fetuses with human genetic material. They further advised that due to the close genetic relationship of humans with higher primates (apes and chimpanzees with whom we share 98% of our genetic material) the production of human-primate chimeras should be prohibited. The committee also cautioned against the introduction of human embryonic cells into primate blastocysts.

The arguments employed by this group of scientists and philosophers were secular not religious, but many of the concerns they cited - the dignity of humankind, questions about the essence of what it means to be human, and the right of animals to be treated with respect - would be shared by many religious scholars including Muslim *ulema* and *muftis*.

## Personal Reflections on Justice (*'adl, qist*) in Islam

This brings me to an area about which I would have liked to hear more discussions over these 3 days - by this I refer to the central role of social justice, *'adl* and *qist*, within Islam.

I know that Islam encourages pursuit of knowledge and considers scientific inquiry as a *fard kifaya*, but it also speaks of the importance of choosing the middle road, using temperance (*al-wasat w' al-'aitadaal*), as we make our way in life on earth.

In my opinion, the fervor to pursue science mechanically for the sake of science itself can be counterproductive. When medical research changes its character from altruism to business and personal gains in worldly life, it makes us like those who not only forget God but also forget themselves. (Qur'an 59:19)

I am not a scholar of Islam, an *alimah*. But I do know that *al-qawaid al-fiqhiyya* take into account not only the benefits of the individual but also the consequences of our actions not only for the future of the *ummah* but also of the human race of which we are a

part. We have heard that benefit to individuals cannot be obtained at the cost of the welfare of society. Important *qawaid* include principles that "fending off harm must take priority over incurring a benefit," and that "one can bear an individual harm to fend off a public one." Another advises that "harm cannot be waived by resorting to another harm."

I speak as a concerned Muslim physician. In my opinion, Islam is a religion that is grounded on the foundation of social justice. It compels us to bring about *'adl* and *qist*, justice and equity, for the *masalih*, the welfare, of the community and not merely that of a few individuals who can afford the benefits which stem cell research promises.

Increasingly, medical research and researchers are changing their values from one of altruism, *eesar wa hibb al-ghair*, to one of business, *tijara*. Much of the fruit of recent advances in human genetics will be available to only those who are in the position to afford it. We must ask ourselves how many of the beneficiaries will be among the masses of the poor, including Muslim *ummah*, who inhabit this earth and still cannot afford clean drinking water, shelter over their heads, and means to feed their children.

The Qur'an tells us repeatedly that true believers are those "in whose wealth (fortunes) the suppliant and the deprived have a share." (51:19) And yet the 2003 UN Human Development Report tells us that 800 million of the world's population, a large number of who reside within Muslim countries of Asia and Africa, go hungry daily. Another 1.1 billion people have no access to safe water while we are being swept away with the seduction of science and its promises.

It is time for Muslim scholars, physicians and scientists to bring their own perspectives of social justice to the discussions on the science of human-animal genetic mixing. In the case of genetic engineering whether this be in agriculture or animal species, and in the use of human embryonic stem cells to produce human-animal hybrids, we must begin to define clearly what are the *daruriyyat*, the necessities, versus the *hajiyyat*, the complementary and the less necessary.

Genetic engineering and stem cell research certainly hold promise

for better understanding of human diseases. But the complexities of this rapidly evolving and very expensive science must be understood, and it's potential for benefits and harms for individuals versus the future of larger society and humankind weighed carefully.

Final Suggestion: Let me end by making some broad recommendations for your consideration.

1 - Genetic engineering of plants and animals, and novel ways to derive human stem cells through production of human-animal chimeras is moving forwards rapidly. This is complex science. It is necessary for healthcare professionals and religious scholars alike to keep abreast of these advances in order to provide informed opinions and guidance rather than broad statements.

2 - I suggest that in our discussions of such issues we take greater notice of the centrality of social justice and equity that form the foundations of Islam and are also considered important values in other religious traditions. We live in a world of finite resources and our priorities in research must take into account justice and fair distribution of the fruits of scientific progress.

3 - From our *ulema* and *fuqaha* I request greater clarity in their opinions on genetic engineering of plants and animals, and where a line must be drawn in this research. This is important if we are to serve our role as "trustees" of God's creations. It will be useful if the Academy can define the "harm" that they speak of avoiding. There is also the need for a more definitive statement from the scholars on interspecies mixing of cells and genetic material.

4 - There must be *timely* dissemination of the opinions of *ulema*, and in languages understood by the Muslim populations of this world a majority of who are now not familiar with Arabic. As an example, Pakistan has 150 million Muslims with only few who are conversant with Arabic. With the rapid march of science this information must be made available as soon as possible. We were provided the English translation of the revised Code of Ethics for Muslim healthcare professionals during this conference, and yet these were formulated in the conference held in December 2004.

5 - And lastly, we must realize that many of the concerns about the direction in which genetic engineering research is moving, and its repercussions for the progeny of Adam, are shared by thoughtful people, secular and religious alike. Our sources and methodology for arriving at moral conclusions may differ but there is sufficient overlap in our humanistic values that allow a dialogue. We can learn from one another, enrich our understanding, and search for a confluence of values rather than a focus on our differences.

The Qur'an says- "If Allah had pleased He could surely have made you one people but He wished to try and test you. So try to excel in good deeds." (5:48) In this *ayat* lies an important message for us.

# RECENT RESEARCH ON "TELOMERASE" ENZYME AND THE CONCEPT OF "IMMORTALITY"

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# Recent Research on "Telomerase" Enzyme and The Concept of "Immortality"

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Human cells contain 23 pairs of chromosomes each that carry the genes that characterize and control the functions of the cell. The genes are coded according to "nucleotide pairs," arranged on the DNA double strand in a unique way for the species (human) and for the individual (molecular fingerprinting). As the living cells replicate, the double strands separate and each becomes a template for a new DNA strand, allowing the original double stranded DNA to become two identical double strands of which one goes to each of the two daughter cells. To regulate this process the double strand of the original cell maintains connection through the tips of the chromosome so that the new double strands maintain a relationship with each other. The mechanism that maintains that is a DNA cap at the two terminal ends of the chromosomes. They are formed of non-coding pairs of nucleotides (approximately 20,000 each) that share in holding the two new daughter double strands together. Each cap is termed a "**telomere**." In this process of cell division the telomere loses few hundred pairs of its nucleotides, but the major portion of the telomere remains intact and helps in the future division of the cells. However, with each cycle the telomere becomes slightly shorter. As we continue with our lives, the telomeres get gradually shorter and shorter until a critical level is reached, prohibiting the cell from any further division. Once this cell dies, it no longer can be replaced. Depending on the type of these cells, their functions cannot be carried out anymore and diseases such as Alzheimer's, Parkinson's, heart attacks, and others start to occur. These are usually related to senility due to the fact that the cells have undergone numerous cell division cycles, causing a loss in telomeres. If there is a way to maintain the length of the telomere, these senility disorders could be prevented. The function of the brain, heart,

muscles, and other organs would be maintained resulting in a healthier, longer life.

The enzyme that helps form or replaces the telomeres is called "**telomerase**." In the human being this enzyme is only present and functioning in the germ cell (egg and sperm); in the resulting embryonic stem cells of the developing fetus and in some regenerating tissues. That is the direction that certain drug companies are investing in; to get a product that re activates this enzyme beyond the early fetal life.

If this happens, together with the recent great progress in health care, and in the new discipline of "**regenerative medicine**," the average survival of humans is expected to increase significantly well beyond the age of 70 years (one generation ago in the western world) and the current life expectancy of 100 years for the new generation.
Let us now direct our attention to an opposite situation. Normally some of our cell's DNA may acquire some damage that creates a cancerous cell. In many or most of these cells, the telomerase enzyme that was inactive since fetal life is reactivated. This cancer cell, with reactivated telomerase, can make the cell rebuild the portion of the telomere that is lost with every division causing the cell to continue dividing for very long periods without aging or dying. In some cancer cells telomerase level is directly related to prognoses. Some of these cancer cells have continued to grow in tissue culture and have for years outlived the individual they started in. In a sense, these cancer cells can achieve "immortality" in the laboratory.

If we can turn off that telomere in the cancer cell, the telomerase can't regenerate and will continue to deplete with every cell division, till the cell dies. So we have situation where: for cancer therapy **telomerase inhibition** is an attractive treatment. On the other hand, **telomerase stimulation** is attractive for expanding the potential of cellular proliferation with delay in senility and improving tissue regeneration. A combination of both objectives i.e. stimulating telomerase in body cells without causing cancer would be an optimal situation. This is currently a major goal for several research and drug companies. Recently progress has occurred in both directions and they

are trying to solve the question: Is telomerase an immortality gene or an oncogene?

Approaches of researchers to activate the telomerase include chemical (drugs) and infecting the body with viruses that carry the active gene but do not harm the cells. The direction is promising and some firms have already claimed some success to the extent that last year California voters approved a $3 billion bond to start a "California institute of regenerative medicine" that includes research on aging, tissue repair, stem cells and telomerase.

## What are the implications?

**Religion: In the Quran:**

- There is no immortality for humans in this life
- Some may wish to survive 1000 years
- Noah lived 950 years
- The issue is not how long you live but how much good you do

**Society:**

- Over population expected
- Burden on resources.
- Benefit of long productivity of experts
- Necessary changes in education system.

**Ethics:**

- This technology will not be available to all members of society
- A new unprecedented class would emerge
- More resources used by smaller percentage of population in a nation and in the world
- This technology will not be available to poor societies or countries: gap between 1st world and 3rd world will be much wider

## Discussion:

We have reviewed the topic of **Telomerase** enzyme as an approach to immortality of the cells, and probably as a future means of delaying

aging: the enzyme is usually referred to as the "Enzyme of immortality." Though the issue of immortality in humans is not considered literally, research in the area has created great interest, writings, and debates in ethics and among some religious groups. New corporations have started; known among them is "Immortality Institute" (ImmInst.org) that deals with wide varieties of issues regarding anti-aging approaches. If we run a search on Google for telomerase in the news we find about 850,000 links, and if we focus on telomerase and immortality we get about 50,000.

Anti-aging medicine is very important for **individuals and for societies**. In **Islam**, "doing good" is an imperative?? Muslims are required to promote what is good for society and prevent what is bad, and to compete in doing that. If anti-aging measures help maintain the productivity of an individual, and if that individual's productivity is good for society, then the anti-aging measure is good. Otherwise, anti-aging measures would not, or should not, be desirable. The Quran mentions that someone may wish to survive for 1000 years, but that would not shelter him/her from hell fire if what they are doing is evil. So longevity in itself is not a plus if it is not associated with doing good to society.

The length of the life of an individual cannot be predicted and only God knows when an individual is to die. However, with improvements in healthcare over the past several decades, the average survival of Western populations increased from 40 years to 50, 60, and 70 at the present time. With the rapid pace of healthcare improvements, the expected survival of the new generation is expected to be 100 years, especially with the developments in regenerative medicine and in stem-cell technology. The new progress in telomerase research may push the age more towards that "relative immortality" age of 150 or more. For a Muslim view "relative immortality" may be realized only if God wants it to be. An interesting point to mention is that the Quran states that prophet Noah lived for 950 years.

How would anti-aging **genetic technologies** affect the relationship between individuals and society? It would be by the impact of the actions of the individual, now living longer, on the society: if good

actions, carried over longer life, it is good. If evil actions carried over longer life, it is bad for the society.

We may direct our discussion to the "appropriate" **use of limited resources**. All through life, those who can afford something try to get it and those who cannot will not, especially when resources are scarce. In general, longevity leads to more resources being committed to the increasing numbers of older people. This may put pressure on resources needed for the younger growing generation, whether in food, health care, housing, transportation, etc. If there is enough for all, there is no harm, but the expectation would be the aging population will take away some resources from the younger and underprivileged population, and that is a problem. Even if an advanced, wealthy nation can afford to provide the extra resources for the aged, most likely that will be on the expense of resources that should help a 3rd world nation and there would be greater inequity within a nation and between nations. The main balancing mechanism would be promoting social justice as encouraged by religions and governments.

There is always concern that genetic technologies may lead to new form of **eugenics** in which the disabled are gradually eliminated. This should never happen. We should try to eliminate the disability not the disabled. A hopeful model for that would be the direction to treat fetal disorders by fetal constructive treatments and the growing fetal stem cell technology instead of resorting to termination of pregnancy.

# HUMAN CLONING FROM THE VIEWPOINT OF FIQH AND ETHICS

*Dr. S.M. Mohaghegh Damad*
Iran

# Human Cloning from the viewpoint of Fiqh and Ethics

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The Catholic Church as well as Muslims pay special attention to the institution of family and its divine character. This common stance has led to common concerns in many issues of genetic engineering, including the issue of cloning. As a result, we have witnessed a special sensibility of the Catholic faith and many Muslims towards this theme, which both have raised it before numerous forums.

The Catholic Church decisively condemns efforts aimed at human cloning, calling it an unethical act that violates human dignity. As seen by the Catholic Church, there is no difference between human cloning and therapeutic cloning, thus both are to be rejected, because in the latter case, too, an embryo takes shape, which is subsequently destroyed, and this runs opposite to the most elementary right of any human being, namely the right to live. Thus, the Catholic Church demonstrates a certain internal consistency on this issue. However, due to a number of considerations, it had to meet the demands of Catholic believers in the realm of genetic engineering, forcing it to loosen its theoretical rigidity in several cases.

In its criticism of human cloning the Catholic Church mostly refers to theological and ethical arguments, the most important ones being the neglect of human dignity, the instrumentalization of mankind, and the weakening of the role of the family. The Catholic Church's opposition to human cloning actually is part of its opposition to issues like abortion and euthanasia, and therefore has to be understood within that broader framework.

Muslim fuqaha, for their part, view human cloning as "haram" (forbidden by religion), and they list numerous arguments against it. In their view human cloning is "haram" for theological, fiqh-related, ethical, social, psychological and scientific reasons. They see human

cloning as a means of weakening religious beliefs, changing God's creation, violating human dignity, disturbing family life, and bringing heritage and lineage regulations into disarray. Therefore they hold cloning even for partners living together to be illegitimate, showing unanimity on this issue. In this regard, Muslim fuqaha and the Catholic faith side with each other.

This ban has been expressed in several declarations, Fatwas and resolutions. Islamic organizations and independent personalities have repeatedly emphasized this ban. The "Madma' al-Bohûs al-Islamyya" ("Conference of Islamic Discussions") of the Al-Azhar University has issued a Fatwa in defiance of human cloning, asking the governments of the world to prevent it in whatever form it might be practiced.(1) The European Council on proclamation of decree" افـــتـــاء and Research"(2) too has called human cloning "hazam"(3) Also, the office of "*Rabitatu al-'Alam al-Islamî*", stationed in Mecca, has condemned human cloning as "haram" and asked for a worldwide law to be drafted against it. Furthermore, a seminar held in Morocco in 1997 ended with several recommendations, one of them calling for the "prohibition of human cloning by the transfer of stem cell of body to the nucleus-free ovule".

The final declaration of the "Council of Islamic Fiqh" clearly reflects this unanimous viewpoint. After a preamble about man's position in the order of being and Islam's consent to the pursuit of knowledge and scholarship, this declaration asks for a "ban on human cloning by the two above mentioned methods or any other method that leads to the increase of mankind." (The Journal of "Madma' al-Fiqh al-Islamî", p. 421) The "two above mentioned methods" are, first, the embryonic cloning with the help of zygotes or the impregnated egg and its subsequent division, and second, body cloning.

(1) The news of this ban can be found in the Arabic site of "Nida al-Eman" under www.al-eman.com from Dec. 29, 2002 as well as the Arabic site of Al-Khalij under www.gulfpark.com from Oct. 16, 2002.

(2) Al-Maglis al-Urubi lil Ifta' wa al-Bohus.

(3) The text of the debate on this issue is placed on the site of this Council, see www.ecft.org from Oct. 22, 2004.

Finally, the Health Ministers of the Gulf Cooperation Council have declared their total objection to human cloning, calling it the biggest crime that is irreconcilable with medical ethics. It is worth adding that the "Madma'al-Bohûs al-Islamyya" of the Al-Azhar University not only totally banned cloning, but also recommended the Islamic punishment envisaged for "muhâribs" (i. e. "combatants") to be enacted in the case of those practicing this technology. This Madma', in a declaration issued Dec. 12, 2002, repeated its previous viewpoint and added that cloning changes mankind, who has been given dignity by God, to a playground for experiments and the production of disfigured and deformed types of man. Therefore, this declaration says, it is necessary to rise against cloning as vehemently as possible (Al-'Alam al-Islamî, 1423 A.H., p. 1777).

The most important theological arguments of Islamic scholars against human cloning center around the following points: 1) doubting creation; 2) the issue of miracles; 3) the theme of challenge with the Creator and interfering with his acts; 4) breaking the tradition of diversity; 5) jeopardizing Muslim religious beliefs; and 6) playing with creatures by changing their genes. And on the ground of religious jurisprudence their main arguments are that cloning 1) terminates the necessity of sexual reproduction; 2) confuses the lineage; 3) creates uncertainty about family affiliations; 4) causes confusion about alimony and inheritance regulations; 5) abolishes the institution of marriage and family; 6) makes void the meaning of freedom; 7) enables illegitimate relations; 8) fosters homosexuality; and 9) leaves room for criminal misuse.

Among Shiite fuqaha there is no unanimity on this issue; instead, four separate standpoints can be distinguished among them, reaching from full consent to total rejection. Shiite opponents hold cloning to be "haram" not for theological reasons, but solely because of certain religious-judicial, legal and social deliberations. But even opponents of human cloning hold therapeutic cloning to be permissible. This position separates them from the catholic view on the matter. Actually, since the opponents of cloning among the Shiites reject this practice only on the basis of fiqh and social considerations and not for reasons

of theology and faith, they are somewhat separated from the Sunni viewpoint, too. They also deviate from the catholic path by allowing for therapeutic cloning.

## Analysis of the theological reasons for banning human cloning

Are the above mentioned theological arguments strong enough to prove the validity of the Sunnis' claim, and can a ban on human cloning be rationally deduced from them? At first sight the answer seems to be positive, especially since a strong solid consensus exists on the case, brought about by a judicial council and on the basis of Fatwas issued by high-ranking Sunni scholars, a consensus that draws up such a long list of objections to human cloning that at times even the very idea of rationally criticizing it does not occur to one's mind. Nevertheless, when these arguments are examined carefully and stripped of their evocative character, they seem to be somewhat exaggerated and in essence lacking the convincing power of rational argumentation. In fact, some of these arguments even do not obey by the elementary principles of rational argumentation so that the purported conclusion cannot logically be drawn from the premises. Besides that, some of the arguments even have nothing to do with human cloning, while some contradict and neutralize other ones. Some, in turn, are irreconcilable with the principles of *Ijtehad* and, if accepted, one is forced to follow premises that Islamic scholars would not accept.

It seems that among some objectors of cloning there still exists no clear understanding of the mechanism of this relatively new technology so that most of their charges against it are irrelevant. Therefore, it would be appropriate for these objectors to seriously study the matter first before judging about it, thus gaining a more profound knowledge and reaching a sounder judgment.

Some Shiite scholars take the principle of permission اصالة الاباحه as their starting point, claiming all of the arguments against human cloning to be insufficient and hence licensing this act. They declare cloning to be one of man's recent achievements that enables a deeper insight into divine habits and can be gainfully used without a need to

worry about mankind. This viewpoint distinguishes them from the catholic faith and from some of the Sunni scholars. Their stance is compatible with the prevailing principles of Shiism.

It must be said that among Muslims a serious study of this matter has still not taken place, while those religious scholars who did occupy themselves with it have mostly confined themselves to issuing Fatwas, whereas on the other hand scientists have not profoundly analyzed the matter neither. Therefore it is necessary to view this issue not as an isolated problem but as part of genetic engineering as a whole. The various dimensions of the issue must be taken into consideration and instead of an attitude that is determined purely by religious legalism (fiqh), one should analyze its ethical aspects as well and drive the discussion ahead with an eye on the human status of the fetus. It is in this sense that the following proposals are suggested here:

**a) Establishing fundamental concepts and guiding principles**

The Islamic countries must be enabled to formulate their detailed positions on this kind of issues that face them with challenges, objections, and intellectual and theoretical gaps, while at the same time they are potentially rich in their argumentation due to the richness of their religious orientation. Here proper attention must be paid to the weaknesses in order to remove them.

One of these weaknesses is the lack of development of Islamic viewpoints on fundamental concepts. To take an example, in the International Declaration of Human Genome and Human Rights (in its Preamble, in its Articles 10, 11, and 15, *passim*) as well as in the International Declaration on Human Genetic Data (in its Preamble, in Article 10, *passim*) three concepts have been emphasized, i. e. "human rights", "fundamental freedoms", and "human dignity", while these documents have been ratified with the aim of protecting these concepts. The truth is that Muslims have hardly reached a consensus on the framework of these concepts, especially the last one which is the cornerstone of the idea of human rights. Of course these concepts, by their very nature, are matters of wide dispute and even theoreticians of human rights are divided among themselves in their analyses and

argumentations. But it is undeniable that Muslims are much more divided on these matters than non-Muslims. When according to paragraph B of Article 1 of the *International Declaration on Human Genetic Data* every intervention with the human gene has to be in accordance with the international system of human rights, it is impossible to take serious action on this matter without clear, explicit, and precise positions on the principles of this system.

**b) Devising a consistent ethical system without contradictions**

Another shortcoming relates to the drawing up of a unified and consistent ethical system that makes analyses of new ethical problems possible. Despite the fact that Islamic texts offer substantial material for ethical teachings, these teachings have not been worked out properly, and no unified and effective ethical theory has been deduced from these texts. But, as Mary Robinson has rightly pointed out, even the universal system of human rights is suffering from this weakness. As she put it, a major *inconnu* is the "domain of ethics" in its specific sense. It is not exaggerated to say that today we are living in an ethical void. Former certainties and hypothesis are no longer valid. Of course we are not lamenting the fading away of past hypothesis. But the absence of systems of belief and their rules strengthen in us the feeling that our world is passing through an unstable phase, a phase that removes us more and more from the perspective of a new world order(1). At any rate, in their encounter with the astonishing achievements of biotechnology and the numerous human and ethical questions connected with them, Muslims are seriously in need of a comprehensive ethical theory about the present circumstances. It is difficult to take far reaching and congruent steps to implement the points of the world declarations without having a clear stance on ethical theories. Such a stance is necessary, first because no legally binding concept controlling the results of biological technology, including the area of genetic research and interference, yet exists. Notwithstanding the viewpoint of the theory of natural law, which holds that

(1) Robinson, Mary, *"les cles du xxl Siecle"* edition seuil /UNESCO Tr. Into Persian by E.Beigzadeh,Tahghighate hughughi,No.33-34 2001, p. 329.

at least in fundamental issues the true law still is the ethical law, we need an ethical system, because the legal system, especially in newly emerging areas, is closely connected with this law. The law of these areas, especially in the early stages of its formation, are clearly and significantly influenced by the principals of ethical teachings, whose main characteristics, according to Warnoch(1), include the criteria of "sufficiency". Ethical teachings, by their nature, are an expression of human interests, and they intend to enhance mankind's benefits, general solidarity and happiness. The principles find broad acceptance in society, and individuals as well as governments should adhere to them even before drafting legal enforcement guarantees.(2)

A clear stance on ethical theories is secondly needed because adhering to different ethical theories leads to entirely different results. Thus, there might be actions that are quite permissible in the utilitarian school - which aims at a maximal gain for a majority of the people - that are not allowed in the Kantian ethical system - which sees each individual as the goal of creation. It is interesting to know that in 1984 Drek Parfit in his book "Arguments and Ethics" defended an ethical theory that examined ethical problems resulting from social policies and that have an impact on the structure and welfare of future generations; he thus argued against the proliferation of nuclear weapons. At the same time, however, other philosophers of ethics supported a viewpoint that eventually defended the need for these weapons.(3)

Thirdly, the scope of technology is so wide and almost unlimited that many of its results will affect the lives of future times, i. e. the life of those who are not yet born, who are not responsible for them and who are not yet entitled to them neither. But still, from an ethical and humanitarian point of view, we are not entitled to neglect them.

(1) Warnoch,G.1983, pp. 69 and 91

(2) For a study of the relation between legislation on the legal and ethical level, see Gorewich,G.Tr. into Persian,by H.Habibi, 1979, pp. 225-228.

(3) R.Nobahar "*,International Declaration on Human Genetic data:Concept, Approaches, and Its compatibilities with Islamic Perspectives*" in Bimonthly Research Journal of Mofid University,No.48,p.69,Feb-Mar.2005

**c) Elaborating the relation between "Fiqh" and "Ethics"**

Besides an ethical system, the relation between "Fiqh" and "Ethics" has to be formulated as well. In some Islamic countries like our own one, Iran, Fiqh in its conventional meaning influences the structure of the judicial system, while in other Islamic countries it plays at least some role in shaping the thoughts as well as the culture of society. The question is to what extent this intellectual system feels obliged to follow the principles of an ethical system. Even if the problem mentioned in the previous paragraph is solved and a comprehensive and effective ethical system is conceived, will the prevailing religious-judicial understanding feel obliged to respect the framework of that system? Are there any general ethical values beyond religious ones that religious lawgiving (fiqh) would see as binding, even if there are arguments in Igtihad and Fiqh that would allow to neglect them? Thus, one of the voids in countries such as ours is the lack of an exact elaboration of the relation between the "ethical system" and the "judicial system".. Thus, no country and no legal system that wants to be active and influential in these areas can easily bypass ethical necessities.

This author holds that the analyses of man's position and status given in religious texts are not of a merely anthropological or metaphysical nature, but lead to the conclusion that man, not only in an ontological sense, but also in his legal and social relations enjoys dignity as a fundamental right. The Ayah "Keramah" of the Holy Koran (Al-Israa, 7) as well as other religious teachings allow for "dignity" to be understood as each individual's inalienable respect, [a kind of] a primary and natural status that is imperishable and that, as a special criterion bestowed on man by God, imposes certain ethical and legal obligations on each person. Among these, one can point at the ethical obligation to protect the status of dignity as a divine bestowment, which everyone in turn can legally claim to be respected by others. Furthermore, one can point at the fact that because of the universality of the concept of man's dignity no one is entitled to

violate another person's dignity but is rather held to view its respect as an obligatory task.

In a religious interpretation, the right of dignity has at the same time the character of a duty, as much as the right to live obliges man before God to protect life; thus, no one can renounce his right of dignity and self-respect.

Obviously, this principle has such a broad conceptual application that it can limit many genetic research. Besides a research and interference done without the affected person's consent, i. e. one that violates the principle of individual autonomy, actions undertaken *with* a person's consent, too, should be not in violation of man's dignity. In other words, the principle of consent and of freedom of will, despite all its importance in many legal actions including the discussion of genetics, succumbs to the principle of man's dignity. As a result, man cannot legally give his consent to a form of genetic interference with his genome that violates his respect and dignity; just as another person neither can, pointing at the "individual's consent", approve any interference with his genome that disregards the principle of man's dignity.

The teachings of Islam, be they legal or ethical ones, are of such a broad scope that they allow for endorsement of the current studies on man's genetic structure while at the same time they take serious the worries connected with these studies as well as their means and their findings. In this area, what Muslims need in order to keep pace with the world community, is first of all a sound understanding of the facts involved as well as of the short and long range consequences of genetic studies and interferences. The next step is the conceptualization of a compatible and coherent ethical system by turning to fiqh as well as trying to establish a legal order in accordance with this ethical system. Further and more exact examinations of Islamic viewpoints on principles such as man's dignity, the principle of solidarity among human beings and the need for altruism, and the principle of justice and caution (احتاط), as well as studies on the way of implementing

these principles in the domain of genetic studies, especially the study of the relation between these principles in case they should conflict with each other, all these deliberations will furnish Muslims with a solid ground for the issue under discussion.

# DISCUSSION

# Tenth Session

**Chairman**: Dr. Abdul Aziz Saleh

**Rapporteur**: Dr. Abul Fadl Muhsin Ibrahim

**Chairman**: His Eminence, Dr. Mohd Sayyid Tantawi.

**Dr. Tantawi**: Allah Almighty favored our Father Adam to the Angels; for He gave Adam the knowledge He did not give to the Angels. The Qur'an tells the story as follows, "And He taught Adam the names of all things; then He placed them before the angels, and said: "Tell Me the names of these if ye are right." They said: "Glory to Thee: of knowledge we have none, save what Thou hast taught us: in truth it is Thou Who art perfect in knowledge and wisdom." He said: "O Adam! Tell them their names." When he had told them, Allah said: "Did I not tell you that I know the secrets of heaven and earth, and I know what ye reveal and what ye conceal?" (Al Baqarah: 31-33). Another manifestation of honoring man is the fact that Allah Almighty subjugates many of His creatures for the service of man. This is reiterated in several Qur'anic verses. For example, Allah says, "It is Allah Who hath created the heavens and the earth and sendeth down rain from the skies, and with it bringeth out fruits wherewith to feed you: it is He Who hath made the ships subject to you, that they may sail through the sea by His Command; and the rivers (also) hath He made subject to you. And He hath made subject to you the sun and the moon, both diligently pursuing their courses: and the Night and the Day hath He (also) made subject to you. And He giveth you of all that ye ask for." (Ibrahim: 32-34). This universe with all its sun, moon, sea, rivers and lands, is subjugated in service of man. The Blessings Allah bestowed on man are countless. The honoring of Allah, Exalted be He, for man is a great honor seen and felt by us. Allah says, "If ye would count up the favours of Allah, never would ye be able to number them;" (Al Nahl: 18). What distills assurance into my soul is that all Messengers came with essentially one Message. The essence of this Message is sincerity in worshipping Allah, the One and Ever-Subduing and adhering to good manners and noble ethics.

These are agreed upon by sound human minds. Besides, all the honorable Messengers demonstrated good manners and called people - male or female - for abiding by good manners. Since Allah has created this universe and till Allah inherits it with whoever on it, men of wisdom and sound minds - and they are many though there are many narrow-minded people too - agreed upon that there are virtues to be adopted and vices to be avoided. Those wise people agreed that justice is a virtue while inequity is a vice. Shyness for them is a virtue and depravity is a vice. The Holy verses read, "Afterwards one of the (damsels) came (back) to him, walking bashfully." (Al Qasa: 25). This verse describes a woman dealing with Prophet Moses, who was not a Prophet at the time. His mission began after this incident. All the same, this woman adhered to the virtue of bashfulness on coming to Moses (PBUH). This is because the sound human mind guides to good manners. Yet, if Satan possessed one's soul, he turns vices into virtues and vice verse. The Qur'an tells us the story of those whose souls and minds were blurred. They said, "O Shu'ayb! We shall certainly drive thee out of our city- (thee) and those who believe with thee; or else ye (thou and they) shall have to return to our ways and religion." He said: "What! Even though we do detest (them)?" (Al A'raf: 88). Such narrow-minded people also said as narrated by the Qur'an, "Drive out the followers of Lut from your city: these are indeed men who want to be clean and pure!" (Al Naml: 56). For these narrow-minded people, purification has come to be a vice and depravity has come to be a virtue. Thus, the human mind agree - since Allah created man till Allah inherits the earth and what is on it - that there are virtues to be adopted and vices to be avoided. Then comes the issue of technology. To my understanding, if what is meant by technology is the scientific progress that benefits humanity, it will be unlimited. This is because the human mind is in a state of non-stop development. Consequently, the scientific progress in all aspects of life develops on annual and maybe on monthly basis. Similarly, life is renewable and ever-developing and this begets the scientific advances and inventions. Thus, if technology means serving the best interests of man - by providing man with arms, plants and the like - it is most welcome. It is this scientific progress that can make man benefit from these blessings bestowed on

him by Allah Almighty. Suffice it that the first Qur'anic verse to be revealed was, "Proclaim! (or Read!) in the name of thy Lord and Cherisher, Who created..." (Al 'Alaq: 1). Allah Almighty also ordered His Prophet to pray Him for more of the beneficial knowledge, "High above all is Allah, the King, the Truth! Be not in haste with the Qur'an before its revelation to thee is completed, but say, "O my Lord! Advance me in knowledge" (Ta Ha: 114). Of course, the word "knowledge" comprises the religious knowledge, medical knowledge, engineering, agriculture, the social knowledge and knowledge of all fields of life. All knowledge that benefits man within the limits of the permissiblity set by Allah Almighty, is a knowledge urged by the Creator, Exalted be He. The Holy Qur'an shows us that of all people, the most fearful of Allah are scholars. Allah says, "Those truly fear Allah, among His Servants, who have knowledge" (Fatir: 28). This means that, fearing Allah is confined to those of knowledge - each in his field of specialization. Allah says, "Seest thou not that Allah sends down rain from the sky? With it We then bring out produce of various colours. And in the mountains are tracts white and red, of various shades of colour, and black intense in hue." (Fatir: 27). For example, the more those specialized in embryology know in this field, the more fearful of Allah they get and the stronger their faith becomes. We pray Allah Almighty to guide us all to His Straight Path. Thank you.

**Chairman**: Dr. Ezzeddin Ibrahim

***Dr. Ezzeddin Ibrahim***:

Mr. Chairman, I'd like to withdraw my request to speak. I intended to contribute to answering the beneficial question raised by his Reverend. But the answer of the Grand Mufti in Arabic is more than sufficient. I am confident that we have competent interpreters capable of conveying this answer to the Reverend -though he masters the Arabic language- in English, the language he used in posing the question. The English translation must have found its way to those who speak English. This suffices me. Thus, I withdraw my request. But before withdrawing, I'd like to congratulate the other two speakers - Dr. Farahat Mu'azzam and Dr. Omar Al Alfi- on their exciting lectures. Thank you.

**Chairman**: Dr. Ted Peters, please.

***Dr. Ted Peters***: I thank each of the three addressees. Let me address the issue of chimeras in Dr. Farhat Moazam's presentation. I certainly want to underscore how important it is for us ethically to think today about the issue of chimeras which will become increasingly important tomorrow. In that spirit, I would like to make 3 points. The first one is a question addressed to both Muslims and women Catholics, who are committed to a doctrine of fining the human person in light of believing the divine law, and to establish this law, whether you do that, it is that divine act which establishes human being as human. Let me say that chimeras is going to cover a large number of values of scientific research in the near future. I would not want to see religious people try to put the breaks on the scientists, because the research is very important. We already have human-to-human chimeras in cancer therapy. So, chimeras may become very normal form of medical therapy.

Now, the next issue, I think you mentioned about the depletion of human embryonic stem cell. The intention is really to do a very specific kind of research. I think, this is absolutely crucial for the next chapter in this kind of research.

My final point is that I would like to see religious people to think through this application and draw the lines so that we understand better, just what the sciences are doing and what the implications might be. Thanks.

**Chairman**: Thank you! Prof. Winslow.

***Dr. Gerald Winslow***: Actually, Dr. Peters said very much all of that. I think, at any time, we have a new development in medicine; there is the possibility that it will shock people. Think for example, when the first blood transfusion was done, it was a shocking thing for people.

When we speak of chimeras, it is to Prof. Moazam. It is easy to generate a certain amount of shock with this. So, I think, sometimes it is important to understand the intention and also the safeguards. You mentioned about National Academy of Sciences. It is not just the

National Academy of Sciences but it was a joint effort of Institute of Medicine and other organizations to produce guidelines in the area of chimerism.

Finally a question to any of the panelist in the room, what should we expect from any of the revealed religions when it comes to guidelines in moving genetic material?

**Chairman**: Dr. Hassan, please.

***Dr. Hassan Hathout***: The unique thing about human being is the eligibility for individual responsibility. And, that is why the human being was given freedom of choice. Any thing that tampers or confuses that very individual's personal responsibility wouldn't be acceptable. Anything else can be acceptable, I think. Thank you.

**Chairman**: Thank you Dr. Hassan. Dr. Taha Abdul Rahman, please.

***Dr. Taha Abdul Rahman***:

In the Name of Allah, Most Gracious, Most Merciful. I'd like to thank the three lecturers for these valuable presentations and the new problematic issues they raised. I'd like to stop at two points. The first point is the relation between ethics and fiqh. I'd like to extend thanks to the great authority Muhaqiq Al Damad for raising this point which is extremely serious. I am particulary concerned with this issue, for I see that the Islamic Fiqh holds ethics and Fiqh as two separate entities. Islam took the shape of laws and the ethical aspect was completely overlooked. This is despite the fact that the Fiqh legislation cannot be established without an ethical basis. Thus, we need a pattern of the ethical values, on the basis of which we promulgate laws. Why legislation? Because legislation nowadays is of partial nature though it should be of an integrated nature. This integration cannot be achieved without drawing a definite pattern of values: the Islamic values. Jurists came to notice some of these values with regard to the objsctives of Islamic Law. Yet, there are several Islamic values that are not invested at all in the Fiqh legislation. I'd like to refer to one of these overlooked values. It is one of the most important amongst these values. It has just been mentioned by the Grand Imam. It can be

considered the first value on which the Fiqhi pattern should be built. By this I mean the value of life. Had life existed as an Islamic value-not only value but a philosophy, we would not have had these Chemiras resultant from mixing species. From now on, we should be attentive to this value. I am to write a book on this issue to highlight when Fiqh and ethics were first divorced in the Islamic religious life. This divorce began early. It dates back to the days of Hassan Al Basry. Some of the issues we have been discussing for a whole month are but the result of this early divorce between Fiqh and ethics. This is the first point. I hope that Muslim scholars would pay attention to this issue and suffice not with deducing the Fiqh. They should also deduce the Islamic ethics and put them in the shape of preachings. They can also be put in ethical philosophies that compete with those of the west. The only condition of these philosophies is that they must be of deductive and not didactic ethics. As we know, deduction is ruled by certain logical laws. The second point is the Chimeras which were discussed by Dr. Farahat. I thank Dr. Farahat for discussing this point. Chemiras result from mixing species. Here I have a question for the Muslim jurists. They permitted the inferior Chemiras - the genetic modification of plants and animals. Yet, they forbade the superior chemira: introducing human genes to animals. In my opinion, the permission of the inferior chemira may end up with affecting man. The Holy Qur'an involves a general and comprehensive honoring for the whole creation by virtue of its praising Allah. None of Allah's creatures but praises Allah Almighty; hence the honor. It is true that there is a special honor endowed on the human beings. But I believe that all the creatures are of sacred nature. Thus, no species should be mixed with another. Each species should rather remain as it is singing Allah's praises. That is what I want. Thank you.

**Chairman**: Dr. Abu Ghuddah.

***Dr. Abdul Sattar Abu Ghuddah***:

We also have the rule of Maslaha Mursalah: to weigh both the benefits and harms of anything. He referred in length to many of the benefits of cloning. But he did not expatiate as much on the bad impacts. As Al Ezz Ibn Abdel Salam said, "there is no such thing as

an absolute interest. Each interest involves some harm and each harm involves some benefit. This is substantiated by the verse on wine, "But the sin is greater than the profit" (Al Baqarah: 219). I'd like to say that the preservation of genealogy is one of the objectives of the Islamic Law. It is one of the restrictions set to honor man. Once this restriction is violated, man faces a lot of problems. This clone comes to the world lacking any connection with the social institutions: the institutions of family, kinship and society itself. This also leads us to the rule of "fending off evil". It is possible that cloning produces people of no identity, people that have no rights or duties. Thus, Sheikh Al Muhaqiq asks us to reconsider these issues. Finally, I'd like to explain the issue of ethics. The Muslim jurists paid great attention to ethics. Some of them incorporated it in the Islamic Fiqh like the Maliki School. The book "Al Jame' fil Malikiyya" is all ethics. Some incorporated it as verdicts like the Hanafi School which uses the terms of undesirable, commended, prohibition and permissibility. On finding out that this cannot incorporate all the ethics, they wrote books like "the legal ethics" by Ibn Muflih which consists of three volumes and the book "Noble ethics" by Al Tabari. How can we say that there are no books on ethics? Thank you.

**Chairman**: Shukran. Dr. Ajeel Al-Nashmi

***Dr. Ajeel Al-Nashmi***:

My remark is concerned with the last point mentioned by Dr. Abu Ghudda. This is the first time for me to hear that Muslim Jurists did not believe in the issue of ethics. It is just that they separated it from Fiqh; for Fiqh is a notification of the practical legal verdicts and their detailed substantiation. Thus, it is a science of the mandatory verdicts. This is similar to separating the science of Hadith from the exegesis of Qur'an. I never heard that our Muslim scholars paid no attention to ethics. Thank you.

**Chairman**: Shukran. Dr. Farhat, 2 minutes please.

***Dr. Faraht Moazam***: I appreciate the comments. The issue as to whether human animals chimeras are going to be problematic or not? Really, in Islam, based on the issue of the ensoulment time, that is something I'll leave to our religious scholars to address. What I do

know is based on the best recommendations that came out of the Al-Fiqh Academy in 1998, although it is never very specific. But, as I say, I am not the Aalima. Any way, the point of my talk was not for shock value. It was certainly not meant to be. The issue is that I have raised concerns, that are being raised, about the issues of mixing species. These are arguments, actually a lot of people and seculars have put forward. These are concerns not from the religious group essentially, it also comes from sociologists, anthropologists and also bioethicists.

Personally to me is the issue of the direction that science is taking in view of the limited resources we have. I come from a part of the world, i.e. called the developing world. So, to me the issue becomes more of social justice and equity when we begin to pursue an extremely expensive kind of research.

For Dr. Winslow, I didn't have the time to give the details about the NAS. I don't think that the report, if you read in detail, which I have, was essentially well. This is an area one has to be careful, because of the concerns that the average public has. They recommended very clearly that certain studies should not be permitted at this time in addition to which they had also said it is critical that this scientific community propose and implement limits on what is to be allowed.

Dr. Taha, thank you very much for appreciating my talk.

**Chairman**: Since all questions are directed to Dr. Mohaqeq, a little more time to him. 5 minutes, please Dr. Mohaqeq.

***Dr. Mohaqeq Al-Damad***:

I have benefited a lot from the generous Sheikh, Dr. Tantawi. He mastered the explanation of the verse of honor, may Allah protect him! I extend my thanks to him. I understand that he did not want to answer me back, but rather he agrees with me. Yet, I'd like to add to the meaning of honor in the verse you referred to, "We have honoured the sons of Adam" (Al Isra': 70). The Qur'anic verses tackling man's honor are multiple. I think that honor is one of the rights given to man by Allah. In the contemporary world, if honor is one of the

human rights, Muslims may well say that we have no human rights. In the verse of honor, Allah made honor one of man's rights that cannot be usurped or limited by any one. Honor is, thus, a personal right. It is further a basic right on which many religious verdicts are based. From this right, I have deduced many juristic verdicts. I'd like to say to the professor that I did not want to defend cloning- Allah Forbids. I rather said that it runs counter to the ethical foundations. Yet, we have to review our ethics in light of their sources: the Holy Qur'an, the Hadith, and the Prophetic Tradition. Our ethics should be verified in light of our Fiqhi foundations. Concerning the rule of "fending off evil" and Al Masaleh Al Mursalah, I studied these topics and I am fully acquainted with them. I even have some writings on these matters. What I wanted to say is that we have to go back to the ethical origins like honor, understand them and set for them a comprehensive definition, so as to deduce legal verdicts from them. Thank you for the issues you highlighted, sheikh! I know that this is a discussion session in which people should maintain dialogue and consider the opposing opinions. If man participated in a session where all people agree on his opinion, what would be the significance of dialogue? Thank you.

**Chairman**: Before closing, I have just two small comments. First comment is about languages. I have the experience when I was trying to give the first lecture in English with the British colleague, we agreed that English is a difficult language, Arabic is the easy one.

The second issue, I just want to say that I would end by what I started with. One of my friends, a professor, told me that if ever, in your research and interpretation you feel you are going to the complex direction, then just you have to think that you are wrong while you are going through the simplest issues i.e. is the right way. So, I would like to beg you to try to keep things simple. Thank you very much.

# Topic IV: How and Where do We Draw The Lines?

## Eleventh Session
## Thursday, 9 February 2006

## Human Being and His Creation: Where We Can Draw Lines - Islamic, Christian and Philosophical Perspectives

**Chairman** : Dr. Ajeel Al-Nashmi
**Rapporteur** : Dr. Aly Al Mishal

***Speakers:***

*1 - Dr. Ibrahim Badran*
*2 - Dr. Bishop Camillo Ballin*
*3 - Dr. Jaafer Sheikh Idris*

# EXPECTED RISKS AND BENEFITS OF GENETIC RESEARCH: WHERE AND WHEN WE DRAW THE LINES

*Dr. Ibrahim Badran*

Egypt

# Expected Risks and Benefits of Genetic Research: Where and When we Draw The Lines

***Dr. Ibrahim Badran***
Egypt

During recent decades fundamental research in genetics has developed at an increasing pace. In human genetics new insights into the molecular background of diseases and new technologies, especially of DNA analysis, have enabled the early and exact diagnosis of an increasing number of congenital disorders, the identification of parents at increased risk of having affected offspring and genetic counseling.

