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Development of a regional position on human cloning

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Executive summary

Biotechnology in one form or another has been practised by mankind since time immemorial. Man's quest to manipulate nature to his advantage is perhaps as old as mankind itself. The recent advances in genomics and biotechnology have brought humans close to procreation of their own kind. So long as genomics and biotechnology are applied to plants and other animals they are rarely questioned, but once the experimentation begins to cross the threshold to involve humans themselves, the ethos, principles and beliefs upon which humans have lived over centuries begin to shake. Reproductive cloning, the science of replicating humans, is without any doubt considered immoral. It is prohibited in all religions, societies and cultures and is recognized as a gross violation of human dignity and all ethical norms. Thus there is a global consensus on banning of reproductive cloning.

Therapeutic cloning on the other hand possesses enormous potential for revolutionizing medical therapeutic techniques. It brings renewed hope for cure of diseases that had been deemed impossible to treat. The dilemma with therapeutic cloning is that it requires stem cells and the best stem cells are those that are derived from early human embryos. The technology therefore is perceived as having the potential for reproductive cloning. This raises doubts, apprehensions and concerns (both ethical and moral) among many, that the unscrupulous may take undue advantage and pursue their own interests. The global debate that rages today is whether all forms of cloning should be banned. There are those who argue that the ban should not apply to therapeutic cloning, as it would stifle scientific research and development and block efforts to find new cures for diseases at present considered untreatable, and to improve, ultimately, human health.

At present, some countries allow stem cells to be harvested from left over embryos created through *in vitro* fertilization techniques. Others allow the creation of early embryos for the specific purpose of acquiring stem cells. Still others do not condone any form of cloning practices. In an attempt to reach a global consensus on the issue, the United Nations General Assembly in November 2003 failed to reach any agreement, and voted to delay decision for 2 years, by which time it was believed that more information would be available to enable an informed decision.

From the Islamic perspective, the debate on human embryonic cloning should centre essentially around three key arguments. First, does cloning conflict with Islamic beliefs and to what degree is it permitted? Second, what are the consequences of cloning in societies? And third, at what stage is an embryo considered a living being? Almost all believe that reproductive cloning is prohibited. Many also are of the view that therapeutic cloning should also be prohibited. However, every one agrees that scientific research and the generation of new knowledge, particularly when it is in the interests and benefit of mankind, must go on. To stifle such efforts would be contrary to the basic tenets of Islam. Therapeutic cloning therefore is viewed by many scholars as belonging to this category; having potential to benefit mankind. Some argue that cloning cannot be considered contrary to religion, because the knowledge advancement is ordained by God; just as man cannot be the creator of the plant by sowing its seed, similarly man cannot ever be considered as creator of life.

Muslims take different views on the onset of life. Although all agree that life begins to develop at inception, all also agree that an embryo is not considered a human until the soul is embedded into the fetus. Some Muslim scholars believe that this takes place on day 120, others that it takes place on day 40. There are varying opinions among different cultures and societies on the beginning of life in an embryo, the objective being not to desecrate human life and dignity.

The global discussion on cloning under United Nations auspices is due next year. The debate among Muslim countries and Muslim scholars, as well as other countries continues. It is important that such dialogue not only considers the scientific merits but also the moral, ethical and legal implications. Islam supports any research when it is done with the desire to alleviate human suffering and disease. Therefore the Arab and the Muslim world should continue the discussion, arrive at a consensus and present its view to the General Assembly. It is crucial for those making the decision, to weigh all options carefully and analyse the risks versus the benefits that may accrue, through open and fair assessment. The decision, one way or another, will have profound and far reaching consequences for our future generations.

1. Introduction

One of the greatest controversies triggered by the rapid pace of evolution in biology, particularly in genomics and biotechnology, has been the technique of cloning. The technique itself is not very new, and has been applied to both the plant and animal kingdoms for quite some time now, without even stirring a ripple of concern in international conscience. So long as cloning has concerned species other than humans, and is providing a useful service to mankind, it has been accepted. One might argue here as to what defines a "useful service" to man. However, as long as this form of cloning (non-human) suits human needs, and so long as it does not cause harm and does not conflict with religious beliefs, it has been considered acceptable. The big issue arises when the cloning technique begins to be applied to the human species.

