THE POSITION OF STEM CELL RESEARCH

(Buhuth al-Khalaya al-Jadhariyyah)

UNDER ISLAMIC LAW

BY

BADARIYYAH RABI'U ABUBAKAR

SPS/12/MLL/00008

BEING A DISSERTATION SUBMITTED TO FACULTY OF LAW, BAYERO UNIVERSITY, KANO IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF DEGREE OF MASTER OF LAWS (LL.M).

AUGUST, 2016.

THE POSITION OF THERAPEUTIC CLONING UNDER ISLAMIC LAW

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DECLARATION PAGE

I hereby declare that this work is the product of my own research efforts; undertaken under the supervision of Dr. Mamman Lawan Yusufari and has not been presented and will not be presented elsewhere for the award of a degree or certificate. All sources have been duly acknowledged.

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CERTIFICATION PAGE

This is to certify that the research work and the subsequent preparation for this thesis by Badariyyah Rabi'u Abubakar, SPS/12/MLL/00008 were carried out under my supervision.

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APPROVAL PAGE

This thesis has been read and approved in partial fulfilment of the requirement for the award of degree of Master of Laws (LL.M).

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ACKNOWLEDGMENT

All glory is to Almighty Allah, the Lord of the universe. He alone we worship and from only Him we ask for help. We pray He guides us aright-the path of those upon whom He has bestowed favour, not of those who have evoked (His) anger or of those who are astray. I testify to His oneness, and that Muhammad (S.A.W) is His servant and messenger. I thank Him for everything in my life and for the excellent opportunity to undergo and successfully conclude this LL.M programme. I pray to Him to keep protecting me and increase me in knowledge and wisdom.

I will use this opportunity to thank my family members for their prayers; I also wish to appreciate good the gesture of Hon. Justice R. A. Sadik I pray to God Almighty to reward all of them abundantly.

I appreciate the guide of my supervisor, Dr. Mamman Lawan Yusufari; Ph.D (Warwick). I appreciate his effort and spared times. His cooperation contributed a lot to the success of this work. Jazaakallahu khayran, Ameen. My appreciation also goes to Dr. Usman Shu'aib (Zunnurain), Dr. Rabi'u Sani Shatsari, Dr. Muhammad Isa, Dr. Aisha Haruna, Prof. Nasir Ahmad and Prof. N. B. Usman for their contributions to this work.

My deep and sincere appreciation goes to everyone that has in one way or the other assisted with anything including words of encouragement during my programme. Jazaakumullahu khayran, Aameen.

DEDICATION

This thesis is dedicated to;

1. good image of Islam;
2. My parents: Hon. Justice R. A. Sadik and Hajiya Binta M. Rabi'u.

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ABSTRACT

Therapeutic cloning is a newly emerging technology that promises a wide variety of benefits for humanity. The traditional notion of therapeutic cloning is to produce human *embryos* for use in research with the goal of harvesting *stem cells* that can be used to study human development and treat diseases. This newly emerging technology has caused a great deal of ethical, legal and theological discussion and debate. Using doctrinal method, this research examined the history, meaning and nature of cloning; though emphasis is more on therapeutic cloning and the rationale behind it. It examined problems associated with the practice of therapeutic cloning in the society and also further examined its validity under Islamic law by weighing the technology on the *Shri'ah* scale. And at the end, the research found that therapeutic cloning is valid and permissible under Islamic law. The work concluded that: so many diseases could be healed through the use of therapeutic cloning; neglecting the carrying out of therapeutic cloning would result in loss of lives, causes of diseases and injury to people; promotion of the practice of therapeutic cloning in the society may also serve a great purpose in changing peoples' view on the subject matter; there has to be regulations that would give access to proper rules; even though therapeutic cloning is allowed under Islamic law it has to be for the purpose of treating diseases only. The work suggested that conducting such practice under Islamic law principles will enhance its preservation and promotion.

CHAPTER ONE

GENERAL INTRODUCTION

1.1 BACKGROUND

Cloning is to make a duplicate copy of an original living thing such as a plant, animal or human. Human cloning is to make a duplicate copy of the human himself,[1] while therapeutic cloning involves the production of human embryos for use in research with the aim of harvesting stem cells that can be used to study human development and treat diseases.[2] This is bringing a lot of confusion ranging from the strong belief that man is playing the role of God, risk of harm to the child/embryo and killing the values and Islamic morals in the society.