The way of life, is likely to be transformed more fundamentally in the next few decades than in the previous thousand years. Animal and probably human cloning could be a commonplace. Parents may choose to have their children gestated in the desired form. Genetic changes could be made in human fetuses to correct deadly diseases and disorders and enhance mood, behavior, intelligence, and physical traits.

"Jeremy Rifkin", the founder and president of the Foundation on Economic Trends in Washington, D.C., issued a book in 1998 "The Bio-tech Century: Signaling efforts for "Harnessing the Gene and Remaking the World". Also he was Co-author of a book entitled "Who Should Play God."

In both he warned the world of the danger of the new technological revolution esp in procreation Research. He warned of many risks, hazards, and declared that new genetic commerce raises more troubling questions than any other economic revolution in history. Rifkin added that we are in the "THE FORBIDEN ARENA"; which include playing with genes, artificial creation of cloned, chimeric, and transgenic animals. Also, the commercialization of human genome, surrogate wombs, male and female gametes, frozen embryos, and test tube babies used for sale or fabrication of human organs. He asked: What will it mean to live in a world where babies are genetically engineered

and customized in the womb, and where people are increasingly identified, stereotyped, and discriminated against on the basis of their genotype? What are the risks we take in attempting to design more "perfect" human beings?

Among other risky human gene research and therapy he predicted that screening of genetic diseases would become widespread, raising serious questions about genetic discrimination by employers, insurance companies, and schools. He expressed his concern over the increasing commercialization of the Earth's gene pool at the hands of pharmaceutical, chemical, and biotech firms, and raised questions about the potentially devastating long-term impacts of releasing genetically engineered organisms into the environment.

**All these dimensions are non-ethical and forbidden.**

**On the other hand Biotechnology and genetic engineering definitely has added benefits:**

- Through screening genetic diseases, as an INLET to gene therapy, and cure and also in exploring many fields in therapy to save lives.
- Through drug research, many new products can be discovered to cure serious diseases
- Plant research, and animal husbandry research may solve the problems: facing the expected food deficiency and starvation expected with a Population burst which would add a billion mouth needing food every 10 years on the average in this globe.

* Matty Harry & Taka Kala, from Finland said:

The DEONTOLOGICAL CRITICS of Biotech, Argues that The Gene Splicing Techniques can involve means which should never be performed as it may lead people to perform Acts which are forbidden.

They postulated "The Safest policy is to prohibit the - implementation of new ventures if there are doubts concerning their organic & moral rightness without risk.

(*) MATTY HARRY & TATA LALB, Physiologists Finland medicine & Health care philosophy (KLWER Publication (1:16/46) 1998).

They added certain elements in their consequential attitude to Bio-Tech:-

1 - **Benefits**: if it offers evidence based desirable contributions in the fields of health, pharmacy, agriculture and food industry.

2 - **Dampening factors** to stop, if there is any suspicion contradicting benefits expected..., How?

   a - By lowering the quality or quantity of the resulting products of research.

   b - If it be concerned with benefits only, beneficiaries in industry act through raising prices only to serve rich consumers.

   c - But forgetting the benefits to the poor,
   **all these make a red line.**

3 - **Risks**: it is banned if any shadow of doubt that research caused harm or undesired results (remembering that cost is not a risk) as benefits always outweigh economic cost and make it a prize-worthy enterprise except when danger is expected.

4 - **Financial Costs**: Research is often very expensive, but these costs should not be a barrier and should not change priorities in proceeding especially if hopeful human revenues are taken in account.

## GENOMICS AND GENE THERAPY

The Evolution of the genome project aroused lot of discussions for fear of deleterious outcomes of playing with gene specificity.

Research in genomics was directed to clarify the characters that define the specific biological function of each gene.

Each species and each individual has its own gene specify, this means that an individual has its own specific genetic pattern designed in a specific order. This is a heavenly gift, but it is to be untouchable neither to add nor to substract without a reason in healthy or disease free individuals.

**These spheres opened the door for gene therapy starting in steps**

- Investigating the specific gene identity
- Searching genetic aberrations

- Identifying genetic modifications needed.

**The Basis of prohibitions: Restrictions forbidding action in genetic engineering**:

- Calculating risks and harms in the relatively new scientific, venture is imperative.
- In genetic intervention and research when not perfected can be caused disastrous damage, e.g. possible production of genetically modified organisms, or beings.
- Remembering that errors research in plants and animals research is reparable and not as dangerous as in humans.

**Preimplantation Genetic Diagnosis (PGD) and Conventional Prenatal Diagnosis (PD)**:

Most experts consider PGD as an additional option for couples at increased genetic risk of giving birth to a child with a genetically-caused disease or malformation this is not as a replacement for 'conventional' prenatal diagnosis (PD) by amniocentesis or chorion villus biopsy.

PGD is still considered to be a highly specialized experimental procedure with a limited scope; only a few hundred healthy children have been born during the past decade as a result of PGD. PD has a 30 year history of clinical application. PGD and PD are similar in that they offer couples at increased risk an opportunity to give birth to a child without a genetically-caused disease or malformation. In PD, this approach may be at the cost of terminating a pregnancy at 11-19 weeks. In PGD abortion is avoided.

## THE RED LINES

1 - The indication in Islam is prohibitive if the diagnosis is directed to define the sex keeping the male, ridding the female through cultural predelction disciminating feminism for social or economic reasons. This in Islam is equivalent to abortion, which is absolutely forbidden.

2 - Another prohibited action, in Islam, is to respect the cells remaining after I.V.F by destroying them, and forbidding selling

or abusing the existing cells of the blastocyst after a specific experiment.

3 - Also Islam prohibits to use the cells for tailoring an Embryo with the intention of enhancing a specific character e.g. colour of hair, eyes, or other features. But in certain cases abortion or destruction of the examined ovum is indicated if the investigation proves or predicts disease, as Turner's diseases or Taysack's disease or Thalacemia. In this field, specifically it is imperative in all experiments needing interventional therapy that the technique must be perfected. This field is not a place of experimentation on humans since, errors are disastrous.

4 - **Germ Line Intervention Risks:** when a germ cell shows specific abnormal genes, it needs splicing or resection or implementation of healthy genetic grafts bearing normal characters. This type of intervention needs long training & practice on animal or plant genes, before proceeding to Humans.

5 - With regard to germ-line interventions, the most fundamental argument is that we do not have the right to predetermine characteristics of future generations. Neither PGD nor genetics in general should become instruments for intergenerational tyranny.

6 - Another argument against genetic enhancement of normal human characteristics is that it would profoundly affect our self-perception as persons - (i.e.) as autonomous beings.

7 - A final objection against testing for normal characteristics, selection and enhancement is that even if societal agreement on the 'ideal' human being is researched, it will inevitably reinforce stigmatization and discrimination of those who do not fall into the accepted standards of genetically desirable traits. And who is able to define now the ideal human characteristics for the future?

8 - The same prohibitive attitude is taken when human discriminative selection is targeted for political reasons, investing hidden genes in different races, creed or for social discriminative reasons (e.g during the Nazi's epoc) when using genetic patterns to rid some citizens or minorities.

## CLONING

Cloning is a technology which has been widely employed in the field of biology to produce genetically identical cells, tissues or whole organisms of plants or animals. In the existing legal texts concerning human cloning, reference is made to techniques to create artificially an embryo, fetus or individual that is genetically identical to another embryo, fetus or individual alive or dead.

Currently, two methods to create genetically identical mammals are known: Embryo splitting and somatic cell nuclear transfer (SCNT). Embryo splitting is the separation of cells of the embryo at a very early stage of development into two or more before their implantation into a uterus. The separated cells each develop into a complete organism which is genetically identical to the others. This sometimes happens spontaneously resulting in identical tiwns. Somatic cell nuclear transfer, on the other hand, is an attempt to create embryos asexually. The nucleus of a somatic cell will be inserted into an enucleated egg instead of fusion of male and female gametes. Therefore, the embryo created in this way is genetically almost identical to the donor ccll of the nucleus.

**Reproductive Cloning:**

One of the possible reasons to create genetically identical embryos is to implant such embryos into a uterus so that a baby carrying the identical genetic characteristic to another person will be born. This is often referred to as "Reproductive Cloning". This is absolutely forbidden in humans.

**Therapeutic Cloning:**

The objective of so-called "Therapeutic Cloning" on the other hand is to create a clone embryo by SCNT that would be used for therapeutic purposes such as deriving embryonic stem cells without generating a pregnancy. The potential of therapeutic cloning has been the issue of intense discussion within the international community as one possible way to produce cells, tissues or organs that are genetically compatible with patients to treat diseases and physical injuries. For

this purpose, the nucleus of a somatic cell of the patient would be transferred into an unfertilized enucleated egg and be developed to an embryo. In the course of derivation of stem cells, the embryo would be destroyed. Since the therapeutic potential is unclear at the moment, it is better to speak of 'research' cloning rather than therapeutic cloning.

**Guidelines for Reproductive Cloning:**

At present, there is no country which permits reproductive cloning of human beings by legislation or guidelines. Concerning the prohibition of this practice, three approaches appear in existing national legislation as follows:

1 - Prohibit the creation of clone embryo (by embryo splitting or by somatic cell nuclear transfer (SCNT))

2 - Prohibit the implantation of a clone embryo into a uterus.

3 - Prohibit any attempt to artificially create a human being genetically identical to another human being (embryo or fetus) alive or dead.

**Guidelines for Therapeutic cloning:**

Currently, there exist three different positions on embryo research:

1 - Generally prohibit research on embryos (with some specific exceptions) and/or creation of embryos for research purposes.

2 - Permit research on supernumerary embryos produced for fertility treatment but prohibit creation of embryos for research purposes.

3 - Permit creation of embryos for research purposes under strict conditions.

Positions 1 and 2 are interpreted as prohibiting therapeutic cloning and position 3 is understood as possible permission for research in therapeutic cloning depending on the conditions provided for embryo research. Nevertheless some ambiguity persists in position 1 when exceptions to the prohibition on embryo research are provided for the purpose of "research for preventing or treating diseases" or "research for therapeutic purposes".

**Comments on Risks of Reproductive Cloning:**

1 - Reproductive cloning in farm animals is allowed in the hope to satisfy the ever growing need for the very rapidly increasing world population.

2 - A Golden Rule to Remember: It is accepted as a medical principle, that not, to proceed to any new intervention on human or drug use except if it proves safe averting any possible damage possibly be faced, also any risky intervention has to be calculated e.g. the act of therapeutic nuclear transfer, except if perfectly.... mastered.

It is accepted that if human cloning is practiced in man it will collapse all social systems and feelings not only between males and females, wife and husband but also reflects on parenthood between sons and parents, disturbing the natural reproductive values, & above all disturbing the belief as an ethical virtue between human beings and God. Disrupting the heavenly sacred marital relationship which preserves human race& the relations of parentship which is accorded the highest merit of consecration.

If scientists in laboratories take the role of God then human material will fall under the intellectual property do main, and life will be a commercial or, industrial, venture with collapse of all sacred human values and also the social systems that proved valid and maintained since Adam and Eve.

This disastrous move, will shift the supremacy of the human race that is privileged with brain power, wisdom, faith, love and all esteemed values in humans, probably to become robot-like breed losing the meaning of life, and the supremacy of human values, becoming a patented product and not as masters of earth.

Thus for all these reasons human cloning is absolutely prohibited.

**Scientific Risks of procreation Technology:**

- A very expensive exercise
- Expected errors need repetition hundreds of times

- Inability to control results, high percentage of failure and death of experimental animal, added to the.....
- Frequency of anomalous development

These risks are not uncommon in animal trials but in human beings experimentation is not only a risky irreparable venture but also it is forbidden for moral, ethical, social, legal and religion reasons. Here the only exception is allowed when used for therapeutic purposes, abiding with Islamic Shareea that says "whenever human benefit is expected God's blessings be".

Dr Zaqzouq "Minister of Religious Affairs", said that Islam praises the human dignity to all Mankind irrespective of color, creed gender or race, thus it is considered a human right.

- Islam commends learning and searching for the truth, as this is a human right, research should be within the limits of law, religion and ethics.
- Islam also praises the family rights, in marriage and Commends legal procreation to keep mankind and NASAB, refusing illegal relations & prohibiting illegitimate specific sexual relations with mother, sister, step mother, step sister, daughter & step daughter & milked sister as a heavenly praised relation to perfect & also to protect the family integrity.
- **For all reasons mentioned human cloning is forbidden except for therapeutic indication**

## BEHAVIORAL GENETICS

This is a rapidly developing scientific field, exploring through research to identify and follow the genes influencing behavior. The genes are supposed to influence and identify with specify behavioral qualities in different sects, populations, countries and races.

It's main concern lies on specific qualities of characters: intelligence, attitude, depression, aggressive abilities and the athletic excelled excellence. Results of behavioral research in genetics aroused lot of troubles and discussions since it can exposes the qualities for illegitimate use or abuse. It may excite the intention to discriminate certain sects of society or population. The question to be answered is the

possible and exact identification and validation of the relation between genetics and specific behavioral patterns. The most recent results predicted the existence of specific gene identifty that may condemn or discard some groups of people to criminal or immoral acts without any material proof. Here errors in identification can disturb legal aspects in the Court of Justice.

## Research values and Risks in behavioral genetics:

1* - It entails Exploring the relation between many dimensions:

a - The genetic pattern

b - The environmental influences

c - Social as related to ethical standards and

d - Consequential influences in-between, all dimensions

2* - Difficulty of defining norms in behavior that correlated with genetic patterns.

3* - Restrictions of encroaching on human rights and securing dignity, this makes research a very difficult task.

4* - Accepting that the specific disclosure of the relation of genetic identification as related to behavior, being a very difficult task, this entails major debate in defining this specific relation and may, predispose to personal or social damage.

5* - Prenatal selective behavior diagnosis is prohibited in these cases except if targeted to disclose other deficiencies that need gene therapy.

6 - Research in this area may result in social discrimination (Eugenics) or isolation,disregarding human dignity.

7 - Considering the legal interpretation of a criminal act may reflect positively or be negated, by the explored behavioral genetic pattern. This is a case for study

8 - Homosexuality is considered legal in certain countries but considered immoral in Islam. The alleged belief that this behavioral

* Andrew fujusin & Philippa taylor consulation be Nulfeild foundation 2003.

specificity lies in an eugenie error causing built up character through an intersex gene. This postulate is refused in Islam.

## TO CREATE A CELL

**Risks in trials to create a human cell:**

The trails to create a human cell was a title in Scientific American journal December 1999, the writers expected that this can happen in few years to come. The preparation of the material of life through securing the required RNA basic amino acids and the proteins for life on a hope to create a new living cell. This postulation predicts that if this cell can acquire LIFE and divides, then the secret of life is disclosed & probably a being can be created *In Vitro.*

The writers of this issue predicted that if this cell be created and divided it will start Debate: Moral, Ethical, & Religious. Islam condemns that, such a field of research is to be forbidden since it encroaches on the power of creation, the sacred right & power of God the Whole Mighty.

This Imaginary postulate should invite authorities in the U.N. agencies and world religious leadership, to put limits and Norms & restrictive regulations to stop these ideas. Fokoyaman has put an explanation to define the meaning as follows: to put or draw redlines between what is possible and what is prohibited

He ended that this exercise is illegitimate as much as human reproductive cloning, that is absolutely forbidden.

# WHERE THE CATHOLIC CHURCH STANDS ON GENETIC ISSUES

*Bishop Camello Bellin*

Kuwait

# Where The Catholic Church Stands on Genetic Issues

***Bishop Camello Bellin***

Kuwait

It gives me pleasure to present the principles of the Catholic Church concerning genetic issues, particularly how the church directs its faithful followers to practically apply these principles. I would like to thank everyone involved in making this seminar a reality. I would also like to thank you Mr. President and to thank the audience.

The Catholic Church believes that man's life on this earth is sacred. We are entrusted with the task of maintaining it in a responsible way. It is also our duty to help elevate this life to perfection in matters of love and self-sacrifice for God and for other human beings. The church embraces this value with renewed reverence and feels called upon to declare this "bible" to all people all the time. It is the bible of God's love of man, of human dignity, of life; it is all one and the same bible.

We need to be greatly committed to this joy-causing value because of increasing and wide-spreading threats to the life of individuals and people, specially if such a life is vulnerable and unprotected. In his epistle "The Bible of Life" Pope John Paul II wrote: "With the remarkable advances of science and technology, we witness new forms of danger to man's dignity: a large section of public opinion are justifying some crimes against life in the name of individual rights. Based on this premise, that section demand not only exoneration from all blame but the State's approval of a free hand in practicing these activities with full and free support by the health services. All this threatens to seriously change the view to life and relations between people. Legislations in many countries do not sometimes keep close to the principles underlying their constitutions. They not only let perpetrators go with impunity, but recognize as legal their practices against life and its full sanctity.

This represents and immense moral breakdown: what was considered a crime unacceptable to public taste is now gradually becoming respectable in the view of society. Even medicine itself, which is entrusted with protecting human life and caring for it, is drifting in certain areas towards committing such acts that target man. By doing this, medicine distorts itself, contradicts its noble mission and does a lot of damage to the dignity of those who practice it."

(The Bible of Life, 4)

For all this, the Catholic Church sets down the following principles:

1 - The church does not accept any technology that jeopardizes man's life from the moment of conception up to the moment of natural death. However, the church has nothing against any technology that aims to preserve man's life, keep him safe and sound and treat his illnesses.

2 - The doctrines of the Catholic Church stipulate that man should be privileged with full freedom and call it: "the freedom of God's children". It does not follow, however, that man should set out impulsively on a course of action without any boundaries or guidelines. Man is often enslaved by his lusts, passions or circumstances in a way that detracts from his freedom. A truly free man is he who can liberate himself from these weaknesses and evils. Once thus liberated, he can take the right decisions and work for life, not against it.

This kind of freedom is essential especially in the field of genetics where man must be free in order to protect life and preserve it. There is a rule of thumb in our Scripture: "Do not do to others what you do not want them to do to you." Subjective judgment can never supersede the ethical judgment. The general ethical principle should serve as a frame of reference when considering personal mutable circumstances. For example, if a girl conceives from fornication, it is an individual situation to be judged in light of the moral principle rather than the girl's personal circum-

stances. The girl's pregnancy has produced another life that we should not sacrifice in order to keep up the girl's reputation. In the meantime, we do not put the girl on trial. On the contrary, we should take special care of her and treat her with deep understanding. Therefore, when we say that pregnancy resulting from fornication is wrong we are judging the incident not the wrong doer.

3 - Undoubtedly, we would like to see further advances by science and wish that medicine could find the proper therapies for diseases that plague human beings. But the Catholic Church does not permit the use of embryonic cells because they contain new life we have no right to violate or exploit for the purpose of achieving a scientific development. Life is never to be violated, no matter how great the purpose is.

4 - We should uphold an ethical frame of reference in light of which each individual case is to be studied. A solution not based on this frame of reference is rendered unacceptable.

5 - Medicine should do its level best to save man's life and alleviate his pains without jeopardizing another life. Let's consider a real-life case: a pregnant woman with cancer; should the doctor terminate the life of the fetus in order to treat the mother in a more effective way? Our belief is "never kill a life to save another". The Italian lady who was suffering from cancer refused to take any therapeutic measure that could adversely affect her baby. Consequently, the baby was born intact but the mother died. She was therefore ordained Saint by the Catholic Church. The aim of medicine is not to combat pain but to respect life. This should lead us to another thorny problem, viz, Euthanasia, where we terminate someone's life to exempt him from his sufferings. God accepts a patient's pains and make them a spring of life for him, for his family and for the whole world. Faith, any faith, certainly opens up for the patient new horizons that help him much to bear his pains. Whoever accepts God's Will, will be comforted by God in ways never imagined by medicine.

Based on these principles, the Catholic Church presents the following directives:

- The Catholic Church does not accept research on embryos, or technologies of stem and embryonic cells except if they aim to treat the embryo. We believe that embryonic cells contain new life which must never be used as research material. By the same token, the Catholic Church does not permit prenatal diagnosis because it implies discrimination against those who do not receive the same treatment. The basic principle is that everyone must be accepted for what he is. Pope John Paul II said," Prenatal diagnosis which does not raise any moral problems if used to determine necessary treatment for the unborn baby leads in many cases to suggesting abortion or performing it". (The Bible of Life, no. 14)
- For the same reason, the Catholic Church opposes Preimplantation Genetic Diagnosis (PGD). We can not reject a human being because he turns out to be different from what we expected.
- The Catholic Church opposes reproductive cloning because it violates the system enjoined by God for procreation. Pope John Paul II says about Assisted Reproductive Technologies (ART) of various types: "These seem to be in the service of life in many cases but they open the door to new violations against life. In addition to the fact that these technologies are morally unacceptable as they isolate reproduction from its natural context of a complementary husband and wife sexual act, they have a high statistic of failure not only on the level of fertilization but later on as well on the level of fetal growth where the fetus is liable to death shortly after implantation.

Another related problem is that the number of embryos far exceed what is necessary for implantation in the mother's uterus. This "embryonic surplus" is either discarded or kept to be used in research that reduces human life to a mere biological commodity under the pretext of scientific or medical advancement". (The Bible of Life, no. 14)

- The Catholic Church opposes genetic engineering but encourages embryonic treatment because it loves life and wants to maintain it

as the sole property of God. "Human life is sacred", Pope John Paul II says "Because it presupposes God's creative work and maintains a special relationship with its Creator, its only target; for God is the sole Master of life from beginning to end. No one is justified under any circumstance to claim the right to directly destroy an innocent human being"

(The Bible of Life, no. 53)

- The Catholic Church does not accept In Vitro Fertilization (IVF) because it stands out of the natural method ordained by God for procreation.

In conclusion, I would like to quote what Saint Paul wrote to the Ephesians: "Walk as children of light.....proving what is agreeable to the Lord; and do not have fellowship with the unfruitful works of darkness." (Ehpesians 5: 10-11)

# OUR HUMANNESS - UNALTERABLE ESSENCE AND CHANGEABLE ACTUALITY

*Dr. Jaafar S. Idris*

K.S.A.

# Our Humanness - Unalterable Essence and Changeable Actuality

*Dr. Jaafar S. Idris*
K.S.A.

Developments in the science of genetics have aroused the interest of scientists, as well as the rest of us, in some fundamental questions of our life and given them some urgency.

What does our humanity consist in? Do we have an unalterable nature in virtue of which we can be considered the humans we are, or is our nature a *tabula rasa* on which culture, the environment and now genetic engineering dictate what they want? Do we have a soul, and if so what is the difference between it and our bodies? What is its relationship with the body?

It was natural for believers in God to be more concerned with such questions, and to give answers to them based on the teachings of their religions. I am glad to be given the honor of participating in this vital discussion and to be given the opportunity to present what I consider to be an authentic Islamic view on these important issues.

I am concerned here mainly with the question of human nature. If the nature of a thing is the collection of qualities which make it the thing that it is, then every thing must necessarily have a nature. We might differ about some of the qualities of a thing, whether they can be counted among those that form its nature, but we cannot say of something that we know and deal with that it has no nature at all, or that its nature is constantly changing. This is a matter of logic. There should therefore be no dispute about the fact that human beings have a nature that makes them the beings they are. There should also be no dispute about the fact that this nature must be fixed, because if it changes then the thing that has the new nature must be something different from a human being, just as water or oxygen must be something different from the water or oxygen that we know and deal with if their nature changes.

The question should not therefore be about whether or not humans have a nature, or whether or not that nature is changing: it should be about the kind of qualities that make them the beings they are.

We are all agreed that we have bodies, and that these bodies have a nature in virtue of which they need for example certain things for their existence. We are also agreed on the fact that we have certain mental qualities without which we cannot be the human beings that we are. A being that is intrinsically unable to think, or will, or know, cannot be a human being even if it had a body that looked exactly like that of a human, and even if it had some of the other mental qualities of humans. Thus if genetic engineering could bring some being like these, we should not say that it changed the nature of humans, but that it came up with a new being that has nothing to do with us. Assuming this to happen, it will not abolish human beings; normal humans will continue to exist and be reproduced in the natural way they have always been. The question would then be: is it in our interest, as normal humans, to allow something like this to happen?

The answer of a believer in God would be an emphatic no! Why? Because he believes that no being can have a nature that is even equal, let alone superior, to that of a human being. Anyway, this should be the position of a Muslim.

Humans, according to Islam, have many qualities that distinguish them from other creation, but these qualities are not of equal importance. Let us start with what, according to Islam, is 'spiritually' common to all creation and then deal with humans as a special creation.

## All Creation is Muslim

Every created thing worships its Lord; each according to its special makeup. The Qur'an gives us some details of this worshipping that is common to all creation.

*Submission. (Islam)*

> 003.083 Seek they other than the religion of God, when to Him submit (aslama) whosoever is in the heavens and the

earth, willingly or unwillingly, and to Him they will be returned.

*Glorification*

59:1 All that is in the heavens and all that is in the earth glorifies God.

*Prostration.*

022.018 Have you not seen that to God prostrate whosoever is in the heavens and whosoever is in the earth, and the sun, and the moon, and the stars, and the hills, and the trees, and the beasts, and many of mankind.

*Obedience.*

030.026 To Him belongs whosoever is in the heavens and the earth. All are obedient to Him.

## Humans, a Special Creation

Human beings are a special creation; but they are no exception to the fact that their essence is that of being servants of God. They are however distinguished from all other creation by certain qualities that make them the special beings they are with a degree above other created things.

First, Adam, the father of all human beings was created in a special way. God tells us that He created him with his own hands (38:75)

Second, He told the angels to prostrate themselves to him once he was created (2:34)

Third, He breathed into him a spirit (called in Arabic *rooh*) with which He did not endow any other animal. (38:71-2)

Fourth, He made all that is on the earth subservient to humans:

002.029 He it is Who created for you all that is in the earth

Fifth, He endowed them with dignity:

017.070 Verily we have honored the Children of Adam. We carry them on the land and the sea, and have made provision of good things

for them, and have preferred them above many of those whom We created with a marked preferment.

Sixth, He taught him what the Qur'an calls the names of things in virtue of which he became more knowledgeable than the angels:

002.031 And He taught Adam all the names, then showed them to the angels, saying: Inform Me of the names of these, if you are truthful.

002.032 They said: Be glorified! We have no knowledge saving that which You have taught us. Lo! You, only You are the Knower, the Wise.

002.033 He said: O Adam! Inform them of their names, and when he had informed them of their names, He said: Did I not tell you that I know the secret of the heavens and the earth? And I know that which you disclose and which you hide.

## Body and Soul

The human body and the human soul are two different entities with different sets of attributes and functions, but they are in many ways connected and interdependent.

The fact that they are distinct is stated in many Islamic texts:

First, in the creation of Adam, the soul, *rooh*, was breathed into an already created body:

> 015.029 So, when I have made him and have breathed into him of My Spirit,
>
> do ye fall down, prostrating yourselves unto him.

Second, when a human child is born it is born as a living thing but without a soul. The soul is breathed into it when it is about forty days old[1]

Third, when a person dies, his soul leaves his body.

> 039.042 God receives (men's) souls at the time of their death, and that (soul) which dies not (yet) in its sleep. He keeps that

(1) Bukhari, Book of Creation

(soul) for which He has ordained death and dismisses the rest till an appointed term. Lo! herein verily are portents for people who take thought.

Fourth, if a person goes to paradise he will have a body with a nature different from his present worldly body, though he will continue to have the same soul.

## The Human Soul

Human beings, according to Islam, are born good. This goodness is an attribute of the human soul; it consists in being

a - born with a natural capacity to be aware of the fact that they are servants of God, their sole Creator who alone is to be worshipped. All the other good human qualities are related to this basic quality. I mean the qualities of cognition and volition, of morality and prudence, of rationality and of the aesthetic taste, and so on. They are related to it in the sense that they are strengthened by it, in the sense that they are justified by it, and in the sense that they act as avenues that lead to it. They are thus used in the Qur'an as standards on which it bases its arguments for inviting people to its truths

b - created with a wholesome soul,

c - given the capacity to distinguish between what is morally good, and what is morally bad:
091.007 And by the soul and Him Who perfected it
091.008 And inspired it (with conscience of) what is wrong for it and
(what is) right for it.
091.009 He is indeed successful who causes it to grow,
091.010 And he is indeed a failure who stuns it.

All of God's commands and prohibitions in Scripture have their foundation in this original good nature of the human soul. It is because of this that the religion to which Prophets like Muhammad invite people is called the religion of human nature:

030.030 So direct your face toward the religion, (thus) turning

> to the truth, a religion that is the fitra (original good nature) upon which he created human beings; there is no changing of God's creation. That is the true religion but most people know

And it is because of this Divine commands and prohibitions are justified in the Qur'an in terms of their compatibility with the good qualities of this original human nature. Gambling and alcoholic drinks are for example prohibited because Satan, the archenemy of human beings, uses them to create enmity and hatred among people (5:90-91) who are born to be faithful brothers. The justification that is given for killing the killer is that it saves life (2:179).The relatives of the killed person are given the right to forgive or take ransom, because in this way even more lives are saved. Prayer helps to prevent them from committing grave sins. Being mindful of God gives peace to their hearts. And so on and so forth.

d - Humans, however, are created as willful beings; they are therefore given the choice either to live an actual life that is a reflection of their natural humanness, or to rebel against their human essence and live a life of alienation.

God likes for them to choose to worship Him, and He helps them in many ways to make this right choice:

> First, He does not create them neutral between these alternatives, but makes this choice the natural thing for them to prefer; it is the one that makes them live in peace with themselves.
>
> Second, He makes His whole creation consist of signs of His existence and His attributes of perfection, and provides in it evidence for the truthfulness of the Prophets whom He sends, and the Messages with which they come.
>
> Third, He makes belief in God the only alternative that is compatible with all the good qualities they have: reason, the moral values of justice, mercy, wisdom and so on.
>
> Fourth, He sends Prophets with messages that describe for them in detail the good life that is compatible with their good

essence, give them reasons for their being so, and adduces arguments against the alternative of rebelling against their Creator and therefore their own human essence.

Fifth, If they make the wrong choice, still however much their actual life is perverted, their essence remains incorrigible; they always have the chance to make the decision to come back to their it so long as they are alive, and their all-Merciful God will always accept them.

It seems from this that no external factor can change or corrupt the human soul and deprive it of some or all of its good qualities. Only the person himself can corrupt himself by his willful acts.

## The Human Body

The soul, we said, is of a nature that is completely different from that of the body. But it needs a body to make the actual life of the human person an expression of the humanness of his soul. The body that it needs is not however any body; it is a special body that is designed to suit that soul.

a - Though this body is in many ways like that of animals, it is the one with the best form, as the Qur'an says.

b - Because it is a special body it is to be treated with respect even when it is dead. To cut off part of a dead human body, the Prophet tells us, is (as sinful as) cutting it off a living body.

c - When a person dies and his soul leaves his body, that dead body is to be washed and cleaned; it is to be wrapped in clean cloth, and be berried. People are told to stand up when a funeral passes by irrespective of whose funeral it is.

d - Human bodies are not to be mutilated even in war.

e - Because the soul uses the body, many of its acts are attributed to some bodily parts, especially the heart. But the language used leaves one in no doubt that what is meant is not the physical body part.

f - Human beings are advised not to degrade themselves by behaving like animals especially when performing acts of worship. We are

told not to raise our voices the way donkeys do. The Prophet saw someone leading another by a rope; he cut the rope and told him to lead him by his hand. He tells us that, when performing prayer, we should not make any act that looks like that of an animal. We are thus told not to come down for prostration as a camel does, not to make our acts of prostration like the pecking of a crow, not to sit as a dog sits, and so on. We are even told by the Prophet not to wear beast hide that makes us look like them.

This is not to be taken as unfair prejudice against animals; it is only meant to advise the human to behave in the way that suits his human nature. He is however encouraged and even ordered to care for animals and show mercy towards them. The Prophet tells us of a prostitute whom God forgave and even caused to enter paradise because she descended into a well and brought water in her shoes to quench the thirst of an almost dying dog. He tells us on the other hand of a woman who went to hell-fire because she kept a cat that she neither fed nor allowed to seek food for itself. Animal bodies are not to be maimed, neither are their faces to be branded. When the Prophet saw a brand on the face of a donkey, he cursed the person who branded it.

## Genetic Engineering

There are in Islam, some general principles that help to guide us in our dealings with God's creation, and that can thus help us in the position we take regarding genetic engineering. These include the fact that

a - Every thing God creates He creates in the best of ways.(32:7)

b - All of God's creation around us is created to serve human beings.

c - This creation should not therefore be altered.

d - There are close relations and links not only among the constituents of an individual creation, but also among all creation

e - Experience tells us that the results of all such alterations have been harmful.

You might say that we do, we have to, till the land, plant crops, kill animals, dig wells and canals, build bridges, and so on. Yes indeed but in doing all this we are working within the natural order not disrupting it. We do the same when we fix something that goes wrong; we seek cures for our ailments and the ailments of our animals; we might to that end even have to cut off some parts of our bodies. This is because though God's creation is the best, it cannot, in the nature of things, be as perfect as its Creator is.

Genes should be dealt with in the same way. There is no harm in replacing genes that are not working properly with better ones. Genetic engineering should not aim at perfecting nature; it will only distort it.

If the human person, body and soul, is the best of God's creation, any tampering with it will only make it worse. We are warned in the Qur'an of making any alterations in God's creation. One reason for this might be the fact: that there are close relations and links not by only among the constituents of an individual creation, but also among almost all kinds of God's creation.

Genetic engineering should not therefore aim at perfecting nature; it will only distort it. It should only be resorted to for therapeutic purposes.

As to human cloning there is in my view nothing that justifies it and much that is against it. The way a human being is naturally reproduced is a way that is very well connected to nature; it involves sexual urge, close intimacy between two individuals, growth in the uterus of a natural mother, love, suckling, caring and the joy of childish behavior; it has father and mother, brothers and sisters and relatives. But a cloned being lacks many of these qualities and relations. What kind of a creature is that going to be? And what is the need for it? Isn't it really odd that while we try to control natural birth, we encourage un-natural production of creatures that, to say the least, lack some of the qualities of naturally reproduced humans?

# DISCUSSION

# Eleventh Session

**Chairman**: Dr. Ajeel Al-Nashmi

**Rapporteur**: Dr. Ali Mishal

**Chairman**: Dr. Saad Al-Din Hilali.

***Dr. Saad Al-Din Hilali***:

I'd like to thank all the participants who enriched this session. The stance of the Catholic Church was clear towards all the issues posed by the Bishop. The stance of the Catholic Church towards life is an explicit good stance conforming to the results reached by the IOMS in its first session more than 25 years ago. This stance is supported by the Prophetic Hadith on the case of two women who fought and one of them killed the other. The murdered woman was pregnant at the time. So, she and her fetus were killed. The Prophet (PBUH) judged that blood money had to be paid for the fetus. At this point, a man called Huzail stood and protested in rhymed words saying, "How can blood money be paid for (a fetus) who did not eat or drink or see the moon. All this is wrong." The Prophet (PBUH) said, "This is one of Satan's brothers for the rhymed words he uttered." This incident proves that Islam respects pregnancy from its beginning. This is the opinion adopted in the recommendations of the IOMS and most of the Fiqh Academies. We thank his Reverend, the Bishop, for holding the marital life sacred like Islam. Allah Almighty says, "And among His Signs is this, that He created for you mates from among yourselves, that ye may dwell in tranquility with them, and He has put love and mercy between your (hearts)" (Al Rum: 21). The call for contemplating the relation between husbands and wives aims at taking care of the first constituent of society, creating love and mercy between the couple and denying extra-marital relations. Nonetheless, there must be second thoughts concerning the call for leaving she who commits adultery unpunished -as stated by the Bishop. Even if the adulterous woman begets a child, this child is respected by virtue of its life. Islam respects life, even if it were based on adultery. Yet, whoever commits a mistake must receive the due punishment, and not therapy. If we

presented the adulterous with therapy, we will be then treating the honest and dishonest as equals. Another point needs to be reconsidered is the Church's rejection of performing abortion when necessary to save the mother's life. This needs rethinking; for the mother's life is a complete and stable one. One of the fundamental rules stipulates that "In continuity, what is not forgiven in the beginning, can be forgiven." The life of the mother is continuous while that of the fetus is still in its dawn. Perhaps, this is the logical answer to the colleague who wanted in a previous session to draw an analogy between breast surrogacy and womb surrogacy. There is a difference between the two cases, because in foster breastfeeding the baby has already come to life and is in need of milk; hence the jurist rule, "In continuity, what is not forgiven in the beginning, can be forgiven." My last point is about the Church's refusal of the IVF. The Church needs also to have second thoughts in this respect to save many of the couples and families that need procreation within regulations ensuring that there will be no third party in the process other than the married couple. Thank you.

**Chairman**: Shukran. Dr. Mounir Abdel Massih.

***Dr. Mounir Farag Abdel Massih***:

Thank you, Mr. Chairman. The first question I'd like to answer is the one about extra-marital pregnancy. In the Yugoslavian war in Bosnia, several nuns were raped. It is known that nuns consecrate their lives to worship and do not get married. But they were raped and got pregnant. What was the appropriate course of action in that case? Pope John Paul the second said that they had to leave the monastry and search for a job to earn their living to support their children. But my colleague says that the followers of each religion should say whatever they believe in. The Catholic Church refuses abortion because it holds that it is Allah's Will to give a certain family a deformed person. Then, we move to the issue of IVF. There is a Christian family working in the Institute of St. Jose. They tried hard to have children, but all their attempts were doomed to failure. This couple work in the department of birth control in the institute. They saved countless children from abortion. They just say to the parents,

"we do not have children. Keep the child and on delivery, we will take it." On hearing such words, the parents decide to keep the fetus. This is a tight plan put by Allah to teach people about the pain experienced due to the deprivation of children. We may say that this couple should seek therapy and do anything to have children. Yet, the Church forbids IVF technique. This is for two reasons: unionism and reproduction. The act of procreation is a unionist act. But in IVF technique a third party intervenes in the process. From a reproductive view, if Allah wills people to have children, they will without IVF techniques or the fertilization out of uterus and the like. In all the centers using such techniques, more than one fetus is produced and parents are given the right to choose one fetus and reject another! Thank you.

**Chairman**: Dr. Bruce

***Dr. Bruce Foltz***: Thanks to all 3 speakers for their fine presentations. I would like to address to Dr. Idris specially about our institution by Aristotle, who had been widely appreciated by Islamic philosophers as well as philosophers of Christians and Jewish. This is distinction between two ways the things can exist. They can exist by nature, by forces, by art or technique or things can exist by nature that is naturally. Aristotle gives example of tree, which exists naturally, in contrast to bed, naturally to be made. A believer would probably want to make distinction between things that are created and those constructed. As we undergo recent inventions with human body and soul, is there a point looking ahead when human nature could lose its very status as something created and become something constructed and hence lost its very nature? Is this something we need to be concerned about?

**Chairman**: Shukran. Dr. Ted Peters.

***Dr. Ted Peters***: I would like to address a question to Dr. Idris. Thank you for the careful deliberation of theological matters related to soul. This is very relevant topic because of the relationship between ensoulment and human dignity, protectable human dignity in bioethical sense. My question has to do with what do you recommend or think of the soul's metaphysical or nonmetaphysical entity? I was

impressed by your statement that human soul couldn't be divine because GOD, and GOD alone is divine. And, I want to say yes, of course. For me, I am a Lutheran Christian and it is important in my tradition that we admit that we cannot, by alone human reason or strength, establish a relationship with GOD but, GOD or our God's grace establishes a relationship with us. Now, I like to use the word "soul" to refer to that relationship with GOD. And that relationship, which GOD has established, even I enjoy the benefits of that relationship.

**Chairman**: Shukran Dr. Ted Peters. Dr. Akram, please.

***Dr. Akram***: As a geneticist, I would like to make a very short comment It is obvious that all religions respect the spirit and man. Yet, we should not prevent the use of any modern technique merely because it is abused. We know that lots of things are being abused and are still of benefit to humanity. For instance the pre-natal diagnosis is extremely beneficial for us. Formerly, we could not but use the markers and cell imuunoassay which affected the pregnancy. Another option was abortion which is impermissible. Now, we can conduct a CBS and use the DNA technology at early stages of pregnancy. The results of such procedures are 100% correct. We encourage the use of such techniques, not to perform abortion but to administer the possible therapy. Through these techniques, we can diagnose the case of a given child and begin its treatment during pregnancy or after birth. This early diagnosis gives a chance to modify the genetic deformities of a certain child. Thus, on delivery a normal child, instead of a deformed one, is born. Why don't we use this technique with the conditions of setting the appropriate limits, supervising it and making sure it is not abused? The second example is the genetic therapy. As well known, this kind of therapy can be of benefit in the treatment of incurable diseases. We treat the diseased genes. This kind of treatment is deployed on animals at present. It is sometimes used also in treating incurable diseases like HIV and the muscular atrophy. It gives hope of treating the diseases that had no cure in the past. Why don't we encourage this procedure and set limits for it like we did in the field of cloning skin cells and hepatic cells? It

is greatly hoped that cloning would put an end to the procedure of organs transplantation. Why do we not encourage IVF procedures and set restrictions and tight supervision so that it is not abused? In fact, the IVF technique rendered many of the infertile people happy. The Qur'anic verse reads, "He leaves barren whom He will..." (Al Shura: 50). Infertility cannot be treated through IVF. No given technique can be of use for fertile people because this is Allah's Will to render them as such. It is also impermissible to freeze eggs and sperms, because they can be misused. But suppose that a woman would take chemotherapy and this would leave her barren! Why can't she preserve her egg through freezing till she finishes this chemotherapy and then use IVF technique to have children? Thank you.

**Chairman**: Dr. Muzaffar

***Dr. Muzaffar Iqbal***: I want to caution also as we deal with substantial issues. To be more careful in the use of certain terms, Sheikh Jaafar Idris used the word "divine". I would like to know what does he has in mind? In Arabic, when we use the word "divine" from his information, I understand that he used the word "soul" in the sense of "*Ruh*". That was clear through the explanation he gave, but not clear from the term that we discussed on the first day. The English word "soul" more properly represents the Arabic "*Nafs*" and "spirit", perhaps, be a better word using for "*Ruh*". Because, I see Dr. Ted Peters face lighting up when he understands, and he has been struggling with this issue, it's a very complex issue. For a while, when he understands that the ensoulment happens after a certain period 40 days, 120 days depending on which tradition we are talking about, then his face lights up, because, I suppose, many of the people see that way. Because, here we have a body without soul, without the "*Ruh*". Therefore, we understand that it has less sanctity, somehow. And that opens up the field of genetic engineering. Whereas, if I understand you correct Shiekh Jaafar Idris, the Islamic concept, this is also my understanding, is that there is a degree of sanctification. And lesser, even the least degree of sanctification does not make it violable, the thing remains unviolable, even the non-living inorganic things remain unviolable. They have a sanctity merely, because, they have been

created. So, at all levels of existence, all created things have certain unviolability. They have a certain degree of sanctity.

**Chairman**: Dr. Mamdouh Gabr.

***Dr. Mamdouh Gabr***:

In the Name of Allah, Most Gracious, Most Merciful. In fact, my address has to do with the interventions we heard. Today's speakers have astonished us with their valuable lectures. My comment is concerned with the addresses of Dr. Badran and the Bishop. It is also concerned with the words of Dr. Ikram about the permissible and the impermissible. This rings an alarm. On putting recommendations for the three religions, we have to take into consideration what is permissible and what is not in the three religions. On putting special recommendations for each religion separately, we should also heed this point of permissibility. We should also heed the ability of states to implement the proposed laws. Thus, when we stipulate certain conditions or when we even draw any guidelines, we will be able to abide by them; for it is the implementation and not the guidelines that poses the problem in the third world. Thus, we should be cautious to issue recommendations that fit the realistic status in our countries. This way, they could be put into force and we would evade the perils unaccepted by us both in terms of science and religion. Thank you, Mr. Chairman.

