
An Analysis in Religious Perspectives on Emerging STI

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Abstract

New biomedical technologies are used nowadays everywhere in the world, and thus in countries of different cultural and religious backgrounds. They constitute emerging technologies and promise a wide variety of benefits for humanity. They also caused much legal and theological debate. While some forms of its application were prohibited in the beginning, they have now started to be used in many countries. Application of these new methods of research and treatment in modern medicine makes new diagnostic and therapeutic interventions possible, but also often raises new complex bioethical problems, which cannot be discussed and judged independently of cultural attitudes. Recent advances in the field of cloning and stem cell research have introduced new hope for treatment of serious diseases. But this promise has been accompanied by enormous questions. Currently, cloning is a matter of public discussion. It is rare that a field of science causes debate and challenge not only among scientists but also among ethicists, religious scholars, governments and politicians. One important concern is religious arguments. Various religions have different attitudes toward the morality of these subjects; even within a particular religious tradition there is a diversity of opinions. This article briefly reviews Islamic perspectives on emerging technologies such particularly biotechnology (reproductive/ therapeutic cloning, stem cell research, genetically modified food). The discussions throughout the paper demonstrate that while some ethicists and religious scholars argue that some emerging technologies are unethical in the Islamic tradition, tradition permits them as long as such research are aimed at improving human health.

Keywords: Emerging Science; Reproductive Cloning; Embryo Research; Ethics; Stem Cell Research

1. Introduction

“The Prophet said science is of two sorts: The science of bodies and the science of religions.” (Nezami). Of all its accomplishments, the West is perhaps most proud of its scientific revolution, which has been unfolding for the past half-millennium. In the centuries preceding this intellectual sea change, the Arab world played a pivotal historical role. Its own scholars studied nature and pushed the bounds of knowledge, while its scribes preserved the discoveries and insights of earlier thinkers whose works did not fit well with the prevalent Christian dogma of a world unfolding according to a divinely predetermined plan. In recent times, however, Arab and Muslim societies have turned away from science, precluding these societies from enjoying its many benefits. Most Muslim scholars argue

that every individual should have a vested interest in advancing science and technology in the Arab and Muslim world. Not only can science and technology help to feed people, improve their health, and create wealth, but they can help reduce societal tensions and build international bridges for badly needed dialogue and mutual understanding. Islam and science describes the relationship between Muslim communities and science in general. From an Islamic standpoint, science, the study of nature, is considered to be linked to the concept of *Tawhid* (the Oneness of God), as are all other branches of knowledge.

In Islam, nature is not seen as a separate entity, but rather as an integral part of Islam’s holistic outlook on God, humanity, and the world ^[24]. This link implies a sacred aspect to the pursuit

of scientific knowledge by Muslims, as nature itself is viewed in the *Qur'an* as a compilation of signs pointing to the Divine. It was with this understanding that the pursuit of science was tolerated in Islamic civilizations, specifically during the eighth to sixteenth centuries, prior to the colonization of the Muslim world [25]. 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. This revolutionary procedure 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 [15].

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. 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 article highlights the contemporary challenges of advancing biotechnologies focusing on three areas of cutting edge biotechnology, namely:

- i. Reproductive human cloning
- ii. Genetic technology and human embryo research (stem cell research)

- iii. Genetically modified food

2. Challenges and Opportunities in Emerging Science, Technology and Innovation

Islam always encourages the use of science and the scientific method. Even Prophet advocates his followers to learn knowledge as far as possible and impart to the people. Acquiring knowledge is obligatory upon every Muslim (*Al-Tirmidhi, Hadith 74*). In Islam, science and technology should be used for moral ends and serve humanity's legitimate needs, and be considered as yet another means to understand and see God's power and glory. Contribution of medieval Islamic scholars to science and technology is tangible and vast. They were inspired by the teaching of *Qur'an* and *Hadith* to discover much knowledge about the world especially in the field of science and technology. This shows the importance of religion in science and technology play an important role as a basis for the discovery of the scholars that do not conflict with the teachings since medieval.

With all these developments taking place so rapidly, how well do people really understand on emerging technologies particularly biotechnology? Most of us are probably aware of certain bio-technological terms and concepts, as they may have been used in the media especially when used in agriculture, food science, and medicine. In a simple sentence biotechnology means any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use. Though biotechnology is another scientific field that gets much attention by major part the world, the progress towards maturity level can be seen after the discovery of the structure of the gene (deoxyribonucleic acid, DNA) five decades ago in 1953 which propelled genetic sciences to the forefront. From there biological science has continue to evolve, with protein protein synthesis in the 1960s, tissue culture in the

1970s, molecular markers in the 1980s, genetic engineering in the 1990s and genomics at the turn of the millennium.