Before opening any debate on the issue, it is important to define and understand what exactly we mean by cloning, and in particular human cloning. In its simplest form, cloning is defined as the exact replication of cells. Unicellular organisms are primed to replicate (clone) themselves by nature. Multicellular organisms and higher species replicate naturally through a reproduction mechanism involving male and female germ cells. Cloning in higher species therefore involves the process in which the nucleus of a somatic (non-germ) cell is taken out and inserted into an enucleated fertilized female germ cell (egg, ovum). This cell then has the capacity to divide and grow into an exact replica of the original from whom the somatic cell was taken. That is how the first cloned sheep, Dolly, was created. This is **reproductive cloning**, and can in theory be applied to any species, including humans.

We also know that within humans (and other animal species) there are cells called stem cells. These are undifferentiated cells, as they have not yet developed into particular types of cells in order to carry out specific functions in the body. Nevertheless, they have the DNA within their nucleus that encodes for genetic information for their future characterization as they develop; for example a stem cell encoding for skin tissue will eventually develop into skin tissue, a stem cell encoding for heart tissue will eventually develop into heart tissue and so on. When the nucleus of a stem cell is removed and replaced by a nucleus of another cell type, the stem cell will then be reprogrammed to produce the product of the implanted nucleus, when it fully develops. This is **therapeutic cloning**.

The potential for therapeutic cloning is enormous. It can revolutionize the way many diseases are treated now, and the technique offers cures for diseases hitherto considered untreatable. The technology brings the hope and promise of producing tissues and cells to replace those that are damaged or destroyed by way of disease or other causes. To illustrate, the nucleus of a stem cell can be removed and replaced by the DNA in the nucleus of a developed cell, for example an islet cell (one that produces insulin which controls circulatory blood glucose). Then by way of this nuclear transfer, the stem cell will develop into an islet cell. If such therapeutic cloning research were to be successful, then a supply of islet cells could be manufactured for use in islet transplants to control, even cure, diabetes. In similar manner, this technique can be applied to find cures for many diseases. The difficulty is that this technology is still at an experimental stage and needs extensive research before any fruitful outcomes will come into common practice. The stem cells can be obtained from both adult and fetal tissues, umbilical cord and early embryos. However, it appears that the ability of the stem cells to transform is limited, except for those cells that are derived from human embryos, which seem to have a high pluri-potential capacity [1].

2. Reproductive cloning vs therapeutic cloning: the global debate

At this time there is a global consensus across countries, regions and all faiths that reproductive cloning should not be allowed. There are two main reasons. First, because the science and knowledge is limited and far too many risks are involved. Most cloned animals end in miscarriage. A significant proportion fail to develop beyond early stages, and many are born either sick or deformed. It took 227 attempts to clone Dolly successfully! Many cloned animals suffer from a wide range of developmental problems and die prematurely [2]. Second, and more importantly, the argument against reproductive cloning is based on moral, ethical, religious and cultural grounds. The potential of the technology to

create humans has far reaching implications that threaten to upstage and destroy the centuries old values and practices upon which humanity has survived. No religion or society at this stage is prepared to allow clones of humans, and there is no ambiguity about this.

The debate regarding therapeutic cloning is, however, somewhat different. The central objective of this technique is to cure disease, improve health and hence strive to better the quality of life for humans. This calls for research and development in therapeutic cloning to improve the knowledge, skills, expertise and techniques for achieving the stated objective. The problem, however, is that therapeutic cloning requires embryonic stem cells, and to acquire these, early stage embryos are needed. This raises not only serious ethical, moral and religious concerns, that revolve around the rights of the embryo, onset of life itself, hazards to women etc, but also the fact that the technology can lead to potential for human cloning. With its widespread and unchecked use, the risk of the technology falling into the hands of those who are unscrupulous becomes very high.