**Chairman**: Dr. Safa

***Dr. Safa***:

In the Name of Allah, Most Gracious, Most Merciful. Actually, I'd like to thank those in charge of this conference. I'd like to thank Dr. Awadi and Dr. Al Gindy. I also thank Allah for granting me the chance to attend this conference from its second day. In fact, it is a highly valuable and beneficial conference, especially for the professors in the schools of medicine. As a specialist in forensic medicine and professional ethics, the topics tackled were of special interest to me. My comment is about the body and the words of Dr. Idris. We disapprove of uterus rental for many reasons. First, there are medical reasons hindering the process. If the surrogate mother contracted an

incurable disease that necessitates abortion, would she have the permission to abort the baby? She is subject to a contract. We all know that she would not be allowed to abort the baby which can possibly lead to her death. What if the surrogate woman suffered from hemorrhage during delivery -which is a possibility- and the operating surgeon had to perform a hysterectomy? Should we deprive this woman of her womb? Thus, we would be depriving her of getting married and having children, for the womb is the only body organ capable of carrying a pregnancy. This way, we deprive this woman of being a real mother after getting married in the future. This surrogate mother can also be suffering from a genetic disease. Medically speaking, we know that the mother's blood reaches the baby through the umbilical cord. In this case, the fetus would be liable to having needless genetic diseases it would not suffer from in the case of normal pregnancy. We also disapprove of uterus surrogacy for social reasons. How can this surrogate mother, who is unmarried, be allowed to get pregnant and appear in society as a pregnant unmarried woman? This is not socially accepted. It is also disapproved of in Islam and all religions. There are also religious reasons for our disapproval of this method. The uterus is one of the body parts. The body is the sheer possession of Allah Almighty. Thus, it should not be sold, purchased or rented. This is completely different from the human milk and the human blood. Womb surrogacy is a vast case.

**Chairman**: Dr. Abu Ghuddah

***Dr. Abdul Sattar Abu Ghuddah***:

The first point is a comment on the issue referred to by Dr. Ja'far Al Sheikh Idris. He referred to the precious significance of Allah's being man's Creator. He denoted that there is a relation between the Creator and the created one. The created one must be the Creator's servant. This significance was expressed by Imam Al Shatby in a few words on discussing the objectives of the religious ordinances: the obligations and prohibitions. Imam Al Shatby said that the general objective of the religious obligations is freeing man of the yoke of his inclinations. Thus, man can be the slave of Allah by his free will as he is His servant by force. Man is Allah's slave by force, because Allah

created man. These ordinances came to turn this into an optional, voluntary and pursued slavery. The second point I'd like to discuss is that Dr. Idris pointed out that the knowledge concerning the spirit can be attained. In fact, we would like to discover the entity of spirit, but this is impossible. Allah says, "Say: "The Spirit (cometh) by command of my Lord" (Al Isra': 85). yet, there are manifestations of the existence of the spirit in man's body. These manifestations can be detected and noticed. This was the methodology adopted by the religious authority Ibn Al Qayyim on writing a book on the spirit. He further enlisted in this book all the religious texts that deal with the spirit within man's body and what it experiences in the grave and after that. We can accept such ideas because they are derived from the Revelation. But the identity and entity of the spirit cannot be known. This is due to the aforementioned Qur'anic verse for one. This is also due to the nature of the spirit; for it cannot be put to tests so as to realize what a spirit is. Thank you.

**Chairman**: Dr. Mohd. Ali Al-Bar.

***Dr. Mohd. Ali Al-Bar***:

First, judging on man's behavior and IQ through the genes is an extremely intricate issue. For instance, the Schizophrenia is a mental disease in which genetics play a major role. But not all characteristics are genetic. Yohanna Ibn Musawee was the physician of Al Ma'moun and Al Mu'tasim 1200 years ago. He was a very brilliant Christian physician. Yet, his son was extremely stupid. Musawee himself wrote on this topic saying, " Had the Sultan given me permission, I would have performed an anatomy on my son alive to know the reason of his stupidity and dumbness. Thus, I would have benefited humanity by discovering the reason and therapy of stupidity. But unfortunately, the Sultan permits it not." The issue of the genetic control is very complicated, for it involves the impact of the surrounding environment. I extend my thanks to Sheikh Ja'far Idris for his address. Unfortunately, some Muslims misunderstand the concept of "spirit". In many of the Qur'anic interpretations you saw, one can read that Allah blew from His Spirit unto Adam. This can be understood as if part of Allah's Spirit moved into Adam's body and all human beings

afterwards. This is rather a concept of Torah. Some also mistakenly think that Allah created Adam in His Image. Yet, this is a Christian concept. When I visited the Vatican, I was stunned to see St. Peter's Church. On orders from the Pope, the renowned Michael Anglo painted Allah as an old man with a bushy beard creating Adam as a creature identical to Him but smaller in size. Christians say that man is partially divine and partially human (from dust). These notions do not exist in Islam. The phrase "blew from His Spirit Unto man" means honored man. Thus, some Muslims are of the mistaken belief that man is part from Allah, Exalted be He. If so, then all of us are gods. This is a western, originally Greek, concept. Yet, it is renounced in Islam. Ibn Al Qayyim wrote a great book on "spirit". He is one of the few Muslim scholars who defined the spirit and discussed this in length. Ibn Al Qayyim said that the true nature of the spirit can be known. Nonetheless, the majority of the Muslim scholars said that the entity of the spirit cannot be discovered. The word "spirit" has so many meanings. L Shoukany mentioned 20 meanings of this word. Ibn Al Qayyim maintains a lengthy discussion on the spirit. I endear Ibn Al Qayyim so much because he is one of the few scholars alleging the possibility of knowing what a spirit is unlike the majority of the Muslim scholars. Thank you.

**Chairman**: Sheikh Ali Taskhiri

***Sheikh Ali Taskhiri***:

I wanted to comment on the speech of Sheikh Ja'far. The human nature of man is characterized with his fitra. It is the fitra that distinguishes man from animals and makes the human act superior to the bestial one. On dividing man's emotion into areas denoting this fitra, the first area would be the virtual area. This is called by wise men and philosophers "the area of the theoretical mind". This involves the fitri theoretical perceptions. An example of this is perceiving that the universe cannot be created on its own. There is also the area of "the practical mind". This denotes man's realization of the beauty of justice and the monstrosity of inequity. There is also "the mental area" which involves the ability to reason. Man has the ability of freeing himself from the relativity area. This ability is exclusive to man who

can, due to this, develop the reality he lives. After the "mental area" comes "the will area". Man is remarked by having an independent will which is not affected by many factors. This will retains its freedom till the end. Another area is "the area of inclinations". There is an inclination towards the pursuit of knowledge, artistic relishing and survival. These are human inclinations. All these areas are sub-classifications of fitra. This fitra distinguishes the essence of man from all other creatures. Man should refine all these elements; hence the role of religion. Religion refines the mind and free will. It also satisfies the human inclinations in a natural way so that none overwhelms the other. Fitra also manifests itself through the spirit. The spirit is an entity created by Allah Almighty. Its knowledge is confined to Allah. Through spirit, man's humanity is realized and his fitra is manifested. In fact, Prophets arouse what is hidden within souls and minds. Imam Ali says, "To arouse what is hidden in the minds and direct them towards the goal." Yet, the spirit has some known traits. By this I mean the ability of human understanding to assimilate the facts. I also want to focus on another issue. The Bible itself stipulates that the adulterous must be penalized. So, how can our Christian brothers call for leaving unpunished the woman who performed any sexual act before her marriage? The Bible itself stresses the penalization of the adulterous. Another term that I'd like to highlight is "the sexual partner". In no provisional or religious law can we find a term equivalent to "the marital partner": the husband. In Islam, it is not accepted to have any sexual act but in wedlock. Islam does not believe in or care for extra-marital relations. Further, Islam can set grave consequences for such relations. Yet, the child of the adulterous person should be paid attention and cared for in Islam. Even the punishment of the adulterous woman must be postponed till after the delivery of the baby. The life of such baby should not but be respected; for it is not its fault to abort him. Thank you.

**Chairman**: Sheikh Mohd. Mokhtar Salami

***Sheikh Mohd. Mokhtar Salami***:

In the Name of Allah, Most Gracious, Most Merciful. In the beginning, I'd like to express admiration of what I have heard today;

for it is a new methodology. The three esteemed lecturers agreed on referring to the pure source: the spiritual source. None of them but referred to the purity of the spirit, which is mirrored in their words. Yet, I'd like to stop at some points. First, I have listened attentively to the esteemed Dr. Badran, the meticulous scholar who is distinguished with noble manners and great humbleness. With my appreciation, I beseech him allow me to denote some of the problems I had on listening to his lecture. The esteemed professor drew for us some red lines. We are most grateful for him for this. But when a red line is drawn, one would be curious to know some necessary details. One would like to know the consequences of crossing this red line and the reasons for drawing this red line. Man would also like to know what are the harms and evils that make this red line a must. The professor did forbid many things without explaining any of these details. Secondly, the professor mentioned "the hazards of early diagnosis" during the course of his lecture. What are these hazards? He also said that genes are a gift from Allah and should not be toyed with. But everything is a gift from Allah Almighty: the genes, the body, the land and so forth. We do not toy with the genes; for the physician interferes because he believes that his intervention is of benefit for the patient. How can we distinguish between toying and trifling with creatures on the one hand and beneficial intervention on the other hand? The last point the professor mentioned in his valuable address dealt with Allah's Will. No man at all can defy Allah's Will. To illustrate this, I will briefly narrate an incident that happened to Umar Ibn Al Khattab, may Allah be pleased with him! He headed for Levantine where plague prevailed. Yet, he returned on hearing about the plague. People asked him, "Do you escape Allah's Will?" He answered them saying, "An escape from Allah's Will to His Will." Man cannot defy Allah's Will. Thus, when man affects some genetic modifications or attempts to combine between human and animal genes, he should not be described as defying Allah's Will. Rather, he should be described as messing with the universe. Man can mess with the universe. Therefore, Allah Almighty prohibits man in the Holy Qur'an from spreading evil in the universe. The Reverend Bishop also said a sentence that I could not understand. He said, "This is a

mistake of reality and not of man." To my understanding, the right and the wrong as well as the good and the evil are always attached to man. I judge any of man's acts as right, wrong, good or evil. I never judge man's acts as being a "reality". What is the meaning of "reality" here? Something not attributed to man? The woman who committed this mistake is the one responsible for it. Thus, the mistake is the reality that should not exist and is attributed to whoever caused it. The esteemed professor Sheikh Idris opened this vast topic of spirit. I believe that man has three elements: body, mind and spirit. Each of these elements has the sort of exercise that enables it to elevate above its present status to a better one. We are urged to elevate with our bodies, minds and spirits. The body should be trained so that man can elevate with it to higher ranks. Second, through acquiring knowledge, permanent organization and expulsion of emotions, the mind gets loftier and its judgments become sound. Then comes the issue of the spirit. Its exercise is to be found in prayers. The religious scholars who succeeded in educating man and refining his soul, help man elevate his spirit. Though the areas of the body and mind can be defined in all people, this is not the case concerning the spirit. Thus, the Prophet (PBUH) pointed out this by saying, "The true dream is one part of prophethood." Man can see in his dreams an event that did not happen before. However, Allah distills it into man's soul, opinion and sleep. Sometimes, it is distilled into man's life and spirit depending on the degree of its purity. The person may at one moment feel gloomy. After a couple of days, this person finds out that at this specific moment, something that matters for him happened. This spiritual dimension is a completely different dimension other than time and place. We realize the influence of the spirit, but not its entity. Early today in my address, I said that it is not impossible to attain knowledge of the soul. Yet, it is not attained by mental or ordinary abilities. However, I highlighted the Qur'anic verse, "They ask thee concerning the Spirit (of inspiration). Say: "The Spirit (cometh) by command of my Lord: of knowledge it is only a little that is communicated to you, (O men!)" (Al Isra': 85). Man could not know any part of the universe till he knew the necessary information (premises) of it. Similarly, man cannot know the spirit but after having

the necessary premises which he does not have yet. Even if Allah granted us unlimited knowledge one day and the human mind witnessed a huge breakthrough, he would not be able to realize the spirit. However, knowing the spirit is not an impossible task. There is no religious texts in the Qur'an or the Prophetic Tradition stating the impossibility of attaining such knowledge. Thank you.

**Chairman**: Dr. Habibah

***Dr. Habibah Chaabouni***: First, I'd like to ask the Rev. Bishop, "What is the stance of the Church towards the research on animals?" Secondly, this is the fourth day of this conference. I am specialized in genetic diseases. Thus, I work in the field of genetics. Given this, I'd like to shed light on an important issue. Every day, those specialized in genetic diseases - whether physicians or not - come across an incurable, difficult and fragile case. This happens in the field of the daily work and the field of research. For three days, we have been listening to valuable lectures delivered by men of religion and specialists in genetic diseases. Yet, we haven't listened to any lectures on medical ethics, not even once. No matter if man is a physician, a scientist or a researcher; he needs ethics. It is these ethics that allow his work to be positive, especially in the field of medicine. I wished that we had listened to a specialist in Medical ethics and Bioethics. Let's not forget that there are councils and associations specialized in medical ethics and bioethics. I wished we could listen to one of the representatives of these councils which are considered the link between field workers like physicians and researchers on the one hand and the men of religion and jurists on the other hand. Similarly, no one discussed the issue of education. Should we teach medical and science students about these permissible and impermissible acts in the field of daily medicine and the field of scientific research? I read the conference agenda and found no lecture discussing medical ethics and bioethics. I hope that one of the participants can give us a glimpse about this issue of medical ethics and bioethics which are known all over the world: in the Muslim and non-Muslim countries.

**Chairman**: Dr. Abdel Aziz Al-Swailem

***Dr. Abdel Aziz Al-Swailem***:

In the Name of Allah, Most Gracious, Most Merciful. I have a comment and a question. I will state the comment first. It is the right of the ethics committees which discuss some of the ethical issues to discuss many of such issues. However, the researcher is too busy conducting his research to know what happens in such committees. My question is directed to the esteemed speakers. Does the role of ethicists and religious scholars come before or after research? In other words, are they approached before the research to express their approval or disapproval of it? Or does their role come after the research is conducted and then ethicists and scholars put the relevant regulations and controls? The answer, in fact, is highly important; for on it many of the issues discussed throughout the last few days are based. The other question is directed to the Bishop. This is a point that perplexes me. In pregnancy, when one of the two lives should be ended, who will be given the priority? It is obvious from the presentation that there is a great keenness to preserve life which is agreed upon. But on the hazard of losing one of the two lives, how can we behave? Do we preserve the mother's or the fetus's life? Thank you.

**Chairman**: Dr. Hanan Hamamy

**Dr. Hana Hamamy**:

I'd like to add that drawing red lines is the crossroad between the attainment of knowledge and the pursuit of knowledge on the one hand and how we use this knowledge on the other hand. Knowledge is a gift bestowed on us by Allah Almighty. Allah is the One Who permitted us to acquire this knowledge which we can never be denied. Thus, red lines are drawn for the uses of this knowledge for the welfare of man and humanity. Thank you.

**Chairman**: Dr. Assad

***Dr. Assad Al-Sahmarani***:

In fact, I have two remarks on methodology. The first is that some of the brother scientists spoke in English. But they quoted some

Qur'anic verse, the translation of which changed the meaning of the original verse. Therefore, I suggest that the esteemed colleagues should recite the verses in precise Arabic so as to spare the Qur'anic text these immense blunders, especially that the Holy Qur'an is not allowed to be translated. This is unanimously agreed upon by the Muslim jurists. The second remark I have is that we are here in this hall to get acquainted with the stances of others. We are not here so that one of us imposes his religious stance on the others. The goal of this conference is getting acquainted with other stances, for it is important to know the other. Islam urges Muslims to know the other. Knowledge involves science, mingling and interaction. This is the importance of this conference. We thank all those who lauded it. I address my last point to Bishop Camillo. The Code of Personal Affairs we have for the Christian communities stipulates the punishment of the adulterous married woman. Sheikh Taskhiri talked before about the adulterous married woman and proposed divorce as a sort of punishment. The rape incident which Dr. Munir mentioned in Bosnia involved Muslim women too and the research complexes of Al Azhar adopted the same stance of the Catholic Church. Thus, there is no disagreement in this concern. But I think it is the unmarried woman whose punishment is controversial. As for the Christian married woman, she must be punished for committing adultery. Thank you.

**Chairman**: Dr. Omar Suleiman

***Dr. Omar Suleiman***: My question is to Dr. Jaafar Sheikh Idris. I think that probably he knows about the research on vital energy. I wanted to know if vital energy has to do anything with the spirit. This research was done by Prof. Al-Agid. Can vital energy be used for medical reasons so as we avoid the manipulation on genetics?

Second question, actually, one of the colleagues raised. I wanted to know the opinion of Catholic Church related to animals with human genes. This question was already raised.

**Chairman**: Dr. Malik Badri.

***Dr. Malik Badri***: My comment is on the words of Dr. Ja'far Idris. In my opinion, he adopted the thought of Sheikh Ghazali who said that a spirit was blown into man. This spirit changes according to the

deed you perform. If used in thinking, it becomes the mind. If this spirit is used in evil, it is called the evil-prone soul. I agree with Dr. Muzaffar that there is a "spirit" and a "soul". Let's refer to the Holy Qur'an. In Qur'an, the spirit was not described but as good, while the "soul" is described as evil in one place and as good and tranquil in another. Yet, the Qur'an refers not to Nafs as "the soul". It can rather be translated as a reflexive pronoun like the one in this Qur'anic verse, "When thy Lord drew forth from the Children of Adam from their loins- their descendants, and made them testify concerning themselves..." (Al A'raf: 172). Thus, it is the soul that is punished and called to reckoning. As for the spirit, it is endowed by Allah. It always calls man for righteousness. We cannot know the entity of the spirit. We do not know the true entity of electricity. Is it atoms or mere energy as they say? Yet, we can recognize its effects. This applies to the spirit. The second point is about a term used by Dr. Badran at page 13. This term is used in all the books tackling genetics. By this I mean "the Genetic fault". Homosexuality is considered legal in certain countries, but it is considered immoral in Islam. The alleged belief is that this behaviour specifically lies in a genetic error caused by built-up character through an inter-sex gene. "Who brought this genetic fault"? Are we talking about God's making a fault? So, it's very important for us as Muslims, it's better to use the word "genetic disorder" rather than a genetic fault or mistake. And, he says at the end of the sentence that it's causing built-up character through an inter-sex gene. This postulate is refused by Islam; it is not refused by Islam only, but also by science. All the evidences that were brought to show that homosexuality is inherited are incomplete and refuted by other scientists. Actually, the main person who brought up this was Levay. In his study, he hypothesised that the people who are homosexuals are found to have cells different from those who are heterosexual. Then, they discovered most of the cases who were homosexuals died of AIDS. Why don't they speak about the heridability of "Pedophilia"? Nobody speaks if Pedophilia is inherited, because still in the western world it is considered bad. Nobody speaks about the heridability of having sex with animals, because animals do not go to courts to complain. So, I think that the whole concept is

rather simply to make homosexuality acceptable. It's really an unfortunate thing. Thank you.

**Chairman**: Dr. Mohd. Abdul Gaffar Al-Sharif

***Dr. Mohd. Abdul Gaffar Al-Sharif***:

Thank you, Mr. Chairman. I have a point of order concerning the fundamentals of Fiqh. I think that Imam Ghazali in his book "Ihya' 'Ulum Al Din" stressed this point. There are legal terms, words or expressions whose meanings change by time. So, many people try to add modern connotations to the Qur'anic word that came in accordance with the Arabic text and the Arabic language at the time of Revelation. Al Ghazali mentioned words used in Fiqh, wisdom, the Holy Qur'an and the Prophetic Hadiths as examples. At that time, the words "spirit", "soul" and even the word "mind" were confined to the meanings known in that Arabic environment. There was no such difference between "spirit" and "soul". All the differences between these terms emerged in the late eras when the Muslim scholars were affected by the Greek philosophy and the previous religions. Thus, impartiality came to the surface. In the Shaqbazdiyya, they assign separate locations for the spirit, the soul, the mind, and lust. But is there any substantiation for that? Based on understanding the religious texts, each sect tries to substantiate their beliefs. Therefore, in these issues, we should refer to the early environment and the Arabic language. I want to comment on another issue. Some said that Islam sets controls on the scientific research. Islam sets controls on the research in terms of its harmful or beneficial nature and its negative and positive impacts. But when it comes to knowledge itself, Islam sets no restrictions whatsoever, even on the knowledge about the spirit. If man can penetrate the heavens and go farther than that, he has the right to do so. Thank you.

**Chairman**: Dr. Ibrahim Badran

***Dr. Ibrahim Badran***:

In the Name of Allah, Most Gracious, Most Merciful. First of all, I'd like to say that I am not a researcher in the science of genetics. Yet, I consider the science of genetics to be the bridge between science

and benefit. It is the way that defines the means of benefiting from knowledge away from whatever harms the human life. This is my opinion. Second, I don't claim to be a specialist in the field. I am a surgeon, but I sought the assistance of one of my dear students, a teacher of biology, when I was asked to talk about this issue. Third, I do not know to which of the two categories of people described by Bernard Shaw I belong:

"Those Who Know More And More Of Less And Less, Until They Know Every Thing About Nothing, Or Those Who Know Less And Less Of More And More Untile They Know Every Thing About Something)"

I cannot summarize my stance in this life. I am a surgeon, an administrative officer, the head of a committee of ethics, and a member of the Islamic Research Academy. I love man, all that is human and comply to all the valuable fundamentals which take care of man in his life. The first question is about the red line and its causes. I happened to see a red line concerning the time limit. I skipped half my paper in the presentation. I read every other line not to offend our esteemed professor, the Chairman of the session. In the conference, I stick to the commitment of not crossing the red line: the right of other people. You have asked about setting a code of ethics. I think that each and every step in life must have a defined righteous path. Deviations are part of man's truth. Any man can through his thought, inclinations, mind and specialization; develop a set of ethics. I recall that one of my colleagues had his son's ear cut off by mistake during the surgery. As a result, his son lost his mind, and committed suicide. Did my colleague do this intentionally? Of course, no. He was just too afraid; for a surgeon never operates on his son. Most of the science comes from the developed world and its application in the developing world faces many hindrances: poverty, capabilities, and compromises, as well as preferring what is cheap and choosing the easier ways. In my opinion, all these are impediments plaguing all the developing countries, except those Allah protected. Therefore, I am for avoiding the possibilities of fault. Many things have to be noticed in this specialization. We draw red lines because we deal with an

unknown entity- the gene. The genetic specialization is a new one. In the early 1970's, I was in Belgrade and the man who won the Nobel Prize said in his speech, "I am talking to you today and am sorry for not talking to you next Friday. But thank God that I did not talk to you last Friday; for last Friday's knowledge did change and it will change once more by next Friday. What I said today may turn out to be incorrect." Can you believe that this field of science - like the other fields concerned with surgery, fevers, pediatrics legislation and religion- analyzes things that have been there for a thousand year? That is why I say that it is imperative to be extremely cautious in our actions through drawing red lines in the fields, in which blunders may happen. This is one issue. The other issue I'd like to discuss is that these procedures are liable to environmental interventions. On the emergence of AIDS in 1974, the HIV was diagnosed and said to be caused by the green monkey. This was sheer policy. In fact, this HIV is no more than a genetic mutation that took place in one of the labs in a certain country- either France or the United States. From there, the HIV was transferred to other labs and then to man. How can HIV be caused by a monkey? It was rather produced by mistake in one of the labs during an unsuccessful experiment. Yet, it is not for the best interest of human beings to cast doubts on the credibility of science. Thus, I say of the contingency of drawing red lines. The third point I'd like to address is the environmental influence on genes. It is well-known that the environment is one of the certain factors that influence the human constitution; the genes themselves. Some of the genetic diseases increase in some areas and disappear in other areas. I attended a conference in India which suffers from the high rate of hematic diseases. A pediatrician spoke about all the social brackets in India and made all those participating in the conference envisage the status of the poor mother that must lose her child before the age of twenty and fathers of average income who can spend 1000 Dollars a month and make his son live till the age of 35. This pediatrician also depicted the state of the Maharaja who can get that gene removed and make his son live for 70 years. Is this fair? In my personal opinion, the surrounding environment has a great impact. The surrogate mother surely affects the fetus because it feeds on her blood. Thus, if this

surrogate mother has a genetic disease, it will be contracted by the baby. The issue of red lines must adopt the principle of caution before that of happiness and success.

**Chairman**: Bishop Camillo

***Bishop Camillo Ballin***:

I will let Dr. Mounir answer the questions posed by Dr. Hanan and Dr. Habibah Al Cha'bouni. Once either of the two lives; of the mother or the fetus; must be ended, the physician cannot directly interfere against that of the fetus. I mentioned the story of the woman who died, because she chose not to be treated so as not to affect the health of her baby. No direct methods can be taken to harm the baby. We cannot put an end to any life. As for the difference in status, there is no difference between a married adulterous woman and a woman who committed a sexual act before marriage. The Church does not judge in light of the sinner, but rather in light of the sin itself. In the Bible, Jesus does not judge the adulterous woman. At first, he said to those present that if any of them has never sinned, he should pelt her with stones. So, all of them left the place. She was left alone with him. Then, he asked her if anyone had judged her. She answered, "No." On hearing such answer he said to her that he also would not judge her and urged her to leave in peace. Does this incident mean that Christianity allows sin or considers it to be a trivial matter? No, but Christianity loves the person- the sinner. Christianity wants to cure the sinner and help him so that he would never go back to sin. We cannot say that Christianity does not punish sinners. We rather say that the Lord accepted to help every one so as not to go back to sin. Diagnosis is highly important. The Church does not prohibit such genetic diagnosis. As I mentioned in my lecture, the pre-natal diagnosis which raises not moral problems is accepted. This is so if this diagnosis is used in defining the therapy that could be necessary for the baby. Yet, this diagnosis in many cases can be a chance for proposing the conduction of abortion. Therefore, the Church does not forbid the diagnosis, but it must not be a reason for conducting abortions or any other operations. Finally, there are stances common to both Christianity and Islam like holding marital life as sacred and many other

principles we heard in the lectures. There are many rules in Islam and Christianity enabling them to cooperate to form together a good society. Now I leave the floor to Dr. Mounir.

**Chairman**: Dr. Mounir

***Dr. Mounir Farag Abdul Massih***:

First of all, like Dr. Badran I am also a surgeon and am not a geneticist. The first is issue is about the experimentation on animals. It is noteworthy that the opinion of the Church is not to be reached by men of religion alone. There is what is called the papal Academy of life. This is concerned with all the issues of Bioethics. This Academy constitutes of scientists, physicians, philosophers, men of law and theology. The opinion of the church is concluded by these scientists who are the deans of medical schools and science schools or university presidents from various countries. As for the research on animals, I agree that animals should not be tortured or harmed by this kind of research. This research should not also result in a damage in the environment or the animal at the present time or in the future. If this research is for the benefit of man like increasing the quantity of milk and meat in cows, it will be accepted. However, the use of animal tissues or cells is not acceptable so as not to mix between different species. Dr. Cha'bouni asked about the Bioethics. There are many universities teaching bioethics. What we studied in the School of Medicine is completely different from the several topics of Bioethics pertaining to the Catholic Church. This is due to the fact that there is great difference between the Bioethics and the history of Bioethics. This will be discussed in detail in a lecture I will deliver in a conference on Forensic Medicine that would be held in Cairo Sheraton Hotel. There will also be a book compiling all the information on Bioethics. This book will be in Arabic. It is now being translated into three languages in Egypt and Lebanon. Bishop Camillo, on telling the story of the pregnant woman, began it from the moment of choice. The physician told her that she had a chance to be treated, but demonstrated the results of such treatment on the fetus. The mother alone -and not the physician- took the decision. But I wish we could have read the complete story of this woman to see how she was

faithful and religious in her childhood. This is what made her take this decision. This is the peak of love. Thank you.

**Chairman**: Sheikh Jaafar Idris.

***Sheikh Jaafar Idris***: The question of ART and creation. I am also concerned with that. But, I am not very optimistic, I am very pessimistic. Science will not abolish the existence of human being. I agree with you that our relationship is basically the relationship of the soul with GOD. As I said in my paper, the soul is used in the body even when we worship GOD, we raise our hands, move our lips and we feel the relationship between the states of our body and the states of our mind. When I prostrate myself, my mental state is different from when I lie on my back and raise my legs up. So, I can't worship GOD in the latter form. One of the matters to which ALLAH Sub'hana Wa'ta Aala guides us is how to use our body for worshiping. So, the body is very important.

**Chairman**: Dr. Ahmed Raja'i El-Gendy.

**Dr. El-Gendy:** I want to clarify a given point for Dr. Cha'bouni about the teaching of ethics. Since its establishment in 1978, the IOMS enlisted medical ethics atop its code. The IOMS paid great attention to ethics in its first phase. Yet, at that time, things were not so clear. We did not know whether ethics should be a science to be taught or not. Thus, we tried to expose many of the problems faced by physicians, chemists and other members of the medical staff in forums in which we rally the medical and religious scholars. 3 years ago, we decided to put a curriculi for Medicine Schools on Medical ethics. It would contain parts about the Islamic heritage and its contributions, the Islamic philosophy, fiqh and the real problems. 3 days ago, the IOMS Board of Trustees convened and the general secretariat proposed a draft of this curriculi which was approved on condition that we put a complete schedule and start the execution of this project. The present physicians should be provided with an explanation of all these issues. Thus, we have to call for work and discussion sessions. We have already embarked on this. Perhaps, Dr. Farahat Mu'azzam has the antecedence in this regard; for she has established a good center for this purpose. However, we have already begun and attempted to

communicate with the University of Kuwait to set a blueprint of this project. The second part of this project would be concerned with students of medical schools. Yet, what is the content that was agreed upon? How would this be achieved? And who would accomplish it: the professors of medicine or the IOMS? There was a good dialogue held in this regard. In the near future, there will be a whole syllabus for Medical schools students and another one for the physicians who practice medicine now. You have also asked about the issues of ethics and bioethics. If you open the e-mail and press the relevant button, you would find most of the information. My last point answers the question of Dr. Suwailam: do we conduct experiments first and set foundations then? Or do we put the regulations before conducting experiments? This is the problem of research in this field. Most of this research is secret. No one declares that there is such research till a problem emerges. I will give you a simple example. In the first session of the IOMS held in 1983, Dr. Abdel Hafiz Helmy, Dr. Hathout and I published a research paper on cloning. Dr. Hathout shouldered the presentation. All the same, the paper included nothing about cloning as we know it now. It was merely an article on frogs and flights of fantasy. Yet, the IOMS held a forum on this topic in which it was thoroughly discussed. On the basis of this forum, the IOMS prohibited cloning and set the appropriate bases. But the other problem is the relation between the resolutions issued by the IOMS and those issued by the Fiqhi and executive Academies. Thank you.

# Topic IV: How and Where do We Draw The Lines?

## Twelfth Session
## Thursday, 9 February 2006

## Stem Cell Controversy – Islamic, Jewish and Christian Perspectives

**Chairman** : Dr. Gerald Winslow
**Rapporteur** : Dr. Malik Badri

***Speakers:***

*1 - Dr. Ted Peters*
*2 - Dr. David Bleich*
*3 - Dr. Abdulaziz Al-Swailem*

# THE STEM CELL CONTROVERSY: SECULAR FORM AND RELIGIOUS SUBSTANCE

*Ted Peters*

U.S.A

# The Stem Cell Controversy: Secular Form and Religious Substance

*Ted Peters*

U.S.A

**Abstract**: This paper analyzes three religious frameworks for moral discourse influencing public policy debate regarding scientific research into human embryonic stem cells. The three frameworks are (1) embryo protection, (2) nature protection, and (3) medical benefits. These three provide the "religious substance" for the "cultural form" of bioethics. The three frameworks originate in the West, born within Christian and naturalistic circles. Jewish and Muslim bioethicists tend to articulate ethical commitments from within the third framework, medical benefits. We can expect continued worldwide debate regarding the ethics of scientific research to draw upon these partially visible religious traditions.

**Key Terms**: stem cells, ethics, religion.

The worldwide rush into stem cell research is replete with a near worldwide controversy over ethics. The once secluded life of the laboratory scientist has been invaded by news reporters and video cameras which analyze and scrutinize. The invading investigators are looking for newsworthy accusations, violations of ethics, immoral acts. On the one hand, research scientists enjoy the public attention. On the other hand, they fear exposures that could inhibit if not retard their work.

The ethical criteria by which stem cell science is measured is religious in content, even if applied to the secular enterprise of science by a secular body politic. The ethical issues in this case are religious in a double sense. They are religious because their original formulation came from religious communions such as the Roman Catholic Church. Even though the formulations have become secularized by being translated into procedural guidelines, their theological origination is

unmistakable. The influence of the church lives on in secular discourse.

These ethical concerns are religious in a second sense, a broader sense. The Protestant theologian Paul Tillich said frequently, "culture is the form of religion and religion the substance of culture."(1) This may sound like an amorphous understanding of religion; but it is no less real than the specific traditions we know as Islam, Judaism, or Christianity. The religious substance of our emerging global culture includes science, secularity, and ethics. All three are in interaction with one another. The global veneer of secular science has an underpinning, a legacy from the historical religious traditions now translated into secular ethical concerns and codes.

In what follows I would like to examine the ethics of human embryonic stem cell research in light of the public controversy. I will show that the public controversy is in stalemate, largely because we have three contiguous and incompatible ethical frameworks within which ethical discourse is articulated. The failure to settle ethical matters is due less to moral disagreement and more to the incompatibility of these ethical frameworks. Although these three frameworks are distinctive to Western culture, they have dribbled around the world and influenced our shared global culture; they are influencing the religious dimension inherent within secular science.

The specific concerns registered by theological voices within Islam, Judaism, and various branches of Christianity contribute to the public discourse, and even contribute significantly to the emerging shared culture. Yet, in themselves, the historical religions can only formulate the issues for their respective constituencies, while the more inclusive secular surface of culture translates these issues into laboratory guidelines and procedures.

(1) Paul Tillich, *Systematic Theology*, 3 Volumes (Chicago: University of Chicago Press, 1951-1963) III:158.

## Three Moral Frameworks: Embryo Protection, Nature Protection, and Medical Benefits

In brief, the branch of science to which this paper is addressed is research on human embryonic stem cells (hES cells). "Stem cells are defined functionally as cells that have the capacity to self-renew as well as the ability to generate differentiated cells."(1) The pluripotent stem cells we are talking about here have the potential for regenerating human tissue and providing promising therapies for persons suffering from spinal cord injury, brain deterioration, heart disease, diabetes, cancer, and many other traumas. Public controversy has threatened to shut down stem cell research; and where the research proceeds it is governed by increasingly strict ethical guidelines. The moral frameworks within which the public controversy has been taking place is the subject of what follows.

The three moral frameworks I perceive to be operating in the worldwide public debate over human embryonic stem cells are these: (1) the *Embryo Protection* framework; (2) the *Nature Protection* framework; and (3) the *Medical Benefits* framework.(2) Within each framework we can identify more than one coherent position.

| **Embryo Protection** | **Nature Protection** | **Medical Benefits** |
|---|---|---|
| Vatican Catholics | President's Council on | Most Research Scientists |
| Evangelical Protestants | Bioethics Leon Kass | Liberal Protestants |
| US White House | Anti-Paying God | Jews and Muslims |

(1) Douglas A. Melton and Chad Cowan, "'Stemness': Definitions, Criteria, and Standards," in Robert Lanza, Editor, *Handbook on Stem Cells*, 2 Volumes (Amsterdam: Elsevier Academic Press, 2004) I:xxv..

(2) The analysis of these three frameworks provides the structure for a book I am now researching in cooperation with two Berkeley colleagues, Karen Lebacqz and Gaymon Bennett, tentatively titled, *Immortal Lines: Theologians Say "Yes" to Stem Cells*. See our theological brief on stem cells at Counterbalance: http://www.counterbalance.org/evo-brf/index-frame.html).

## 1: The Embryo Protection Framework

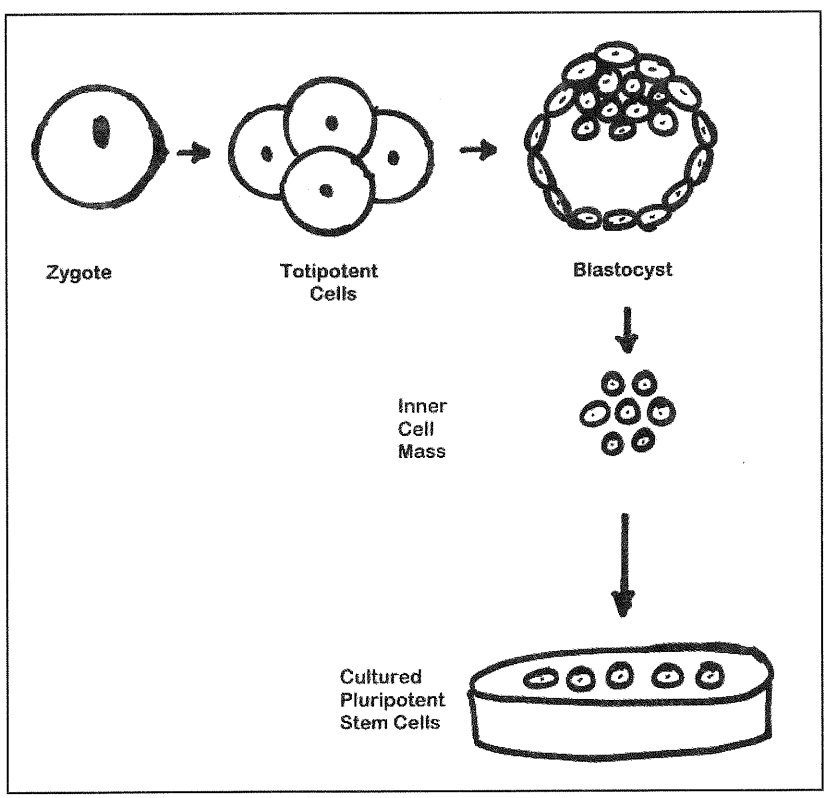
The first moral framework we call the *embryo protection* framework. The most prominent issue in the public debate about stem cell research is the moral status of the embryo. People have asked: should an embryo be granted the same moral status as a human person? The embryo protection framework takes this as the principle moral concern. This concern functions as a moral frame for understanding and interpreting all of the stem cell debate.

This framing of the ethical question begins with the origin of stem cells. The destruction of the blastocyst takes center stage. Many who operate within this framework take the zygote as having a moral status equal to that of any other person. They argue that the destruction of the blastocyst is tantamount to taking a human life. Insofar as human embryonic stem cell research requires the destruction of a blastocyst, it is held to be morally illicit, regardless of the potential good it might offer.

On what grounds might we think the early embryo possesses a dignity that forbids scientists from harming it? The most sophisticated account is provided by Vatican Catholics. It ties together ensoulment, dignity, moral protection, and genetic novelty. This position, articulated already in the 1987 encyclical *Donum Vitae* provides the foundational moral logic for what would later become the official Roman Catholic position on the stem cell debate.[1] *Donum Vitae* argues that three elements are crucial to the creation of a morally defensible human individual: the father's sperm, the mother's egg, and a divinely implanted soul. *Donum Vitae* notes that at fertilization a novel genetic code - neither that of the mother nor that of the father - is created. *Donum Vitae* takes this genomic novelty to be evidence of the presence of a unique individual, and thus reasonably the moment of ensoulment. Ensoulment is the event which establishes a divine moral claim, so that the destruction of the blastocyst constitutes not only murder

(1) Congregation for the Doctrine of the Faith, *Instruction on Respect for Human Life in its Origins and on the Dignity of Procreation (Donum Vitae)* (22 February 1987), Acta Apsotolicae Sedis 1988,80,70-102. See also: John Paul II, *Evangelium Vitae* (25 March 1995), Acta Apostolicae Sedis 1995, 87, 401-522.

but an offense against God's creation. Alleged empirical evidence that the early embryo has this divinely ascribed status is the uniqueness of the person-to-be's unique genetic code. Once a unique genome has been established, then it is morally incumbent on us to protect it from harm.




The orienting bioethical principle of the embryo protection framework is "nonmaleficence" - that is, "do no harm." To take a life (the life of the developing zygote in this case) violates the do no harm principle. According to many working within this framework, our first ethical responsibility is to forestall stem cell research. Those who support stem cell research are accused of disrespect for the value of human life. Foremost among those who frame the debate in this way are Roman Catholic spokespersons and some outspoken Protestant American evangelicals.

When the issue is framed this way, those who support stem cell research must argue that an early embryo or blastocyst is not a 'human person' and that destroying it is not equivalent to murder. These arguments can be difficult to make. If the blastocyst is not yet fully a human person and therefore protectable, when does a developing zygote become protectable? The public debate has largely raged over this question; the embryo protection framework has set the terms of the debate. Because so much public attention is given to this framing, we sometimes fail to notice that voices speaking out of two other frameworks are trying to be heard.

**2: The Nature Protection Framework**

This brings us to the second moral framework on our list, the *nature protection* framework. This framework responds to a perceived threat to human nature posed by stem cell research and especially cloning. It is the threat that ours scientists will *play God* with the human genome and lead our society toward *Brave New* World. Those who operate within this framework concentrate their ethical attention on potential unforeseen negative consequences of stem cell research, consequences triggered by human limitation and human pride. Despite the good intentions that inform scientific pursuit, those who employ this framework perceive threats to nature, even our human nature, in the face of advancing biotechnology.

Two arguments cluster in this framework. Both arguments begin by imagining future negative consequences of research and work back to our present situation to assess whether or not contemporary science is on a trajectory toward those futures. The first argument is consequentialist: The use of our technologies is walking us down the path toward a "Brave New World." Those who advance this argument fear that if we do not stop proliferating new technologies, we will drift toward the *Brave New World* that novelist Aldous Huxley warned us against in the 1930s. Whatever our good intentions might be today, lurking in the future is a world that we will not be able to control. Hence, we should not take the first steps.

This is a version of the "slippery slope" or "camel's nose under the

tent" argument: once we take a first step, such as developing stem cells, we will not be able to draw a line and prevent further technologies. Eventually we will do something immoral and regret the consequences of our actions. Some argue, for example, that the destruction of the developing zygote will coarsen our collective conscience, desensitizing society to the value of human life. This desensitization, in turn, will signal a fundamental violation of our own humanity.

For some, however, the immoral step is not eventual, but immediate. Here we find the second argument in this framework. This argument suggests that the use of stem cell technologies violates something essential about human nature. This is not simply a question of consequences, but of not violating important natural and human boundaries. Some will argue, for example, that the fertilization of an egg outside the human body is "unnatural" and therefore wrong. Such technologies (e.g. cloning) are said to elicit within us a deep sense of repugnance; our moral judgment should be guided by this intuitive sense of repugnance.(1)

Both of these arguments claim that any manipulation of human genes - even to support better human health - risks violating something sacred lying deep within our nature. As such, these manipulations reflect human pride or *hubris*. A central ethical agenda is to prohibit our scientists from "playing God" - that is, to prevent our society from thinking that we can improve ourselves by genetic technologies, especially cloning and stem cell therapies. Instead, we should appreciate what nature has bequeathed us, including our limitations and our imperfections.

Leon Kass, former chair of the US President's Council on Bioethics, brings his background as a Jewish intellectual into the sphere of secular bioethics. He "defends the reasonableness of public disquiet regarding the dangers of 'playing god', of coercion and

(1) Leon R. Kass, "The Wisdom of Repugnance," in *Ethical Issues in Human Cloning*, ed. Michael C. Brannigan (NY: Seven Bridges Press, 2001) (first published in *New Republic*, June 1997)

especially of dehumanization - in both deed and thought - that are raised by prospects of genetic enhancement and by an approach to human life that defines us in terms of our genes."[1] Our human nature needs to be protected from the dehumanizing interventions of genetic scientists.

These first two frameworks - embryo protection and nature protection - are quite different from each other when it comes to basic assumptions and orienting values. However, they have been brought into an alliance by the White House. When in the summer of 2001 US President George W. Bush was preparing what would become his executive policy regarding stem cell research, he consulted with Leon Kass and visited Pope John Paul II at the Vatican. The president's policy statement of August 9, 2001, permitting stem cell research but limiting it to pre-existing lines, emerges from a confluence of embryo protection and nature protection.