Nowadays, new technologies have always produced unintended consequences and faces number of new ethical challenges today with the rise of technology and our interaction and dependence on it. While the new emerging technologies such as biotechnology have promoted some benefits to the world, yet, it raises some ethical issues especially to public. For example, genetically modified food on food safety, human cloning on family institutions and stem cell on the status of embryo produced. The futures of emerging technologies clearly depend on the capacity to meet a range of key challenges; technical, social, economic, and political. On the other hand, some uses of technological innovation have the possibility of having many more innocent victims than others. As Islamic countries strive to enhance their scientific and technological capacities to respond to the environmental stresses and seize the development opportunities of the 21st century they confront several ethical challenges on emerging technologies.

3. Islamic Perspectives on Emerging Science, Technology and Innovation

As a complete and comprehensive way of life, the teaching of Islam encompasses all fields of human endeavors, spiritual and material, individual and societal, economic and politics, national and international. The instructions which regulate everyday activity of life by an observant Muslim are called *Shari'aa* (Islamic law). There are two primary sources of *Shari'aa*; the *Qur'an*, words of God and *Sunnah*, the authentic traditions of the Prophet. The process of interpreting the two primary sources of Islamic law called *fiqh* or Islamic jurisprudence. *Fiqh* covers all aspects of law, including religious, civil, political, constitutional and procedural law. *Fiqh* depends on 4 sources; interpretations of the

Qur'an, interpretations of the *Sunnah*, *Ijma* (consensus among scholars) and *Qiyas/ Ijtihad* (analogical deduction). *Shari'aa* describes itself as a guide, a light and a mercy. It is this philosophy of the law which is alive to the contemporary challenges of advancing technologies.

3.1 Islamic Perspectives on Reproductive Human Cloning

There have been tremendous interest and anxiety expressed by the people regarding human cloning. Although recent advances in cloning have been offered new hope for curing diseases such as diabetes, Parkinson's, neurologic degeneration, Alzheimer's, osteoporosis and so forth, the technology has been accompanied by social, political, economic, legal, religious and ethical questions worldwide. Even the Islamic world concerned about the recent developments in genetic engineering because it interferes with the process of creation and lead unethical and immoral practices.

According to *Qur'an*, human beings are created through a family system, through a male and female: (*al-Nisa* 4:1; *al-A'raf* 7:189; *al-Hujurat* 49:13).

O mankind, fear your Lord, who created you from one soul and created from it its mate and dispersed from both of them many men and women. And fear Allah, through whom you ask one another, and the wombs. Indeed Allah is ever, over you, an Observer.

- *al-Nisa* 4:1

It is He who created you from one soul and created from it its mate that he might dwell in security with her. And when he covers her, she carries a light burden and continues therein. And when it becomes heavy, they both invoke Allah, their Lord, "If You should give us a good [child], we will surely be among the grateful."

- *al-A'raf* 7:189

O mankind, indeed We have created you from male and female and made you peoples and tribes that you may know one another. Indeed, the most noble of you in the sight of Allah is the most righteous of you. Indeed, Allah is Knowing and Acquainted.

- *al-Hujurat 49:13*

Thus, the proper and acceptable way of producing children is through the joining of males and females in marriages and then through their union the procreation should take place. In this way the family is preserved. The children born in this way carry the genes of both parents and this combination gives them identity, balance and a wholesome personality. Islam does not allow producing children without marriage. While modern jurists allow a woman to carry the fertilized ovum of a person to whom she not married, *Shari'aa* prohibits the production of single-cell to allow a woman to carry the embryo produced from a single cell of even her husband or herself. As we move on to understand the ethical issues associated with cloning, at the center of the debate in Islam is going to be the question of the ways in which cloning might affect inter-human relationships as it against the natural process (*fitrah*).

Besides, a true Muslim believes in the system of cause and effect in the world; all creation takes place solely through His will. Cloning would be only manipulating God's creation. Therefore scientists would not become God or replace God. Nevertheless, cloning technology is also *haram* because it may cause problems such as danger to human personality, dignity, honor and family system as well to society. Furthermore, human reproductive cloning is expensive and highly inefficient. For example, Dolly, the first mammal successfully cloned after 227 attempts cost a great deal with a failure rate exceeding 98% and died due to premature rheumatism.