At present, in many countries, researchers are using the unused fertilized eggs in infertility clinics for therapeutic cloning. These eggs are allowed to undergo division and development to early stage embryos, from which the embryonic stem cells are thus harnessed. In some countries, researchers also create embryos for the specific purpose of carrying out research in therapeutic cloning. As this technique is still developing, a relatively large number of embryos are required to obtain a stem cell of interest. In several countries this is permitted by appropriate legislation, but in others, the lack of specific regulations enables the researchers to take advantage and to carry on with their research in this area. The issue is indeed of global concern, and hence has been the focus of international debate. For several years now, countries have been calling for a United Nations convention to address human cloning. The issue is not about reproductive cloning, which as already noted, every one agrees should not be allowed. The stalemate is really between countries that favour a total ban on all forms of cloning, whether reproductive or for research into its therapeutic applications, and those that are of the view that the ban should only apply to reproductive cloning and that legislating therapeutic cloning should be left to the discretion of the countries. The discussion on the issue during the United Nations General Assembly in November 2003 failed to reach a global consensus, and the Assembly narrowly voted to delay the decision for a period of 2 years upon recommendations from the Organization of the Islamic Conference [3]. It was argued that in 2 years time, there would be adequate and greater knowledge and information available on cloning and a more informed global consensus could be better achieved.

In November 2005, the UN Assembly is set to vote on this issue once again. While the position of many countries remains unchanged, there are others that, increasingly, consider the need for research in therapeutic cloning to outweigh the dangers that it poses and that are creating favourable environments to support research (and development) in therapeutic cloning. In spite of the European Parliament vote of November 2002 favouring a total ban on human cloning [4], the United Kingdom recently granted its first licence on human cloning for the purpose of harvesting stem cells [5]. Japan's top scientific council has recommended to the government to allow limited cloning for human embryos for research purposes [6]. The United States of America, whose government had earlier banned public sector funding for research on human cloning, very recently allowed limited and conditional support to embryonic stem cell research. The Arab countries, on the contrary, are pondering a region-wide ban on human cloning, whether for reproductive or therapeutic purposes. A draft for a treaty on cloning was discussed at a recent meeting of the legal experts representing the ministries of justice of Arab States in early June 2004 [7].

3. Cloning and Islamic perspectives

The debate on cloning within the Eastern Mediterranean Region has undoubtedly to remain within the confines of religious beliefs, ethical norms and values of the society. It also must be viewed in the context of the technical skills, knowledge and expertise that exists currently in the Member States, and more importantly, it must also take into account the future stakes involved. Overall, the status of embryonic cell research in the Region is weak; nevertheless, *in vitro* fertilization techniques are

common. Many countries have well developed facilities for embryonic cell research related to animals. In the absence of clear regulations and guidelines, the potential for exploitation and misuse therefore exists. At the same time, some Member States (as well as some other Muslim countries outside of the Eastern Mediterranean Region) are fast developing their scientific infrastructure, within which research and development for health figures strong and is gradually taking centre-stage. The overarching challenge is, therefore, to find a balance, between the need to avoid the trampling of human dignity that may possibly be induced by human cloning, and the need for continued improvement in the quality of human life through research and development.

From the Islamic perspective, the debate on human embryonic cloning should hinge essentially on three key arguments. First, does cloning conflict with Islamic beliefs and to what degree is it permitted? Second, what are the consequences of cloning in societies? And third at what stage is an embryo considered a living being?

The Islamic Fiqh Academy, in its 1997 meeting, agreed that cloning does not contradict the Islamic faith. God is the creator of the Universe and therefore the advancing knowledge and technology development that has made cloning possible was pre-ordained by God Almighty's will. Just as the person sowing the seed is not the creator of the resulting plant, so the cloning technician is not the actual creator of the plant or animal thus produced [8]. The scientific breakthrough in cloning can thus be regarded in a way as divine will to provide mankind with moral training and maturity [9]. There is a general consensus that cloning of plants or animals to improve quality and productivity as well as for cure of human diseases is not prohibited in Islamic law.