### 3: The Medical Benefits Framework

This brings us to the third framework: the *medical benefits* framework. Few people doubt that hES cell research offers tremendous promise for medical advance. For many, this promise serves as the framing consideration within which all other concerns related to stem cell research must be considered. In contrast to the other two, this framework begins by developing a positive vision for the future and then works back to the present situation asking: in what way can biomedical science help us actively bring about that future?

Here the orienting bioethical principle is "beneficence," or "doing good." This principle holds that we are morally obligated to pursue the good. Stem cell research appears to be a way of doing good; human embryonic stem cells have the potential for regenerating human organs and other tissue, if not immediately at least in the future. Moreover, the promise of regenerative medicine is currently based upon a theory with considerable experimental corroboration. The promise of stem cell medicine is realistic. Relief of human suffering,

(1) Leon R. Kass, *Life, Liberty and the Defense of Dignity* (San Francisco: Encounter Books, 2002) 23

the lengthening of lives with improved health, and overall advances in human flourishing are taken as compelling by those who advocate from this framework. These considerations are used to frame all other concerns.

The ancient Greek, Hypocrites, said, "benefit and do not harm." This is the first formulation of both beneficence and nonmaleficence. Those who advocate the medical benefits framework embrace both. However, they understand these two principles as standing in a particular relationship to one another. Beneficence takes precedence. Beneficence provides an orienting vision that calls us to actively engage in pursuit of human betterment. Of course this vision cannot be pursued by just any means. Indeed, some means may come into conflict with the vision itself. Here the principle of nonmaleficence can make such conflicts visible. In doing so it serves to focus attention back onto the positive ethical vision.

This ordering of beneficence and nonmaleficence is exemplified by Jesus' parable of the Good Samaritan.

NRS**Luke 10:29** But wanting to justify himself, he asked Jesus, "And who is my neighbor?"(30) Jesus replied, "A man was going down from Jerusalem to Jericho, and fell into the hands of robbers, who stripped him, beat him, and went away, leaving him half dead.(31) Now by chance a priest was going down that road; and when he saw him, he passed by on the other side.(32) So likewise a Levite, when he came to the place and saw him, passed by on the other side.(33) But a Samaritan while traveling came near him; and when he saw him, he was moved with pity.(34) He went to him and bandaged his wounds, having poured oil and wine on them. Then he put him on his own animal, brought him to an inn, and took care of him.(35) The next day he took out two denarii, gave them to the innkeeper, and said, 'Take care of him; and when I come back, I will repay you whatever more you spend.'(36) Which of these three, do you think, was a neighbor to the man who fell into the hands of the robbers?"(37) He said, "The one who showed him mercy." Jesus said to him, "Go and do likewise."

The actions of the priest and Levite in Jesus' story were oriented

by the principle of nonmaleficence: they did not do any additional harm to the already beaten and suffering man on the side of the road. They simply passed by on the other side. The actions of the Samaritan, by contrast, were oriented by beneficence: he pursued an opportunity to be of help. The Samaritan went out of his way to provide medical services and nurse the suffering man back to health. This tells us why so many Christian hospitals are named "Good Samaritan Hospital."

Christians who vigorously support stem cell research out of a medical benefits framework are sharply critical of those who would shut it down. The number of persons now living and yet to be born whose lives could be saved or improved by regenerative medicine number in the millions, perhaps hundreds of millions. Any delays in the progress of this research could be measured in the numbers of persons who will not benefit from stem cell research. As those who operate in the embryo protection framework call supporters of stem cell research to account for the moral status of the embryo, in a similar way those who operate within the medical benefits framework call those oppose stem cell research to account for lives lost by not pursuing this research. For those who hold the medical benefits framework, to retard or prevent stem cell research from going forward, even on the basis of the ethical principle of nonmaleficence, risks "passing by on the other side." It risks failure to love one's neighbors.

### A Jewish Framework

When Jewish ethicists approach issues arising from genetic research, they most frequently find themselves working from within the medical benefits framework. The Jewish commitment to *Tikkun Olam* - the responsibility to join God in repairing and transforming a broken world - provides theological support for scientific research in general, and medical research in particular. The Jewish interpretation of the Bible includes God's mandate to the human race to engage in healing, in making this world a better place. Jewish theology presumes that God's creation is not done yet. It's still on the way. We look to the future rather than the past to discern God's will. And God's will

includes creative and redemptive activity yet to come. In short, healing and transforming are godly. The potential for medical benefits will play the decisive role in Jewish ethical thinking.

Jewish ethicist Eliot Dorf writes: "The potential of stem cell research for creating organs for transplantation and cures for diseases is, at least in theory, both awesome and hopeful. Indeed, in light of our divine mandate to seek to maintain life and health, one might even contend that from a Jewish perspective we have a *duty* to proceed with that research."(1)

If we ask questions from within the embryo protection framework, we note that the Jewish tradition does not date morally protectable personhood with conception, as does the Vatican. Rather, the question of personhood and ensoulment does not arise until quickening, thought to be at forty days. Because of this, Jewish ethicists seldom make claims from within the embryo protection framework.

**An Islamic Framework**

When we turn to Islam, we find that in America Muslims fully support human embryonic stem cell research. They oppose human reproductive cloning. Still, the majority support stem cell research when discarded embryos are used; and nearly half support the creation of embryos for research purposes. We find in Islamic capitals around the world such as Cairo and Tehran scientific institutes springing up to pursue stem cell research.

Muslim ethicists are not likely to raise issues from within the embryo protection framework nor try to block deriving stem cells. Their situation is similar to that of the Jews. In some sections of the Qur'an we find quickening dated at 40 days after conception, elsewhere ensoulment at 120 days. In neither case would this produce an equivalent to the Roman Catholic commitment to ensoulment accompanied by dignity already at conception. The blastocyst is not considered an individual person; and the use of it for stem cell

(1) Elliott N. Dorff, "Stem Cell Research-A Jewish Perspective," *The Human Embryonic Stem Cell Debate*, edited by Suzanne Holland, Karen Lebacqz, and Laurie Zoloth (Cambridge: MIT Press, 2001) 92.

research does not violate Islamic law. The Islamic Institute in Washington strongly supports transferring excess embryos from freezers into laboratories. "It is a societal obligation to perform research on these extra embryos instead of discarding them."[1]

Now, we turn to a most interesting aspect of Islamic thinking. An additional argument is being raised within Islamic circles to support donation of extra fertilized ova in IVF clinics to stem cell research. Here is why. Inheritance is extremely important in cultures influenced by Islamic tradition. Inheritance is dependent upon blood lines; so genetics is an area of science put to use in determining just who is eligible to inherit family property. Clarity in this regard is paramount.

Muslims who take advantage of reproductive technologies such as IVF worry about the excess fertilized ova in frozen storage. Might a mistake occur? Might one or more of these frozen zygotes accidentally get planted in another woman? Might there be a possibility - even if remote - that one family's genes might appear in the genome of a stranger? Could that person eventually make a claim on inheritance?

Now, such a worry can be eliminated if all frozen embryos are eliminated. Muslim families frequently offer their excess embryos for laboratory use, because this guarantees that genes with potential inheritance claims will not get out. The result is that laboratories will find a source for research materials among Muslims.

### U.S. National Academies of Sciences Guidelines

In the spring of 2005, The U.S. National Research Council of the National Academies released "Guidelines for Human Embryonic Stem Cell Research." Such guidelines reflect the mindset both of research scientists as well as the political climate. This is secular science in its most prominent form.

Yet, between the lines, one can discern the influence of religious sensibilities and theological concerns. The National Academies respond to four issues voiced in the public debate: (1) derivation of hES cells involving the destruction of the blastocyst; (2) deliberate creation of

(1) http://www.islamicinstitute.org/i3-stemcell.pdf#search-'Muslim%20Stem%20Cell'.

blstocysts for research purposes; (3) risk of exploiting women to obtain oocytes; and (4) fear of mixing human and nonhuman cells during research.(1) With these public issues in mind, the resulting guidelines affirm the use of embryos originally created for reproduction and, when not used for reproduction, discarded and donated to scientific research. What we do not see is encouragement to create new embryos specifically to harvest stem cells. Even if some scientists would deem it preferable to create new embryos for new stem cell lines, for ethical reasons discarded embryos created for other purposes are judged to be "ethical."

Even though this is a strictly secular guideline for scientific research, the voice of the Vatican can be heard whispering between the lines. This is not a criticism. I do not wish to suggest that there is anything wrong with this. Rather, my point is that what appears on the surface to be a strictly scientific or secular form of deliberation embodies, in its depth, religious substance.

**The 14 Day Rule**

Those who would like to work from within the medical benefits framework are obligated to respond to the claim of the embryo protectionists that babies are getting killed by morally calloused scientists. The question of the morally protectable dignity of the blastocyst at 4 to 6 days must be addressed with a persuasive argument that potential individual persons are not being sacrificed in the name of scientific progress.

This is where the "14 Day Rule" enters the picture. According to the 14 Day Rule, we do not have a morally protectable human individual until the early embryo adheres to the uterine wall of the mother, and this occurs between day 12 and 14. Here is the logic.

Several morally relevant biological changes occur between the embryo's $12^{th}$ and $14^{th}$ day of development. At 12 to 14 days the *in*

(1) National Research Council and Institute of Medicine of the National Academies, "Guidelines for Human Embryonic Stem Cell Research" (Washington DC: The National Academies Press, 2005) 36. or http://www.nap-edu/catalog/11278.html.

*vivo* embryo adheres to the mother's uterine wall. The primitive streak, which marks the location of the future backbone, appears; and the central nervous system first begins to develop. At this point we have an individual for the first time. Twinning can no longer occur. Prior to 14 days, some argue, the embryo cannot (strictly speaking) be treated as a morally protectable individual. All this takes place long after the stage analyzed in the stem cell debate, namely, the blastocyst stage at 4 to 6 days. The 14 Day Rule obviates reliance upon nonmalificence toward the blastocyst and opens a clear running field for beneficence toward future patients.

Curiously, the 14 Day Rule has been most forcefully articulated by a conservative Roman Catholic bioethicist, Norman M. Ford.(1) Even though Ford himself does not do the following, in principle, one could adhere to the 14 Day Rule to approve stem cell research and still hold the Vatican prohibition against abortion. This is because an abortion consists of the removal of a fetus from a woman's body; and this takes place many weeks beyond the 14th day.(2)

Permission to perform research on early embryo's prior to the 14th day was approved in the United Kingdom by the Warnock Commission. The National Academies Guidelines mentioned above, also

(1) Norman M. Ford, *The Prenatal Person: Ethics from Conception to Birth* (Oxford: Blackwell, 2002).

(2) Some developmentalists who oppose abortion as the removal of a fetus from a mother's body still support stem cell research on blastocysts which are never placed within a woman's body. The 14 day rule within the embryo protection framework provides the open window here. Fourteen day rule advocates note how gastrulation and the appearance of the primitive streak *in vivo* marks the earliest point at which one should ascribe moral status to the human embryo; because this point marks organized development and the onset of what will become sentience for an individual. Norman Ford provides a philosophical defense of the fourteen day proposal for Roman Catholic consideration in *When Did I Begin? Conception of the Human Individual in History, Philosophy and Science* (Cambridge UK: Cambridge University Press, 1991). For further analysis of the fourteen day proposal and its implications especially for Christian bioethics, see Ted Peters, *For the Love of Children: Genetic Technology and the Future of the Family* (Louisville KY: Westminster/John Knox Press, 1996) 112-116 plus the careful treatment by the National Council of Churches of Singapore, *A Christian Response to the Life Sciences* (Singapore: Genesis Books, 2002) 91-101.

recommends the 14 Day Rule for research on *ex vivo* embryos. "Research that should not be permitted at this time....Research involving *in vitro* culture of any intact human embryo, regardless of derivation method, for longer than 14 days or until formation of the primitive streak begins, whichever occurs first."(1) The California Institute for Regenerative Medicine, established by Proposition 71 in 2004, follows the same logic but draws the line at 12 days.

What is significant, is that such an ethical restriction on hES research is just a step removed from the theological argument regarding morally protectable dignity. If the theological requirement of ensoulment and dignity is that we have an individual person, then the 14 Day Rule plays it safe, so to speak. It invokes as an observation about the establishment of individuality to set its ethical guideline. Again, religious substance works just below the surface of the cultural or ethical form.

**What about Adult Stem Cells?**

Because of the prominence of the embryo protection voices, some have thought that all ethical issues would disappear if only we could avoid destroying the blastocyst. Some argue that "adult" stem cells, if fully researched, are likely to hold the same benefit as embryonic stem cells. "Adult stem cells" refer to multipotent stem cells such as those found in the blood stream or sperm. They can be derived from living persons or umbilical cords and would not involve destruction of an early embryo. This means that early embryos can be protected and human dignity honored if adult stem cells are substituted for hES cells.

Let us look a bit more closely at what science says. Ann Kiessling and Scott Anderson describe the fundamental features of adult stem cells this way: "they maintain the ability to divide throughout life and give rise to specific cell types. Blood vessel stem cells give rise to blood vessels, but cannot give rise to sperm, and spermatogonia cannot give rise to blood. Hence, the developmental potential of adult stem cells is

(1) Guidelines," 7.

restricted."[1] Adult stem cells have the potential for tissue specific regeneration. However, because they are already well down the ladder of differentiation, they do not integrate into other types of tissue and, therefore, do not have the potential that hES cells have for the goals of regenerative medicine.

For these scientific reasons, many argue that adult stem cells will not solve the ethical issues. Adult stem cells are already partially differentiated, already designated for a limited range of tissue types. They are not pluripotent. To date, no credible experiments on adult stem cells have demonstrated that their value to regenerative medicine is equal to that of embryonic stem cells. Some studies have suggested that adult stem cells from one tissue type can migrate to and integrate into other tissues. However, it has not been demonstrated that these stem cells actually become the new tissue type; that is, they do not produce daughter cells of that tissue type nor do they appear to regenerate that tissue. In order for transplanted stem cells to be valuable for regenerative medicine they need to be capable of three things: 1) they must lodge in the host tissue, 2) they must become that tissue type, and 3) they must regenerate that tissue. As of this writing, only embryonic stem cells have demonstrated all three capabilities. Most scientists recommend that adult stem cell research continue, to be sure; but they recommend that embryonic stem cell research also be continued.

Because of this, several other proposals have been made. One suggests that stem cells might be derived from "organismically dead" embryos - those that were frozen following IVF and upon being thawed fail to divide. If they are declared organismically dead, then using them does not involve killing. Others have suggested that it may be possible to remove one or two cells from the inner cell mass in order to culture stem cells. Just as one or two cells are often removed from an IVF embryo in order to check for genetic disease, this process would not destroy the blastocyst. Still others have proposed that we might use science to create an organism that is genetically engineered

(1) Ann A. Kiessling and Scott Anderson, *Human Embryonic Stem Cells* Sudbury, Massachusetts: Jones and Bartlett Publishers, 2003) 4.

so that it could not develop into a full-fledged human embryo or fetus. Or it might be possible to stimulate an egg into dividing without having fertilized it or used SCNT; thus, there is no "embryo" but only a dividing egg.(1)

Two things should be noted about these proposals. First, it should be noted that their development attests to the significance of the embryo protection framework. Each represents a way of trying to avoid the problem of killing the early blastocyst. Second it should be noted that each of these proposals raises new and difficult ethical issues. For instance, removal of one or two cells from the inner cell mass might put that blastocyst at risk for anomalies if brought to birth.

**Additional Ethical Questions**

We have identified three moral frameworks within which the public policy positions are argued: embryo protection, nature protection, and medical benefits. In principle, one could argue for or against stem cell research from within any of these frameworks. For instance, although those who stress benefits will tend to support stem cell research, some have cautioned that the benefits are still theoretical and therefore should not count as strongly as others count them. Most who stress embryo protection will oppose stem cell research, but some have argued that even within a framework that finds the embryo 'fully human' from the very beginning, it is possible to argue for stem cell research.

Those whose primary ethical concern is the violation of something 'essential' to human nature can also disagree about what that 'essential' quality is: is it preserving the link between biology and reproduction, or preserving the sense of service to others or of the common good? Christians who differ on these issues can take different stances on stem cells even within the same framework. However, it is true that in general in the current debate the strongest opposition

(1) These proposals are discussed in a "white paper" of the President's Council on Bioethics published in May 2005 and entitled "Alternative Sources of Human Pluripotent Stem Cells."

comes from those operating out of the first two frameworks, and the strongest support from the third. It is important to note, however, that Christian voices can be heard in all three. Embryo protection is not the only "Christian" way of framing the issues at hand.

While they have not been given the same public attention, a number of additional ethical questions have arisen within the stem cell debate. First, there are justice questions. Because genetic research is very expensive and today's investors expect to reap tomorrow's profits, how will costs and expectations affect distribution of benefits? Will people living in the poorer nations of our world benefit? Or will only citizens of the wealthier nations gain in health and longevity? What might be done to make expensive genetic therapies universally available?

These justice questions lead to a second concern. What might be the impact of stem cell research on women? All stem cell and cloning research requires human eggs. Women have to supply them. Will the hyper ovulation necessary to obtain eggs in sufficient quantities threaten the health of the younger women who provide them? Should researchers pay women for eggs? Will such payment provide opportunities for poorer women to increase their income? Will we end up with a form of economic exploitation within the research industry? No accusations are being made here. Rather, ethicists need to pursue such justice questions.

Third, the public discussion to date seems to presume that the source of embryonic stem cells is spare or unused zygotes previously produced by *in vitro* fertilization in clinics. It has tended to ignore the creation of new embryos either through *ex vivo* fertilization or somatic cell nuclear transfer (SCNT). Of the four original stem cell lines of 1998, three used spare IVF embryos; but one was freshly derived. What this means is that the ethical discussion must confront directly the question not only of destruction of "embryos" but also of their deliberate creation for research purposes. The absence of discussion of this option is due to the influence of voices from within the first moral framework.

## Conclusion

Tillich's aphorism - culture is the form of religion and religion the substance of culture - seems to illuminate the public policy debate over stem cell ethics. Ethical deliberation, even when contentious, gives voice to underlying cultural assumptions and cherished values. Religious voices such as that of the Vatican or of bioethicists bring to articulation our substrate of ontological assumptions and commitments. In the case of stem cell ethics, the historical religions provide spokespersons who can interpret what these specific traditions bring to the public policy debate. When eventide begins to settle in the public square, secular watchdogs try to herd scientific researchers into ethical corrals. Those ethical corrals are surrounded by religious fences.

Again, this is not a criticism. Rather, it is an attempt to describe our present situation. The flood of globewide discussion over stem cell ethics is fed by streams from the various historical religious traditions. These flow into the larger pool of secularized ethical debates and resulting guidelines which will be directing the next phase of laboratory research.

# TEST-TUBE BABIES

*Dr. David Bleich*
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# Test-Tube Babies

***Dr. David Bleich***
U.S.A.

With the birth of Louise Brown in the obscure mill town of Oldham in England's northwest region, science fiction of yesteryear became the reality of today. The legend of Faust and Homunculus, the little manlike creature created in a vial, has now become reality through successful development of *in vitro* fertilization.

Under normal circumstances pregnancy occurs when an ovum, an egg cell which has been released by the ovary during ovulation, is fertilized by the sperm of the male as it passes through the fallopian tube. Conception takes place when the ovum is penetrated by a single sperm from among the literally millions of sperm contained in the ejaculate deposited in the vagina. This occurs only when the sperm, after having successfully traversed the uterus, finds its way into the fallopian tube and succeeds in making contact with the ovum. Thereupon, the fertilized egg undergoes a number of cell divisions and subsequently descends into the uterus, where it becomes implanted in the uterine wall.

A significant percentage of infertility problems are the result of a disorder of the fallopian tubes. When the fallopian tubes are blocked or missing it is impossible for the sperm and ovum to make contact. The newly developed technique enables conception to occur outside the fallopian tubes. The procedure involves surgically removing the mature ovum from the ovary, placing it in a petri dish in an appropriate culture medium and adding the male sperm to the solution. The fertilized ovum is allowed to incubate in order to undergo the cell divisions which in normal pregnancy occur in the fallopian tube, and is then introduced into the uterus through the cervical os by means of a pipette. The fetus continues to develop in the uterus in an apparently normal manner. The identical technique may also be utilized to overcome moderate male infertility due to a

low sperm count. A single ejaculate of an average fertile male contains as many as 150 million sperm. Even though conception results from the meeting of the ovum and a single sperm, vast numbers of sperm are destroyed or rendered impotent in the process of traversing the female genital tract. Hence, males whose ejaculate contains a significantly diminished number of sperm experience difficulty in fathering children. *In vitro* fertilization would overcome this difficulty. Since the sperm are placed directly in a petri dish together with the ovum, fertilization is likely to occur even in the presence of only a small number of sperm.

As might have been anticipated, perfection of *in vitro* fertilization has given rise to a host of moral, theological, and halakhic questions. Addressing the annual *Torah she-be-'al Peh* convocation in Israel, the Sephardic Chief Rabbi, Rabbi Ovadiah Yosef, gave his qualified approval to this procedure (*JTA Daily News Bulletin*, August 16, 1978). The Ashkenazic Chief Rabbi, Rabbi Shlomoh Goren, is reported to view conception by such means as morally repugnant, although halakhically unobjectionable (*JTA Daily News Bulletin*, July 28, 1978; *Be-Olam ha-Rabbanut*, no.1, Av 5738, p.1). We shall here endeavor to delineate the specific questions involved and to show how those questions may be resolved in light of earlier precedents in Jewish law.

*In vitro* fertilization has been condemned by some Catholic theologians on the grounds that such interference is not morally acceptable because it is a violation of natural law. This is precisely the same consideration which forms the basis of the Church's opposition to contraception and artificial insemination. This argument is, however, alien to Judaism. Since Judaism does not posit a doctrine of natural law as such, these practices, according to Jewish teaching, must be examined solely in light of possible infraction of biblical proscriptions. In the absence of a specific prohibition, man is free to utilize scientific knowledge in order to overcome impediments of nature.

The first question which must be examined is the moral legitimacy of research involving fetal experimentation. The birth of a test-tube

baby could not, at the time, have taken place in the United States. All such research was abruptly terminated in 1975, when the Department of Health, Education and Welfare was barred from funding *in vitro* fertilization experiments in the absence of prior approval of a national ethics advisory board. Such a board was not constituted until January 1978. The Department of Health, Education and Welfare subsequently approved experimentation of this nature. The crucial issue is that of increased risk of chromosomal abnormalities leading to physical and mental defects when the ovum is fertilized outside the body. It is entirely possible that some aspect of the experimental technique may cause genetic damage. Moreover, it is estimated that as many as one half of all pregnancies are spontaneously terminated by the time of implantation. The mechanism responsible for this phenomenon is not fully known, but there is reason to believe that in many instances this is nature's method of providentially preventing the development of a deformed fetus. Artificial maintenance of the zygote outside the body during this early stage of gestation many prevent the natural elimination of a deformed fetus.

The ethical implications of experimentation which may result in the birth of a defective fetus have been analyzed by a leading bioethicist, Professor Paul Ramsey of Princeton University.[1] Professor Ramsey argues that *in vitro* fertilization followed by implantation is an immoral experiment upon a possible future life since no researcher can exclude the possibility that he will do irreparable damage to the child-to-be: "We ought not to choose for another the hazards he must bear, while choosing at the same time to give him life in which to bear them and to suffer our chosen experimentations."

This argument, insofar as it applies to artificial conception, is entirely consistent with the norms of Torah ethics. Jewish law does not sanction abortion motivated solely by a desire to eliminate a defective fetus, nor does it sanction sterile marriage as a means of preventing transmission of hereditary disorders. However, it does discourage marriages which would lead to the conception of such children. The Gemara, *Yevamot* 64b, declares that a man should not marry into an epileptic or leprous family, i.e., a family in which three members have

suffered from these diseases. This ruling is obviously a eugenic measure designed to prevent the birth of defective children. It follows, *a fortiori*, that overt intervention in natural processes which might cause defects in the fetus would be viewed with opprobrium by Judaism.

Despite the happy initial success in the case of the Brown infant, it will require the birth and maturation through adolescence and into adulthood of a significant number of healthy and normal test-tube babies before the technique may be viewed as morally acceptable. When, and if, it has in fact been demonstrated that the procedure poses no risk to the fetus there can be no objection to the utilization of this technique on the basis of the fact that the original experimentation was morally unconscionable. As observed by Dr. Daniel Callahan, "The history of medicine is full of instances where things were done unethically but led to benefits for people."[2] An obvious example, from the perspective of Jewish law, is that of post-mortem examinations which were halakhically unwarranted at the time of their performance but which have led to acquisition of potentially life-saving information. Jewish ethics knows of no *Miranda* principle which would bar the use after the fact of information obtained by illicit means.

It should also be stressed that, even in the absence of moral or halakhic objections, no woman is required to submit to *in vitro* fertilization. The obligations of women, whether by reason of the scriptural exhortation to populate the universe, "He created it not a waste, He formed it to be inhabited" (Isaiah 45:18), or by virtue of marital contract, are limited to bearing children by means of natural intercourse. In a different context, Rabbi Moshe Feinstein, *Iggrot Mosheh, Even ha-Ezer*, III, no.12, expresses the view that a woman, while bound to assume the pain usually associated with normal childbirth, is under no obligation to conceive when faced with the likelihood of unusual and extraordinary pain. Furthermore, it appears to this writer that the comments of *Tosafot*, *Yevamot* 70a and *Pesachim* 28b, establish - the principle that one need not assume the pain and risk of a surgical procedure for purposes of fulfilling even an obligatory *mitzvah*.[3] The husband's obligations with regard to pro-

creation under such circumstances are discussed by the *Shulchan Arukh, Even ha-Ezer* 154:10-11, and commentaries thereon.

The means employed in procuring sperm for purposes of *in vitro* fertilization do, however, pose a halakhic problem. Jewish law forbids ejaculation other than within the context of intercourse as *hotza'at zera le-vatalah* - destruction of the seed. The question is whether or not semen procurement designed to promote procreation is deemed to be *le-vatalah*. The identical question has been raised in the past, both with regard to semen testing in cases of suspected male infertility and in connection with artificial insemination utilizing the semen of the husband. As has been noted earlier, this question is analyzed in detail by many halakhic authorities.(4)

Removal of semen from the vaginal tract following normal coitus for *in vitro* fertilization would appear to be regarded by most authorities as the optimal method. Although some authorities forbid emission of semen for subsequent insemination other than in the course of coitus, others sanction this practice but disagree with regard to the means of procurement. Some authorities advise that semen be obtained by means of coitus interruptus. Others sanction the use of a condom as well. The permissibility of masturbation for this purpose is a matter of dispute. Such procedures can, of course, be sanctioned only if the sperm of the husband is used exclusively. Under no circumstances should the sperm of any person other than the husband be utilized. Proper safeguards must be established in order to assure that this should not occur even unwittingly.

There are of course a host of other questions which present themselves: Does the husband fulfill his obligation with regard to procreation by means of *in vitro* fertilization? Does a filial relationship exist between the father and a child born in this manner? Does the child enjoy the status of the father as a Kohen or Levite? Is the child considered to be an heir to his father's estate? These questions have been analyzed with regard to children born of artificial insemination and such discussions appear to be equally germane to the case of children born as a result of *in vitro* fertilization. In any event, the

resolution of these questions has no bearing upon the permissibility of *in vitro* fertilization.

It should be noted that one aspect of the *in vitro* procedure - as reportedly performed - does present particular cause for concern. The human female is endowed at birth with as many as a million or more ova. These egg cells mature, ripen, and are normally released between puberty and menopause at the rate of approximately one a month. It is reported that, in order to enhance the chances of success of *in vitro* fertilization without resorting to repeated surgical removal of mature ova, hormones are administered in order to hasten maturation of the egg cells, so that multiple ova may be removed at one time. All ova removed in this manner are exposed to the male sperm. This permits the fertilization of more than a single ovum. The fertilized ova are then examined and carefully monitored for any sign of chromosomal abnormality. Finally, a single blastocyst is selected for implantation and the remainder are destroyed.

The procedure, when carried out in this manner, poses the question of the permissibility of destroying a developing embryo. Many halakhic authorities have ruled that the prohibition against feticide is operative immediately following conception, while others maintain that no prohibition exists within the first forty days of gestation. In the case of *in vitro* fertilization the entire question may, of course, readily be sidestepped by limiting the procedure to the fertilization of a single ovum.

Development and perfection of *in vitro* techniques may, in time, make it possible to select not only the sex but also other genetic characteristics, such as the color of the bay's eyes, IQ, adult height, etc. Indeed, given the almost infinite number of ova and sperm available and the rapid advances now being made in the field of genetics, it is not at all inconceivable that genetic characteristics may be ordered to conform with virtually any parental preference or whim. The moral, genetic, and societal implications of such practices are truly awesome. Nevertheless, the distinction between capricious genetic manipulation and *in vitro* fertilization which stimulates natural pro-

creation and is designed solely to alleviate infertility due to abnormality of the fallopian tubes should be readily apparent.

If properly safeguarded, *in vitro* fertilization may, in time, prove to be a highly beneficial development. Certainly, indiscriminate tampering with nature is dangerous and immoral. Utmost vigilance must be maintained lest we fashion a Huxley-type world in which eugenic selection becomes the norm. Yet, if properly controlled and not permitted to become a substitute for normal human procreation, this revolutionary technique can be a welcome means of bestowing the happiness and fulfillment of parenthood upon otherwise childless couples.

**NOTES**

1 - "Shall We 'Reproduce'?" *Journal of the American Medical Association*, vol.220, no.10 (June 5, 1972), pp.1346-1350, and vol.220, no.11 (June 12, 1972), pp.1480-1485; and *The Ethics of Fetal Research* (Yale University Press, 1975).

2 - *New York Times*, July 27, 1978. p. A 16, col.3.

3 - Cf., however, Rashba and Me'iri, Yevamot 7 lb

4 - See above, chapter 15, note 1. Cf., however, R. Moshe Sternbuch, *Be-Shivilei ha-Refu'ah*, no.8 (Kislev 5747), p.30, who asserts that the considerations serving to permit A.I.H. do not apply to *in vitro* fertilization.

## Host-Mothers

Any parent who has at one time or another been exposed by his children to the captivating Dr. Seuss fantasy, *Horton Hatches the Egg*, will recall the dilemma around which that tale centers: to whom does the offspring rightfully belong, to the irresponsible mother who abandoned it or to the faithful elephant who guarded and protected the egg over a span of months? The fictional solution may be both too facile - and too equitable - for real life. Preposterous and far-fetched as the situation may appear to be, the problems it poses may be upon us before long. We find ourselves in an age in which the science fiction of yesterday is rapidly becoming the reality of today; the hypothetical

curiosity of today may well become the commonplace of tomorrow. These unfolding realia often carry in their wake hitherto unexamined moral and religious questions. Perhaps in no area is this more evident than in the filed of embryology. Science has made it possible to remove an ovum from the uterus of a woman who is herself unable to sustain a pregnancy to term, to fertilize the ovum in a petri dish and to implant the nascent embryo in the uterus of another woman. The embryo then remains in the womb of the "host-mother" throughout the period of gestation until birth.

Rabbi Immanuel Jakobovits, Chief Rabbi of Great Britain, aptly characterizes such practices as offensive to moral sensitivities when resorted to as a convenience in order to avoid the encumbrances of pregnancy. Certainly, all will agree that "to use another person as an 'incubator' and then take from her the child she carried and delivered for a fee is a revolting degradation of maternity and an affront to human dignity."

Convenience is, however, not the only conceivable motive which may prompt a procedure of this nature. Medical factors may well make it impossible for the natural mother to carry her baby to term. Would Halakhah sanction the use of a "host-mother" for the purpose of saving the fetus? If such a procedure is performed, with or without halakhic sanction, who is regarded as the mother in the eyes of Halakhah: the natural mother or the host-mother?

As yet, very little has been written on this subject, although a related question has received some attention in rabbinic literature[1]. Maternal identity became an issue in a case in which the ovary of a fertile woman was transplanted into the body of a previously barren woman in an attempt to enable her to become pregnant and bear children. Which of the two women is to be considered the mother of the child in the eyes of Jewish law? Cases involving a donor who is a married woman pose yet another question. Is the husband of the woman receiving the ovarian transplant thereafter permitted to engage in intercourse with his wife? Is the husband who has sexual relations with a wife carrying a transplanted reproductive organ of another married woman guilty of adultery? The latter question can be

dismissed since the source of specific organs has no bearing upon the halakhic definition of adultery.

Furthermore, a transplanted organ is deemed to have become an integral part of the body of the recipient. For this reason, the recipient of an ovarian transplant must also be considered the mother of any child subsequently conceived. Since it is the mother who nurtures and sustains the embryo, it is the female parent alone who determines the species of the offspring. Accordingly, it is the identity of the mother which is transferred to members of an interspecies. Thus progeny born of interbreeding are member of the same species as the mother. There is, however, a conflicting talmudic opinion which asserts that "the father's seed is to be considered" (*Chullin* 79a). Even proponents of this latter view will concede that with regard to ovarian transplants the identity of the donor need not be considered in establishing maternity. "The father's seed is to be considered" because the father plays a dynamic role in the birth of the offspring. The ovary along is an inert organ and incapable of reproduction were it not for the physiological contributions of the recipient.

To a significant degree, the identical argumentation may be applied in determining the maternity of a child born of a fertilized ovum implanted in the womb of a host-mother. It is the host-mother who nurtures the embryo and sustains gestation. However, the role of the natural mother in determination of identity is a dynamic one and analogous to that of "the seed of the father." It may therefore be argued that, according to those who assert with reference to classification of hybrids that "the seed of the father is to be considered," in the case of an already fertilized ovum, the maternal relationship between the child and donor mother is to be "considered" no less than "the seed of the father." Consideration must also be given to the possibility that perhaps two maternal relationships may exist simultaneously just as maternal and paternal relationships exist at one and the same time. The child would then, in effect, have two "mothers," the donor mother and the host-mother.

According to some authorities, however, the donor mother alone may be viewed as the mother in the eyes of Jewish law. There are

those who maintain that the prohibition against feticide is applicable from the moment of conception and deem the fetus to be a nascent human being even in the earliest stages of gestation. According to this view, the zygote may perhaps be viewed as having already acquired identity and parentage.

The discussion thus far applies only to the transplantation of a fertilized ovum removed shortly after conception. Transplantation of an embryo in later stages of development presents a rather different question. The present discussion is based upon fragmentary sources and is but one aspect of a topic whose many ramifications have yet to be examined.[2] There is indeed a great need for such examination and analysis for the transformations which may soon be wrought by scientific advances in this field touch upon the very foundations of the sanctity of the family.

NOTES

1 - R. Yekutiel Aryeh Kamelhar, *Ha-Talmud u-Mada'ei ha-Tevel*, PP.44-45.

2 - See the recently published article by R. Moshe Hirschler, in his *Halakhah u-Refu'ah* (Jerusalem, 5740), pp. 307-320.

## Genetic Screening

There exist a host of diseases and congenital abnormalities which are the result of genetic causes. Medical science has discovered ways of identifying persons who may potentially become parents of offspring affected in this way. It is also possible to determine during the course of pregnancy whether or not a fetus is afflicted with certain abnormalities by means of a test known as amniocentesis.

The genetic disorder most common among Jews is Tay-Sachs disease. Tay-Sachs disease is a fatal, inherited condition. A child afflicted with this disorder appears normal at birth and may develop normally until five or six months of age. At that point normal development of the nervous system ceases. Over the next few months the infant gradually loses the ability to sit and in time becomes unable to hold up his head. As physical deterioration progresses, the child

becomes blind, becomes subject to frequent convulsive seizures, loses the ability to swallow food and its limbs become stiff. Death usually occurs in the third or fourth year of life.

Tay-Sachs disease is caused by a genetic mutation. The disease appears only in a child who has inherited a pair of genes both of which are defective. One of the pair is inherited from the mother; the other from the father. The parents, each of whom is the carrier of a defective gene which may be transmitted to his or her offspring, are themselves perfectly normal both physically and mentally.

Diseases resulting from genetic mutation are often limited to specific ethnic groups. Tay-Sachs is such a disease and is prevalent among children of Ashkenazic Jews. On the other hand, phenylketonuria, a defective gene common among white gentiles, is very rare among Jews. Similarly, sickle-cell anemia is prevalent among Negroes. The carrier-rate of Tay-Sachs disease among Jews of Central and East European ancestry is believed to be about one person in thirty. Since both parents must be carriers for the child to be affected, it may be assumed that statistically one in nine hundred Jewish couples may have a Tay-Sachs child. Should two such people marry and have children, the risk that they will have an infant afflicted with Tay-Sachs disease is one in four with each pregnancy. This is so because each normal parent possesses two genes, one of which is normal, the other defective. The child inherits only one of these genes, giving him a fifty percent chance of inheriting the abnormal gene from each of his parents. If a defective gene is inherited from one parent but a normal gene from the other, the child will be normal. The statistical probability of his inheriting two defective genes, one from each parent, is ½ X ½, which equals ¼. Since one individual in thirty is a carrier, one in 3600 babies (1/30 X 1/30 X ¼) will be a victim of Tay-Sachs disease. In the non-Jewish population only one individual in 300 is a carrier. Hence, statistically, only one marriage in 90,000 is between two carriers, and only one baby in 360,000 is a victim of Tay-Sachs disease. A similar pattern applies with regard to other congenital disorders produced by a recessive gene.

During the past several years, medical centers in a number of cities

have initiated large-scale campaigns in a massive attempt to eliminate the disease. A carrier can be identified by means of a simple blood test. The enzyme responsible for the condition normally leaks from cells into the circulating plasma. The absence of this enzyme in the plasma indicates that the individual is a carrier. The absence of the enzyme can also be detected in cells shed from the skin of the fetus into the amniotic fluid. It is thus possible to make a diagnosis of an affected fetus *in utero* by means of amniocentesis, which involves tapping the amniotic fluid in the uterus and examination of fetal cells.

Physicians now urgently recommend that rabbis refer prospective brides and grooms to a local testing center so that a blood test may be performed in order to identify carriers of Tay-Sachs disease. As a result of the test the following recommendations are made by the medical personnel involved:

1 - If the screening test for the carrier state is positive in only one member of the couple no danger exists with regard to the offspring of that marriage. Such individuals are counseled with regard to the significance of the mutation and are urged to have their own offspring tested for future reference and counseling.

2 - If both members of the couple are carriers:

   a - They are warned that the risks of bearing a Tay-Sachs child are one in four with each pregnancy.

   b - They are counseled with regard to the alternatives to having their own natural children.

   c - They are admonished that should they proceed to have their own children, fetal monitoring should be undertaken. If a Tay-Sachs fetus is identified, the common medical practice is to recommend an abortion.

The elimination of Tay-Sachs and other genetic diseases is, of course, a goal to which all concerned individuals subscribe. However, the means by which this desideratum is to be attained must be examined carefully because of the halakhic questions involved.

Of serious concern is the advice not to have children when both

prospective parents are identified as carriers of a genetic disease. This is one of the options routinely suggested by genetic counselors.

The obligation with regard to procreation is not suspended simply because of the statistical probability that some children of the union may be deformed or abnormal. While the couple may quite properly be counseled with regard to the risks of having a Tay-Sachs child, it should be stressed that failure to bear natural children is not a halakhically viable alternative.[1] As has been indicated earlier, artificial insemination using donor semen is not an acceptable solution.

Of at least equal, if not graver, concern is the proposal that fetal monitoring be performed with a view toward termination of the pregnancy if the fetus be identified as a victim of Tay-Sachs disease.

The fear that a child may be born physically malformed or mentally deficient does not in itself justify recourse to abortion. The consensus of opinion among contemporary rabbinic authorities is that abortion, particularly after the fortieth day of gestation, is permissible only if continuation of pregnancy constitutes a threat to the life of the mother. In situations in which amniocentesis is performed for purposes of diagnosing a condition for which a medical remedy is available, e.g., blood-group incompatibility which can be treated by exchange transfusion, the physician is not only permitted but is obligated to perform the amniocentesis, even repeatedly. However, amniocentesis carried out solely for the purpose of diagnosing severe genetic defects such as Tay-Sachs disease serves no therapeutic purpose. Since the sole available medical remedy following diagnosis of severe genetic defects is abortion of the fetus, which is not sanctioned by Halakhah in such instances,[2] amniocentesis, under these conditions, does not serve as an aid in treatment of the patient and is not halakhically permissible. Initiation of this procedure in the absence of a therapeutic goal poses a pointless medical risk to both mother and fetus and also constitutes an act of *chavalah* - an unwarranted assault upon the mother.[3]

Blood-testing programs as a screening method for the identification of carriers of Tay-Sachs disease before marriage pose no halakhic problem. In fact, one prominent contemporary authority urges such testing prior to marriage.[4] It must be emphasized, however, that when

Tay-Sachs screening is carried out before marriage and both prospective bride and groom have been identified as Tay-Sachs carriers they must be counseled that Judaism does not sanction a sterile union.

Certainly, marriages which are likely to lead to the birth of defective children should not be encouraged. In what is historically perhaps the oldest recorded item of genetic counseling, the Talmud counsels that a man should not marry into a family of lepers or epileptics. Yet, once such a marriage has been contracted, the obligation to "be fruitful and multiply" is in no way mitigated. Indeed, the commandment with regard to procreation is fulfilled even if the only children born of the union are mentally or physically defective, so long as they, in turn, become parents.[5]

The Talmud emphasizes that fear of undesirable traits in progeny, even when such fears are firmly grounded, does not constitute legitimate grounds for abstention from procreation. The Talmud relates that it was revealed to King Hezekiah by means of the "holy spirit" that his children would be morally deficient. He therefore chose not to marry. The prophet Isaiah was sent to him with the message, "Thus said the Lord, set your house in order, for you shall die and not live." The Talmud interprets this verse as meaning, "You shall die in this world and not live in the World-to-Come," indicating that this severe punishment was to be meted out because Hezekiah made no attempt to sire children. In response to Hezekiah's protestation that he was prompted to refrain from becoming a father because of his realization that his children would not be virtuous, Isaiah retorts, "What have you to do with the secrets of the All-Merciful? That which you were commanded you should have done, and that which is pleasing to the Holy One, blessed be He, let Him do!"[6] Man is obliged to fulfill the divinely imposed obligation to "be fruitful and multiply"; all else in the hands of God.

To this may be added an interesting historical footnote. The risk of a serious genetic defect in cases in which both parents are afflicted with congenital syphilis is very great. Should such a couple actually become parents of a child afflicted with congenital blindness and who, in addition, survives for only ten days, one could readily sympathize

with their reluctance to attempt another pregnancy or even with their decision to abort the fetus should pregnancy occur. But, as one writer recently pointed out, had one such couple acted in this way, Beethoven would never have been born![7]

The emotional distress which an engaged couple are bound to experience upon discovering that they are both carriers is certainly a factor auguring for earlier identification of the carrier state. Sensitivity to the dictates of Halakhah, which precludes both abortion and a sterile union, would indicate that the most propitious time for such screening is child hood or early adolescence. Early awareness of a carrier state, particularly when determination can be made on a mass scale, would contribute greatly to alleviating the gravity of the situation.

It has been argued that genetic screening among adolescents should be discouraged because it would generate psychological stress among those identified as carriers. Whether or not such stress need be feared is a matter of some debate.[8] It is, however, incontrovertible that there is no objective basis for any such psychological trauma. The carrier state for any genetic disorder in no way compromises the health of the carrier. The carrier is a perfectly normal human being in every respect. In fact, there is some evidence that carriers are at an advantage insofar as resistance to tuberculosis is concerned, and there may also exist a correlation between the carrier state and superior intelligence. The carrier's sole concern is the choice of a marriage partner. If the carrier's spouse is not a carrier as well, there is no possibility of bearing Tay-Sachs children. If the significance of these facts is properly understood, there is no reason for trauma to occur. Public education campaigns can do much to cause this to be fully appreciated within the Jewish community.

There should certainly be no question of stigmatization of individuals identified as carriers. Carriers are themselves in no way afflicted, and there is no rational basis for a non-carrier to consider a carrier to be undesirable as a marriage partner. It cannot be overemphasized that a medical problem exists only in a marriage in which both partners are Tay-Sachs carriers. Since Tay-Sachs is a genetically

recessive abnormality there is no possibility whatsoever that a child may suffer from hereditary Tay-Sachs disease if only one of his parents is a carrier. Children born of a union between a carrier and a non-carrier are at risk only of themselves being carriers. Since a Tay-Sachs carrier is in no way less healthy than a non-carrier such a child suffers no disadvantage save the advisability of exercising prudence in determining that his or her marriage partner is a non-carrier. Thus, there is absolutely no reason for any stigma to be associated with the carrier state.