3.2 Stem Cell Research

Stem cells are cells that have not gone through the process of cell differentiation and therefore

have the potential to give rise to many different kinds of specialized cells. This ability allows a stem cell to act as a repair system for the body to replenish other cells as long as the organism is alive. One source of stem cells is from embryos that were formed from a process called in-vitro fertilization (IVF). In Islam, IVF is only allowed for married couples those have difficulties in pregnancy in a normal way as long as the fertilised ovum is placed in the womb of the woman from whom the egg was taken. Scholars agree that there is nothing in Islamic law which forbids many types of fertility treatment, as long as the treatments do not go outside the bounds of the marriage relationship. There are major disagreements about:

- i) whether the child should follow the name of the infertile father or the sperm donor; and
- ii) whether donation is permissible at all if the donors are anonymous.

Another issue arises from IVF is when doctors used some of the embryos before they are implanted to uterus to produce all kinds of tissues, from liver cells to heart muscle cells to brain cells for scientific understanding of human development and for its potential to treat human disease. There are two crucial questions raised to be answered in religious view. First, should an embryo which is formed within few days after the artificial fertilization and is not yet in the womb of its mother, be considered as human being with all the rights of human being? Secondly, will it be acceptable to destroy an embryo for the sake of research even the research can cure many diseases? Some Muslim scholars believe that embryos develop souls at conception, while bigger number of Muslim scholars argued that this happens 120 days after conception whether grown in petri dish (IVF) or inside the uterus of a mother (natural environment). Excess embryos which produced using IVF will be destroyed or frozen indefinitely. These contrary to some Muslim scholars view which described

human existence as occurring in stage. Therefore any disturbances that cause death to potential life are forbidden under Islamic law and liable to be punished for homicide, so, it is encouraged to use adult stem cells instead of embryonic cells. In Islam, any therapeutic study or research is not violent against the *Shari'aa* as long as it does not promote destructive purposes. Thus, stem cell research is acceptable from the viewpoint of Islamic jurisprudence. The Islamic World League has declared that stem cell research is permissible if its source is legitimate without disregarding the standard of informed consent.

3.3 Islamic Perspectives on Genetically Modified Food

Food is one of the basic needs for survival and good health. For Muslim thinkers of the early tradition, view food consumption as one aspect of the commandment to “live a good life”. *Qur'an* urges:

“O messengers, eat from the good foods and work righteousness”
- *Al Mu'minun 23:51*

thus for Muslims, food must be permissible. In other words, the food must be *halal*. Besides that, an equally important but not given much attention by many is *tayyib* or good quality. For instance, junk food and fast food, although the contents may be *halal*, but from the health perspective, it is not good for consumption. Although nowadays food related issues are many, such as nutritional value, metabolic disorders, hunger and etc., issue of genetically modified (GM) food is highly debated among peoples those in favor and against the production of GM food.

The term GM food is commonly referred to crop plants which were created for human or animal by using biological techniques that have undergone genetic material (DNA) change through a process called genetic engineering that combine different genes of another organisms. The main purpose of the food being

modified is to enhance desirable traits such as increase or improved nutritional content. Although biotechnology may be permissible under Islamic law when it is used for the benefit of the public, it is questionable whether such use will be sanctioned if the biotechnology is for the benefit of a certain group of people especially the GM food producers whom stand to profit and also control the food production.

On the other hand, Muslim scholars argued that the production of GM food would violate certain Islamic principles. Muslims strongly believe that Allah is the only creator that has put everything in order on Earth. *Qur'an* exhorts:

“It is He who created all things and ordered them in due proportions”
- *Al-Furqan 25:2*

“We have created everything according to fixed decree”
- *Al-Qamar 54:49*

These 2 verses explain that there is no need for genetic modification of food crops as God created everything perfectly and man does not have any right to manipulate anything that God has created using His divine wisdom. Therefore, just from the above, it seems that GM food is actually a deviation from what is acceptable in Islamic teachings. However, in Islam a human should help each other for survival. Thus, some Muslim scholars believe that production of GM food is tolerable as long as the technology does not cause harm to people or the environment and ensure that genetic modification remains mercy-driven and promotes righteousness to help those in need as the food supply is not enough to support the increasing number of world populations.

4. DISCUSSIONS

Biotechnology has become as a tool of technological advancement in both developed and developing countries though at different

levels in scope and content. Although from Islamic point of view, it seems biotechnology regarded as one of scientific field one should prosper, many Islamic countries are still lag behind in the advancement of biotechnology. Differences in view on certain field by different group of scholars are one of rising crisis for these. For example, human embryo research. While a group of Muslim scholars state that killing embryos is forbidden by the religion as they believe that embryos develop souls at conception and it has the right to its own life, another group expressed that this happens only 120 days after conception. These two different views has brought Islamic countries in dilemma whether to proceed in stem cell research or not until some leaders of Islamic countries issued *Fatwa* (Islamic law) on these matters. Countries like Malaysia and Iran permitted embryonic stem cell research only using frozen embryo or extra embryo in vitro fertilization process is permissible for research purpose. However, permission must be granted from the married couple who are under treatment. The research on the embryo must be done before the embryo reach the *alaqah* stage (stage of human prenatal development). Embryonic stem cells represent the good, the bad and the ugly. When they are good, they can be grown to large numbers in the lab and used to give rise to tissues, organs or body parts. When they are bad, they don't know when to stop growing and give rise to tumors. This is one of the main problems facing stem cell research. This has evoked scholars including Muslim scholars to oppose against stem cell research.