There have been immense scientific developments in the fields of biology, foetal sciences, science of cells, medical biology, genetic engineering and, last but not least, animal cloning, as a preface for human cloning. These developments have exceeded all expectations and have been acknowledged with amazement.[3]

Stem cell research is a newly emerging technology that promises a wide variety of benefits for humanity.[4] It has, however, become a controversial issue. While it is in no way to be disputed that the ability to treat or heal suffering people is a great good, it must also be recognized that not all

[1] Al- khalifa, Islamic verdict on: cloning – Human organ transplantation – abortion – Test-tube Babies – Life support system – Life and death, Al- khalifa Publications, London, 1999, p.11.
[2] Kanchan T., Mohan Kumar T. S., et. el. Multifaceted Aspect of Human Cloning, Department of Forensic Medicine and Toxicology, K.M.C, Manglore and Manipal, Department of Microbiology and Forensic Medicine and Toxicology, HIMS, Dehradun India, 8, 2006,125, P.125.
[3] Al- khalifa, Op. cit note 1, p.5.
[4] Askoy S., Making regulation and drawing up legislation in Islamic Countries under conditions of uncertainty, with special reference to embryonic stem cell research, Journal of Harran University,Faculty of Medicine, Turkey, 2005, 31, 399,p.399.

methods of achieving a desired good are necessarily morally justifiable. This newly emerging technology has caused a great deal of legal discussion and debate.[5]

Human cloning is an ambiguous term, even in science, and may refer to molecular cloning,[6] cecullar cloning,[7] embryo cloning (known as therapeutic cloning technology)[8] and nuclear somatic transfer (NST) (also known as reproductive cloning technology)[9]. The nuclear somatic transfer is what occurred in Dolly[10] and this is what most people care about regarding cloning.[11]

Human cloning has been the subject of news in the United Kingdom (UK), the United States of America (USA), and South Korea, as well as in many other parts of the world. It has been also featured in Hollywood films, in television drama documentaries and in notable best-selling novels.[12]

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[5] Ibid.

[6] Is a set of techniques used to insert recombinant DNA from a prokaryotic or eukaryotic source into a replacing vehicle such as plasmids or viral vectors.

[7] Unicellular organism, such as bacteria and yeast, naturally produce clones of themselves when they replicate asexually by binary fission. The nuclear DNA duplicates by the process of mitosis, which creates an exact replica of the genetic material.

[8] Is the production of human embryos for use in research with the goal of harvesting stem cells that can be used to study human development and treat diseases.

[9] Is a process of nuclear transplantation and embryo splitting. The genetic material from the nucleus of a donor adult cell is transferred to an egg whose nucleus, and its genetic material has been removed. The reconstructed egg containing the DNA from a donor cell is treated with chemicals or electric current in order to stimulate cell division. Once the cloned embryo reaches a suitable stage, it is transferred to the uterus of a female host where it continues to develop until birth.

[10] Dolly was born in 1996 by the scientists Ian Wilmut and his team. This was the famous cloned animal because she was the first animal of any kind ever to be created from cultured, differentiated cells taken from an adult.

[11] Pence G. E., Who is afraid of Human Cloning?, Roman and Littlefield Publishers, New York, United States of America, p.1.

[12] Haran J., Kitzinger J., et al. Human Cloning in the Media from Science Fiction to science practice, Routledge Publishers, 2008, New York, United State America. P.1

There is a broad, albeit loose, consensus among members of the lay public, various legislative bodies, and the scientific community that human reproductive cloning should be banned because there is something deeply immoral about it in principle (i.e, something above and beyond the fact that it would be wholly unacceptable to attempt it in humans until it appears reasonably safe). Precisely what this is, however, continues to elude even the most committed of critics.[13]

These immense scientific developments such as the issues at hand and their applications, which were achieved through advanced technology, point to the greatness of Allah, His Might, His Wisdom, and the perfection of His creation. These things indicate that Allah is their Creator. They also indicate that they were not created by mere coincidence, because they follow a precise order and specific laws that control and regulate them.[14] Allah the Exalted says;