## NOTES

1 - *Iggrot Mosheh, Even ha-Ezer*, no.62. See also *Teshuvot Levushei Mordekhai*, IV, no.68; *Teshuvot Afarkata de-Anya*, no.169; and *Teshuvot Minchat Yitzchak*, III, no.26, sec. 1.

2 - Cf. J. David Bleich, *Contemporary Halakhic Problems* (New York, 1977), pp.112-115. The dissenting view there examined has been emphatically rejected by R. Moshe Feinstein, *Ha-Pardes*, Nisan 5738; see J. David Bleich, "Abortion in Halakhic Literature," *Jewish Bioethics*, ed. Fred Rosner and J. David Bleich (New York, 1979), p. 161, and p.175, note 97.

3 - For the results of a recent study of the adverse effects of amniocentesis, see "An Assessment of he Hazards of Amniocentesis: Report to the Medical Research Council by Their Working Party on Amniocentesis," *British Journal of Obstetrics and Gynaecology*, vol.LXXXV (1978), Supplement, no.2. In this study, increased fetal loss attributable to amniocentesis was found to be between 1.0 and 1.5 percent, and a similar increase in certain major types of infant morbidity was found to be between 1.0 and 1.5 percent. The total adverse effects in terms of combined fetal mortality and infant morbidity is estimated as being between 2 and 3 percent.

4 - Rabbi Moshe Feinstein, unpublished letter dated 18 Adar 5733.

5 - See *Teshuvot Maharil*, no.223; also cited in *Bet Yosef, Even ha-Ezer* 1.

6 - *Berakhot* 10a.

7 - Maurice Baring, quoted by David Daube, *Medical and Genetic Ethics*, pamphlet published by the Oxford Centre for Postgraduate Hebrew Studies (Oxford, 1976), p.8, note 1.

8 - Possible psychological consequences of carrier identification are discussed by E. Beck, S. Blaichman, and C. R. Seriver, "Advocacy and Compliance in Genetic Screening," *New England Journal of Medicine* 291:1166-1170, 1974; M. M. Kaback, R.S. Zeiger, L. W. Reynolds, et al., "Tay-Sachs Disease: A Model for the Control of Recessive Genetic Disorders," *Proceedings of the Fourth International Conference*, Vienna, Austria, Sept. 2-8, 1973, and *Excerpta Medica*, 1974, pp.248-262; M. D. Kuhr, "Doubtful Benefits of Tay-Sachs Screening," *New England Journal of Medicine* 292:371, 1975; and by L. Schneck, A. Saifer, and B. W. Volk, "Benefits of Tay-Sachs Screening," *New England Journal of Medicine* 292:758, 1975.

## Sex Preselection

The medical technology necessary to assure that a baby of a specific gender will be born is already available and is continually being improved. Should such procedures become widespread, the likelihood is that there will be a marked increase in male over female births. A yearning for male babies by prospective parents appears to be manifest in virtually every culture. This is true not only of prospective fathers but of prospective mothers as well. Several studies have revealed that at least two-thirds of all American women express a preference for sons rather than daughters[1]. This desire is even more pronounced among couples planning to have one child.

The desire to choose the gender of anticipated progeny is certainly a recognizable phenomenon in Jewish culture. "The world cannot exist without males or without females. Happy is he whose children are males and woe unto him whose children are females," declares the Gemara, *Kiddushin* 82b. Whether this dictum reflects a sense of male superiority or simply a pragmatic concern based upon the need to amass a dowry for a daughter, as was the custom in days gone by, is of little importance insofar as the present discussion is concerned. But

it should be noted that the halakhic stipulation that a man sire both a son and a daughter in order to conform with the biblical mandate "Be fruitful and multiply" was always sufficient reason for a daughterless father to wish for at least one female child. Clearly, while in the Jewish tradition children of either sex were welcomed as a gift from God, the desire for a child of specific gender was freely expressed without censure.

Even in talmudic times, the desire for children of a particular sex was not simply a subject for wishful thinking. In at least three separate instances the Talmud offers specific advice designed to increase the probability of a male birth. "One who wishes his children to be male and masters of the Torah should examine his actions and woo his wife at the time of intercourse," is the advice of Tractate *Kallah*. Somewhat different advice is offered by the Gemara in *Baba Batra* 10b: "What should a person do so that his children will be males? R. Eliezer says, 'He should gladden his wife prior to intercourse.' Advice of a similar nature is recorded in *Niddah* 70b-71a in the name of R. Joshua ben Chananiah.[2]

The primary halakhic concern is not with regard to the decision to engage in sex preselection but with the method to be employed in effecting sex determination. The methods to which reference is made in rabbinic literature are hardly the ones recommended by contemporary physicians. In terms of current medical practice the most reliable means of sex preselection is to monitor the fetus by means of amniocentesis or by use of other newly developed noninvasive methods which reveal the sex of the fetus through analysis of the fluid emitted through the cervix. If it is determined that the fetus is not the desired sex it can then be aborted. It must, however, be emphasized that Jewish teaching unequivocally rejects the option of terminating a pregnancy simply because the fetus is not of the desired sex. Judaism rejects the view that the decision to carry a baby to term or not to do so is a private matter between a woman and her physician. Indeed, Judaism teaches that man lacks proprietary rights with regard to his own body. There is indeed some disagreement with regard to the

grounds which would justify an abortion, but no authority would accept sex determination as legitimate cause for an abortion.

Another, less radical, method of sex preselection currently employed involves separation of the androsperm (for males) from the gynosperm (for females). This method presents a different type of problem. The procedure which is utilized for this purpose is essentially the same as the method used for procurement of sperm for purposes of A.I.H. (artificial insemination utilizing the husband's semen). The latter procedure is utilized in order to enable a husband suffering from moderate male infertility to sire children. From the perspective of Jewish law the problem is similar to that of masturbation and onanism. Judaism teaches that the male seed may not be wantonly destroyed. To be sure, the vast majority of rabbinic decisors sanction A.I.H. in order to overcome male infertility provided that proper safeguards are employed against substitution or admixture of the sperm of another male. Any disagreement which exists with regard to A.I.H. is with regard to the proper method to be utilized in the procurement of sperm. The rationale upon which A.I.H. is sanctioned is, however, predicated upon the consideration that such an undertaking is designed to fulfill the commandment "Be fruitful and multiply" and is not at all a form of "wasting" the seed.[3] It must be remembered that in A.I.H. procedures several ejaculations are combined for insemination. The entire ejaculate is deposited in the vagina and no portion of the semen is destroyed. Separation of androsperm from gynosperm is undertaken solely in order to enable insemination with one of the two, but not with both. Thus the procedure, to be effective, must result in the destruction of either the male-producing or the female-producing sperm. Hence, an attempt to determine sex in this manner would be a violation of Jewish law.

A third technique limits intercourse to the period prior, and immediately subsequent, to ovulation. There is some evidence that intercourse during this part of the monthly cycle is more likely to result in a male birth. During this period the ovum is located deep within the genital tract. The length of the migratory path and the extent of the secretions to be traversed are therefore greater. Since

male-producing spermatozoa are greater in number and are smaller and hence migrate at a greater speed the statistical probability of male-producing spermatozoum fertilizing the ovum is greater. From the perspective of Jewish law, timing of intercourse is an unobjectionable technique, provided that the wife is willing to forego her claim to conjugal gratification during other periods of the month. In light of the restrictions imposed by the laws of *niddah* this would mean restricting intercourse to one or perhaps two days in the monthly cycle. The likelihood of conceiving a male fetus is enhanced during a four to six-day period prior to ovulation and for a two-day period following ovulation. Restrictions based upon laws of separation during and after the menstrual period effectively bar cohabitation prior to ovulation and usually for a day or so after ovulation as well. It is therefore doubtful that this method would lead to more than a marginal increase in the probability of a male birth

Assuming that a halakhically non-objectionable technique could be found, there is nevertheless nothing in Jewish law which would *require* a couple to seek to produce a child of either sex. Whatever the operative cultural factors may be, there is certainly no halakhic bias in favor of male children. It is true that the commandment "Be fruitful and multiply" is fulfilled only upon the birth of both a male and a female child. However, a couple who are the parents of any number of children of one sex are under no obligation to utilize any artificial method in order to increase the chance of the birth of a child of the other sex. This is so by virtue of the nature of the *mitzvah* of procreation. The Sages, *Shabbat* 31a, declared that on the day of judgement a person will be asked "Did you engage in procreation?" Note, the individual will not be asked, "Have you sired children?" He will be asked, "*Asakta be-piryah ve-rivyah* - Did you engage in the acts which lead to the birth of children?" This is only logical. Birth is a natural event, an act of God. It does not require a human act, certainly not on the part of the male to whom the *mitzvah* is specifically directed. How, then, can God command a deed which it is not in the power of man to perform? The answer can only be that birth itself is not a *mitzvah*; the *mitzvah* is the act of cohabitation. It is

the sexual act which is within the domain of man; what occurs subsequently is in the hands of providence. The birth of a son and a daughter is simply the point at which there is no longer a pentateuchal obligation (as distinct from a continuing obligation stemming from prophetic sources)[4] to continue to perform acts which make procreation possible.

Maimonides, *Hilkhot Ishut* 15:1, makes this point quite clearly. In codifying the *mitzvah* of procreation he is careful to spell out that the *mitzvah* does not constitute an obligation to bear or to sire children but rather, "A man is obligated to engage in coitus at each of the appointed times until he has children."[5] The divine mandate is discharged by engaging in cohabitation with a fertile wife in the normal manner. There is no obligation to seek "heroic measures" to assure the birth of a child, much less so to guarantee the birth of a child of a particular sex.

There are also other considerations auguring against sex preselection. A society in which human beings are produced according to predetermined specification must reflect to a greater or lesser extent the evils of Huxley's *Brave New World.* There is ample evidence indicating that parents who prefer male children are more numerous than those preferring female progeny. Hence predetermination of sex would undoubtedly lead to a sharp increase in the number of male births. This phenomenon would inherently lead to grave sociological repercussions. A demographic surplus of males over females would mean that a significant number of male would not be able to find marriage partners. Such a situation would certainly be counter to the goals and values of Judaism. It is also quite likely that such a state of affairs would lead to increased prostitution, rape and homosexuality.[6] Jewish teaching would deem such social and moral evils as far too high a price to pay in order to satisfy the desire for progeny of a particular sex.

As a matter of public policy, Jewish law advocates the curbing of even normal sexual activity under certain circumstances. The best example is the admonition found in *Shulchan Arukh, Orach Chaim* 240:12 against cohabitation during periods of hunger. Certainly,

tampering with natural processes in a manner which would lead to social upheaval and unrest is contrary to the public policy advocated by Jewish teaching. Assuredly, society would be justified in preventing such a situation from arising. Society would find ample justification in the teachings of Judaism for discouraging widespread sex preselection. Moreover, were sex preselection to become prevalent, society would be justified in demanding the establishment of safeguards in order to assure that the ratio of male to female births remain roughly equal.

## NOTES

1 - See T. J. Thorndike, "Genetics and the Future of Man," *Horizon*, Autumn 1973, p.56; Charles F. Westoff and Ronald R. Rindfuss, "Sex Preselection in the United States: Some Implications," *Science*, 184, no.4137 (May 10, 1974), pp.633-636; and L.C. Coombs, "Preferences for Sex of Children Among U.S. Couples," *Family Planning Perspectives*, November and December, 1977, p.259.

2 - For a fuller discussion of sex preselection techniques in rabbinic literature see J. David Bleich, "Sex Preselection," *Jewish Bioethics*, ed. Fred Rosner and J. David Bleich, Augmented Edition (Hoboken, N.J. 2000), pp. 92-94.

3 - For a discussion of the halakhic issues involved in artificial insemination see above, chapter 15.

4 - "In the morning sow your seed and in the evening withhold not your hand" (Ecclesiastes 11:6) is understood as an exhortation to engage in procreation not only in the "morning" of life, but also in the "evening" of life, i.e, even after statutory requirements have been fulfilled.

5 - See also Rabbi Moshe Sternbuch, *Olam ha-Torah*, no.2 (Tevet-Shevat 5736), pp. 16-23.

6 - Amitai Etzioni, "Sex Control, Science and Society", *Science*, 161 (September 13, 1968), pp. 1107-1112.

## Genetic Engineering

Genetic engineering has made it possible to manipulate the DNA of microorganisms, animals and plants in order to satisfy human needs. Science has developed bacteria that ingest petroleum in order to alleviate the environmentally devastating effects of oil spills, sheep whose milk contains a drug used in treatment of cystic fibrosis and a host of genetically modified foods. One third of the harvest of corn, soybeans and canola in the United States is genetically modified to make the crops resistant to insects. At least in the laboratory, it is possible to remove DNA from a salmon that keeps the fish from freezing and to introduce it into strawberries in order to produce a freeze-proof strawberry. It is also possible to introduce animal genes into plants. A small company in Syracuse has contracted with a scientist at the University of Connecticut to develop a genetically engineered cat that will not cause allergies, an effort that may prove to be highly profitable, since it could allow countless numbers of people who cannot now do so to keep cats as pets. Scientists at the University of Florida have patented a method of implanting a silkworm gene into grapevines to make the vines resistant to Pierce's disease, a blight currently menacing vineyards in California. The silkworm gene kills the bacterium responsible for the blight.

There is, of course, reason to be concerned with regard to possible deleterious effects of genetically modified foods upon humans. There is evidence that corn that has been genetically modified to produce a toxin that kills a caterpillar called the European corn borer may also kill monarch butterflies. Genetically modified crops may produce unfamiliar proteins that might prove to be allergenic, toxic or carcinogenic. These concerns are appropriately addressed both by the scientific community and by government regulatory agencies.

The theological and religious question is whether man has the right to intervene in the natural order by mixing and mingling the genetic material of diverse species. There is no reflection in Jewish tradition of a doctrine that establishes a global prohibition forbidding man to tamper with known or presumed *teloi* of creation. There are indeed individual thinkers who have explained the rationale underlying

particular *mitzvoth* in a manner echoing such a concept. Biblical commandments prohibiting interbreeding of species and the mingling of diverse agricultural species certainly lend themselves to such an interpretation. Although Rashi, in his commentary to Leviticus 19:19, regards those restrictions as *chukkim*, i.e., arational statutes not subject to human inquiry, Ramban, in his commentary on the same verse, takes sharp issue with Rashi and opines that interbreeding and prohibited mingling of species are forbidden as constituting illicit tampering with creation. Ramban states that every creature and every plant is endowed by God with cosmically arranged distinctive features and qualities and is designed to reproduce itself as long as the universe endures. Interbreeding and cross-fertilization produce a reconfiguration of those distinctive qualities and also compromise reproductive potential. By engaging in such activities man usurps the divine prerogative in producing a new species or entity with its own novel set of attributes and, presumably, a species less than optimally suited to fulfill the divinely ordained *telos* associated with the original species.

Ibn Ezra has been understood as presenting the matter in a somewhat different light in declaring that the Torah prohibits cross-breeding of species because the act thwarts propagation of the species and hence represents an injustice to the animals who are prevented from fulfilling the divine purpose of propagating their respective species.[1] Accordingly, Ibn Ezra explains the prohibitions against the mixture of agricultural species as well as the combination of linen and wool in the cloth of a garment as violative of the natural order decreed by the Creator.[2] R. Samson Raphael Hirsch had no difficulty in explaining the prohibition regarding *sha'atnez* (the mixing of linen and wool) in similar terms. Indeed, R. Hirsch understood all *chukkim* as being reflective of the principle that man should not interfere with the order and harmony - and hence the *telos* - of creation.[3] According to R. Hirsch, such laws are distinguished from *mishpatim*, or so-called rational commandments, only because our duties towards our fellow men are more intelligible to us by virtue of our recognition of our own needs and aspirations. That particular purposes are similarly assigned to animals and even to inanimate objects is not

immediately grasped by the human intellect and hence *chukkim* are depicted as arational. It is noteworthy that, although R. Hirsch regards these commandments as designed to prevent interference with divinely ordained *teloi*, unlike natural law theologians, he regards the *teloi* themselves as not being readily apparent to human reason. That understanding of the nature of *chukkim* is certainly confirmed by the fact that no natural law philosopher has ever asserted that the manufacture of linsey-woolsey or even agricultural hybridization is intuitively perceived as interfering with the divine plan for creation.

Were it to be assumed that tampering with the ostensive or presumed nature of animal species is always forbidden, most forms of genetic engineering would be illicit. No bacterium is designed by nature to clean up oil spills by metabolizing petroleum or to excrete human insulin for use by diabetics. In the absence of evidence in rabbinic sources to the contrary, it must be assumed that, even accepting Ramban's explanation of the prohibition against interbreeding or R. Hirsch's broader analysis of the rationale underlying *chukkim* in general, biblical strictures must be understood as limited to those matters explicitly prohibited(4).

There is a perceptible tension between the concepts enunciated by Ramban and R. Samson Raphael Hirsch and the many midrashic sources indicating that man is an active partner in the process of creation and, as such, is charged with bringing creative processes to completion. Indeed, the biblical charge to Adam exhorting him to "fill the earth and conquer it" (Genesis 1:28) seems to give Adam *carte blanche* to engage in any form of conduct that is not specifically proscribed. The problem is readily resolved if it is understood that, in general, the functions and *teloi* of the products of creation are not immutable; that the Creator did not intend to bar man from applying his ingenuity in finding new uses and purposes for the objects of creation;(5) and that there is no injustice to animal species or inanimate objects in doing so. Immutability of function and *telos* is the exception, not the rule. Thus, for example, it has never been suggested that manufacture and use of synthetic fibers in the making of clothes is in any way a contravention of either the letter or the spirit of the

law.[6] The exceptions were announced by the Creator as formal prohibitions. It is precisely because human reason cannot intuit, or even comprehend, when and under what circumstances contravention of the natural order is inappropriate that these commandments are in the nature of *chukkim*.

More generally, man's creative power, at least to the extent that it does not involve creation of novel species, is extolled in rabbinic sources. The divine appellation "*Shaddai*" is understood in rabbinic exegesis as an acronym "*she-amarti le-olami 'dai*' - Who said to My universe, 'Enough!' " Thus the verse, "I, the Lord Shaddai" (Genesis 17:1) is rendered by *Midrash Rabbah* 46:2, "I am the Lord who said to the universe "Enough!"" R. Jonathan Eibeschutz, *Tiferet Yonatan, ad locum*, followed by R. Joseph Ber Soloveichik, *Bet ha-Levi, ad locum*, explains that, in His creation of various artifacts, God arrested their development before completion. Man plants a seed, the seed germinates, a stalk grows and kernels of wheat develop. The Creator could well have made it possible for the kernels to crumble into flour, for the flour to absorb rain or moisture from the atmosphere, for the wind to churn the water-drenched flour so that dough be formed and for the heat of the sun to bake the mixture in order to yield a product that might literally be termed a "breadfruit." Instead, the Creator arrested the process long before its completion and ordained that grinding the wheat, mixing the flour with water, kneading the dough and baking the bread be performed by man. Similarly, the flax plant could have been endowed with properties causing strands of flax to separate and intertwine themselves in a cloth which might grow in the shape of a cloak. Instead, the process is arrested and brought to completion by man. Indeed, the Gemara, *Shabbat* 30b, declares that in the eschatological era the Land of Israel will yield "cakes" and "linen garments." *Bet ha-Levi* explains that the import of that statement is simply that, in the end of days, God will allow the processes of creation to reach their destined end by modifying the natural order in a manner that will permit the creative process to become complete and thus spare man any travail. In the interim, however, He has declared, "Enough!," i.e., He has precipitously interrupted the process of creation and co-opted man, who must complete the process, as a collaborator in fashioning the universe.

It is abundantly clear that human intervention in the natural order is normatively interdicted only to the extent that there are explicit prohibitions limiting such intervention. Moreover, there is no evidence either from Scripture or from rabbinic writings that forms of intervention or manipulation not expressly banned are antithetical to the spirit of the law. Quite to the contrary, Jewish tradition, although it certainly recognizes divine proprietorship of the universe, nevertheless, gratefully acknowledges that while "The heavens are the heavens of God" yet "the earth has He given to the sons of man" (Psalms 115:6). In bestowing that gift upon mankind, the Creator has granted man dominion over the world in which he lives and over living species that are co-inhabitants of that world. Man has been given license to apply his intellect, ingenuity and physical prowess in developing the world in which he has been placed subject only to limitations imposed by the laws of the Torah, including the general admonition not to do harm to others, as well as by the constraints imposed by good sense and considerations prudence.

The tension between the role of man as the agent of completing the work of creation and biblical prohibitions against certain forms of interference in the natural order is elucidated by R. Judah Loew, popularly known as Maharal of Prague, in his *Be'erha-Golah*, chap 2:3, *s.v. Masechet Pesachim*. The Gemara, *Pesachim* 54a, states that the creation of a number of entities was planned by God before the first Sabbath but they were not actually created until the conclusion of the Sabbath. Upon the conclusion of the Sabbath "the Holy One, blessed by He, bestowed understanding upon Adam and he took two stones, rubbed them one upon the other and fire emerged; [Adam] brought two animals, mated one with the other and from them emerged a mule." Clearly, this statement reflects the notion that the potential for both fire and interspecies is the product of divine creation and that the potential became actualized through the intermediacy of human intelligence which is itself a divine gift.

Maharal notes that, although interbreeding of diverse animal species was clearly interdicted by the Torah, the Sages certainly regarded the breeding of mules by Adam as a fulfillment of the divine

plan. Maharal boldly declares that the fact that God has prohibited a certain act does not necessarily mean that God has renounced the effect of that act. Thus crossbreeding of animal species was prohibited to Israel at Sinai but was not forbidden to Adam because the breeding of mules was incorporated in the divine blueprint for creation. Thus a distinction must be drawn between act and effect. And, if disdain for the effect is not the rationale underlying the prohibition of the act, there exists no basis for expanding the prohibition to encompass any act that is not formally within its ambit.

Man's role is "completion" (*hashlamah*) of the process of Creation. Insofar as "completion" of creation is concerned it is the divine plan that such development take place. Mararal asserts that it is the divine will that even interspecies such as the mule come into being, although not in circumstances that involve violation of Torah law. Thus cross-breeding was permitted to Adam because emergence of interspecies is integral to "completion" of the universe. According to Maharal, crossbreeding by a person who is not commanded otherwise (or in situations in which the prohibition does not apply) does not constitute a violation of the divine will or of the divinely ordained *telos* because "the way of Torah is one thing and the way of completion is another matter entirely."

Genetic manipulation involving even the introduction of a gene of one species into the genotype of an alien species does not constitute a violation of the prohibition against crossbreeding. *Chazon Ish, Kila'im* 2:6, notes that violation of the commandment occurs only in directly causing copulation between two living animals. *Chazon Ish* declares that artificial insemination designed to produce an interspecies is not forbidden just as an *inter vivos* organ transferred from one species to another is not forbidden. It is thus quite obvious that genetic manipulation, since it does not entail a sexual act involving partners who are members of different species, cannot be regarded as forbidden.

A similar principle applies to genetic manipulation of agricultural species. R. Shlomo Zalman Auerbach, *Minchat Shlomoh*, II, no.97, sec.27, declares that pollination of one species with pollen of another species does not result in a fruit that would be halakhically classified

as a hybrid. Thus, although Rabbi Auerbach affirms that the fruit of an *etrog* tree produced as the result of grafting of a lemon branch may not be used on *Sukkot* for purposes of fulfilling the *mitzvah* of the four species, he nevertheless regards pollination as an entirely different matter. Accordingly, rules Rabbi Auerbach, if an *etrog* is pollinated with the pollen of a lemon tree the resultant fruit is an etrog and may be used for fulfilling the *mitzvah*. Rabbi Auerbach declares that the prohibition against hybridization of species applies only to the planting or grafting vegetative material that might independently yield fruit or a seed capable of germinating independently. Pollen can never grow into fruit; hence, for purposes of Halakhah, introduction of foreign pollen[7] does not affect species identity. Again, it is quite obvious that such pollination conducted artificially by humans is not prohibited. Similarly, it follows that introduction of a gene of a foreign species is not forbidden as a form of hybridization since an isolated gene can never develop into a tree or into a plant.

## NOTES

1 - See R. Abraham ibn Ezra, *Commentary on the Bible*, Leviticus 19:19 and R. Judah Leib Krinsky, *Karnei Or, loc cit.* See also R. Abraham Chill, *The Mitzvot: The Commandments and their Rationale* (Jerusalem, 1974), p.236.

2 - See the supercommentary to Ibn Ezra of R. Shlomoh Zalman Netter, Leviticus 19:19, published in the Horeb edition of the Pentateuch (Jerusalem, London, New York, 5711). A similar interpretation was earlier advanced by *Ohel Yosef* and *Mekor Chayyim* in their respective works on Ibn Ezra published in *Margaliyot Torah (Stanislaw, 5687).*
*Mekor Chayyim understands Ibn Ezra's comments regarding inter-breeding of animal species in a like manner. However, these scholars' understanding of the passage in question is less than compelling. Cf., R. Abraham Chill, The Mitzvot, p.236.*

3 - See R. Samson Raphael Hirsch, *The Nineteen Letters of Ben Uziel*, Eelventh Letter; *idem*, *Horeb*, sec.327.

4 - Rambam, *Guide of the Perplexed*, Book III, chap.37, regards the

*chukkim* as prohibitions designed to deter idolatrous conduct. The actions in question, he asserts, were cultic practices associated with pagan worship and sacrifice. According to Rambam's understanding of these commandments, there is no hint of a negative attitude with regard to intervention by man in the natural order.

5 - Cf., R. Joseph B., Soloveitchik, "Confronation," *Tradition*, vol.-VI, no.2 (Spering-Summer, 1964), p.20.

6 - It is indeed the case that one finds occasional comments in rabbinic writings representing those prohibitions in phraseology that is general and unqualified. See, for example, the sources cited *supra*, note 2. Nevertheless, it seems to this writer that those comments must be understood in the manner herein indicated.

7 - An apparently contradictory statement by R. Shlomoh Zalman Auerbach appears in a different volume, *Minchat Shlomoh, Tinyana* (Jerusalem, 5760), no.100, sec. 7. In that work Rabbi Auerbach writes that hybridization of trees is forbidden "even if the hybridization is [performed] only by means of injection of sap that, if planted in the ground, would not at all sprout." In context, Rabbi Auerbach's statement in *Minchat Shlomoh, Tinyana* seems to be offered in order to establish a negative view regarding genetic manipulation of agricultural species. Nevertheless, in the same discussion, Rabbi Auerbach emphasizes that, with regard to animals, genetic manipulation since it does not involve a sexual act does not constitute a violation of the prohibition against crossbreeding.

## Cloning

There is no gainsaying the fact that the world has witnessed quantum leaps in scientific and technological advances since the mid nineteenth century or, according to Jewish reckoning, since 5600, i.e., the year six hundred in the sixth millennium. As foretold by the *Zohar, Bereshit* 117a, the benefits are not merely pragmatic; the explosion of human knowledge is categorized by the *Zohar* as the direct result of heavenly inspiration and serves to herald the advent of the eschatological era of the seventh millennium.

God reveals himself in the processes of nature with the result that insightful understanding of the laws of nature is, in at least some minuscule way, tantamount to apprehension of the Deity. Thus Rambam, *Hilkhot Yesodei ha-Torah* 2:2, writes that love of God is acquired by reflection upon His wondrous created works in which His wisdom can be discerned and, in *Hilkhot Yesodei ha Torah* 4:12, Rambam declares that increased understanding of the nature of created entities carries with it enhanced love of God. Accordingly, the perfection of the universe of which the *Zohar* speaks in describing the burgeoning of knowledge as the harbinger of the eschatological era is at one and the same time both preparation in the physical sense and preparation in the intellectual sense. In the physical sense it is comparable to Sabbath preparations carried out on the preceding day, so that, with the coming of the Messiah, man may enjoy undisturbed leisure to engage in spiritual pursuits; it is also perfection in the sense of intellectual preparation and development in the form of appreciation of the grandeur of creation, and hence of the Creator, so that man will be equipped for the more profound understanding of the nature of God that will be attainable in the eschatological era.

There can be no doubt that unraveling the mysteries of procreation and the genesis of human life are integral to this process. Attempts to fathom those mysteries are entirely laudatory. Whether or not those endeavors yield any licit practical benefit is secondary; their major value, as well as that of all aspects of theoretical science, lies in qualitatively enhanced fulfillment of the commandment "And you shall love the Lord, your God" (Deuteronomy 6:5). The legitimacy of acting upon such scientific information is another matter entirely. Surely every thinking person recognizes that not everything that can be done should be done; that which is possible is not for that reason moral.[1]

Not everything that *can* be done *should* be done. But it is a truism that, in the usual course of human events, that which *can* be done *will* be done.

Since the early 1970s ethicists have grappled with the implications of human cloning.[2] What was then a vague specter now looms as an

imminent reality. With the most recent breakthrough in the cloning of fetal mice in Hawaii it is evident that "advances in science are coming faster than even the most confident scientists had imagined."[3] Dr. Lee Silver, a mouse geneticist and reproductive biologist at Princeton University, described the speed at which cloning has progressed as "breathtaking" and added, "Absolutely, we are going to have cloning of humans."[4] The protestation of scientists such as Dr. Ryuzo-Yanagimachi, whose cloning experiments have electrified the scientific world, that "we should stick to reproduction the way that Mother Nature did for us"[5] notwithstanding, it is now conjectured that *in vitro* fertilization clinics will add human cloning to their repertoires within the next five to ten years.[6]

The new era of reproduction technology was ushered in with the birth of Dolly on July 5, 1996, at the Roslin Institute in Roslin, Scotland.[7] The birth of a cloned sheep was the culmination of research undertaken by Dr. Ian Wilmut on behalf of PPL Therapeutics, Ltd., a small biotechnology company with headquarters in Edinburgh. The purpose was to use sheep to generate drugs for use in treating human diseases such as hemophilia and cystic fibrosis. Genetic engineering had already been employed to produce sheep whose milk contains a drug, apha-l antitrypsin, that is used in treatment of cystic fibrosis. The purpose of cloning sheep was to avoid the laborious and expensive process of genetically engineering large numbers of animals individually. With cloning, once an animal has been genetically adopted, the process need not be repeated; the animal can simply be cloned and, since all its clones will have identical genetic characteristics, the clones will also produce the same drug.[8]

Research in cloning techniques has implications far beyond the goal of facilitating the manufacture of pharmaceutical products from genetically altered cells which itself is potentially of far-reaching benefit in the treatment of numerous diseases and disorders. Cells of mature organs are capable of reproducing themselves but cannot be altered to form the cells of different organs. In effect, the DNA of differentiated cells is programmed to reproduce cells of one specialized type and of no other. Thus, for example, if a pancreas is destroyed a new pancreas

cannot be generated by other cells in the body. Successful cloning of adult cells demonstrates that, when inserted into an ovum, the program of a cell's DNA can be reversed thereby allowing the cell to reproduce and develop into cells of other bodily organs. When the process is more fully understood, it may become possible to create particular organs to replace those that become diseased or destroyed.

As noted, with the successful cloning of Dolly, the prospect of human cloning became much more than a theoretical conjecture. The initial reaction of both ethicists and scientists was that human cloning is morally unacceptable. President Clinton, following the recommendation of the National Bioethics Advisory Commission, banned the use of federal money to conduct human cloning experiments and requested that privately funded enterprises adhere to a voluntary ban on human cloning. Nevertheless, at present, other than in California,[9] the cloning of a human being is perfectly legal in the United States, although it is prohibited by law in Britain, Spain, Denmark, Germany and Australia.[10]

The climate of opinion has changed rapidly. Three decades ago, two fertility experts, Sophia J. Kleegman and Sherwin A. Kaufman, wrote that reproductive breakthroughs pass through several predictable stages. Reactions proceed from "horrified negation" to "negation without horror" to "slow and gradual curiosity, study, evaluation" and, finally, to "a very slow but steady acceptance."[11] The *volte face* that has occurred with regard to the prospect of human cloning is best expressed in a headline that appeared in the *New York Times*. "On Cloning Humans, 'Never' Turns Swiftly Into 'Why Not.'"[12] In that article Dr. Steen Willadsen, the cloning pioneer who developed the fundamental methods for cloning animals, is quoted as saying that it is just a matter of time before the first human is cloned. Earlier, John Paris, a Jesuit ethicist, remarked that he is certain that humans will be cloned: "I can't imagine a world in which someone won't try it. There are two things that drive man - power and money. And fame leads to fortune. Someone will try it."[13]

There is ample reason to assume that Jewish teaching would not frown upon cloning of either animals or humans simply because it is a

form of asexual, and hence "unnatural," reproduction. The Gemara, *Sanhedrin* 65b, relates that R. Hanina and R. Oshia met every Friday for the purpose of perusing *Sefer Yetzirah* in order to create a calf for their Sabbath meal. This anecdote is recounted by the Gemara without the slightest hint of censure. The text incontrovertibly yields two principles: 1) asexual husbandry, at least with regard to animal species, is morally innocuous; and 2) harnessing metaphysical forces, or "white magic," at least when practiced by masters of the Kabbalah, is acceptable. Although there is nothing in this narrative that may be cited as providing an explicit basis for extending such sanction to creation of a hybrid, interbreed or genetically engineered animal, the report certainly reflects acceptance of the legitimacy of asexual, and hence homologous, reproduction of animals.

Although, from the vantage point of Jewish tradition, animal cloning presents no ideological or halakhic problem, the same cannot be said with regard to the cloning of a human being.

The ethical implications of fetal experimentation which, by its very nature, may result in the birth of a defective neonate were analyzed some time ago by the late Professor Paul Ramsey.[14] In the early days of *in vitro* fertilization Professor Ramsey argued that such a procedure represented an immoral experiment upon a possible future life since no researcher can exclude the possibility that he may do irreparable damage to the child-to-be. In the words of Professor Ramsey: "We ought not to choose for another the hazards he must bear, while choosing at the same time to give him life in which to bear them and to suffer our chosen experimentations."[15]

This argument is no less applicable to homologous reproduction than to artificial conception and is entirely consistent with the norms of Torah ethics. Jewish law does not sanction abortion motivated solely by a desire to eliminate a defective fetus, nor does it sanction sterile marriage as a means of preventing transmission of hereditary disorders. However, it does discourage marriages which would lead to the conception of such children. The Gemara, *Yevamot* 64b, states that a man should not marry into an epileptic or leprous family, i.e., a family in which three members have suffered from those diseases. This

declaration obviously represents a eugenic measure designed to prevent the birth of defective children. It follows, *a fortiori*, that overt intervention in natural processes which might cause defects in the fetus would be viewed with opporobrium by Judaism.

It has also been suggested in some quarters that cloning may be morally acceptable in situations in which the sole child of parents who have become infertile develops a terminal disease. By means of cloning, the parents could use a cell obtained from the child to create another child who would be an exact replica of the child they are about to lose. However, tragic as such cases may be, there is nothing in those circumstances halakhically to distinguish that situation from more usual situations of infertility.

Nevertheless, there are some very rare situations in which cloning, despite the attendant risks, may be regarded as moral and even laudatory. Despite the contrary view of some early day authorities, the overwhelming consensus of rabbinic opinion is that restrictions governing interpersonal relationships, including the prohibitions against theft and "wounding," are treated no differently from purely religious prohibitions and are suspended in face of danger to human life.(16)

There have been unfortunate cases of children afflicted with leukemia whose only chance of survival is a bone marrow transplant. To be successful, a donor must be genetically compatible, otherwise the transplant will be rejected. When bone marrow of family members is incompatible, finding a suitable match is exceedingly difficult. There have been cases of the mother of such a child becoming pregnant in the hope that the newly born child will be a suitable donor. However, the statistical probability that the child will be a compatible donor is only twenty-five percent. If cloning were available, parents, in such rare situations, could clone the ill child. The newly born infant would be disease-free but would be genetically identical to its afflicted sibling. Medically, the child would be an ideal donor.

There may well be other forms of research requiring cloning designed to find a cure for disease that may benefit individuals who are in the category of a *choleh le-faneinu*, i.e., individuals for whom the danger and potential benefit is regarded as actual rather than

merely hypothetical. Under such limited circumstances - and only in such circumstances - human cloning, when scientifically prudent and undertaken with appropriate safe-guards, may be deemed appropriate and halakhically sound.

More significantly, cloning technology may prove to be extremely beneficial in cell and tissue therapy. Embryonic stem cells have the ability to differentiate into any cell type and, in theory, could be produced from human blastocysts. Perfection of cloning procedures would make it possible for a person to provide the nucleus of his own cell to replace the nucleus of a donor egg. Stem cells could then be taken from the developing blastocyst and induced to differentiate in culture.[17] Those cells would be genetically identical to those of the person from whom the nucleus was taken with the result that cell and tissue replacement would be possible without the problems of rejection currently attendant upon transplantation. Rejection of transplants occurs because the body's immune system recognizes the transplanted tissue as foreign. Cloned tissue is genetically identical to the tissue from which it is cloned and hence will not be rejected. The goal of such technology would be the cloning of human tissues and organs rather than of human beings. Although the cloning of human beings is highly problematic, the cloning of tissues and organs for therapeutic purposes is entirely salutary.

Society certainly has reason to regard development of cloning technology with concern. Such concern is by no meas limited to the exaggerated fear of the specter of mad scientists engaging in cloning for nefarious purposes *a la* the specter of *The Boys From Brazil.* Quite apart from the earlier discussion regarding concern for potential defects in the clone, society has reason to fear that untrammeled cloning may result in a disproportionate number of clones of one gender, that a multiplicity of persons identical to one another may spell confusion and give rise to an assortment of social problems and that idiosyncratic preferences may create an imbalance in the distribution of physical attributes and human talents. These and other demographic concerns are quite real. Tampering with natural processes in a manner that would lead to social upheaval is not included in

man's mandate "to fill the earth and conquer it" (Genesis 1:28). Assuredly, society is justified in preventing such a situation from arising. Accordingly, society has both the right and the obligation to regulate experimental endeavors designed to perfect techniques necessary for successful cloning of humans. The goal of such regulation should be assurance that those skills be utilized only for purposes that are beneficial to society.

## NOTES

1 - Cf. the statement "... what is technically possible is not for that reason morally admissible," Congregation for the Doctrine of the Faith, *Instruction on Respect for Human Life in its Origin and on the Dignity of Procreation (Donum Vitae)* (February 22, 1987), introduction, sec. 3. Although that document is not an expression of Jewish teaching, the validity of the quoted axiom is self-evident.

2 - See Willard Gaylin, "The Frankenstein Myth Becomes a Reality: We Have the Awful Knowledge to Make Exact Copies of Human Beings," *New York Times Magazine*, March 5, 1972, pp. 12-13, 41-49.

3 - *New York Times*, July 23, 1998, p. A1.

4 - *Ibid.*, p. A20.

5 - *New York Times*, July 24, 1998, p. A12.

6 - *New York Times*, July 23, 1998, p. A20. In an editorial accompanying the report of the cloning of Dolly, the editors of *Nature* voiced the opinion that "Cloning humans from adults' tissues is likely to be achievable any time from one to ten years from now." See *Nature*, vol. 385, no. 6619 (February 27, 1997), p. 753.

7 - A full report of the methods employed in causing that event to occur was published by I. Wilmut *et al.*, "Viable Offspring Derived from Fetal and Adult Mammalian Cells," *Nature*, vol. 385, no. 6619 (February 27, 1997), pp. 810-813.

8 - See Gina Kolata, Clone: *The Road to Dolly and the Path Ahead* (New York, 1998), p. 25.

9 - *New York Times*, December 2, 1997, p. A24.

10 - *Clone*, p. 32.

11 - Sophia J. Kleegman and Sherwin A. Kaufman, *Infertility in Women: Diagnosis and Treatment* (Philadelphia, 1966), p. 178.

12 - December 2, 1997, p. A1.

13 - *Clone*, p. 39.

14 - Paul Ramsey, "Shall We 'Reproduce'?" *Journal of the American Medical Association*, vol. 220, no. 10 (June 5, 1972), pp. 1346-1350, and vol. 220 no. 11 (June 12, 1972), pp. 1480-1485; and *idem*, *The Ethics of Fetal Research* (New Haven, 1975).

15 - Paul Ramsey, *Journal of the American Medical Association*, vol. 220, no. 11, p. 135.

16 - The Most frequent discussion of this issue in a medical context is in conjunction with post-mortem dissection of a corpse. For a survey of the conflicting positions regarding this matter see the discussion of autopsy in chapter 33 of this volume.

17 - For a discussion of the propriety of destroying nascent human life generated in this manner and at this very early stage of development see this writer's *Contemporary Halakhic Problems*, IV (New York, 1995), 24, note 10 and his *Bioethical Dilemmas: A Jewish Perspective* (Hoboken, N.J., 1998), pp. 209-211.

# STEM CELLS AND CLONING RESEARCH: SIMILARITIES AND DIFFERENCES

*Dr. Abdel Aziz Bin Muhammad Al-Suwailam*
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# Stem Cells and Cloning Research: Similarities and Differences

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Saudi Arabia

Many researchers, ethicist and scholars deal with cloning issues with very high precautions since cloning is unethical and interfere with many religious issues, however when we discuss the stem cells research the positive attitude to the stem cells application will dominate the other issues. In fact there are many similarities issues between cloning and stem cells research. The ethical issues on the cloning and stem cells will be presented. This paper will represent the cloning methods and applications and stem cells resources to highlight the common ethical issues between the embryonic stem cells and cloning to unify and homogenize the religious and ethical stand on the similar issues.

## Introduction

In its seventh session, the International Committee for Bioethicism (2000) discussed some of the hectic issues of the worldwide scientific arena, such as research on senility, the nervous system and the expected results of the genome project and its economic repercussions. Yet, one of the most prominent and hectic modern scientific issues is the acceptability of the use of the inseminated human eggs stem cells in research. This issue took most of the time of the committee that could not reach unanimity in this concern. The scientific reports recently published unravelled the fact that for the first time multi-potent human stem cells were insulated and then implanted successfully. This was paid great attention that put medical biological research to new horizons.

This brief glimpse includes a simple introduction on stem cells showing what stem cells, embryonic stem cells and adult stem cells are. It also tackles the scientific importance of stem cells and how to obtain them. Further, this introduction shows why this research is

considered promising and involving great risks and expectations in the realm of health care?

Stem cells are cells capable of splitting producing more than one type of cells, unlike other cells that only produce cells similar in type to the mother cell. The human body consists of several types of stem cells, including those capable of producing different cells but cannot constitute tissues. An example of these can be unquestionably found in adults. By this I mean those cells in the bone marrow that produce blood cells. This type of cells is not the essence of this presentation. It is rather about the stem cells, found in embryos, which can split making body tissues and organs.

Research on stem cells of inseminated human eggs requires the researcher to inseminate the egg with a sperm in test tubes. Then, he should stop the pre-implantation embryo (if it can be called so) from growing. This is to research and make use of the stem cells by growing them in a special media. Such research is expected to produce special tissues used for treating some diseases, such as some types of cancer, diabetes and some diseases of the nervous system. In advanced stages, whole human body parts can be produced for the benefit of patients in need of organ transplant.

The question raised on the tables of the bioethicism committees is: Is it acceptable to stop the growth of the inseminated egg (the zygote) to deploy it in the treatment of many incurable diseases or should this inseminated egg have its sanctity and privacy which make it incumbent on the legislative authorities to protect it from the researchers' toying with it?

## Preface

Man's creation begins when an egg is inseminated with a sperm forming an inseminated egg (a zygote) that consists of one cell, but has the whole potential of producing any of the cell types. Hence, called totipotent stem cells. In the first hours of insemination, the inseminated egg begins to split into a group of cells having, on their turn, the full potential of producing a whole set of different cells. Each of these cells, if implanted in a uterus, can create a whole foetus as

well as the supporting tissues of placenta and necessary membranes. This is the exact scenario of identical twins creation where two of the totipotent stem cells split into genetically-identical twins. Four days after the insemination after having several cycles of cell splitting, the totipotent cells embark on producing specialised cells forming a vacuum ball called (Blastocyst). The blastocyst has an external layer of cells that later constitute the placenta and tissues supportive to the growth of the foetus in the uterus. In the cavity of the ball is a cluster of cells called the inner cell mass- the originator of all the foetus tissues and organs. Unlike the aforementioned cells, these cells alone cannot originate a living creature due to their incapability of developing foetus-supportive tissues. That's why these cells are called the pluripotent stem cells. Such cells can produce several cell types, but not all the cells necessary for the foetus growth. Afterwards, the cells in the inner cell mass start to reproduce through repeated division to produce highly specialized cells, like blood stem cells that constitute all blood cells, muscular stem cells and skin stem cells: the main source of all the skin cells in the human body. These highly specialised cells are called the multipotent stem cells - the most known cells in the human body.