While paternity in terms of Islamic law is established only within a heterosexual marriage. Asexual reproduction threatens the biological architecture that informs classical Islamic law. Intergenerational inheritance of property occurs along the lines of kinship associations in Islam, and therefore the hype of biotechnology surrounding genetic engineering threatens that specific narrative of kinship relations the way it is known. It is feared that genetically engineered offspring will find

themselves in a legal and ethical no-man's-land in terms of existing Islamic criteria, challenging the entire system. One concern most religious experts voice is that asexual reproduction will promote discrimination between different kinds of offspring: children with naturally reproduced genetic make-up who will be subject to one set of rules versus children bearing artificially engineered genetic make-up who will be subject to a different set of norms^[8]. Much of the reaction to genetic engineering on the part of Muslim traditional jurists and ethicists points to cloning of the sheep named Dolly as an indicator of the malevolent trajectory of techno-science. Most fear that human cloning would be the ultimate perversion of reproduction the way it is known, and fears of its sinister consequences abound. While a very few scholars are unconditionally open to the possibility of therapeutic uses of genetic engineering, majority express extreme caution blended with suspicion about the purposes of such techno-science^[18]. Others in south Asia, especially Pakistan, were outright dismissive of the merits of therapeutic uses of genetic engineering^[8].

It is also undeniable that biotechnology could solve many of human problems such as hunger. They present solutions to overcoming poor crop yields, while reducing crop losses due to pests and drought. If those days it was impossible to grow fruits in the desert, now with the advancement of science and technology has made it possible. In Qatar, they convert desolate salt flats irrigated with treated sewage into an agricultural oasis. They did it by applying a special fungus that enhances the ability of plant roots to absorb water. They utilize the knowledge of biotechnology to address issues such as soil salinity and pest infestation, particularly in date palms, yet there are no biotech-enhanced crops under commercial production for either local consumption or export. As Islamic view permit on GM foods/ crops for the public interest, many of Muslim countries still impose strict regulations on importing GM foods as there is still strong debate going on the status of foods

that been modified through biotechnology. Among of the questions raised was on the concern

about the theoretical production of foods with genes from pigs as Islam too forbids eating of pork. Although there are fears about the possibility of the harmful effects of GM food technology and GM food products on human beings and the environment, there are no laws within Islam which stop the genetic modification of food crops and animals. Other risks are ruining biodiversity and killing beneficial insects like ladybugs and bees, which also unlawful in Islamic teaching.

And when it is said to them, "Do not cause corruption on the earth," they say, "We are but reformers."

- Al – Baqarah 2:11

5. CONCLUSIONS

With the world on the brink of conflict that is likely to reverberate for years to come especially on the issues of security, Islamic teachings hold that the application of biotechnology are not only permissible but also obligatory if they result in either alleviating human suffering or in saving human life. While religious groups are active in influencing the public regarding bioethical positions, and this is particularly evident with issues concerning human cloning, stem cell research and genetically modified food, much collaboration and discussion are needed between ulama and scientists to address bio-technological issues. This in turn would assist them to not only provide the necessary Islamic input, but also explain to Muslims - through Friday sermons (*khutbah*), religious lectures and the like — the Islamic perspective on biotechnological issues. Finally, opposition of any kind to biotechnology does not mean that Islam is opposed to technological progress. Rather, Muslim scholars seek to examine and understand all aspects of biotechnological applications to ensure that these applications are consistent with basic teachings and fundamental principles of Islam. Serious discussion of the moral justifiability of

biotechnology must consider all kinds of potential risks such as political abuse, commercial exploitation, and adverse effects upon interpersonal relationships. Moreover, Islam is a flexible religion and acknowledges the need to accommodate its teachings to life's realities and necessities and to human well-being. (Mirza 2004). Muslim scientists should be encouraged to play a leading role in biotechnology research. If they take the lead, many evils that exist now will certainly vanish and humanity will receive the real reward of biotechnology researches. In Muslim countries, therefore, biotechnology research should be made a priority area and for fostering it all kinds of incentives should be provided.

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