إِنَّا كُلَّ شَيْءٍ خَلَقْنَاهُ بِقَدَرٍ

And We created everything according to a precise measure.[15]

Although science is common and not particular to a view of life, its products and its applications are to be used according to the dictates of Islamic law. That which is allowed under the law can be taken and used, and that which

[13] Burley J. and Harris J., Human cloning and child welfare, Journal of Medical Ethics University of Manchester, 1999, 25, 108-113, p.108.
[14] Al-Khalifa, Op. cit., note 3, p.9.
[15] Q54:49.

is prohibited is to be left out. This is the way we should view and deal with all things that are the products of science.

Human reproductive cloning is not permitted in *Islam* because the religious dimensions of human cloning are determined by positive and negative aspects of this new technology.

However, there is therapeutic cloning which because of its benefit is still surrounded by juristic controversies and this is the state of this research work. Therefore, it is based on this that the issue is covered by this research work. And the work evaluates the issue based on the *shari'i* principles, to see what can be taken and what should be avoided.

1.2 STATEMENT OF THE PROBLEM

Human and therapeutic cloning are bringing a lot of problems ranging from the strong belief that man is playing the role of God in creating human and part of the human body, killing the value and Islamic moral in the society and risk of harm to the child/embryo. This technology is considered morally problematic when the source of the stem cell is from a human embryo. Nonetheless, there is a consensus that of all the types of stem cells, hESC (human embryonic stem cells) are the most promising for particular and important research and therapies. Yet, there are controversial issues regarding the "killing" of the human embryo for stem cell derivation. The prospect of cloning human embryos by somatic cell nuclear transfer (SCNT) into oocytes has engendered mix of fear, excitement, controversy and extremely polarized opinions in spite of the fact that the colonist come up with the idea of embryonic stem cells as a tool to be used in therapeutic

cloning with the aim to remedy diseases, not for the means of production as in the case of human cloning.

The fears attached to cloning generally among other things are: (1) that a clone's autonomy will be compromised and the genetic uniqueness lost because of it identical genome. (2) The embryo is not worth of the right of a baby or fetus. The act of cloning is to violate the rights of the clone in the future because the clone will not be created for their own benefit but someone else's, and this is an instrumental way of using another human as a means to someone else's which is unacceptable human control. (3) Cloning is replication and not a reproduction. The asexual nature of the process is unnatural and found only in the lowest forms of life. Thus, cloning degrades human dignity. (4)Human destruction. (5) The embryo would be created or clone for research purpose only.

The starting point for any considerations about research on human embryo including researches on stem cell is about the dignity of embryo during the early stages of its formation. There is a controversial issue and variety of opinions existing among the scholars on the dignity of human life.

The moralist shows that ensoulment plays a central role in most scholars' argumentation regarding the moral status of the embryo. According to scholars who state that the moral status of the embryo changes gradually over time, ensoulment is just one of the important stages of embryological development. Since the embryo is the core of the human being, which is acknowledged as the greatest of all creations in the religious texts, it should be inviolable from the first moment of conception regardless of its

embryological development. According to scholars who claim that the ensoulment brings about a categorical change in the embryo's lifespan, ensoulment gives the embryo an exceptional moral status. No matter what is the exact time of the ensoulment, intervention to the detriment of the embryo including stem cell research or termination of pregnancy is forbidden after ensoulment takes place.

Another fear 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 interhuman relationships. In large measures, Muslim concerns in this connection resonate the concerns about the social role of parenting and nurturing interpersonal relations. Islam regards interpersonal relationships as fundamental to human religious life. Muslims have raised questions about manipulation of human embryos beyond IVF implantation in terms of their impact upon the fundamental relationship between man and woman and the life-giving aspects of spousal relations that culminate in parental love and concern for their off-spring. Hence, the more intricate issues associated with embryo preservation and experimentation have received less emphasis in these ethical deliberations. To be sure, since the therapeutic uses of cloning in IVF appears as an aid to fertility strictly within the bounds of marriage, both monogamous and polygamous, Muslims have problem in endorsing the technology.