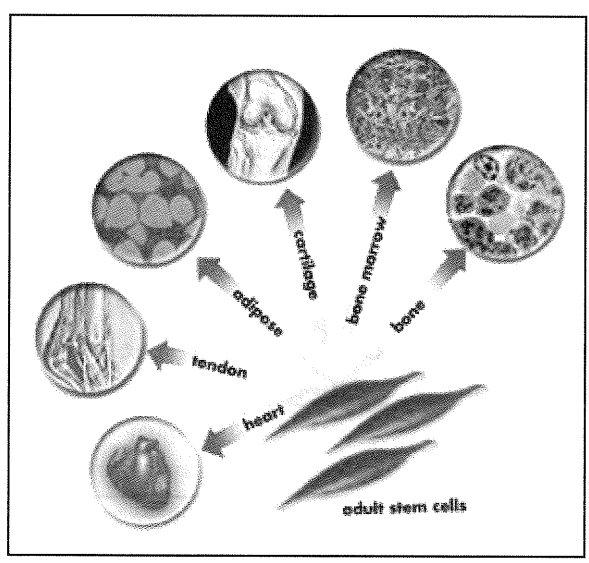
**First: Embryonic Stem Cells**

Embryonic stem cells can be obtained from the inner part of the blastocyte; a stage of the inseminated egg division. Inseminated, the egg becomes one cell capable of producing a whole person with all his organs. In this stage, it is called a totipotent cell which undergoes several divisions in a stage called the blastocyte. The blastocyte consists of an external layer of cells and supportive tissues necessary for the foetus formation in the uterus. The inner cells, in the meantime, are used in the creation of the body tissues of the living creatures. Though these cells can produce any other body cells, It cannot produce a whole foetus. This is because they are unable to form the placenta and other supportive tissues vital to the foetus' formation. Stem cells, then, undergo a process in which they are highly specialized so as to produce stem cells responsible for formulating cells of definite functions.

**Second: Adult Stem Cells**

These can be equally found in both children and adults. These cells are necessary for substituting the tissue cells that die after a given period. All the adult stem cells in all tissue types haven't been discovered yet. But some problems pose before the scientists in deploying the adult stem cells. One of these problems is that they exist in too small a number that they cannot be insulated or purified. Further, this already small number gets even smaller with age. Add to this the fact that these cells do not have the same potential of reproduction the embryonic stem cells have. Over and above, they may develop some flaws as a result of being subjected to some factors such as toxics.

There are some important distinctions between embryonic and adult stem cells. Embryonic stem cells secrete telmorase enzyme that helps its repetitive and infinite division. On the other hand, adult stem cells secrete this enzyme only in small amounts and at long intervals. This makes them short-lived. Embryonic stem cells can be transmuted into all types of human body tissues. Meanwhile, adult stem cells do not enjoy this ability of transmutation and thus are inferior in rank to the embryonic stem cells.




The means of obtaining stem cells

The cellular lines of these human cells are delineated by one of the following ways:

1 - Dr. James Thompson's method: in it the pluripotent embryonic cells are insulated from the inner cellular mass of the foetus in the blastocyte stage. Then, these stem cells are to be cultured to produce cellular lines of embryonic stem cells. Some of these cells actually turned into types of different tissues.

2 - Dr. Gerhart's method: he insulated the embryonic stem cells obtained from aborted embryos. The scientist selected those cells of the foetus that would constitute the testicles and eggs later (embryonic germ cells).

(A Diagram)(*)

The method adopted by Thompson and Gerhart to obtain embryonic stem cells

3 - Cloning method: This method depends on somatic cell nuclear transfer. According to this method, scientists took a natural egg of an animal and enucleated it. Then, in controlled lab conditions, a nucleus of a somatic cell (not of the egg or sperm) was merged with the enucleated egg. Thus, a new cell fully capable of producing a whole living creature was formulated. These new cells are thus totipotent and will grow into the blastocyte stage. At that point, the inner mass cells can be the source of cellular lines. This method follows the same well-known technique of cloning. Yet, the goal of this method is not to produce a whole living creature. It is rather deployed to obtain embryonic stem cells for treatment purposes. This method has the privilege that the resultant stem cells are genetically identical to the individual whose nucleus was taken and introduced to the egg. Hence, the solution to the rejection of the tissues by the body immune system. Moreover, the inseminated egg is held to be the most primordial and potent stem cells, for they have the ability of producing any kind of body tissues.

(A Diagram)(*)

(*) Not received from author.

4 - Adult stem cells were obtained from the placenta..

5 - Adult stem cells were obtained from adults' tissue cells, such as bone marrow and fat cells.

## Cloning: an entire duplication of the genetic code

To highlight this fact, we will spotlight the reproductive ways Allah Almighty created in nature in plants and all living creatures. These ways can be divided into two:

### The first way: sexual reproduction

The female egg, pollen and sperms carry half the number of the chromosomes. In plants, seeds are produced when the female part of the flower (the pistil) is fertilized with pollen from the same tree or another tree of the same species. In human beings and animals, the nucleus of a female's egg unites with a sperm secreted by a masculine gland forming thus the first cell which divides into two, then four and keeps doubling. Cells specialize in order to produce distinct organs such as the heart, the head, the liver, eyes, hands and feet in the new creature's body. This is the origin and most used method of creating in both animals and humans. Allah Almighty says:

'And of everything We have created pairs: that ye may receive Instruction.' (51:49) and He also says:

'(He is) the Creator of the heavens and the earth: He has made for you pairs from among yourselves, and pairs among cattle: by this means does He multiply you: there is nothing whatever like unto Him, and He is the One That hears and sees (all things).' (42: 11)

This means is mating and creating masculine and feminine natures. A means made by Allah's Wisdom, Knowledge and Omnipotence to be a mechanism for living creatures to procreate in a precise and incredible way. After mentioning this means, Allah Almighty praised Himself saying that He is not paralleled in this. The techniques of genetic engineering unravel every now and then wonders of this means and its precision.

**The second means:**

What can come under the title 'cloning'. In it, part of a living body (one cell or a group of cells) is taken and put in an environment suitable in terms of temperature, humidity and food. It is kept there till it grows and becomes a duplicate of the source living body. This means used to be deployed in plant reproduction in ancient times. Over ages, man discovered this means through trial and error. Such means is practiced in labs and is called tissue planting technique and results in a plant genetically identical to that from which the original cells were obtained.

## The confluence of stem cells and cloning:

Stem cells are cells capable of splitting producing more than one type of cells, unlike other cells that only produce cells similar in type to the mother cell. The human body consists of several types of stem cells, including those capable of producing different cells but cannot constitute tissues. An example of these can be unquestionably found in adults. By this I mean those cells in the bone marrow that produce blood cells. This type of cells is not the essence of this presentation. It is rather about the stem cells, found in embryos, which can split making body tissues and organs.

Research on stem cells of inseminated human eggs requires the researcher to inseminate the egg with a sperm in test tubes. Then, he should stop the pre-implantation embryo (if it can be called so) from growing. This is to research and make use of the stem cells by growing them in a special media. Such research is expected to produce special tissues used for treating some diseases, such as some types of cancer, diabetes and some diseases of the nervous system. In advanced stages, whole human body parts can be produced for the benefit of patients in need of organ transplant.

The question raised on the tables of the bioethicism committees is: is it acceptable to stop the growth of the inseminated egg (the zygote) to deploy it in the treatment of many incurable diseases or should this inseminated egg have its sanctity and privacy which make it incumbent on the legislative authorities to protect it from the researchers' toying with it?

## The application and uses of stem cells

1 - The use of stem cells in what is known as cell therapy, for there are several diseases and ailments, the main reason of which is the cellular dysfunction and body tissues damage. This provides treatment for a large number of incurable diseases, such as Alzheimer, Parkinson, the spinal cord injuries, heart diseases, diabetes, arthritis and burns.

2 - To help define the main reasons and mistakes that usually lead to fatal diseases like cancer and congenital defects caused by abnormal cell division and specialization.

3 - In pharmacology: stem cells research will help innovating and developing medical drugs as well as testing their impact and effectiveness.

4 - Understanding the complex events inherent in creating man.

5 - Overcoming the immune system rejection of implants.

## The latest advances in stem cells research.

- For the first time, stem cells are used in the treatment of a heart disease patient.
- The use of stem cells in heart diseases treatment tests.
- Producing blood cells from embryonic stem cells.
- Preserving the new-born's umbilical chord blood to treat it from cancer when adult.
- Turning adult stem cells into new nerves and tissues.
- Implanted stem cells enable paralysed animals to walk.
- Turning stem cells into neural cells for brain diseases treatment.
- Embryonic stem cells for the Parkinson treatment.
- Marrow cells in the treatment of kidney cancer.
- Stem cells for treatment of diabetes
- Genetic engineering and stem cells in the treatment of rheumatism and arthritis.

## The stances of different countries and religions

Countries take different stances concerning this issue. For instance, Germany incriminates toying with inseminated eggs stem cells and prohibits the insemination of more than one egg in cases of out-of-uterus fertilization, such as IVF technique. In France and Britain, it is allowed to use artificially fertilized eggs in medical research. As for USA, it prohibits the use of government funds in such research. Despite this, some states utilizes private corporations' financial support in conducting this research.

Similarly, religions differ in perceiving this crucial matter. This draws on the time of blowing the soul into the foetus. The Catholic and Orthodox hold such an act to be impermissible as a sort of murder. Judaism, on the other hand, maintains that the soul is blown into the foetus in uterus after 40 days of pregnancy. However, Judaism allows conducting such research to enhance the health of individuals which has precedence over keeping the life of the foetus (so far without a soul). As for Islam, the sixth session of the Islamic Fiqh Academy, held in Jeddah (17 - 23 Sha'ban 1410), discussed the issue of excess inseminated eggs and decided that 'when fertilizing the eggs, the scientist must confine himself to the number required for implantation so as to avoid an excess of fertilized eggs. If, by any means, an excess of fertilized eggs exists; it should be denied any medical care till it dies naturally'. The third forum of the Islamic Organization for Medical Sciences, held in Kuwait (20 - 23 Sha'ban 1407), discussed the issue of excess inseminated eggs and permitted research on excess eggs, whether fertilized or not. But this has one constraint demonstrated by a forum called (Reproduction in the light of Islam) and asserted in another called (Some Medical Practices from the perspective of Islam). This constraint is not to change Allah's natural Law and to avoid deploying science for the sake of evil, corruption and sabotage. (Refer to 'The Islamic Law' magazine, the sixth session, the sixth edition, the third vol.: P.1949)

## Resolution (no. 100/2/d.1) dated 18- 23 Safar 1418 A.H. of the Jeddah session of the Islamic Fiqh Academy, an affiliation of the Organisation of Islamic Conference, on human cloning. It reads:

First: the impermissibility of human cloning in both aforementioned methods or any other method leading to the human procreation.

Second: breaching on the legislative rule in article one would incur legislative punishment dependent on the consequences of such an act.

Third: the impermissibility of introducing a third party into the marital relationship in the shape of donor uterus, egg, sperm or somatic cells.

Fourth: It is religiously permissible to adopt the techniques of cloning and genetic engineering in the field of germs, all micro-organisms, plants and animals within the constraints of the Islamic Law in a way that leads to benefits and shuns away harm.

Fifth: Calling upon the Muslim countries to enact laws and innovate systems necessary for eliminating both direct and indirect attempts by local and foreign entities and research establishments and foreign experts with the aim of making Muslim countries an arena for experiments on cloning.

Sixth: Collective follow-up by both the Islamic Fiqh Academy and the Islamic Organization for Medical sciences for cloning and its scientific advances. Add to this controlling the terms relevant to that issue as well as holding the necessary forums and meetings to shed light on the relevant rules in the Islamic Law.

Seventh: Calling for the foundation of specialised committees of experts and Islamic Law scholars in order to define the bioethical code of research to be enforced in Muslim countries.

Eighth: the call for establishing and funding scientific institutes and establishments conducting research in biology and genetic engineering, excluding human cloning, within the frame of the Islamic Law constrains. Thus, the Muslim world would not be a copier and follower in this field anymore.

Ninth: dealing with scientific development from an Islamic perspective and calling upon the media to adopt the religious view in tackling these issues and avoid deploying the media in a way counter to Islam. Calling upon the media to enlighten the public opinion and keep it informed prior to decision-making in accordance with Allah's orders:

'When there comes to them some matter touching (public) safety or fear, they divulge it. If they had only referred it to the Messenger

or to those charged with authority among them, the proper investigators would have tested it from them (direct)' (4: 83)

**The resolution of the Islamic Fiqh Academy of the Islamic World League in its fifth session dating 11/7/1419 A.H. 31/10/1998 A.D. concerning the deployment of genetic engineering read as follows:**

First, asserting the resolution of the Islamic Fiqh Academy, an affiliation of the Organization of Islamic Cooperation concerning cloning (no. 100/2/d/10) in its tenth session held in Jeddah from 23 - 28 Safar 1418 A.H.

Second, making use of genetic engineering in preventive medicine and diseases treatment or mitigating its harms provided that this does not cause greater harm.

Third, the tools and methods of genetic engineering are not to be used in hostile or evil purposes as well as all that is religiously impermissible.

Fourth, any of the tools and methods of genetic engineering is not to be used in a way abusing man's identity and individual responsibility or to intervene in the genetic code with the pretext of improving the human race.

Fifth, it should not be permitted that any research is conducted or used for treatment or diagnosis relating to man's genes without a precise prior evaluation of the potential risks and benefits of this action. The research is not to be conducted but after getting the Islamic Law permission and the results should be held totally confidential. The process is also to maintain the rules of Islamic Law urging us to respect man's rights and dignity.

Sixth, the tools and methods of genetic engineering may be used in the field of agriculture and animal husbandry provided taking all the precautions to prevent inflicting any harm - even in the long run- on man, animal or environment.

Seventh, the Academy calls upon the companies and factories of medical and food commodities and other products deploying genetic engineering to make known the composition of these products so that

the informed consumers can decide on solid ground whether to use them or not and to shun whatever is impermissible or harmful.

Eighth, the Academy admonishes the physicians and owners of labs to fear Allah the Almighty and awe the Ever-Watchful as well as avoiding harm infliction on the individual, the society and environment.

## The resolution of the Islamic Fiqh Academy an affiliation of the Islamic World League in its seventeenth session held in holy Mecca in the period 19 - 23/10/1424 A.H. 13- 17 /12/2003 A.D.

This resolution tackles stem cells; the cells originating the foetus. Allah endowed such cells with the potential of producing different human somatic cells. Recently, scientists succeeded in identifying, insulating and growing these cells with an eye to innovating treatment and conducting scientific experiments. Stem cells are expected to have a promising future and great impact in treating many diseases and congenital abnormalities and some diseases like cancer, diabetes, kidney and hepatic failure and the like. These cells can be obtained from numerous sources. Of these are the following:

1 - Premature embryo in the stage of (Blastocyte; the cellular ball composing all the somatic cells), the main source of which is the excess eggs of IVF projects. A donor's egg can be inseminated with a donor's sperm to produce a gamete and grow it into the blastocyte stage. Then, stem cells can be obtained.

2 - Embryonic left-over at any pregnancy stages.

3 - The placenta or the umbilical chord.

4 - Children and adults.

5 - Therapy cloning: taking a somatic cell from an adult, and merging its nucleus in an enucleated egg so as to reach the blastocyte stage, in which stem cells can be obtained.

In this regard, the Academy's resolution included what follows:

First, stem cells can be obtained, grown and used for treatment purposes or conducting permissible scientific research, once the source is permissible. Examples of non-prohibited sources are:

1 - Adults provided their permission and the absence of the risk of harming them.

2 - Children with their parent's permission for a legitimate interest and ensuring the lack of harm.

3 - Placenta and umbilical chord, with parents' permission.

4 - Embryonic left-over resultant from natural or permissible therapeutic abortion and with the parents' permission, heeding the seventh resolution of the twelfth session of the Academy about cases of permissible abortion.

5 - Excess gametes from IVF projects, if available and donated by the parents, with the emphasis that they cannot be used in conceiving illegitimate pregnancy.

Second, if from an impermissible source, stem cells are not to be obtained or deployed. Here are some showcases:

1 - The left-over of an embryo intentionally aborted without legitimately plausible medical reason.

2 - Intentional fertilization of a donor's egg and another's sperm.

3 - Therapeutic cloning.

## Ethical aspects

1 - **Women's rights**: this involves exploiting women as egg-producing machines and the issues relevant to exposing their private parts.

2 - **Ownership:** who owns the produced cells: the egg donor, the somatic cell donor or the producing researcher?

3 - **Blowing soul in the embryo and the right to life:** how far leniency can go concerning fertilized eggs? Which have the priority: using or disposing of them?

4 - **Moral rights:** the moral right of the cells. Should they be treated as animals?

5 - **Principles:** is the principle of enucleating an egg and inseminating it using a somatic cell acceptable? And why?

6 - **Harms and benefits:** setting priorities through assessing the harms and benefits of damaging cells and taking eggs off for insemina-

tion taking into consideration all the inevitable harm as well as the potential public benefit.

## Finally

Now, there are several questions on the discussion table of national and international committees of bioethicism. These questions reflect the discrepancy between countries and religions in this regard. Reaching a decision requires finding answers to questions as:

- When more than one egg is externally inseminated with the goal of implanting only one of them, the best, in the uterus; is it right to use the rest in scientific research instead of damaging them?
- When an enucleated egg is fertilized with another somatic cell of the same person to produce a foetus (as in the case of Dolly the sheep) for the purposes of scientific research, is this ethically acceptable?
- Who has the right to donate the embryo? Do they have to be husband and wife or any man and woman?
- Who has the right to stop the foetus' growth?
- Are these attempts considered serious steps on the way of coming up with an ethical justification of human cloning?
- Does seeking a treatment for incurable diseases justify conducting such experiments?
- Should the priority be given to research on embryos or to adult stem cells despite the limited and difficult nature of the latter?

## Research on embryonic stem cells is on the same foot ethically with that on cloning. Though not identical, both types of research are judged in the same way.

The question posed to all who may be concerned, whether specialised in this field or not, is: 'is the world on the verge of a new nuclear bomb with limited peaceful applications and infinite devastating impact? Is the human nuclear split of the cell going to be more dangerous than the nuclear split of the atom? Would this research trend entice the developed countries to compete in using humans as research objects?

## Definitions

| | |
|---|---|
| DNA | Abbreviation of Deoxyribo Nucleic Acid, the substance forming the genes |
| Genes | The functional unit of hereditary aspects, a part of the DNA centred on a specific place of the chromosome. Genes organize the process of forming enzymes or any other protein in addition to some of the body functions. |
| Somatic cells | This term means all the types of body cells, except sperms and eggs, which include 46 chromosomes. |
| Sex cells | Eggs in women and sperm in men and they have 23 chromosomes. |
| Specialized cells | Cells capable of forming certain types of tissue, such as neural and muscular tissues, but unable to produce a different type of tissue. |
| Embryonic stem cells | Also called 'origin or basis cells'. These cells can divide and reproduce giving different kinds of specialized cells. Like somatic cells, they have 46 chromosomes. |
| Adult stem cells | Stem cells found in the already specialized tissues, such as bones and blood... etc, |
| Totipotent stem cells | A stem cell with full potential of forming any cell type. |
| Pluripotent stem cells | Stem cells found in the inner cellular mass of the embryo fully capable of producing any cell type, but cannot produce embryo-supportive cells found in the placenta and membranes. |
| Multipotent stem cells | A specialized cell with an ability to produce different types of cells of a given tissue. They, for example, can produce white and red corpuscles and blood platelets out of multi-potent blood cells. |
| Somatic cell nuclear transfer | Transferring the nucleus of a somatic cell to an enucleated egg. |

# DISCUSSION

# Twelfth Session

**Chairman**: Dr. Gerald Winslow

**Rapporteur**: Malik Al Badry

**Chairman**: Prof. Mishal

***Dr. Aly A. Mishal***: The term 'reproductive cloning' was several times discussed during this session and also in previous sessions. I just want to say that 'reproductive cloning' was considered a technical and scientific failure for many years. As you know that the 'Dolly did not die, Dolly was killed, a mercy killing, because of the major medical problems that Dolly faced. So, most people stopped doing it on technical basis. I don't think that ethical campaign was very influential in stopping reproductive cloning. The ethical campaign probably convinced some governments of stopping financing. However, private companies are more inclined towards therapeutic cloning and towards using stem cells and cloning to produce materials. Reproductive cloning has fallen down many years back. Thank you.

**Chairman**: Thank you. Dr. Safa

***Dr. Safa***:

In fact, we thank Dr. Suweilam for this valuable and beneficial lecture on cloning. The lecture was simple and informative. But to what extent is the cloning of the internal human parts is used in comparison with that of the skin germination? Is it still in the experimental phase? Is there any hope of success? Thank you.

**Chairman**: Dr. Iqbal

***Dr. Muzaffar Iqbal***: Thank you very much Mr. Chairman. It is rather unfortunate that you have to limit time for questions or comments in this very important session, which has actually opened up a huge area that has been neglected through the last three days of our conference. What would be the impact of any of these technologies on the rest of the universe? The second area which I wanted to comment is on what Dr. Farhat said by saying i.e. science is no more what it used to be. Science is the product of a given culture, of a given

civilization, which has a worldview of its own. So, all of these new technologies are emerging from a given cultural, historical, even scientific background. And, as the last speaker beautifully showed us the picture of the rest of the world, what are the social, economical, cultural implications of these technologies?

**Chairman**: Thank you! Bishop Camillo.

***Bishop Camillo Ballin***: I like to clarify the position of the Catholic Church concerning the use of stem cell. It is the embryonic stem cells which are prohibited for use but the adult stem cells can be used. So, Catholic Church allows adult stem cells and not embryonic stem cells.

**Chairman**: Thank you Bishop. Prof. Omar Suleiman.

***Dr. Omar Suleiman***: I would propose that there should be a system to guarantee transparency in research in this area. There should be a registration system and the international inspection team. I hope that WHO will make something like that. Thank you.

**Chairman**: Dr. Lehmann

***Dr. Lisa Lehmann***: Thank you. I just wanted to think about the reliable technology in the diversity of opinion that exists within Judaism and Jewish law. In general, in this issue, I think, there is a variety of opinion on specific issues. There is also a difference in perspective on what is the consensus, what is the majority opinion within Judaism. I just want to point out. Because, I think, that it is very important for our colleagues from different faiths to recognize that in US, in the testimony before congress and stem cell research, which is published as part of National Bioethics Commission Report of US government, the orthodox Jewish actually favoured the use of embryonic stem cells. Similarly, the state of Israel, a Jewish state, interested and committed to the idea of 'Halakha' or Jewish law, has also developed policies that are in favour of use of embryonic stem cells, particularly about the use of surplus embryo from IVF. It's important to recognize that Israel is one of the countries that is in the forefront of stem cell research. I believe that from a Jewish perspective the use of embryonic stem cell from IVF surplus embryos is actually permissible.

**Chairman**: Thank you. Dr. Abdul Aziz Saleh.

***Dr. Abdul Aziz Saleh***: Just a comment. Two days before this meeting, I had been asked in another conference on stem cell research and genetic engineering to present the views of the Islamic concept. Actually, I went through the books and there is a clear position. I see here it looks-like we have different views, still debating this. So, my point to our Islamic scholars is that we have in this book a very clear position "*Awwal Majlis Mugamma Al-Fiqh Al-Islami*". Even they specify the legal aspect and legal sources of stem cells and the illegal sources, and a very well defined position. This is my comment on what we have done in the Islamic Organization for Medical Sciences (IOMS) and in other committees. Actually, my question to Dr. Ted Peters is on the issue of the patency of the outcome of stem cell research. We are very much concerned of the equity issue.

**Chairman**: Thank you. Dr. Al-Aqeel.

***Dr. Aida Al-Aqeel***: It is very unfortunate that Dr. Al-Swailem has left us, because he had to catch his flight. I just want to complement him for his elegant talk. Really, he made of the ethical points of stem cell research very clear. Just one point about the UN resolution. It was on the 8$^{th}$ of March. I spoke about it yesterday. I put my first point was that there is no reproductive cloning for any reason. And, the UN General Assembly put certain priorities for biomedical research and also for the molecular genetic engineering. One of their priorities was infectious diseases rather than what we are doing at the moment. This is one point. Another point is patent. I could tell you about my experience with patent. I have discovered the disease and ended after my thought when we found the gene for it and we tried to patent that. However, since there was a collaboration between us and a Center Altroys, the other side of hemisphere, they did the patent excluding us. So, this is something, we should think of it, as a scientist in this part of the world.

**Chairman**: Dr. Mohaghegh Damad.

***Dr. Mohaghegh Damad***:

In the Name of Allah, Most Gracious, Most Merciful. I have a

question for Dr. Peters on behalf of the Christians. We understand from the sacred sources of the Catholic Church that the fertilization history in the human reproduction is confined to procreation and giving poeterity. Given this, how can they explain the birth of Prophet Jesus (PBUH)? In the Qur'an and al the Sacred Books, Jesus is said to have certainly been born from a mother and no father. Based on this exceptional case, why does the church say that human reproduction is confined to the marriage between man and woman? Thank you.

**Chairman**: Thank you. Dr. Abdul Gaffar Al-Sharif

***Dr. Abdul Gaffar Al-Sharif***:

I have one question to ask. I will not talk about the medical use of genes. The issue of cloning is a very important one which raises an ethical question: is it considered a disease to have no children to treat it that way? Or is it a normal situation amongst humanity? If it were a disease, why would the doctors invent contraceptives? Do they help people get sick? Is it considered an illness in some nations only, but the poor are required to minimize their reproduction rates? This is a highly important religious and ethical issue that should receive due answers. Thank you.

**Chairman**: Thank you. Dr. Shaheen.

***Dr. Shaheen***: Only note to Dr. Ted Peters. In your paper, page 8, last paragraph, third line 'in some sections of the Quran, we find quickening dated at 40 days after conception, elsewhere ensoulment at 120 days'. I think this is not in the Quran. This is in the prophet's Hadith. May be through the translation you wrote as Quran. Please correct it as Hadith.

As for Dr. Abdel Azeez Suweilam, I thank him for his valuable lecture. Yet, I have some comments to make. I heartily agree with him that therapeutic cloning does not actually exist now. It can rather be a cover for other practices. This is also stated at page 8 of the paper presented by Dr. Badran which redas, "the sense of the therapeutic potentials is unclear of the moment it is better to speak about research cloning rather than therapeutic cloning." The same problem is found in the term "pre-embryo" used by Dr.Suweilam and Dr. Peters for the

first days before implantation. This term is to denote 40-45% of fetuses in normal pregnancy before implantation. This also applies to the possibility of conducting research. He compared between cloning, IVF and ART. In the beginning, when the IVF technique appeared it was animitation of what happens inside the mother's body in the Fallopian Tube and the womb. Then, the imitation was fulfilled in the lab with the use of an egg and a sperm; a very ordinary process. Cloning, on the other hand, is not an imitation. It is rather a nuclear transfer. The nucleus of a somatic cell is transferred to an egg whose nucleus is removed. The most important problems of this technique is the cell cycle of these severe Chromosome mutations, the death cases and the high ratio of fetus loss. This is due to the inability to control the cell cycle of an egg with the cell cycle of the nucleus implanted in it.

**Chairman**: Dr. Abdul Rahman Refai

***Dr. Abdul Rahman Al-Refai***:

In fact, all people connect the human or genetic spirit with the Hadith on blowing the spirit into man after the stages of the sperm, the clinging clot of congealed blood and the fetus lump. Yet, the verification and edition of the Prophetic Hadiths substantiate something else of a more precise nature. When the sperm reaches the womb, the angel in charge of it takes the sperm and asks, "O Allah! Is it formed or not?" if not formed, it is expelled by the uterus. If the sperm is formed, it is implanted in the uterus. Then, the angel asks about everything concerning the new creature. Allah Almighty tells the Angel everything about it and says, "Go to the Preserved Tablet!" There, the story of this sperm is written. Some Hadiths even involve more details saying thet the Angel knows even about the setbacks of this would-be man and his luck. Then the Hadith says that if the sperm enters the uterus, Allah forms it after 7 days. This conforms to the genetic life of the embryo; hence the inviolability of the fetus. The Prophetic Hadiths discuss this issue. In these seven days, Allah forms this sperm and moulds it in whatever image He wills. The Qur'an, Hadith and Islamic Law urge the woman to preserve her pregnancy from the moment she knows of it. When a pregnant woman was

beaten on the belly by her husband's other wife and she was killed, the Prophet (PBUH) judges the payment of blood money for the killed fetus and a grand blood money for the mother. The prophet (PBUH) did not ask about the age of pregnancy. This substantiates that from the first 7 days, pregnancy is held sacred as the alive and fully developed man is.

Chairman: Dr. Farhat Moazam

***Dr. Farhat Moazam***: Thank you. Just two quick comments on Dr. Peters' talk. I really enjoyed it. My first comment is on the Ethics review committee, other people have also raised that point. It's good that Joran Hars is in Ethics review committee, but what I wanted to make sure was people do understand that in itself it is not sufficient to prevent unethical research.

Second thing, I wanted to make a point that you say regenerative medicine and here again it comes back to some of the points that was raised. The WHO Study, which Abdullah Daar is chairing, sent out a questionnaire to developing countries listing 20 diseases and that could be taken care of by regenerative diseases and it was interesting to see this particular list. Here again, regenerative medicine, whom will it benefit which leads to my final comment, Jesus is the healer. I think that's a beautiful motive. But, I think that Jesus was with those who are less privileged and those sunned by the society. It was not really to benefit those who had it already.

**Chairman**: Thank you Dr. Moazam. Dr. Gamal, please.

***Dr. Gamal***: Regarding what Dr. Ted Peters has raised about the religious leaders to approve the research on cloning. I want to say that this subject should be dealt with as cautiously as possible. Because, let me tell you the story of the advent of dynamite by Edward Noble. He told the first time that it is good for the humanity, just to extracting the precious gold. After that, you can notice how number of problems have crept in after abusing such inventions.

**Chairman**: Dr. Farouk

***Dr. Farouk Gad***: I have two questions. The first question is for Dr. Ted Peters. We have heard the Muslim perspective from Dr. Abdul

Aziz Swailem. I would like to hear, because your last word was that research in stem cell must go. I agree with you. And, you heard the facts that when they made cloning, they used 100 trials and then when they cloned they used 277 trials. What about human, I expect may be use 1000 times to try until we get one human to be cloned.

The second question is for Dr. Rabbi. In Israel, they tried very successfully and they even published last year about production of insulin from human embryonic stem cell. Another example given for that to compare human producing of insulin in 1971 in Germany. What is the use perspective for that to produce insulin from human embryonic cell? Thank you.

**Chairman**: Dr. Ted Peters.

***Dr. Ted Peters***: The first was just a reminder that no such thing as cloning of human being exists, be the reproductive cloning or therapeutic cloning, to my knowledge. So, we are anticipating future in this regard.

The third presentation made clear the cloning history, the stem-cell history. The idea of developing two animals with the same genome. Dolly simply is the latest chapter of the earlier developments. It is very important in the field of animal husbandry. That's the point of animal reproductive cloning. Human being has been cloned, experiments failed. We don't know why it is not working. Stem cell research has a separate developmental history. With regard to the death of Dolly, let me mention that when I visited Ian Wilmut in August 2002, he told me that Dolly has developed very unusual disease. And, he didn't know for sure, why? But, he said Dolly's activity is very different from other sheep. Because Dolly was world famous, people coming to visit Dolly every day, and she stood on her back legs to greet all of these visitors. Sheep can't do that, and that caused the deterioration of her back legs. When Dolly died a lot of people took lee.., aah... you see cloning doesn't work. Why that happened?

With regard to the term 'pre-embryo' and embryo, there were people who tried to distinguish between them. But Catholic Bioethicists said, follow all the sayings on them. So for the most part, I use two terms, the key word is 'pre-implantation embryo'. My judgement

is that there is a real difference between embryonic development outside and inside the mother's body. It is my judgement, but I could be wrong on that outside the mother's body, there is no potency of becoming a human being. Is the genetic code there? Yes, the problem is to overemphasize the value of the genetic code.

Finally, I get back to the economic justice issue. This is an enormous ethical issue which should be dealt with. I would like to divide it into two sub categories. One is general economic justice. We have economic distribution justice issues in all walks of life. There is nothing unique to genetic research. Now, what are the issues that are specific to genetic research in the context of distribution of justice?

**Chairman**: Thank you. Dr. Rabbi.

***Dr. Rabbi David Bleich***: Let me address the questions. As far as categorization of the majority and minority options are concerned, I stand by my comments both verbal and in writing. Israel is not a theocratic state. Therefore, any public policy formulated in the State of Israel should not be assumed to be in conformity with Jewish law or nonconformity with Jewish law.

The other point was very significant. In the US, when the government struggled with the issue of funding of stem cell research, President Bush announced in radio address that the funding will be withheld from any project using a stem cell line that was developed after the time of his announcement but those that were in existence before were perfectly accepted. His moral stance was based upon use of federal funds for research involving stem cell lines developed afterward. By providing funds, the government would be at least remotely involved in the development of those stem cell lines, and that this would be immoral.

Now, in so far as general medical ethics are concerned, the history of medicine is replete with the results on unethical experiments, as every one knows. In the United States, *post factum* utilization of information illegally obtained is enough reason to ban its admission as evidence in a court of law.

In so far as the history of science is concerned, if we ban the use

of data obtained from immoral experimentations, there would be many areas of medical research that would be closed. Judaism does not have such a principle.

Nevertheless, to the question the speaker asked, the insulin which has been produced would not be off bounds in so far as Jewish law is concerned. The insulin or any other product you create in such a manner would be acceptable.

**Chairman**: Thank you Dr. Bleich. Since this is my last opportunity to address you from this podium, I just want to thank Dr. Al-Awadi, the IOMS, and to Dr. El-Gendy for shouldering this event with best efforts. We are here to understand each other.

# Topic IV:
# How and Where do We Draw The Lines?

## Thirteenth Session
## Thursday, 9 February 2006

## Stem Cell, Prenatal Diagnosis and Reproductive Technology – Islamic Perspective

**Chairman** : Dr. Khalid Al-Mathkoor
**Rapporteur** : Dr. Shahid Athar

***Speakers:***

*1 - Dr. Musa Mohamed Nordin*
*2 - Dr. Maher Hathout*
*3 - Dr. Abdulfadl Mohsin Ebrahim*

# ISLAMIC MEDICAL ETHICS AMIDST DEVELOPING BIOTECHNOLOGIES

*Dr. Musa Mohamed Nordin*
MALAYSIA

# Islamic Medical Ethics Amidst Developing Biotechnologies

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## INTRODUCTION

Heralded by the revelation of the double helical structure of the DNA molecule in 1953, the 21st century is aptly designated the biotechnology century. The 20th century of physics, which saw the transformation of silicon into computing magic, was embraced with enthusiasm by virtually every household. However, unlike her predecessor, the same cannot be said about the advancements in biomedicine.

These revolutionary procedures in biotechnology has probed the outermost boundaries of what is scientifically possible and acceptable. Micro manipulation at the very earliest stages of human development, at the level of the embryo, single cell and genetic structure is undoubtedly a very delicate and sensitive issue with potentially explosive ethical, social, medico-legal and religious ramifications. Hence, the turbulent and not uncommonly hostile controversies that has since evolved.

Some of the issues in biotechnology which are debated contentiously and extensively across all segments of human society, include assisted reproductive technologies, human reproductive cloning, therapeutic cloning, embryo research, genetic engineering, euthanasia, organ transplantation, abortion and contraception.

## THE JURISPRUDENCE OF BIOTECHNOLOGY

As a complete and comprehensive way of life, the teachings of Islam encompasses all fields of human endeavours, spiritual and material, individual and societal, economics and politics, national and

international. This is well understood from the revelation during the occasion of the prophet's farewell pilgrimage.

"This day, I have perfected your religion for you, completed My favour upon you, and have chosen for you Islam as your religion" (5:3).

And the instructions which regulate our everyday activity of life is called Shariah.

(Islamic law). The Shariah is the epitome of the Islamic spirit, the most typical manifestation of the Islamic way of life, the kernel of Islam itself (1). Bioethical deliberations is inseparable from the religion itself, hence Islamic bioethics must remain and flourish within the confines of the Shariah.

All Muslim scholars and jurists are agreed that four sources of Islamic law remain in the forefront of all deliberations in Islamic jurisprudence (Fiqh), known as the Masadir al Shariah (2). They are:

1 - Quran

2 - Sunnah (authentic traditions of the prophet)

3 - Ijma' (consensus)

4 - Qiyas (analogy)

Others which are not founded on a material source (nass) from the Quran or Sunnah but capturing the spirit of the Shariah and taking into consideration the welfare of the community include:

1 - Istihsan - the choice of one of several lawful options

2 - Istishab - continuation of an existing ruling until the contrary is proved

3 - Urf - customs or precedent which does not contradict nass

4 - Maslahah or Istislah - consideration of public interest or welfare

5 - Shar'u man qabluna - the laws of our predecessors, either confirmed or abrogated by the primary sources

6 - Qawl as-sahabi - the narrative of the companion of the prophet

The purposes of the law (Maqasid al Shariah) arranged in their order of importance are directed towards the preservation of (3):

1 - Deen (religion)

2 - Nafs (life)

3 - Aql (mind)

4 - Nasl (progeny)

5 - Maal (property)

This classification which is permanent and immutable defines succinctly and clearly the objectives of the community and gives it balance and a sense of purpose. Three of these priorities are directly related to the preservation of health, namely life, mind and progeny.

And from the outset it must be emphasized that the Shariah is guided by five cardinal principles (Qawaid al Shariah). These are (4):

1 - The principle of intention - intent is all important in actions

2 - The principle of certainty - certainty cannot be changed by doubt and all acts are permissible unless there are clear prohibitions

3 - The principle of injury - do no harm, injury must be removed or compensated

4 - The principle of hardship - hardship calls forth ease and facilitation, need or necessity makes for allowing what is prohibited

5 - The principle of custom - custom or precedent is the rule unless contradicted by nass

These cardinal rules lead the scholars and jurists to think of Islamic Fiqh as the subject of five vital conceptions (5):

1 - There are few absolute obligations (takalif)

2 - Gradualism in the promulgation of laws

3 - Making the burden lighter when making and executing laws

4 - Hardship is avoided and necessity is taken into account

5 - Justice and equity must always prevail

The Shariah is therefore a living, dynamic and relevant entity. It is for everyone, everywhere and for all times. It also describes itself as a guide, a light and a mercy (6). It is this philosophy of the law which is alive to the contemporary challenges of advancing biotechnologies. I

have chosen to illustrate this harmony and the relevance of the law to three areas of cutting edge biotechnology, namely:

1 - Reproductive human cloning

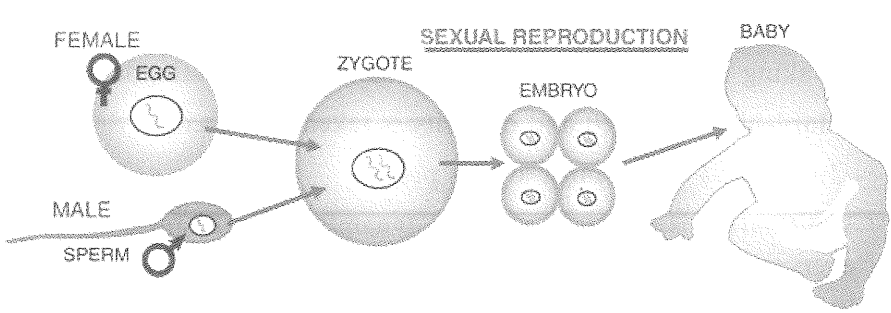
2 - Therapeutic cloning

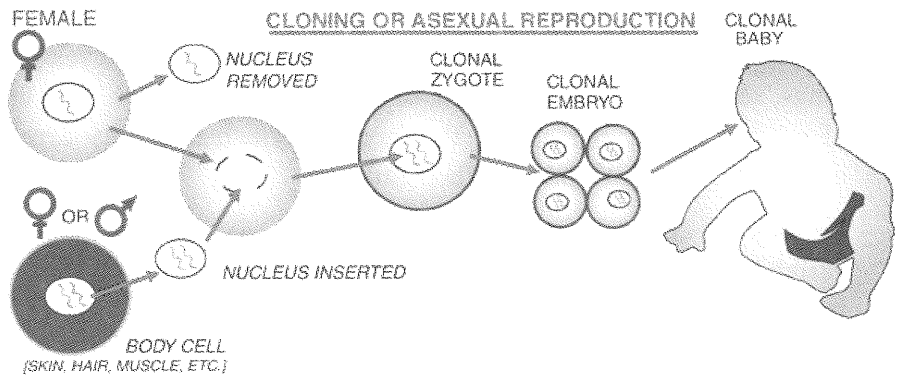
3 - Genetic technology and human embryo research

## HUMAN REPRODUCTIVE CLONING

When man was experimenting with cloning in plants, frogs and small marine animals, the Islamic Organisation of Medical Sciences (IOMS) based in Kuwait, convened a seminar in 1983 in which 2 papers were presented which dealt with the potential of human cloning and the shariah perspective on this possibility. When the cloning of Dolly the sheep by the technique of somatic cell nuclear transfer was announced in February 1997, the IOMS in their 9th Fiqh Medical seminar updated their juristic opinion on this most contentious issue (7).

Like the IOMS, virtually every Islamic seminar, jurisprudence council or individual scholars have concluded that cloning procedures aimed at producing human clones is not permissible. The majority considered it Haram (not permissible) in all its details (8). Whilst a minority opinion considered in Haram as a way to prevent a cause of harm (the necessity to refrain from causing harm to oneself and others). This latter juristic opinion keeps open the option of read-dressing the issue should new information become available and approved by Shariah. The use of somatic cell nuclear transfer technology even between husband and wife was also not approved.






The rationale for prohibition were as follows:

a - The basic concept in reproduction is to abide by the Shariah approved system of legally binding marriage, through the union of the sperm and ovum.

b - Human cloning is against the natural process (Fitrah) of human relationship of marriage and reproduction

c - The major harms far exceed the benefits. These include the disruption of lineage, family relationships and social fabric of humanity.

d - The anticipated social, moral, psychological and legal implications of human copies.

e - The possibility of interfering with the male-female population dynamics.

The ethics aside, the science of human reproductive cloning is not evidence based:

1 - It is an inexact science - there were 277 attempts before Dolly was possible. "Even with mammals the risks are monumental let alone humans, it is criminally irresponsible" says Ian Wilmut, the "creator of Dolly". Failure rates are in excess of 98%.

2 - It is an inefficient technology - Abortion rates are 10x higher, stillbirth rates are 3x higher. Natural reproduction is more efficient and... more fun.

3 - Unproven safety - Dolly suffered from premature rheumatism and

early death (she was "a sheep in lamb's clothings"). Other abnormalities include large offspring syndrome, underdeveloped lungs, reduced immunity, increased congenital anomalies. The list of misadventures increase by the day and which infertility expert or cloner is going to publish their failures!

4 - Besides it compromises the gene pool - it reduces genetic variability and diversity. One virulent pathogen maybe sufficient to wipe out the whole clone population.

The national and international response to the new technologies of human reproductive cloning have suffered a policy lull. Eight years post-Dolly, only a few countries have either drafted or enacted laws to bring human genetic and reproductive technology under responsible societal governance. As of November 2003, 77% of countries have not taken action to ban reproductive human cloning. Malaysia is in the final stages of drafting laws to ban the reproductive cloning of human beings.

Apart from a small minority of "rogue cloners" there is an international consensus against the reproductive cloning of human beings. However the opportunity to elaborate an international convention to ban reproductive human cloning was lost when member countries disagreed on the extent of the ban.

The USA and Costa Rica in the Policy on UN Cloning Treaty 2003, proposed a full ban on both reproductive and therapeutic cloning. Whilst other member countries supported the Belgium proposal for a partial ban, that is to ban reproductive cloning and allow national discretion on therapeutic cloning.