Islamic countries and Muslim scholars are all unanimous in their opposition to cloning (of humans). There have been numerous calls for banning human cloning throughout the Muslim world by way of various fatwas, opinion of religious leaders, community polls and national/international Islamic bodies [8,10,11]. The main reasons cited include the fear that man, by creating life, is attempting to play God. Only God is the creator-not humans. It is an unnatural way of reproduction that is contrary to what God has ordained for humans. There will be loss of kinship and lineage, both of which are central and core values in Islam. Who would be the father, mother, brother or sister of the clone? Mixing of kinship or the loss of it, would be considered as *haram*, and is therefore prohibited in the religion. Cloning is also feared because of its ability to create designer human beings, superior or inferior, depending upon the motives and discretion of the architect (who will clone). This of course will be of great harm to societies and nature. The fact is that all major religions of the world oppose human cloning [12], principally because of the fear that a) it would corrupt, taint or destroy traditional family relationships and lineage, b) the destruction of embryos for research is tantamount to murder, and c) it meddles with God's universe in a way that humans should not.

The main concern against human cloning is, therefore, the inherent fear of the ability of humankind to re-generate itself, which obviously conflicts with the beliefs, values, systems and environments within which humans have lived over the centuries of their existence. The current (but limited) state of knowledge and the high risks involved in cloning procedures and their out outcomes, further strengthen and justify the case against human cloning. Nevertheless, there is one common parameter where every one (all humanity) agrees. And that is the desire and determination of man to alleviate human suffering and disease. This has been a key tenet of human development throughout the ages, in all societies, cultures and religions. Throughout the Muslim world, and in all the religious fatwas, edicts, resolutions and recommendations against cloning, a clear message emanates: that the wellbeing of individual beings is sacrosanct. Islam encourages research and investigation. In the past, medicines and then vaccines were important discoveries that offered cure and prevention from diseases. The cloning technology now offers new ways and opportunities for disease cure. The Prophet (Peace be upon Him) has very clearly commanded us to seek cure, for God Almighty did not create a disease without creating its cure [10].

A leading Egyptian Islamic legal scholar Sheikh Yusuf Al-Qaradawi, whilst reasoning the forbidding of human cloning in Islam, stresses that Islam embraces scientific progress and research and that at no time during Islamic history has there ever been a conflict between Islam and science. Therefore, if

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cloning creates a human being, it is a violation of Islamic beliefs, but if it is to be used for specific parts of the human body such as the heart and kidneys, for the purpose of treatment, this is not only permitted, but recommended and rewarded by God [13]. It is of interest to note that the members of the Islamic Fiqh Academy, in its 1997 seminar, while clearly articulating the position of the Academy on therapeutic cloning, that it should not be permitted, also stated that, in exceptional cases, it could be allowed in future, provided it is not implemented in contradiction to Islamic law [8].

From the discussion presented above, there is no disagreement on the issue when the matter relates to human cloning in Islam. This is completely taboo and there are no opposing views on this. However, given that Islam mandates nations to pursue science and knowledge, and sanctifies the seeking of cure for human illnesses, the door for research in therapeutic cloning remains ajar. As long as the technology does not create humans, but seeks to cure disease and illness, and does not conflict with religious beliefs, it should be encouraged.

Since stem cell research involves early stage embryos, it is important to examine how Islam views inception of life itself, as any tampering with embryos, and thus life, is in direct conflict with Islamic teachings and therefore haram. The subject was the focus of discussion at the Seminar on Human Life: its inception and end as viewed by Islam, held in Kuwait in 1985 [14]. The participants graded inception into three clear phases (stages). The first stage of inception is the time of fusion between the sperm and ovum into a zygote. This stage establishes the genetic code for the individual that will be created out of the zygote as it develops. The second stage begins when it settles inside a woman's body (assuming here, the womb). The third phase begins when the spirit (soul) is embedded into the fetus. This is considered to be day 120 of inception. Some (Muslims) believe this to happen at day 40 of inception. An embryo is considered a living organism from its conception and it is to be respected in all stages, especially after the spirit is breathed in. Tampering with an embryo (to cause abortion for instance) at any stage after conception is considered unlawful by many in Islam, except in cases when it becomes necessary. Some experts believe that abortion before the 40th day of inception, particularly when there is a justification, is lawful. It is quite clear that Muslims consider an embryo to acquire human status at the time when the spirit is breathed into it. So it can be argued at least that Islam does not totally prohibit early embryonic stage research, especially if it is justified and deemed necessary. However, the manner in which the early embryos may be obtained and the inherent risks to women who would be the source of such embryos, pose serious ethical and social problems.