According to the Catholic teaching oppose cloning whether therapeutic or reproductive, as the process is the same in either case only the purpose is different. Moreover, to them is that every possible act of cloning human is intrinsically evil and can never be justified.

There is a general lack of understanding of the term stem cell research/therapeutic cloning, many has confused that therapeutic cloning carried out what human cloning has. This is what brings the necessity in this research work and to find out the legal value of stem cell research and to discover the conditions and requirements of the permissibility of stem cell research practice under Islamic law.

1.3 RESEARCH QUESTIONS

Bearing in mind the aforementioned problems, it is obvious and of paramount importance to provide security of life and property in the society. Therefore, it is based on these problems this research work addresses the following question:

What is the Islamic law position on the practice of therapeutic cloning?

1.4 AIM AND OBJECTIVES OF THE STUDY

The main aim of this work is to examine the practice of therapeutic cloning and its validity under Islamic law and the work seeks to achieve the following objectives:

1. To examine the meaning and nature of therapeutic cloning.
2. To determine the benefit and harm of therapeutic cloning to humanity.
3. To examine the available legal framework guiding the practice of therapeutic cloning under *Islamic* Law.
4. To determine the permissibility of such practice under *Islamic* Law.

1.5 JUSTIFICATION

Therapeutic cloning is a contemporary issue which did not happen during the lifetime of the Prophet (S.A.W) and there is no express prohibition on it in the provisions of both the *Qur'an* and *Hadiths* of the Prophet (S.A.W).

Recent developments in stem cell biology have explained a significant differentiation plasticity of many stem cell types in human tissue. Scientists are excited about the knowledge that could come from studying human stem cells. Most of them believe that these cells offer a precious opportunity to learn more about cytopathology, including how diseases develop and how they might be prevented or treated on the cellular level. Stem cells are repair units of the body that serve a central function in the maintenance and regeneration of organs and tissues throughout an organism's lifetime. Their main function is to replenish dying cells and regenerate damaged tissues.

Based on the extensive stem cell research findings, many scientists have claimed that the cells could potentially generate cures and treatment for various diseases including cancers, cardiovascular disease, and igniting hopes of achieving stem cell-based replacement therapy in a medical setting.

Embryonic stem cells (ESCs) are undifferentiated cells which are not programmed to be specific to any matured cell types found in the human body. Therefore, ESCs are fundamental in developing a diverse supply of tissues in the treatment of various diseases such as Parkinson's, Alzheimer's, spinal cord injuries and cardiovascular disease. Nonetheless, ESC research has been an issue of ethical, legal, and social controversy because it involves destroying embryos to obtain the cells. Because of the bright potential of stem cell-based treatment, it is vital for health care providers to keep abreast

of current advances in stem cell science, particularly when there is an enormous potential of revolutionising therapy in the form of cell replacement therapy.
Public are often ignorant of the complexities of scientific research, this research is necessary to examine not just the meaning of therapeutic cloning but also its real constituents, which will give idea of the likely victims.

Therefore, it is important to examine its position under *Islamic* law. This research is further important and necessary to ascertain the processes and application of therapeutic cloning. Muslims have a very standard legal system and an all encompassing legal regime. Generally, they do not follow or recognise any concept without having basis for its acceptance. This makes this research necessary to see the permissibility of therapeutic cloning under Islamic law.

Furthermore, it is also noted that Islam is tended to be tagged by some people as a religion that does not accommodate the developments in science and technology, they believe Muslims are conservative. This belief is borne out of some various reasons: (1) attitude of some Muslims, (2) misconception on the good teachings of the religion, and (3) hatred against the religion. This research is therefore necessary to clear the doubt on whether Islam is in agreement with science, reason and reflection.

In the first place, Muslims and non-Muslims will benefit in this research to know the permissibility or otherwise of this practice under Islamic law. In fact, a research of this nature will help lawyers, law students as well as the general public to see the manifestation of the specific legal framework upon

which the principles guiding the practice of therapeutic cloning as known under Islamic law. This will expose and clarify the issue of whether Islam has nexus with scientific advances.