## THERAPEUTIC CLONING

Unfortunately, the confusion and disgust at the prospect of cloning and creating babies has been transferred to therapeutic cloning. In therapeutic cloning unlike human reproductive cloning the end point is not cloning a human being. This technology involves the production of human clonal embryos for the purpose of harvesting stem-cells, tissues and organs. This would open the potential of curing a whole

host of chronic and debilitating diseases including diabetes mellitus, parkinsonism, myocardial infaction and spinal injuries.

The source of the totipotent stem cells has however been a source of intense controversy. Stem cells found in umbilical cord blood, bone marrow and aborted fetuses are generally acceptable from the ethical and moral point of view. Though less plastic, scarce and sometimes quite inaccessible, there have been some success stories with the use of these non-embryonic stem cells.

The use of embryonic stem cells (ESC) is however fraught with highly charged religio-bio-ethical debate. The source of controversy revolves around the various questions about when life becomes a human life; namely:

1 - Is an ovum and sperm a person?

2 - When do the products of conception become a person?

3 - Does a zygote have a full set of human rights?

4 - Does the foetus have a soul?

This concept of personhood is neither logical nor empirical. It is based on one's fundamental assumptions about the nature of the world. It is primarily a religious or quasi-religious concept.

The Roman Catholics believe that the soul enters the body at conception and the fertilized ovum is a human person will full human rights. Pope John Paul II, on 29 August 2000 said, "methods that fail to respect the dignity and value of the person must always be avoided. I am thinking in particular of attempts at human cloning with a view to obtaining organs for transplants: these techniques, in so far as they involve the manipulation and destruction of human embryos, are not morally acceptable, even when their proposed goal is good in itself"

The scientific paradigm defines the pre-embryonic stage as the period from fertilization up to the determinant of the primitive streak at the age of 14 days. The pre-embryo is unable to feel pain or pleasure and therefore has no moral status. They may be cryopreserved, discarded or used for research purposes.

Lord May of Oxford, the President of the Royal Society said, "to cut off this research (without clear understanding of the science of

therapeutic cloning and its potential to contribute to mankind) would be an act of intellectual vandalism comparable to papal censorship of Galileo and Copernicus."

The first verse revealed to prophet Muhammad in the cave of Hira' translates as follows:

"Read! In the name of your Lord, who has created. Has created man from alaqa." (96:1-2)

This verse embodies two very significant messages. From the outset, the Quran emphasizes the primacy of knowledge and follows this with the first lesson in embryology, the very creation of man himself.

The Quran is a book of guidance to invite mankind to the truth and salvation. But nonetheless it contains many "signs" which invites mankind to reflect upon his creation and the world that surrounds him. In various verses, it illustrates lucidly both the physical and spiritual dimensions of man's creation. In chapter 23, verses 12-14, the Quran says:

"And indeed We created man from a quintessence of clay. Then we placed him as a small quantity of liquid (nutfa) in a safe lodging firmly established. Then we have fashioned the nutfa into something which hangs (alaqa). Then We made alaqa into a chewed lump of flesh (mudgha). And We made the mudgha into bones, and clothed the bones with flesh. And then We brought it forth as another creation. So blessed be God, the best to create"

The nutfa represents the blastocyst which embeds within the endometrium. The alaqa, much intrigued the distinguished embryologist, Prof. Moore who was puzzled at how 1400 years ago anyone could accurately describe it as something which clings to the inner uterine wall like a leech. The scholars of Quran were similarly unable to explain the concept of mudgha until microsopy revealed that the chewed lump of flesh resembled accurately the appearances of the somites. And note how explicit the verses has been in illustrating that the ossification centres preceded the formation of the myotomes.

In another verse the Quran very clearly revealed another phase of man's being, the process of ensoulment.

"and breathe into him of His spirit" (32:9)

The soul is a metaphysical concept which is fundamental in Islam and it defines a human individual. The majority opinion in Islam accepts the 120th day of pregnancy as the time of ensoulment. Eventhough ensoulment occurs later, the embryo is respected from the onset of fertilization and acquires consideration as a human foetus after implantation.

And based on these fundamental premises, at least three Islamic Fiqh (Jurisprudence) Councils have given permission for the use of surplus embryos from IVF laboratories for ESC research (9,10,11). However, it is not permissible at this juncture, to consciously generate pre-embryos either by conventional IVF techniques or somatic cell nuclear transfer (SCNT) for ESC research.

As at November 2003, 6 (3%) countries have allowed therapeutic cloning whilst 30 (16%) have prohibited it. The 6 countries in favour of allowing therapeutic cloning to proceed within stipulated policy guidelines are China, Singapore, Belgium, UK, Cuba and USA.

The Federal Embryo Protection Law (1990) of Germany prohibits both reproductive and therapeutic cloning. This represents the spectrum of countries with "relatively restrictive" laws related to reproductive technologies. Others include Austria, the Scandinavian countries, Ireland, Italy, Netherlands, Spain and Switzerland

The other end of the spectrum is represented by the United Kingdom's Human Fertilisation and Embryology Act (1990) and Human Reproductive Cloning Act (2001) and Singapore's Bioethics Advisory Committee (BAC) Report on "Ethical, Legal and Social Issues in Human Stem Cell Research, Reproductive and Therapeutic Cloning" which was approved by the government on 18 July 2002. The UK and Singapore "more permissive" regulations allows the generation of embryos by both IVF and SCNT technologies if there is a demonstrable and exceptional need which cannot be met by the use of surplus embryos.

The "in-between" policies are demonstrated by the Canadian's new Assisted Human Reproduction Act (2004) and Australia's Research Involving Embryos Act (2003). They both allow the utilization of surplus IVF embryos for research but prohibit the creation of human embryos for research and SCNT for research and reproduction. The current thinking in our Malaysian National Committee on Human Cloning seems to favour this line of thought and legal framework; which is also resonates well with the fatwa issued by the three jurisprudence councils in Jeddah, USA and Jordan.

Except for Israel, none of the nations in the Middle East have taken legal action to regulate either reproductive or therapeutic cloning. As at 6 November 2003, Bahrain, Iran, Jordan, Kuwait, Lebanon, Oman, Pakistan, Qatar, Saudi Arabia, Syria, UAE and Yemen voted in favour of Iran's motion on the UN Cloning Treaty Process, to postpone further discussions for another 2 years. This is illustrated in the table below.

| **Region** | **Coun-tries** | **Reproduc-tive Cloning** | | **Research Cloning** | | | | **IGM** | |
|---|---|---|---|---|---|---|---|---|---|
| | | **Prohibited** | | **Prohibited** | | **Allowed** | | **Prohibited** | |
| | # | # | % | # | % | # | % | # | % |
| Africa | 53 | 1 | 2% | 1 | 2% | 0 | 0% | 1 | 2% |
| Middle East | 23 | 1 | 4% | 0 | 0% | 0 | 0% | 1 | 4% |
| South Asia/ East Asia/ Pacific | 33 | 6 | 18% | 3 | 9% | 2 | 6% | 5 | 15% |
| Europe - Eastern | 24 | 14 | 58% | 8 | 33% | 0 | 0% | 9 | 38% |
| Europe - Western | 24 | 16 | 67% | 13 | 54% | 2 | 8% | 8 | 33% |
| Americas & Caribbean | 35 | 8 | 23% | 5 | 14% | 2 | 6% | 3 | 9% |
| **World** | **192** | **46** | **23%** | **30** | **16%** | **6** | **3%** | **27** | **14%** |

Previously it was thought that it would be extremely difficult to develop comprehensive policies to govern human genetic and reproductive technologies. Despite the earlier skepticism, various countries have now shown that it is possible to break the policy deadlock and draft legislation to regulate these new technologies of human genetic modification. Despite their different political and social experiences, some of the national policies thus available have exhibited a remarkable sharing of core principles; namely:

a - they affirm technologies with a real chance of preventing or curing disease

b - they ban technologies which could harm children or open the door to free market eugenics

c - they ensure research involving embryos is tightly regulated

d - they establish publicly accountable means to review policies & make new ones

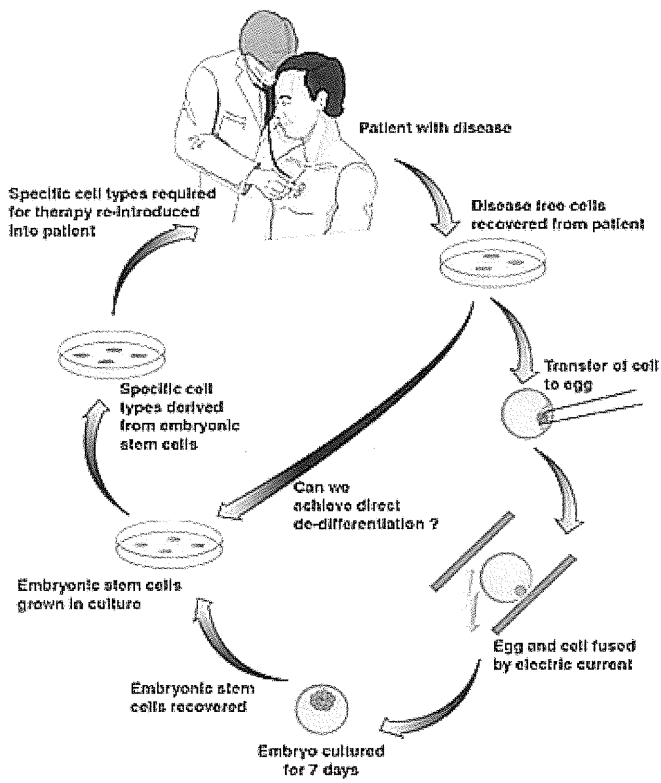
e - they pose no risk for reproductive rights

Probably one of the most far reaching thoughts on this highly controversial issue of ESC research has been that propounded by Sheikh Dr. Yusuf Al-Qardawi, a highly respected and contemporary Muslim scholar who related in his concluding remarks after a lengthy juristic deliberation the following position (12):

"If it becomes possible through research to clone organs such as the heart, liver, kidneys or others which may benefit those who are in dire need of them; then this is permitted by religion and the researcher or scientist will receive the reward from Allah. This is because the research will confer benefit on humanity without loss to others or infringing upon them. Therapeutic cloning with this noble research pursuit is permissible and it is encouraged. In fact, in some circumstances, it may become mandatory to enhance this research in accordance with the need and man's research capability and accountability."

The following diagram illustrates the extreme potential for therapeutic cloning, with virtually zero risk of graft versus host disease (GVHD), with the option of either de-differentiation of the patients

indigenous stem cells or utilizing somatic cell nuclear transfer technology to generate embryonic stem cells.




## GENETIC TECHNOLOGY AND HUMAN EMBRYO RESEARCH

Two hadiths (authentic traditions) related from the Prophet has helped us to have a better insight into the science of genetics.

"Select your spouses carefully in the interest of your offspring because lineage is a crucial issue"

"Do not marry your close relatives because you will beget weak offsrpings"

The second Caliph of Islam, Omar ibn El-Khattab, upon noting

that a particular tribe intermarried with increased frequency, remarked to them:

"You have weakened your descendants. You should marry strangers (people outside your tribe)".

The spirit of the exhortations of the Prophet SAW and his companion was to secure normal and healthy babies, protection of their early well being, endowed with the benefits of good genes from both parents and the prevention of congenital malformations and its consequent disabilities.

A variety of inherited diseases may now be diagnosed in the pre-embryo stage prior to implantation into the uterus. Highly sensitive polymerase chain reaction (PCR) techniques have enabled the rapid amplification of minute amounts of DNA material from the embryonic cells. Fluorescent in situ hybridization (FISH) technology with combination chromosomal probes have made possible the genetic analysis of embryonal sex and various aneuploidies (13).

Some of the potentially debilitating diseases which may be screened include Trisomy 13, 17 and 21, cystic fibrosis, haemophilia, Marfan's syndrome, incontinentia pigmentosa, x-linked immune deficiency, retinitis pigmentosa, fragile X syndrome, muscular dystrophy and Lesch-Nyhan disease. The first preimplantation genetic diagnosis (PGD) was achieved in 1989. Since then, well over 200 diseases or conditions has been further isolated with ongoing PGD research (14).

The First International Conference on Bioethics in the Muslim World held in Cairo from 10-13 Dec 1991 examined very carefully this area of pre-embryo research (15). Collaborating this with the decisions of other scientific cum Islamic jurisprudence seminars, the following practice guidelines may be summarized:

1 - Cryopreserved pre-embryos may be used for research purposes with the free and informed consent of the couple.

2 - Research conducted on pre-embryos is limited only to therapeutic research. Genetic analysis of pre-embryos to detect specific genetic disorders is permissible. Hence diagnostic aids should be provided for couples at high risk for selected inherited diseases. The treated

embryo may only be implanted into the uterus of the wife who is the owner of the ova and only during the span of the marriage contract.

3 - Any pre-embryos found to be genetically defective maybe rejected from transfer into the uterus after proper counselling by the physician.

4 - Research aimed at changing the inherited characteristics of pre-embryos (e.g. hair and eye colour, intelligence, height) including sex selection is forbidden.

5 - Sex selection is however permitted if a particular sex predisposes to a serious genetic condition. One of the first couple to use the technique of sex selection was hoping to escape a neurologically debilitating disease known as x-linked hydrocephalus, which almost always affected boys. Embryonal sex selection would make possible the weeding out of other serious x-linked disorders including haemophilia, Duchenne muscular dystrophy and fragile X syndrome.

6 - The free informed consent of the couple should be obtained prior to conducting any non-therapeutic research on the pre-embryos. These pre-embryos should not be implanted into the uterus of the wife or that of any other woman.

7 - Research of a commercial nature or not related to the health of the mother or child is not allowed.

8 - The research should be undertaken in accredited and reputable research facilities. The medical justification for the research proposal must be sound and scientific and conducted by a skilled and responsible researcher.

The designer baby technology or inheritable genetic modification (IGM) has further accentuated the ethical debate often referred to as "slippery slope" issues. The world's first true designer baby, Nash Brown, was born on 29 August 2000. He was conceived specifically for the sake of his six year old sister, Molly who suffered from Fanconi's Anaemia. His umbilical cord blood was transfused into Molly, with the hope of curing her condition.

Another landmark case was in the UK in 2001, where a British couple was given the go ahead by the courts to select an IVF baby who is Thalassaemia free and has a tissue make-up which precisely match their son Zain who suffers from Thalassaemia and does not have a compatible donor. Umbilical cord blood from the IVF baby would be transplanted into Zain to cure his Thalassaemia.

The table shows that only 27 (14%) countries have taken action to ban the creation of designer babies.

## CONCLUSIONS

Islamic medical bioethics is firmly grounded on the fundamental tenets of the Islamic Shariah. The close collaboration between the scholars of jurisprudence and the scientific and medical fraternity has enabled her to keep abreast of the plethora of advancing biotechnologies.

Despite the wide ranging bio-religio-ethical problems and dilemmas posed by these emerging biotechnologies, Islamic medical bioethics, has provided a "middle of the road" approach moderating between the extremes of conservatism and liberalism. This it does without impeding the genuine and responsible quest for new knowledge and breakthroughs in new research frontiers.

It has provided a legal framework for responsible societal governance of human genetic and reproductive technologies and banned all forms of free market eugenics.

Allah says in Chapter 2, verse 143:

"Thus we have appointed you a middle nation, that you may be witness against mankind, and that the messenger maybe witness against you..."

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# STEM CELLS AND DNA: MODERN ETHICAL CHALLENGES

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# Stem Cells and DNA: Modern Ethical Challenges

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New progress in medicine, particularly in the area of genetics, is opening a window that was never opened before. This may enable us to see and predict areas of our future, in which God is moving them from the realm of ghayb to the area of human knowledge. Moreover it might enable us to control parts of these areas that one could never have been able to control before.

Like every new ability that is now discovered, from fire to using metal, up to the atomic age, every discovery represents a test for humanity, since it could be used for good or evil purposes, depending on the moral basis and the respect or disrespect for the common good. These discoveries in medicine are no exception to this rule.

Some of the main areas fitting the abovementioned description are: stem cell collection and utilization, and DNA collection, storage and utilization with the possible undermining of individual privacy.

In this presentation, I will briefly describe the main issues of each item with the potential dilemmas facing medical ethicists, then I will focus on the issue of DNA collection. As a Muslim American preoccupied by issues of human rights, civil liberties and the right to privacy, I intend to offer samples of the wide and intense debate around the issues within the United States. It is quite clear that issues within the States are not exactly domestic or local, but rather precursors to what will take place in our globalized world.

**Stem cells:** These are the original, primitive cells, at the pre-differentiated stage. They have two important abilities: multiplication and differentiation, that is, taking a course towards being organ cells, like brain cells, heart muscle cells, columnar cells lining the intestines, etc. Usually when they are differentiated, they lose to a variable

degree, the ability to multiply or rejuvenate; they are stem cells no more.

The breakthrough in medicine is to get these cells and direct them towards different lines of differentiation, so they can become nerve cells, brain cells, or heart muscle cells, and then eventually replace the cells that have been destroyed irreparably in different organs, such as the brain, heart or nervous system as required. The best source available for us to get these cells is the human embryo. Recently, however, other sources are being entertained; the most promising source is blood from the umbilical cord. Specialists in the field will discuss these different potential options.

The debate erupted around the issue of the embryo, and so in the USA it boiled down to be a debate around abortion, the fight between the so-called pro-life versus the so-called pro-choice. Then it evolved to be between conservatives and liberals and in election years it becomes a fight between Republicans and Democrats. When science is so politicized, objective, scientific inquiry becomes marginalized.

It is for people of science and conscience to bring the debate back to its legitimate arena, which is the benefit of humanity. In exploring the religious debate about abortion within the three Abrahamic religions, we will notice that within each religion there are: a) multiple opinions (probably with the exception of modern Catholicism), and b) there is a process of evolution. This paper will briefly demonstrate both a and b.

**DNA:** What DNA is, and its individualistic nature will be explored. DNA is equivalent to permanently available fingerprints and identification cards of every individual from whom we can get any traces of tissue or body fluid. Because of that, it is widely used in criminology, and is admissible in courts as almost irrefutable evidence. In addition, it carries the genetic marks that pass through generations, hence came its use to prove or disprove paternity.

The debate about DNA in the United States is again running on political motives and consideration.

The idea of storing or archiving a huge collection of DNA for individuals or groups who can potentially be subject to scrutiny.

The paper will sample a Congressional bill about the subject.

The debate here is mainly about the right of privacy, civil liberties and the potential abuse by authority, or even the possibility of intended or unintended leaking of such information.

While there are valuable uses of studying DNA to prevent the proliferation of congenital diseases, the current debate is focused on the issues of human rights and liberties.

This paper is not offering answers but inviting all to a collective thinking process to find guidelines based on the purpose of Devine Revelation to realize the benefits of human beings.

## The Stem Cell

### What is the stem cell

Stem cells are those cells that serve as a normal reservoir for new cells that may be needed to replace damaged or dying cells.One fundamental characteristic of stem cell, is its lasting ability to multiply when called upon. For the purpose of our discussions,

Stem cells are divided into four groups

Adult stem cells

Fetal stem cells

Embryonic stem cells

Nuclear transplant stem cells

Embryonic stem cells are pluri-potent, that is able to differentiate to form different tissues and organs, as the fetus is growing rapidly to maturity, all his tissues including the brain have stem cells.

Because of our ability now to isolate stem cells the concept of repairing heart muscles by encouraging the growth of new muscles, now became within reach.

This new way of thinking has brought the stem cell to the fore front of Medical research.

The stem cells researchers are increasingly interested in studying these tissues for the progress needed to treat certain diseases and to repair damage of tissues that are are irreparable till now.

However in the past most of the medical research focused on adult diseases with interest in organ repair or development to cure diseases.

Adult diseases can be broadly divided into three categories

Too much cell divisions as in cancers

Too little cell divisions with inability to repair damaged tissue

Or defective cell divisions as in hemophilia or diabetes.

Promising as it is, yet, these developments as well as the research needed to expand them sparked a debate between Scientist and other Social, religious and ethicists groups.

## The Religious, Social Debate:

Because of the fact that the most available and flexible stem cells are those obtained from the human embryos, the debate actually became a debate about abortion.

Abortion is a very polarizing issue in the American Society.

As the United States is the home of the followers of many religions, and as the constitution allows the state neither to promote nor inhibit any particular religion, it was natural that different groups will hold dearly to different positions. To use very broad categorization, that debate was formed - in an over simplified way - within two groups, one called itself "pro life", i.e. anti-abortion, while the other called itself "pro choice."

This eventually meant an argument between conservatives versus liberals, which is further politicized to be between Republicans versus Democrats.

This is not the forum to expose the fallacy of the premises of this classification, or the crossing lines between the two camps as well as the inadequacy of the terminology used by both sides.

Unfortunately each side has its extremists or even its terrorists who

are ready to kill Doctors and bomb abortion clinics, sometimes in the name of God.

When such a complex issue is so much politicized, and when religion is used to justify political stands, and even to affect elections, the objective scientific, as well as religious exploration becomes more difficult.

From a religious point of view, looking at the major religions represented at the United States, we find two realities:

1 - Within each religion, there are different interpretations

2 - Each stand has been subject to development and evolution

The exception may be the stand of current Catholicism, but even there, there is the fact that the stand of the Church now, is different from its very early one, and that there is a very vibrant debate within the circles of Catholics, particularly in the United States.

## A brief look to different religious stands:

Religious opinions on embryonic stem cell research closely tracks positions on abortion. The religions that are liberal on abortion are generally positive about stem cell research. (1)

## The Roman Catholic:

In the 5$^{th}$ Century - Saint Augustine proclaimed that abortion before the quickening "4-5 weeks of development" was neither a sin nor a homicide because there is no living soul.

In the 12$^{th}$ Century, Saint Thomas Aquinas saw embryo genesis as proceeding through 3 stages:

- Vegetative, animal, and rational where only in the rational stage did the fetus gain a soul, concluding abortion before 40 days from last menstrual period is not considered murder.

In 1869, Pope Puis IX changed the direction of the Church, for the first time in Catholic history. Abortion from the moment of conception became the equivalent of homicide; the 1917 code of Canon Law put it all in writing. Thus for nearly 2000 years, the Church accepted abortion. Only in the last 150 years it has been banned.

## Buddhists:

Treat life as a continuum. Most modern Buddhists agree that the decision of whether or not to abort belongs to the mother.

## Judaism:

Is not unified on the issue of elective abortion, but in general, the consensus among reformed Jews is that abortion is a woman's choice. The fetus is not considered a person until it takes the first breath of life at birth -" the delayed ensoulment".

## The Presbyterian Church:

Supports a women's right to choose, as do many other American groups.

Religious opinions on embryonic stem cell research closely tracks positions on abortion. The religions that are liberal on abortion are generally positive about stem cell research.

The Church of Scotland recognizes the potential benefits of embryo research under limited circumstances and hopes that the research will create therapy to help life.

The Ethic Committee at Sydney Adventist hospital says that we should be open to finding the best solution in advancing technology.

The Episcopalian Church is divided. Some bishops permit embryonic research on embryos up to 14 days old.

The Presbyterian approves donating embryos from fertility clinic. This should be limited to embryos that do not have a chance of growing into human being.

The Union of Orthodox Jewish congregation states that "an isolated fertilized egg does not enjoy the full status of personhood."

The Lutheran and United Methodist Churches agree with the Vatican and are opposed to human embryonic stem cell research.

The Southern Baptist Convention asserts that human embryos are the tiniest of human being.

The American Life League "ALL", which is the largest grassroots,

pro-life organization, want to criminalize embryonic stem cell research and want to ban fertility clinics and contraceptives.(1)

## The stand of Muslims:

This is eloquently and briefly summarized by Dr. Hassan Hathout in his Book 'Reading the Muslim Mind'.(2)

Abortion: There are no "pro-life" and "pro-choice" lobbies in Islamic communities, with a raging battle such as takes place in America. Islam views abortion very differently from contraception, since the former entails the violation of a human life. The question that naturally arises is whether the term "human life" includes the life of the fetus in the womb. According to Islamic jurisprudence it does. Islam accords the fetus the status of "incomplete zimma". Zimma is the legal regard that allows rights and duties, and that of the fetus is incomplete in the sense that it has rights but owes no duties. Some of these rights of the fetus are:

1 - If a husband dies while his wife is pregnant, the law of inheritance recognizes the fetus as an inheritor if borne alive. Other inheritors would receive their shares in accordance with the prescribed juridical proportions, but only after the share of the unborn is set aside to await its birth.

2 - If a fetus is miscarried at any stage of pregnancy and shows signs of life such as a cough or movement and then it dies, such fetus has the right to inherit anything it was legally entitled to inherit from anyone who died after the beginning of the pregnancy. After this fetus dies, what it has inherited is inherited in turns by its legal heirs.

3 - If a woman commits a crime punishable by death and is proven pregnant, then the execution of the punishment shall be postponed until she gives birth and nurses her baby until it is weaned. This applies irrespective of the duration of the pregnancy, however early, denoting the right of the fetus to life from its beginning. It applies

(1) "Human Embryonic Stem Cell by Ann A Kiessling and Scott Anderson Jones and Bartlett Publishers,Boston.

even if the pregnancy was illegitimate, which shows that the fetus conceived out of wedlock also has the right to life. All sects and juridical schools unanimously uphold this ruling.

4 - There is a monetary penalty exacted for causing abortion, even if it is inadvertent. This is called the "ghorra." If aggression or willful action causes abortion, suitable punishment by the court is also imposed.

The question of the beginning of life has been discussed in Islamic circles since early times, since the admissibility of abortion is subject to establishing the existence of life (some past jurists permitted abortion before four months, others before seven weeks, of pregnancy, on the assumption that life had not started in the pregnancy.) Some ten centuries ago, Al-Ghazali, a notable scholar, rightly described a phase of imperceptible life, before the phase that the mother could feel in the form of fetal quickening. Recent juridical congresses have reviewed the subject taking into account the applications of modern technology, and concluded that the stage of an individual's life that can be called its beginning should satisfy ALL the following criteria:

1 - it should be a clear and well-defined event;

2 - it should exhibit the cardinal feature of life: growth;

3 - if its growth is not interrupted, it will naturally progress through the subsequent stages of life as we know them;

4 - it contains the genetic pattern that is characteristic of the human race at large, and also of a unique specific individual; and

5 - it is not preceded by any other phase which combines the first four. Obviously, these postulates refer to fertilization.

Abortion is permitted, however, if the continuation of a pregnancy poses a serious threat to the mother. The Shari'a considers the mother to be the root and the fetus to be the offshoot; the latter to be sacrificed if that is necessary to save the former. There are some who argue in favor of expanding the admissibility of abortion to also cover drastic cases of congenital anomalies and fetal illness incompatible with feasible life, if performed before a pregnancy is four months long.[2]

(2) Hassan Hathout. Reading the Muslim Mind. American Trust Publications, Plain field, Indiana, U.S.A. 1994.

Naturally, the debate will go on and on, however, there are potential alternatives that can render the debate irrelevant to the main goal, which is using stem cells to prolong or improve the quality of life.

The most promising research is getting stem cells from umbilical cord, there has been recent reports that a small populations of Stem cells may be present in Adult tissues as the heart, kidney, spinal cord, eye and brain

Our challenges would be to isolate theses cells and encourage their multiplications either from a falling organ or from adult organs donated by individuals before their death.

We can create banks for heart muscles stem cells or other organ stem cells.

Also under Certain conditions instead of using Bone Marrow transplants, venous blood can be enriched with bone marrow stem cells, these cells can be isolated from the vein

All these options may have certain limitations or technical demands; I hope that the specialists in the field will educate us about this exciting area.

In conclusion, I have to say that Islam encourages all kinds of inquiry, discovery and research as a mandate to the Quran. Using what we discover should be guided by the merit of each new discovery and ability based on its benefit to humanity.

## D.N.A.

DNA, (Desoxy Ribo Nucleic Acid) is a protein molecule present in the nucleus of every cell. It holds an extensive amount of genetic information in each different individual. Information related to the physical and mental status of each unique individual. It carries the same genetic marks of the individual, parents, siblings and offspring. In a sense, it is both an I.D. card of the individual, more unique than his or her finger prints and, at the same time, it is a family archive that each one of us carries about ancestors, siblings, and offspring. While most of this information is currently indecipherable, yet the

major goal of the "Human Genome Project" is to decipher the code so that the information it contains becomes accessible.

## What is a genome?

- A **genome** is all the DNA in an organism, including its genes. Genes carry information for making all the proteins required by all organisms. These proteins determine, among other things, how the organism looks, how well its body metabolizes food or fights infection, and sometimes even how it behaves.
- DNA is made up of four similar chemicals (called bases and abbreviated A, T, C, and G) that are repeated millions or billions of times throughout a genome. The human genome, for example, has 3 billion pairs of bases.
- The particular order of As, Ts, Cs, and Gs is extremely important. The order underlies all of life's diversity, even dictating whether an organism is human or another species such as yeast, rice, or fruit fly, all of which have their own genomes and are themselves the focus of genome projects. Because all organisms are related through similarities in DNA sequences, insights gained from nonhuman genomes often lead to new knowledge about human biology.

## The Human Genome Project

Begun formally in 1990, the U.S. Human Genome Project was a 13-year effort coordinated by the U.S. Department of Energy and the National Institutes of Health. The project originally was planned to last 15 years, but rapid technological advances accelerated the completion date to 2003. Project goals were to

*Identify* all the approximately 20,000-25,000 genes in human DNA,

- Determine the sequences of the 3 billion chemical base pairs that make up human DNA,
- Store this information in databases,
  *Improve* tools for data analysis.

## *Transfer* related technologies to the private sector, and *Address* the ethical, legal, and social issues (ELSI) that may arise from the project:

Another aspect of the U.S. Human Genome Project is that it was the first large scientific undertaking to address potential ELSI implications arising from project data.

Another important feature of the project was the federal government's long-standing dedication to the transfer of technology to the private sector.

The highly personal nature of the information contained in the DNA can be illustrated by thinking of DNA as containing an individual's future diary[3]. A diary is the most personal and private document a person can have. While diaries describe the past, this DNA diary, which has the information in one's genetic code can be thought of as a coded probabilistic future diary because it describes the important part of a unique and personal future.

While DNA analysis so far helped in areas of criminology, it became admissible in courts as a very strong evidence to prove guilt or innocence, and while it is used to prove paternity when such a proof is needed, yet the powerful and personal information contained in the genetic material and its availability to other than the person who is subject of the test, sets it apart from a regular diary, that is created by its owner. The sensitive nature of the information about susceptibility to certain stigmatizing physical and mental diseases, not known to the person him or herself, carries potential serious issues about privacy as well as practical repercussions in terms of social acceptability, marriage, employability as well as health and life insurance.[3]

Hence, come the ethical dilemma, while DNA may be collected for a certain purpose, yet the diary is out, the information can be used for purposes different from what it was collected for, whether advertently or through unintended leaking to other sources. In a society that is based on individualism, this sparked a vibrant ethical, political and constitutional debate.

As a result of this debate is "The Genetic Privacy Act," which is a

proposal for the federal government based on the premise that genetic information is different from all other personal information in ways that require special protection.

The ethical debate is fueled by certain proposition to promote DNA testing and utilize these available information, as Proposition 69 DNA Sample collection:

Requires collection of DNA samples from all felons, and from adult & juveniles arrested for or charged with specified crime, and submission of A DNA specimen to State DNA database, and after five years in 2009 to 2010 Proposition 69 will allow collection of DNA specimens from adults arrested for or charged with any felony and from anyone arrested even for mistaken identity "for a felony" or arrested and never charged with a crime.

This will change the principle of every one is innocent until proven guilty. Taking thousands of innocent people's DNA and storing it permanently, alongside felons DNA, is problematic, as we are mixing the innocent and guilty in one Criminal data base, and affecting our privacy rights.

## Demand for DNA Collection:

Those guilty of crime that does actual harm to persons or property should be brought to justice as quickly as possible under the rule of law. DNA holds great promise to exonerate the innocent and prosecute the guilty.

However our fourth and Fifth Amendment rights should be protected. The American civil liberty is opposed to the expansion of DNA testing. Samples should be destroyed within a reasonable period after testing is completed and pending criminal matters are resolved.

Because genetic testing pertains, not only to the individual tested, but also to everyone who shares that person's blood line. Genetic discrimination by private industry may increase. Healthy people may be denied insurance or a job based on genetic prediction.

(3) George J. Annas JD, MPH et al. Health Law Dept; Boston University, School of Public Health.

The Security of DNA information is vulnerable particularly when it is being shared among many different agencies, and the individual has no control over its circulation.

This is why the Genetic Privacy Act was proposed for Federal legislation.

This is based on the fact that Genetic information is different from other types of personal information in ways that require special protection. The DNA holds an extensive amount of information; this if should be accessible to whom?

DNA information contains individual's future; it describes a unique and personal future in terms of physical and mental well-being off this information is obtained by someone else without the person's permission, this person, insurers or employers can use this information. Also information about a person's family, parents, siblings, and children also can be used in the future for more information as more is learned about how to read the code. Information can be used to discriminate against those perceived as genetically unfit.

**DNA Data Bank:** Entities that collected, stored and analyzed and controlled DNA samples needs new rules to minimize the potential harm to individual privacy.

There are many entities that store Genetic materials including FBI, individual state programs that stores DNA samples from convicted sex offender and other criminals, the U.S. army's sample storage program and private medical research projects. Other programs such as Red Cross and other blood banks, private sperm, ovum and embryo banks and state facilities that store blood sample, all these entities have stored genetic information that can be used or misused.

DNA samples may be collected and analyzed for identification for law enforcement purposes if authorized by state law, and for identifying dead bodies.

We need guidelines for Protecting Privacy of Information Stored in Genetic Data Banks. These guidelines should include:[3]

The sample source or his representative has the right to:

1 - Determine who may collect and analyze DNA

2 - Determine the purpose for analysis

3 - Know what information can be expected to be determined

4 - Order the destruction of DNA samples and delegate that after death

5 - Refuse to permit the use of DNA for research

6 - Obtain copies of records containing information derived from Genetic analysis

7 - Research on individually identifiable DNA sample should be prohibited unless authorized by the sample source or his representative.

In spite of all the precautions, still there is the concern expressed by Civil rights groups and Ethicists, that such important information may leak leading to different discriminatory actions against individuals or groups, and may give the Federal Authority the power to invade the privacy of the citizens.

The Society has to debate the risk versus the benefits and to design ways to protect the privacy of its individuals.

# SURROGACY: AN ISLAMIC ETHICO-LEGAL AND SOCIAL PERSPECTIVE

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# Surrogacy: An Islamic Ethico-Legal and Social Perspective

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## ABSTRACT

*Since the 1970s, breakthroughs made in the field of assisted reproductive technologies (ART) have given infertile couples new hope and the chance to have children. One such method has been the combination of donor insemination (DI) along with surrogate mother arrangements. Surrogacy involves a woman bearing the child of another woman who is not in a position to bear a child due to, for example, failure of the wife to ovulate (anovulation) or due to the fact that she does not have a uterus. In that case, the sperm of the husband would be used to fertilize the egg of surrogate mother in vitro and the child that comes into being would have the genetic complement of the husband and the surrogate mother and not that of his wife. Such an attempt to manipulate pregnancy in the laboratory is generally a manipulation which is devoid of any act of love between the spouses and gives rise to a host of ethico-legal and social concerns. This paper attempts to address these concerns from an Islamic religious perspective.*

## INTRODUCTION

All major religions in the world hold that the universe is teleological in the sense that it is based on the belief that the world was created for a divine purpose. Hence, all religions exhort their followers to populate the world so that the divine purpose may be fulfilled. However, approximately 15% of all couples in the world suffer from infertility (Ebrahim, 2002). From the religious imperative to populate the world, people tried, in the past, to overcome the problem of infertility through non-scientific means, sometimes with success and more often with great disappointment. However, with advances made in the field of biomedical reproductive technology,

infertile couples have various options at their disposal, depending on the nature or cause of their problem. In the West today, where secularism prevails, there is no limit to the extent that one may go in trying to rectify one's infertility problem. Perhaps the only concern in that part of the world may relate to whether such biotechnological reproductive manipulations, which does not involve sexual intimacy between the spouses, could affect the family and children. On the other hand, since Muslims are bound by the dictates *Shari'ah* (Divine Law), the dilemma for infertile Muslims is whether it would be permissible for them to resort to biotechnological reproduction in order to become parents?

## Question 1
## SPLIT BETWEEN SEXUALITY AND REPRODUCTION

Undoubtedly, while manipulating pregnancy in the laboratory, there is a definite split between sexuality and reproduction since a manipulation is devoid of any act of love between the spouses. For example, McCormick (1981) argues that such a procedure redefines love "in a way that deflates the sexual and the bodily and its pertinence to human love." But, in the view of the writer of this paper, this ought not to deter a Muslim couple from resorting to biotechnological reproduction. However, they should ensure that the sperm and egg belong to them and that after *in vitro* fertilization (IVF), the fertilized embryo is implanted into the wife's womb. The wife would then carry the baby to term and give birth to the baby. In fact, this would even lead to strengthening the bond between the husband and wife and **would in no way affect the family and the child that is brought into this world in this manner. After all, this biotechnological procedure would meet the child bearing desire of the couple and the child would bear the genetic component of both parents. There would be no risk of strain between them because of the absence of a third party in the whole process** (Ebrahim, 2005).

## Question 2
## CHILDREN AS UNIQUE GIFTS

In direct reference to the various stages of human creation, the *Qur'an* states:

> *"We created you out of dust, and then out of a drop of semen, and then out of a germ-cell, and then out of an embryonic lump, completely formed, and yet incomplete, so that We make your origin clear unto you. Whatever We will, We cause to rest in the (mothers') wombs for a term set by Us."* (*Al-Hajj*, 22:5)

From this Qur'anic passage, we can safely infer that children are unique gifts in view of the fact that there is divine intervention from the moment they are conceived till their birth. This is further reinforced by the following *Hadith*:

> When 42 nights have passed over the sperm drops, *Allah* sends an angel to it, who shapes it and makes its ears, eyes, skin, flesh and bones. Then he says: "O Lord! Is it a male or female?" And the Lord decides what He wishes and the angel records it. (*Sahih Muslim*, 5:499-500)

What is significant in the above *Hadith* is that it can be implied that the nature and character of our children are "given". This then brings us to the question as to what extent do we have a duty or a right to modify their nature or character?

### Modifying the nature and character of our children

The *Qur'an* tells us that human beings are unique individuals, each having their own identity. This can be inferred from the following Qur'anic citation in which reference is made to their fingerprints, the pattern of their markings being permanent:

> *"Nay, We are able to put together in perfect order the very tips of his fingers"* (*Al-Qiyamah*, 75:4).

Undoubtedly, we, as parents, are entrusted to be involved in the *tarbiyyah* (education) of our children, teaching them about the matters of the *din* (religion) and what constitute good manners (*khuluq hasanah*). With the speed at which materialism and secularism are

spreading across the world, it is necessary that we should be models to guide our children to become conscientious Muslims, upholding the commandments of *Allah* (SWT). However, we have to acknowledge the fact that we have only partial control over our children, just like the farmer over his crops. We should do our utmost to create the best conditions for our children to reach their highest potential and to be of the most benefit to their families, communities, and wider society and leave the rest to *Allah* (SWT). **It would thus be wrong for us to manipulate their nature and character which are *Allah*-given**. (Zahrah Awaleh, 2005).

## Question 3
## INFERTILITY: DISPELLING THE MYTH

Muslims firmly believe that procreation of the human species is part of the divine plan as is evident from the following citation of the *Qur'an*:

> "*O mankind! Reverence your Guardian-Lord, Who created you from a single person, created of like nature, his mate, and from them twain scattered (like seeds) countless men and women.*" (*Al-Nisa'*, 4:1)

Generally, Muslims look forward to having children and they are well aware of the *Hadith* of their Prophet (SAAS):

> "Marry women who will love you and give birth to many children for I shall take pride in the great number of my *Ummah* (nation)." (*Sunan al-Nasa'i*, 6:66)

However, at the same time, they firmly believe that nothing happens except as willed by *Allah* (SWT) and their conviction in this regard is based upon the following Qur'anic citation:

> "*To Allah belongs the dominion of the heavens and the earth. He creates what He wills (and plans). He bestows (children) male or female according to His will (and plan). Or He bestows both males and females, and He leaves barren whom He wills: for He* is *full of Knowledge and power.*" (*Al-Shura*, 42:49-50)

Al-Sabuni in his *Mukhtasar Tafsir Ibn Kathir* (1981, 3:282-3) points out that Ibn Kathir, in his explanation of the above *ayah*, asserts the fact that Almighty *Allah* informs (us) that He is the One Who is the Creator of the heavens and the earth, and that He alone decides what is to take place in them. He gives to whom He pleases and holds back (His bounties) from whom He pleases. He creates whatever He wishes. He may bestow (to a couple) only female children and to another males only, while to yet another He may bless (them) with both males and females and may even leave (some of the people) barren.

What is important to reinforce here is that the *Qur'an* (Maryam, 19:2-7 and Hud, 11:72) make references to the barrenness of the wives of at least two Prophets, namely, *Sayyiduna* Zakariyya (A.S.) and *Sayyiduna* Ibrahim (A.S.), but they implored *Allah* (SWT) to bestow them with offspring and He (SWT) fulfilled their prayers. This reinforces the fact that parental instinct is innate.

## Infertility - a disease?

Since the early 1970s, biomedical science has been able to pin point the exact cause of infertility which may be due to certain 'defects" either in the husband or wife. Glass (1982), for example, points out that, amongst other factors, the ducts that carry the sperm from the testes to the penis may be blocked, or the fallopian tubes may be blocked.

In trying to answer the question as to whether infertility is a disease, it is important to take cognizance of the fact that, depending on the nature of the problem, hormone therapy, corrective surgery and more radical means to manipulate pregnancy in the laboratory can actually assist infertile couples to be in a position to have children. In this regard then, attention ought to be drawn here to the fact that Prophet Muhammad (SAAS) urged his followers to seek medical attention whenever they were unwell. For example, the following incident is recorded in the *Hadith* literature:

> The bedouin Arabs came to the Prophet (SAAS) and said, "O Messenger of *Allah*, should we treat ourselves?" He replied, "Yes, O servants of *Allah*, you must treat (your-

> selves): for verily, *Allah* has not created a disease without providing a cure for it, except for one disease." They asked him: "Which one is it?" He replied, "Old age." (*Sunan Abi Dawud*, 4:195)

Moreover, Prophet Muhammad (SAAS) is also reported to have said, "For every disease there is a cure" (*Sahih al-Bukhari*, 3:158)

In the view of the writer of this paper, Muslims should regard infertility as a disease and it would therefore be justified for infertile Muslims to resort to hormone therapy, corrective surgery, but to be cautious about manipulations of pregnancy in the laboratory in order to rectify their infertility.

## The limitations

The laws of inheritance in Islam are based on consanguine relationship and that is why so much importance is given to marriage and procreation. The *Shari'ah* forbids infertile Muslims from making use of a third party through reproductive technology for the purpose of overcoming their infertility problem.

### (i) Sperm donors - unacceptable

In some infertility cases, the husband may be unable to produce any sperm at all (a condition called azoospermia). Or he may be suffering from a neurological condition that makes it impossible for him to ejaculate. Or he may be suffering from a certain disease like diabetes, for instance, which renders him impotent. Or he may be the carrier of a dominant gene for a genetic disorder - Huntington's Chorea, for example (Munson, 1983). This accounts for the existence of sperm banks in certain advanced technological countries

The *Qur'an* recognizes the vital role that the sperm plays in human reproduction and states:

> "*Now let man but think from what he is created! He is created from a drop emitted (i.e. sperm) - proceeding from between the backbone and ribs.*" (*Al-Tariq*, 86:5-7)

But the *Qur'an* warns that this "seed" or sperm should not be

misused in the sense that its emission should occur only in the event of having sex with one's wife. This can be deduced from the verse wherein it describes as one of the qualities of believers that they have sex only with those who are joined to them in the marriage bond. (*Al-Mu'minun*, 23:5-6)

The *Shari'ah* does not justify the use of the sperm of someone other than that of the husband to be used in the process of artificially inseminating the woman. A contemporary Muslim scholar, namely, Dr. Yusuf al Qaradawi (n..d, p. 227), addressing himself to the question of donor artificial insemination states:

> Islam safeguards lineage by prohibiting *zina* (adultery and fornication) and legal adoption, thus keeping the family line unambiguously defined without any foreign element entering into it. It likewise prohibits what is known as artificial insemination if the donor of the sperm is other than the husband.