Most other major religions of the world hold similar views. The Roman Catholic Church vehemently opposes all forms of cloning, but some leading figures among conservative Protestants, given the ambiguity on embryo status and the potential for health benefits, while opposed to reproductive cloning, support therapeutic cloning. The international debate to ban all types of cloning, not surprisingly, is led by countries with a strong Catholic population base and others who have similar views. The Jewish view on embryo status is to a degree akin to the Muslim view. Judaism does not consider a fertilized embryo to have a full human status and the need for research that has the potential to save and preserve life takes precedence.

The concept of life can also be seen through the prism of anatomical embryo development. Some consider an embryo to be alive when fetal movements are first noticed by a mother (at the 16th week of gestation), although ultrasound technology can visualize fetal movements as early as the 10th week of gestation. Others equate life in the embryo with early signs of heartbeat, which begins towards the end of the 3rd week of gestation. Still others would consider an embryo to be alive once the sensory systems start to develop after the 2nd week of gestation with the differentiation of the neural crest cells, the precursors of the human nervous system. In the United Kingdom, where early embryonic stem cell research has recently been legalized, the rules do not authorize embryos to be developed for more than 14 days [5].

4. Conclusion

It is essential that any debate on cloning should not rest on scientific merit alone. By the same token, advances in science should not be regarded as a threat to religious belief or as being in opposition to

the time honoured ethos of human values and culture. Research and science drive innovation for human development. It is important that when creative science and technology begin to tread up on age old and deep rooted concepts of theology and culture, science and religion should engage in constructive dialogue and come to an informed consensus for the good of the public at large.

Recently, *Newsweek* reported the successful derivation of stem cells from cloned embryos in the United States of America [15]. The news accentuated the divide between those who believe that cloning should be outlawed entirely and those who support banning it for reproductive purposes but not for medical research. Times are changing now. Countries strongly opposed to any form of cloning at the last UN debate, such as USA, are now repositioning their stance. Very recently, the United States government authorized limited stem cell research, and in at least one State of the country cloning for stem cell research has been legalized [16]. Several other countries have followed suit. At the global level the number of countries that support therapeutic cloning for stem cell research while remaining opposed to reproductive cloning is growing. This has happened in the light of the emerging knowledge, promise and renewed hope for disease cure that the technology offers.

The next United Nations debate on this subject is due in November of next year. It is important that the Islamic countries come to a consensus on this vital issue. Developing science and technology for better health is a religious and moral obligation. There is a crucial (and urgent) need for Muslim scholars to discuss the issues on cloning rationally, with careful analysis of the benefits and harms and resulting in a balanced outcome. The League of Arab States has also stressed the need for a regional dialogue on health care ethics and human cloning at all levels. Some countries within the Islamic world are at the threshold of cutting edge research and technology in genetics, and some have even crossed it, almost matching the developments in the industrialized countries. Should countries close the door to this development in a heated reaction without discovering all the possibilities, judging all the criteria involved and considering the scope of potential impact for human health and alleviation of suffering? The big question countries must answer, therefore, is whether to recommend a total ban on all forms of human cloning, or a ban on reproductive cloning while allowing room for research in therapeutic cloning and stem cells. A joint decision by the Arab countries and the Muslim world on this issue will have significant and far reaching consequences, not only for the Muslim countries, but also at the United Nations global discussion scheduled for next year.

5. Recommendations

- 1. The global consensus on banning reproductive cloning should be reiterated.
- 2. The Muslim countries should organize nationwide debate on therapeutic cloning and discussions involving all stakeholders including scientists, scholars, clergy, policy-makers and community to arrive at national consensus, and should endeavour to improve knowledge, skills and expertise in this area.
- 3. Necessary rules, regulations and guidelines should be developed to ensure on the one hand the development of therapeutic cloning, and on the other to check and control for any unscrupulous use or misuse of this technology.

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