Thus, according to the *Shari'ah*, using the sperm of other than that of the husband to impregnate one's wife with it is considered an illegitimate act. It is also illegal according to the *Shari'ah* for a husband to have his sperm stored in a sperm bank with the intention that if he dies his sperm could be used to impregnate his wife. Because death renders the marriage union void, in the sense that a woman can marry someone else after a certain specified period - the '*iddat* (i.e., after four months and ten days) (*Al-Nisa'* 2:34). So for the wife to be impregnated after her husband's death with his sperm would be categorized as an illegitimate act.

**(ii) Egg transfer, artificial embryonation and embryo adoption - unacceptable**

Egg transfer involves the transfer of an egg of another woman into the uterus of one's wife. Artificial embryonation and embryo adoption involve the transfer of an already fertilized egg from another woman and placing it in the uterus of one's wife. If attachment to the uterine wall be successful then development of the embryo would take place in the normal fashion. These techniques are opted for in the event that

one's wife may not be in a position to ovulate. Or perhaps she has no fallopian tubes at all. Or there may be something abnormal causing blockage of the fallopian tubes or her tubes may be damaged. It cannot be denied that these three techniques can positively assist an infertile woman to bear a child and even give birth to it. But the problem is that in the case of egg transfer the woman will bear a child who would have half of the genetic identity of her husband and none of her own. While in the case of artificial embryonation or embryo adoption (EA) the child would have neither the genetic complements of her husband nor of herself. Now, the *Qur'an* maintains that in the creation of mankind the roles of the males and females in the process are recognized. For example, it states:

> "O mankind! We created you from a single (pair) of male and a female...." (*Al-Hujurat*, 49:13)

But, the union must be legitimized through the marriage bond. (*Al-Mu'minun*, 23:5-6) Thus, using the ovum or egg or an embryo of another woman though it be transferred into the uterus of one's own wife, would be *haram* (forbidden) according to the *Shari'ah*. The view of Dr. *Shaykh* Yusuf al-Qaradawi, as mentioned above, on artificial insemination with the sperm of a donor, could on the basis of analogy, equally apply against making use the *egg transfer, artificial embryonation and embryo adoption* to resolve infertility.

It is important, therefore, that Muslims ought to bear in mind that if infertility is as a result of some permanent congenital defect like, for example, sometimes a female may be born without a uterus, fertility would be virtually impossible. In that case, the wife should resign her fate in *Allah* (SWT) and come to terms with the fact that her barrenness has been divinely pre-ordained. But she should never lose sight of the fact that her parental instinct and that of her spouse could still be fulfilled by foster parenting an orphan which the *Qur'an* strongly recommends. In doing so they would have the joy of rearing children, though biologically not their own, yet could be brought up as their own children and that *Allah* (SWT) would amply reward them for doing that.

It must also be mentioned here that Muslims are censured from

legally adopting children, thus blotting out their biological genealogy. The *Qur'an* categorically states in this regard:

> "*Allah has not made for any man two hearts in his (one) body: Nor has He made your wives whom you divorce by Zihar your mothers: Nor has He made your adopted sons your sons. Such is (only) your (manner of) speech by your mouths. But, Allah tells you the Truth and He shows the (Right) way.*" (*Al-Ahzab*, 33:4)

It is evident from the above citations that it is absolutely impossible for a child to have two biological fathers and the question that can logically be posed here is whether surrogacy could be a viable option for infertile Muslims?

**(iii) Surrogacy**

Insofar as surrogacy in light of Western Ethics is concerned, for the purpose of this paper, we shall consider it on the basis of at least three of the ethical principles as envisaged by Beauchamp and Childress (1979).

**a) The principle of autonomy**

The principle of autonomy, which pertains to the power to decide on reproductive choice, is compromised since both the commissioning couple and the surrogate have, by virtue of entering into such an agreement, voluntarily accepted certain restrictions to their autonomy. Both parties are bound by a prevailing moral obligation. In other words, the commissioning couples cannot arbitrarily change their minds after the start of the pregnancy. Even if they are divorced, the original contract would stand and they would still be the future parents. However, only in the event that the commissioning parents die before the birth of the child would the surrogate have the option either of keeping the child or giving it up for adoption (European Society for Human Reproduction & Embryology, ESHRE, n.d.)

The surrogate's autonomy too is compromised since she has voluntarily accepted to conceive and deliver the child of another couple. She is expected to honor this agreement with the future

parents. She even has to consent to the termination of pregnancy if after screening it is found that the fetus that she is carrying is suffering from severe malformation (ESHRE, n.d.)

**b) The principle of nonmaleficence**

While this principle suggests avoidance of causing harm, it would literally be impossible to safeguard the surrogate from the risks of pregnancy, which may include miscarriage, ectopic pregnancy, and other complications of pregnancy. Moreover, the surrogate may suffer from psychological problems as a result of giving away the newborn sibling (ESHRE, n.d.)

**c) The principle of beneficence**

This principle relate to "doing of good, active promotion of good, kindness and charity." According to William-Jones (2002), "most surrogates interviewed stated categorically that they were not doing it for the sake of the money; altruism was the primary motivation and remuneration was simply compensation for family work." According to the *Wikipedia*, the online free encyclopedia, it is estimated that in the United States of America, a surrogate is paid between US $ 28 000 and $ 45 000. This has led to several arguments being presentcd against surrogacy, of which some are: "insult to human dignity, the commodofication of the human body, potential exploitation of vulnerable women and inappropriate inducement (coercion) of women" (ESHRE, n.d.)

**Surrogacy in light of the Shari'ah - unacceptable**

According to the *Shari'ah*, marriage is a sacred contract between the husband and wife. It is by virtue of this contract that they are allowed to live together and gratify their sexual instinct which would in most cases result in their being blessed with children as "gifts" from *Allah* (SWT). Resorting to surrogacy when the wife is not able to bear her own children is problematic within the ambit of the *Shari'ah* and tantamount to *haram* (a forbidden enterprise) on the basis of the following reasons:

## I - LEASING OF THE WOMB - AN INVALID CONTRACT

A surrogate mother would, in effect, be "leasing her womb" for the purpose of bearing the child of another couple. Such a contract entered into between the commissioned couple and the surrogate would be considered a *batil* (invalid) contract on the ground that it involves payment being made to the surrogate who would surrender the child to the commissioned couple. This arrangement would be tantamount to "selling" a free person which is totally unacceptable. However, according to Debra Satz (2004) defenders of commercial surrogacy carefully distinguish surrogacy from baby selling and argue that children are not sold as commodities, but rather women's reproductive services are for sale. *Shaykh* Ahmad Kutty, a Senior Lecturer at the Islamic Institute of Toronto, Ontario, Canada, rightly points out "hiring the womb amounts to dehumanizing the process of human procreation by reducing the womb to the level of a commodity that can be bought or rented for service" (http://www.islamonline.net). But, one cannot overlook the fact that in terms of the contract that is signed between the commissioning parents and the surrogate, the surrogate receives full payment after signing over parental rights to the child. This implies that the child itself is the product purchased. The *Shari'ah* censures this practice as an unlawful sale of a free person.

## II - SOCIAL RAMIFICATIONS OF SURROGACY

The social ramifications of surrogacy are many. Their "evils" far outweigh the apparent good. The apparent good is limited to the devolution of patrimonial asset to the commission couple and financial gain that is accrued by the surrogate. Some of the "evils" are as follows:

### (i) Legal wrangling over paternity rights

Here we may cite the case of the so-called Baby M in the United States of America which involved surrogate motherhood. "Mary Beth Whitehead agreed to be inseminated with the sperm of William Stern and to give up any resulting child to him and his wife for $10,000. After giving birth to a child and turning that child over to the Sterns,

Whitehead became distraught. A conflict ensued over parental rights, and a New Jersey court initially gave full custody to the Sterns and discounted the fact that Whitehead was the child's genetic and gestational mother. On appeal, the decision was overturned and the surrogacy contract was invalidated. The court granted custody to the Sterns but ordered that Whitehead be granted visitation rights" (Debra Satz, 2004).

What is more alarming is that according to William-Jones (2002), maternity can today divide into genetic, gestational, and social motherhood, and these roles can be spread amongst a number of women. In a surrogate arrangement, at least three (and possibly as many as five) women can attempt to claim parental rights over a child. "If Mrs. A is infertile and Mrs. B agrees to provide ova to be fertilized *in vitro* with semen from Mr. A, and embryos are transferred to Mrs. C, who agrees to carry the baby to term and hand it over to Mrs. A and her husband after birth, the situation becomes extremely complex and the basic tenets of family law uncertain." That is why Islam totally condemns any form of third party equation in the reproductive process.

**(ii) Undermining the institution of the family**

Commercial surrogacy offers gays and lesbians and single people the opportunity to become parents. Although this may be hailed in the West as a breakthrough, it is in contravention of the *Shari'ah*. The *Qur'an* exhorts Muslims to marry stating:

"*Marry those among you who are single .....*" (*Al-Nur*, 24:32)

This means that marriage is a desirable institution and a necessary avenue for the perpetuation of the human race. The *Qur'an* condemns celibacy as an abomination and so did the Prophet (SAAS). To enter into matrimony implies the fulfilment of the *Sunnah* (practice of the Prophet), which is deemed highly desirable. Furthermore, the *Shari'ah* condemns homosexuality and to give homosexuals the right to have children through the medium of surrogacy would most certainly not be sanctioned by the *Shari'ah*.

Moreover, commercial surrogacy could also lead to enticing

married women to resort to this reproductive option in order to relieve themselves of the agony of going through the pangs of pregnancy and childbirth. It is important to point out here that Islam does not consider pregnancy as a burden but as a blessing. If a mother dies during pregnancy or childbirth she is given the status of *shahadah* ("martyrdom").

**(iii) A bizarre immoral reproductive innovation**

A grandmother in South Africa, namely, Pat Anthony, opted to be the surrogate of the children of her biological daughter, Karen. In essence, she became both the mother and grandmother of the children of her daughter! (*Living and Loving*, 1987).

## USE OF REPRODUCTIVE TECHNOLOGY AND CHANGE OF FUNDAMENTAL RELATIONSHIP BETWEEN PARENTS AND CHILDREN

**a) An element of adultery**

All third party involvement in rectifying infertility, including surrogacy, would in light of the *Shari'ah* involve an element of adulterous implantation. For example, the *'illah* (cause) in surrogacy would be impregnation of the surrogate mother, and the *ma'lul* (effect) is her giving birth to the child. The *Shari'ah* justifies only the woman with whom one has entered into the *nikah* (contract of marriage) with to have the right to fall pregnant and give birth to your children.

On the question of involvement of a third party in in the biotechnological manipulation to rectify infertility, a former head of the Al-Azhar University, namely, *Shaykh* Mahmud Shaltut (1959, p. 300), issued the following religious decree (*fatwa*) condemning donor artificial insemination (AID) and equating it to an adulterous act:

> Artificial insemination with the sperm of a foreign person, is under the *Shari'ah*, a grievous crime and a great sin and is tantamount to adultery for their essence is the same and their result is also the same. For, it is the insertion of the sperm of a foreign person intentionally into a tilth which has not been

> legally tied to him through the bond of marriage.... The legal verdict for artificial insemination in that way is the same as that of adultery which has been condemned and prohibited by the Divine *Shari'ah*.

Dr. *Shaykh* Yusuf al Qaradawi (n.d., p. 227), a contemporary Islamic scholar, addressing the same issue states:

Islam safeguards lineage by prohibiting *zina* (adultery and fornication) and legal adoption, thus keeping the family line unambiguously defined without any foreign element entering into it. It likewise prohibits what is known as artificial insemination if the donor of the sperm is other than the husband.

**b - Confounding the *nasab* (biological lineage) of the child**

One of the *maqasid* (goals of the *Shari'ah*) is *hifz al-nasl* (preservation of progeny). From this emanates the right of the child to have a definite parentage and thus any third party involvement in rectifying infertility would *ipso facto* confound the genealogy of the child. Even if the sperm and egg of the husband and wife are fertilized *in vitro* and implanted into the womb of the surrogate, thus "ensuring" that the child would bear the genetic complement of the commissioned couple, it would still confound the genealogy of the child since Prophet Muhammad (SAAS) said: "The child is for the bed." From this statement a general principle is laid down. A child, legitimate or illegitimate, always has a mother. The mother is the one who gives birth to it. Therefore, the surrogate mother will naturally, truly and legally be the mother of the child. But according to the *Shari'ah*, a child born under the surrogate contract would be considered an illegitimate issue since the contracting husband had not entered into matrimonial contract with the surrogate mother who gave birth to the child. It is to be emphasized here that the *Shari'ah* categorically condemns the introduction of a third party within the reproductive equation.

## Question 4
## GENETIC TESTS BEFORE BIRTH TO DECIDE WHO SHOULD BE BORN

Advances in modern biomedical technology, prenatal diagnoses can today be carried out with considerable accuracy. Monteleone (1981) points out that some of the techniques used for such diagnoses are:

i - Amniocentecis

ii - Fetoscopy

iii - Ultrasound, and

iv - X-rays

These prenatal tests can confirm:

a - the sex of the child; or determine whether:

b - the fetus would be born with a genetically transmitted disease; or

c - with a congenital defect; or that

d - the unborn has a severe fetal abnormality incompatible with life.

It ought to be pointed out that the *Holy Qur'an* tells us:

> "*Verily the knowledge of the Hour is with Allah (alone). It is He Who sends down the rain, and He Who knows what is in the wombs. Nor does anyone know what it is that he will earn on the morrow.*" (*Luqman*, 31:34)

Moreover, the *Holy Qur'an* also states:

> "*Allah does know what every female (womb) does bear.....*" (*Al-Ra'd*, 13:8)

From the above two Qur'anic citations, one could conclude that it would be *haram* (forbidden) for Muslims to make use of genetic tests before birth to either determine the sex of the baby or whether the fetus is defective or not. The writer of this paper is inclined to hold that there is nothing wrong if Muslims were to resort to such genetics tests, but would caution Muslims against taking any drastic measures to terminate the pregnancy either on the grounds that the baby is (i) not of the desired sex or (ii) is defective.

**(i) Choosing the child who has the desired characteristics, e.g., gender**

The writer of this paper is of the view that if one were to abort the baby for not being of the desired gender, male or female, then such abortion would be tantamount to the killing of infant female children during the period of the *Jahiliyyah* (the period of ignorance during pre-Isamic Arabia) and the *Holy Qur'an* categorically states in this regard:

> "*When the female (infant) buried alive is questioned - for what crime she was killed.*" (*Al-Takwir*, 81:8-9)

**(ii) Choosing to abort the defective fetus**

Insofar as resorting to the abortion of a defective fetus is concerned, it is important to note here that in *fatwa* no. 2484, dated 16.07.1403 A.H. issued to the Islamic Medical Association of South Africa by *Dar al Ifta'* in Riyadh, Saudi Arabia, it was categorically stated that it would not be justified to carry out an abortion if the fetus has a congenital defect; or that the unborn has a severe fetal abnormality incompatible with life.

**The dilemma in drawing the line between severe and less disabling conditions**

The writer of this paper is inclined to hold that it would be extremely difficult to draw the line between severe and less disabling conditions. This is so because of the fact that once a woman is diagnosed that she is carrying a defective baby, no matter how minor the disabling condition may be, it would be impossible to convince her not to have her defective baby aborted. After all, the mere knowledge of her carrying a defective baby would most certainly result in her suffering psychological trauma which could prove detrimental to her mental health (Ebrahim, 2005).

**Disabled people's organizations stance on prenatal selection - justified or not?**

The writer of this paper is of the view that the mentally and physically challenged organizations are justified in holding that the use

of genetic tests before birth to choose whether a particular child should be born or not would be akin to eugenic discrimination for that would certainly insinuate that the lives of the physically and mentally challenged are of a lesser value. One should never lose sight of the fact that the possibility exists that a fetus with severe impairment could be aborted spontaneously, or that it could even make its entrance into this world as stillborn, or that it could even survive only for a few hours or days after being born (Monteleone and Moraczewski, 1981).

At this juncture, it is important to note that life and death are the prerogatives of *Allah* (SWT) and that within the period of our sojourn in this world, *Allah* (SWT) could test us in different ways (*Al-Baqarah*, 2:156-157), including making us become parents of fetuses with severe impairments.

We cannot overlook the fact that determining the fate of fetuses with impairments is indeed a highly complex problem. Advocating their prenatal abortion would make it difficult to draw the line between severe and less disabling conditions. It would even lead to the justification of aborting any fetus on the basis of its undesired gender. Moreover, it would even, in time to come, justify the termination of the lives of the physically and mentally challenged and even the old people who are often viewed as gross liabilities to their societies and families.

**Pre-implantation genetic diagnosis (PGD)**

PGD is a technique aimed at analyzing the genetics of an embryo so as to select normal embryos to be transferred to a woman undergoing *in vitro* fertilization. This technique is not only restricted to the selection of normal embryos. PGD is also used to detect monogenic diseases such as cystic fibrosis and Tay-Sachs disease and as well as for elective (non-medical) sex selection. A fairly recent development is the use of PGD to select embryos that would be compatible tissue donors for older siblings in need of transplants. (The President's Council on Bioethics Washington, D.C., March 2004).

**Selection of children using PGD to be tissue donors**

The question that needs to be addressed is whether the *Shari'ah* would allow the deliberate creation of 'saviour siblings'? Sheldon and Wilkinson (2005) define 'saviour siblings' as "children created from embryos selected following Human Leukocyte Antigen (HLA) tissue typing to ensure compatibility with an existing sick child in need of tissue donation."

Sheldon and Wilkinson (2005) rightly points out that using PGD for that particular purpose gives rise to a number of ethical dilemmas:

1 - It is wrong to create a child for a particular purpose (as a 'means to an end')?

2 - It is wrong to create a child with which to perform this particular procedure, because the child would grow up knowing that it had been created for this particular function and this knowledge would be psychologically damaging;

3 - PGD may generate as yet unknown health risks for the child created and so should only be used when there is a known benefit to this particular child (i.e. not merely to third parties such as siblings).

Looking at the issue of making use of PGD for the selection of children to be tissue donors for an already existing child, the writer of this paper is inclined to hold that it would be problematic within the ambit of the *Shari'ah* to justify such an endeavour. In a *Hadith*, Prophet Muhammad (SAAS) states: "*Allah* created the disease and also the cure and for every disease He has provided a cure. So treat yourselves but do not treat yourselves with prohibited things" (*Sunan Abi Dawud*, p. 1142). From this *Hadith*, it can be inferred that while Muslims are urged to seek cure for any form of ailment they are suffering from, they are cautioned against resorting to such intervention that would fall within the category of *haram* (forbidden). Moreover, what is important to note here is that in the process employing the PGD technique, all the embryos that do not have the tissue type of the already existing sick child would most certainly be discarded and only the one that has the matching tissue type would be given the

gift of life on condition that he or she fulfills that particular role. Discarding of all other non-matching tissue type embryos would in the light of the *Shari'ah* be tantamount to the destruction of potential human beings. *Imam* al-Ghazali in his famous *Ihya' 'Ulum al-Din* (2, p.15) states:

> (Human) existence has stages. The first stages of existence are the settling of the semen in the womb and its mixing with the secretions of the woman. It is then ready to receive life. Disturbing it is a crime. When it develops further and becomes a lump, aborting it, is a greater crime.

## Question 5
## ENHANCING A CHILD'S ABILITIES THROUGH GENETIC TECHNOLOGY

There is certainly a fundamental moral difference between using education and discipline to modify and enhance a child's abilities and using genetic technology to achieve the same end. Both the *Qur'an* and *Hadith* urge Muslims to acquire knowledge. In fact, the very first revelation (*Al-'Alaq,* 1-5) stresses the importance of reading for the purpose of one's intellectual development. Prophet Muhammad (SAAS) even went to the extent of stating that "the seeking of knowledge is incumbent upon all Muslims" (*Al-Jami' al-Tirmidhi*, Hadith no. 215). He (SAAS) also emphasized the importance of disciplining children by exhorting them to perform the *salah* and chiding them when they turn 10 years old in the event that they become lax in performing the *salah* (*Sunan Abi Dawud*, Hadith no. 495). Thus parents, besides loving, clothing and feeding their children, have also been entrusted to teach their children about the *din* (religious matters) and to educate their children so that they could become assets to their families, communities and country at large.

Using genetic technology to enhance the child's abilities would in essence set a new standard for what counts as an acceptable offspring while that offspring is still in the embryonic stage. Making use of genetic technology for that particular purpose would be detrimental in the sense that "the attitude of parents toward their child may be subtly

shifted from unconditional acceptance toward critical scrutiny: the very first act of parenting could become not the unreserved welcoming of an arriving child, but the judging of his or her fitness, while still an embryo, to become one's child, all by the standards of contemporary genetic screening" (The President's Council on Bioethics Washington, D.C., March 2004). The writer of this paper is of the view that if genetic technology is used for enhancing the child's abilities, it would in effect be tampering with the *fitrah* (innate nature) of the child as created by *Allah* (SWT) and this would condemned by the *Shari'ah*. Attention may be drawn here to the following Qur'anic *ayah*:

> *"..... (establish) Allah's handiwork according to the pattern (fitrah) on which He has made mankind - no change (let there be) in the work by Allah - that is the standard religion, but most among humankind understand them not."* (*Al-Rum*, 30:30)

Moreover, the *Holy Qur'an* also states:

> *"He it is Who shapes you in the wombs as He pleases, there is no god but He, the Exalted in Might, the Wise." (Al 'Imran, 3:6)*

## Question 6
## IMPACT OF REPRODUCTIVE CLONING ON THE FAMILY

Islam recognizes spousal relationship through marriage as the cornerstone for the creation of a divinely ordained society. Children born in wedlock carry the genetic components of both parents and it is this genetic combination that gives them their identity. Cloning, on the other hand, is the technique of producing a genetically identical duplicate of an organism. A clone is thus the asexual progeny of a single individual. Consequently, this form of genetic replication will most certainly negatively impact upon spousal and child - parent relationship and bring an end to the Islamic family institution. Moreover, human cloning will rob the child of his/her roots (ancestry) and undermine the Islamic laws of inheritance which are based on consanguinity (Ebrahim, 2001).

## Question 7
## TESTING CHILDREN FOR GENETIC DISORDERS

The writer of this paper is inclined to hold that it would be permissible for parents to have their children tested in *utero* for the presence of genetic disorders which would present in later years. For example, "PGD can be used not only to identify abnormalities that would lead to certain and immediate diseases (like Tay-Sachs or Down syndrome), but can also be used to identify an increased susceptibility to particular diseases later in life" (The President's Council on Bioethics Washington, D.C., March 2004).

Normally at the birth of a baby, the umbilical cord with the placenta is usually handed over to the Muslim parent who inters them as per the dictates of the *Shari'ah*. It is now known that blood retrieved from the umbilical cord is a rich source of stem cells. Stem cells are unspecialized blood cells that produce all other blood cells, including blood-clotting platelets and red and white blood cells. Therefore, Muslims could today have the umbical cords of their children stored in view of the fact that like donated bone marrow, umbilical cord blood can be used to treat various genetic disorders that affect the blood and immune system, leukemia and certain cancers, and some inherited disorders of body (March of Dimes Birth Defects Foundation, 2005).

However, it ought to be emphasized here that the *Shari'ah* would in no way condone Muslim parents opting to have their children aborted once they are diagnosed with genetic disorders which would present in later years, like for example, that the child would be susceptible to a late-onset disease like breast cancer or Alzheimer disease, etc. It would be appropriate at this juncture to point out that *Shaykh* Mohammed Mekki Naciri (1973:144) states that all Islamic juridical literature of the different schools of Islamic Law unanimously hold abortion to be a blameworthy act and that it is in no way permissible except if it is motivated by a worthwhile reason. Dr. *Shaykh* Yusuf al- Qaradawi (1980: 169) also points out that all Muslim jurists hold abortion, after the ensoulment of the fetus, to be *haram* (forbidden) and a crime, hence no Muslim should exercise it for it would be a crime against a living being and fully formed creature.

## CONCLUSION

While Muslims do acknowledge the fact that *Allah* (SWT) is responsible to bestow them with children or for making them barren, it has been pointed out that since it is innate in human beings to become parents, it would be perfectly in order to try to resolve the problem of infertility through biotechnological reproductive manipulations. Hence, infertility should be viewed as a disease and Prophet Muhammad (SAAS) has urged his followers to seek medical attention whenever the need arises. However, Muslims ought to be cautious to employ only such biotechnological reproductive manipulations which do not involve the intervention of a third party.

Insofar as surrogacy is concerned, it is apparent that the arrangement between the commissioned parents and the surrogate in reality compromises even the Western ethical principles of autonomy, non-maleficence and beneficence. Moreover, since the *Shari'ah* condemns any form of third party intervention in human reproduction, it is obvious that making use of surrogacy to overcome infertility is a *haram* (unlawful) option for Muslims to resort to. In the discussion on the social ramifications of surrogacy, it was indicated that the "evils" far outweighed the good that resulted from surrogacy.

This paper has also touched upon a number of other issues pertaining to genetics and the family. Insofar as genetic tests before birth is concerned, it was stated that there would be nothing wrong in doing so as long as abortion is not used as an option to terminate the lives of the severely impaired fetuses. As for making use of PGD to select embryos that would be compatible tissue donors for older siblings in need of transplants is concerned, it was pointed out that that would be problematic since the embryos which do not have the matching tissue would be discarded and that would be tantamount to destroying potential human life. Children, it was argued, should be regarded as unique gifts. While parents have a positive role to play in their upbringing and in moulding them to become obedient to the commandments of *Allah* (SWT), they nevertheless do not have absolute control over them and should allow them the space to develop their *Allah*-given potential. Addressing the issue of reproductive cloning, attention was drawn to the fact that it would have detrimental effect on the family. Finally, it was mentioned that while it

would be perfectly in order to have children tested for genetic disorders that could manifest later on in life, it would not be permissible for Muslims to opt for aborting such children who are diagnosed to be prone to genetic disorders. On the other hand, stem cells from their stored umbilical cords can be a source of *shifa'* (cure) for them whenever the disorder manifests late on in their lives..

***Allah*** (SWT) knows best!!!

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# DISCUSSION

# Thirteenth Session
# The Final scientific Session

**Chairman**: Dr. Khalid Al-Mazkour

**Rapporteur**: Dr. Shahid Athar

**Chairman**: Dr. Ahmed Abdul Salam

***Dr. Ahmed Abdul Salam***: I enjoyed listening to Dr. Abul Fadl's excellent lecture. My question is, if surrogate mother refuses to handle the child to the beneficiary, the couple that gave her money to use her uterus then legally, in your country or all over the world, what are the regulations?

**Chairman**: Dr. Lisa

***Dr. Lisa Lehmann***: I have two questions. One for Dr. Nordin. I was wondering if you could further explain why sex selection is not permissible from your perspective? You commented that PGD is okay, but selection is not.

My other question is for Dr. Ibrahim. I was wondering, if you can comment on what the attitude is from Muslim perspective with regard of adoption, given the emphasis on lineage, Islamic Law?

**Chairman**: Mr. Hassan Metwalli, a journalist

I extend my greetings to the IOMS and the participating entities that fully express the true colors of the open-minded moderate philosophy which governs the trends of the western and Muslim scientific centers and institutions which dealt with such critical issues honestly and with due respect. This happens in light of the respect for the human life. In this regard, we beseech the memory of the esteemed presence to remember the role of other Arab research centers like collaboration and follow-up. Closing this center is the loss of an entity that has largely benefited us throughout its studies concerning the human genome from its beginning till announcing it. This center registered the negligence and the truth for the sake of the scientific importance. It also warned against encroaching upon man's sacred nature, ethical rights and perceptions. I'd like to express my hope that

the day will not come when we miss this present gathering and all the persons participating in such conference. I pray Allah that the recommendations of the conference would include an item on the protection of the Arab and Islamic research centers. Thank you.

**Chairman**: Dr. Mohammed

***Dr. Mohammed***:

As mentioned in the morning, I think that the IOMS book has judged many of the issues raised, if not all of them. Concerning the surrogate mother, I think this issue was clearly discussed in several conferences. I cannot proceed for many reasons, the most important of which is that it will introduce new 4 terms: neuron expression, genetic mother, legal father, and legal mother. Thank you.

Chairman: Dr. Yomna

***Dr. Yomna Tarif***: Outside the session, Dr. Al-Bar told me that surrogate mother might be legal according to jurisprudence and Islamic rule, if the surrogate mother is a second wife of his husband. Thank you.

**Chairman**: Dr. Musa Nordin

***Dr. Musa Nordin***: Thank you very much. The general rule of sex selection is that it is not permissible for social reasons. There is a minority that would allow sex selection for social reasons within stringent regulations. But, sex selection via PGD is permissible to obviate certain serious disorders.

**Chairman**: Dr. Aida

***Dr. Aida Al-Aqeel***: It has been said that PGD for sex selection is allowed in Islam only in case, there is a sexual disorder. It's very well clarified. However, sex selection just to have a boy or a girl is not allowed in Islam, because there is discrimination against the female sex. This is another issue. The third issue is sex selection for family balancing, for example, if a family has 5 or 6 children, all girls and the family wants a boy. From my view, as a Muslim doctor, I don't think this should be not allowed in Islam and I think, most the Islamic schools may agree as well.

**Chairman**: Dr. Hassan Hathout

***Dr. Hassan Hathout***: To comment on the issue of sex selection, on the very local level, it is not haram. But, when we decide halal or haram, we ought to look the one that is the local nuclear one, and one that is the social, the world at large. Nature has seen to it that the primary sex ratio i.e. at conception is 107 boys for every 100 girls, and during the pregnancy more males are aborted, during infancy more males died so that around the time of marriage, it is 100 to 100. Sure, there are families of 10 girls, and there are families of 10 boys. If you try to satisfy the individual family, you will end up with the society, probably, where males are 100, and females are only 60 or 70. There will be female shortage which will have very serious, social, and moral complications.

Can a second wife bear a child from her husband semen and the ovum of the other wife? This was discussed, opinions varied, but as far as I remember, it was decided that the word marriage, which in Arabic means 'coupling' is a relation between two, not between three. And, if I have to marry four women, each marriage should have a separate marriage contract, and so a marriage contract, whether I am polygamous or not. Each marriage contract is a contract between two. For the use of third partner, the procreative process whether the third partner is another wife or another woman will not be accepted as marriage. Now, for surrogacy, this is your question, you say that the pregnancy, the uterine relationship is very important. It is the essence of motherhood. It is more important than the ovarian relationship. Islam doesn't want to have a more important motherhood, and a less important motherhood. Therefore, surrogacy is not accepted, there should be only one mother, the exception of lactation has been explained before, but for motherhood apart from lactation, motherhood should better be unified in one woman rather than split, specially unequally between two women.

**Chairman**: Dr. Abul Fadl

***Dr. Abulfadl Mohsin Ebrahim***: Bismillah Hirrahma Nirrahim! As for the question of one of our brothers with respect to what happens in Islamic Law, in a country, for example in my country South Africa,

if the surrogate mother refuses to give the child? I think, there have been several cases in UK as well as in America where the ruling went in favour of the consummating couple, because it is a breach of contract from the surrogate mother.

***Dr. Hassan Hathout***: The surrogate mother will not have the right to keep the baby, because there is a contract. But, this is very serious. Because, a baby and motherhood would be the subject of a contract. It commercializes motherhood and in Islam as well as in other religions, motherhood is not treated as a commodity.

***Dr. Abulfadl Mohsin Ebrahim***: Shukran doctor. Now, as far as Dr. Lisa is concerned, the question she asked about the adoption and a question of lineage. In Islam, we never allowed legally to adopt a child, but every one of us is encouraged to foster a child. The child of a foster parent will get $1/3^{rd}$ whatever the parent earns or if they die, the child is entitled to only $1/3^{rd}$. So, that's why it is different than our own child.

I think, the other question Dr. Hathout has replied to you. But, only one thing, I want to say, I want to be very frank here. You see, prophet Muhammad (PBUH) in a Hadith says "Waladuli Firash". Now, what he meant here, I am using my own understanding, is that a child will always have a mother. The father can have a relationship and goes away, you never come to know who is the father, but the mother who gives birth to child, will always be known. And that's why, I think, the Muslim jurists, in trying to come to who is going to be the mother have relied on this Hadith. But, during the period of gestation in the surrogate mother, a lot of things have passed on from the surrogate mother to the child, even the genes may be modified, we don't know. It is too early to think about it. I think, a serious study ought to be undertaken about that. I think, Dr. Hathout has replied about the second wife, if you have a second wife and using her as a surrogate mother. I think, it is excellently replied by our learned professor. Shukran.

***Dr. Maher Hathout***: I want to comment on the issue of "the child is for the bed". This Hadith is not concerned with verifying the identity of the baby. The mother, anyway, is known beyond doubt.

So, there is no dispute concerning the baby's mother. Thus, this Hadith means that no baby is to be left without being ascribed to a father. Even if there was a doubt in this regard, the man married to the mother at the time should give the baby his name. I noticed that this Hadith was quoted in irrelevant contexts. The Hadith ensures the genealogy of the baby and does not define who the mother should be; for the mother is well-known. Who can deny the motherhood of the woman who got pregnant and gave birth? We are in dire need of adhering to this Hadith to ensure the right of this weak baby who finds no supporter in life, especially if he was the biological child of a man who lacks the decency to face his responsibilities. These days, a well-known case about this issue is raised in the Egyptian society. "the child is for the bed" means that this man is obliged to protect this child and give him a name. Thank you.

***Dr. David Bleich***: A brief question by saying that for the first time in my life I find myself in a forum in which I can get reliable and authoritative answers to questions about Islamic teachings. I want to ask one question with regard to surrogate motherhood not with regard to the morality of proprietary of surrogacy as institution but, for my information, in terms of comparing the position of Islam with the position of Judaism. I have argued that in so far as Jewish law is concerned, a surrogacy contract would be rather foolish on the part of the family that enters into the contract. Because, it would be equivocally bound to child's support, birth of an infant i.e. born. And in Jewish law, that would include paying of the baby's mother to be which means that he is being forced to pay all the money to the woman, whom he has never married. And, that the ultimate custody of the child cannot be disclosed by contract that this is not a valid matter that can be made subject of contract. So that, later if they have mother who had entered into the surrogacy contract and claimed she was to keep the child, the decision will have to be made in terms of child's best interest and given any scenario, the father, who entered into this would be bound to child's support and support of the wife. My position is very simple, where Jewish law is concerned, the contract is not enforceable even post-factum. Dr. Hathout spoke about the illegitimacy or the illusive nature of the contract in the first place. If I heard him correctly, and I may have misunderstood, or he may

not have been precise, I had the impression that he said that the contract would be valid and it is so obvious precisely because you are treating a child as a commodity and that is true only if the contract is enforceable. If the contract is enforceable, certainly the point is well taken. If the contract is not forceable, may be, I just like to have a clarification with regard to what is likely to happen, if there should be such a dispute brought before Islamic authorities for jurisprudence.

**Chairman**: Dr. Hassan

***Dr. Hassan Hathout***: If a contract is not enforceable, why bother to sign a contract any way, if you know it is not enforceable. But, what I know in the States, the cases have to go to court etc. etc. We do sign a contract because our signature is binding, which precisely reduce motherhood to a price not a value and, it is agony for a child if there are two motherhoods competing for it and then purely materialistic on commercial basis.

**Chairman**:

At the end of this session, the last scientific session, I'd like to thank all the speakers and the participants for lauding this session like other sessions. I pray Allah Almighty that you will be rewarded for your patience and for taking the pains to attend these sessions till late. We conclude with the Divine words, in the Name of Allah, Most Gracious, Most Merciful: "By (the Token of) Time (through the Ages). Verily Man is in loss, except such as have Faith, and do righteous deeds, and (join together) in the mutual teaching of Truth, and of Patience and Constancy." (Al 'Asr: 1-3). Thank you.

# RECOMMENDATIONS

# Recommendations

In the name of God, Most Compassionate, Most Merciful

Praise be to God, and peace be upon the most gracious Messenger, prophet Mohamed, and upon his family and companions, and upon all God's messengers and prophets.

The world is witnessing a sweeping revolution in many fields of theoretical and applied sciences. The urge to discover and invent is driving researchers to test every conceivable method and explore every imaginable piece of untrodden land. But, while this feverish scientific activity is increasingly gaining momentum prodded on by successive scientific triumphs, ehical values and considerations seem to have taken the back seat. This dwindling interest in morals seems unfortunately to be a general trend. Some people no longer attach great importance to established ideals or lofty figures in human history. This is evidenced by what has recently happened in Denmark when a newspaper displayed an arrogant and insolent attitude towards prophet Mohamed (PBUH) through publishing disparaging caricatures of this most honored messenger ever sent by God to human kind. The feelings of a billion Muslims across the world were deeply injured by such publication. To add insult to the injury, other newspapers in a number of European countries re-published the outrageous caricatures, which inflamed the Muslim World with shocked indignation. This shameful conduct was denounced by many non-Muslim writers and prominent figures.

The seminar is dismayed to see freedom of speech so abused as to justify this uncivilized attack and ridicule against a revered religious symbol which has an unparalleled status in the hearts of all Muslims around the world.

The seminar strongly condemns any act of assault, criticism or desecration of any of God's prophets and messengers, no matter what the excuse or objective.

As the seminar organizers are fully aware of the need to examine crucial issues that are closely related to man's life, the topic put

forward for investigation and discussion is "Human Genetic and Reproductive Technologies". The seminar's main interest is to see how this matter is viewed by the three divine religions and to compare this with the secular attitude towards these technologies.

The subject has gained great importance because the second half of the 20th century witnessed tremendous developments in science in general and in biomedical sciences in particular. New and vast horizons were opened up in the fields of genetic engineering, human genome and cloning. All indications are that the 21st century will witness even more stupendous achievements and unprecedented applications of scientific findings particularly in the field of biology.

Recent findings and applications in the fields of biomedicine, genetics and genetic engineering have given rise to heated debates in the academic communities of scientists, ethicists and theologians. Opinions have been widely divided. Some are in full support of all these technologies. Others object to some of them. A group of seculars are cautiously reserved about such innovations, while others are simply baffled by them.

The Islamic Organization for Medical Sciences (IOMS) firmly believes it is essential to study such innovations in order to recognize the views and attitudes of specialists in these new fields of science. What is equally essential is that scholars in all religions and faiths should also get to know about the nature of these scientific activities. Theologians of a certain religion should also listen to the opinions and juridical rules of their counterparts in other religions. The ultimate goal is for all these groups to have in mind a true picture of the scientific innovations in each discipline.

In light of all this, IOMS has realized that the best way to put this into effect is to join forces with the Eastern Mediterranean Regional Office of the World Health Organization (EMRO), the Islamic Educational, Scientific and Cultural Organization(ISESCO), and the International Council of Medical Sciences Organizations (CIOMS) to hold an international seminar for looking into all these issues under the general title: "Human Genetic and Reproductive Technologies". Eminent representatives of the three divine religions in addition to

secular philosophers were invited to contribute to the seminar and participate in the discussions.

The seminar was successfully held in Cairo from Muharram 7 to 10, 1427 H. (February 6 to 9, 2006). The sessions were held at the Kuwait Auditorium situated in the Building of EMRO under the auspices of His Excellency professor Hatem Al Gabali, the minister of health in Egypt. The meetings were attended by the Grand Imam of Al-Azhar, Sheik Mohamed Sayyid Tantawi and a large group of scientists and scholars from many Arabic and Islamic countries.

Participants in the seminar activities and extensive discussions included notable specialists in various scientific fields in addition to renowned theologians representing the divine religions, besides sociologists, secular philosophers, psychologists and political figures, some of whom are decision makers. A total of 150 participants were earnestly engaged in a full-scale discussion of the seminar main topics with a view to reaching a clear understanding of the impact of these innovations on the present and future generations and the potential problems they pose to human communities in the whole world.

Along the four days of the seminar sessions, there were serious discussions about the main topics previously mentioned in the introduction. Each group expressed their opinions quite frankly in an atmosphere of freedom, brotherhood, friendship and mutual respect. Everybody was keen to know the truth and accept it when it is finally reached.

All participants were agreed that the issues under discussion were crucial as they pertained to "Man", the most honored creature on earth, and the dangers posed to human beings by an array of technological experiments that can end up all sorts of results.

Therefore, the participants were keen to remove any likely disregard for the safety of persons used as subjects in scientific experiments. This may happen if such experiments were conducted by a breed of scientists who would go to any length to satisfy their insatiable lust for getting into the heart of whatever is still mysteriously and tantalizingly unknown, even at the cost of man's humanity.

In recognition of man's dignity and sanctity, and wishing to see to it that human life is given the value it deserves and that everything is done for its safety and prosperity, the seminar recommended that no humans should be used in experiments unless there are sufficient guarantees for their safety, and unless all necessary precautionary measures are taken to make sure they will not be put in harm's way. Researchers have a moral duty to keep within the precautions and regulations specified in world charters, of which we would like to single out the World Islamic Charter of Ethics For the Medical and Health Professions issued by IOMS in 2004.

For emphasizing world solidarity in facing the dangers of misusing the technological innovations, and in order to stress the need for issuing obligatory international legislations that conform to the principles of the three divine religions in a bid to prevent the exploitation of poor nations in the underdeveloped countries where they could be used as guinea pigs, the seminar participants agreed to issue the following declaration of principles.

# DECLARATION OF PRINCIPLES

# Declaration of Principles

1 - Man is an honored being. Tampering with a human being's constituents and subjecting him to the experiments of genetic engineering without any acceptable objective is in blatant contravention of human dignity.

2 - Religion does not impose any restrictions on the human mind in matters relating to pure scientific research. But the product of this research should not automatically be transferred to application until it is reviewed in light of religious regulations.

3 - Religion recommends that we keep healthy and take all necessary preventive measures to do that. Seeking treatment when disease strikes has always been urged by religion, whether the disease is genetic or incidental. This is not in contradiction to the virtue of patience and resignation to God.

4 - Every human being is entitled to dignity and human rights, no matter what his genetic constitution is or his characteristics are.

5 - No Research may be conducted or treatment effected or diagnosis of a person's genome made without a prior rigorous evaluation of the potential risks underlying these activities. In all cases, there should be strict adherence to religious and ethical regulations set down for such activities. Furthermore, an informed consent should be obtained from the person concerned. If it happens that he is not legally qualified to give consent, then it should be obtained from his guardian who should do whatever is in the interest of that person.

6 - Every person has the right to freely decide whether or not he is to be informed of the results and consequences of any genetic diagnosis applied to him.

7 - The results of all genetic diagnoses, whether conducted at the moment or kept in records for purposes of research or for any other purpose, should be strictly confidential. The information should not be divulged except in cases stipulated in the Medical codes of ethics.

8 - There should be no discrimination against any person because of his genetic characteristics if the purpose or outcome of such discrimination is to infringe upon his rights and basic freedoms or to undermine his human dignity.

9 - No research on human genome or application thereof, especially in the fields of biology, genetics and medicine, should commit a breach of religious rules and regulations, encroach upon human rights or undermine man's basic freedoms and dignity.

10 - Genetic engineering may be utilized for the prevention or treatment of diseases, or for alleviating the harm caused by them. It is acceptable that a gene from a non-human being be inserted into the body of another non-human being for the purpose of obtaining a relatively profuse secretion of this gene which is then used in the treatment of certain diseases. Governments should take up such services and make them accessible to citizens of limited income because these health services are greatly expensive.

11 - Genetic engineering should not be utilized for evil or aggressive purposes or in breaking down the genetic barriers between different species with the intention of creating freaks with mixed up genomes. Such uncommon experimentation sometimes happens to be pursued just for kicks or to satisfy scientific curiosity.

12 - Genetic engineering should not be used to implement a policy of eugenics. Any attempt to manipulate the genes of a person with the purpose of "enhancing" his physical or mental abilities is religiously impermissible.

13 - Scientific advancement should not be monopolized by any country or group of people; neither should scientific activities and practices aim to make profits.

14 - No technological procedure in the fields of human reproduction and genetic engineering should be conducted if it portends real or likely dangers. If the likelihood of harm is limited, pursuit of the procedure had better be discontinued until safer circumstances obtain.

15 - There is nothing wrong with utilizing genetic engineering in the

fields of agriculture and animal breeding, but the utmost precautions should be made against the possibility of long-term harm to humans, animals, plants or environment.

16 - It is the moral duty of companies and factories that produce food-stuffs of plant or animal origins to inform the public about the nature of these products. Consumers should know if the commodities they are buying are natural or genetically engineered. Governments should keep eyes wide open about such products and heed the recommendations issued by the US Food & Drug Administration, the World Health Organization and the Food & Agriculture Organization.

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