1.6 SCOPE OF THE STUDY

Cloning is a wide concept. It has various classifications among which are: molecular cloning, cecullar cloning, embryo cloning (therapeutic cloning) and nuclear somatic transfer cloning (reproductive cloning). This research work has not covered all. The research work covers issues relating to the concept of therapeutic cloning as an aspect of cloning. However, examples may be cited from the other various types of cloning for analysis purposes.

In the recent time, therapeutic cloning is now adopted and is divided into: embryonic stem cells (ESCs), adult stem cells (ASCs) and induced pluripotent stem cells (IPCs). Focus is going to be on embryonic cloning in relation to therapeutic cloning. However, the research work briefly discussed some perceptions of ASCs and IPCs in relation to therapeutic cloning.

On the issue of the practice of therapeutic cloning, therapeutic cloning is a twig from varieties of processes as mentioned above. However, this research work is restricted to embryonic cloning. Therefore, focus mainly is on embryonic stem cells; what stem cell is and how is it derived; how human life (i.e, the life of the embryo) is being respected and protected; the benefit of such practice on human life and whether it is permissible, or not under Islamic Law.

1.7 METHODOLOGY

Considering the nature of the research area, the method adopted by this research work is doctrinal which entails a library-based research. In other words, the research pays attention to theory. A careful comparison between primary as well as secondary sources under Islamic law was made. These primary sources consist of the *Qur'an* and *Sunnah*; and the secondry sources consist of *ijma* (consensus), *qiyas* (analogy), *Istihsan* (juristic preference) and *maslaha*. These are laws relevant to the study of Islamic law. This is for the purpose of getting the original provisions of the Islamic law as relates to therapeutic cloning.

Works of various writers shall also be considered. Their recorded opinions in Journals, textbooks, websites as well as other relevant materials shall be of help to understand the provisions of the primary sources on the subject. The sourced authority will then be analyzed in order to answer the research question.

1.8 LITERATURE REVIEW

The literature relevant to the area of this study are many, they do exist both on scientific and Islamic perspectives. Some of them are hereby examined.

In an article entitled: Engineering and Regenerative Medicine on Bioethical Issue of Tissue Engineering and Regenerative Medicine, a preliminary

review from *Islamic* perspective, Abdul Rahman[16] is of the view that although reproductive medicine (which therapeutic cloning entails) is still in its initial phases, significant breakthrough in this cross disciplinary area has clearly marked the way for the establishment of a promising new biomedicine technology which actively seeks to reconstruct tissues/organs or spare parts for the human body to repair, restore or replace damaged tissues.

To him, however, these breakthroughs have raised a number of moral and legal questions, such as: is it moral to genetically modify the human genes? What are the moral and legal implications of regenerative medicine? Does organ reconstruction or tissue replacement activity violate basic religious beliefs or legal status of the person?[17]

To answer these questions it is of his conclusive view to explore relevant concerns from the *Islamic* perspective, by using texts of the *Qur'an*, *Hadith*, both *Muslim* jurists (*fuqaha*) and ethicists' opinion on these matters.[18]

It is of his idea that tissue engineering and regenerative medicine is likely to revolutionize the way scientists and health professionals improve the wellness and the quality of life for people around the world. The field of tissue engineering, which aims to repair, regenerate, and/or improve injured or diseased tissue and/or functionality has evoked intense interest and holds great potential for improving the human life. Tissue engineering, which started in the late 1980's, is a field of research that envisages the use of both

[16] Abdul Rahman R., Sulaiman N.A., et al., Bioethical Issues of Tissue Engineering and Regenerative Medicine: A Preliminary Review from Islamic Perspective, Department of Biomedical Science, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, vol.4, 48-56.
[17] Ibid.
[18] Ibid.

principles of engineering and life sciences towards the advancement of biological substitutes to restore, maintain, or improve tissue function.[19]

The nature of the title and scope of the work led the author to discuss the embryonic stem cell without defining the term, the origin of embryonic stem cell and the distinct stages of embryonic development or how its life comes into existence. The author also mentioned that the tissue engineering approaches are addressed within the principles of *Islamic* jurisprudence (*usul-al-fiqh*) without providing an explanation on the term '*usul-al-fiqh*', how this discipline explains how law is derived from the *Shari'ah* sources (*Qur'an*, *Sunnah, Ijma' and Qiyas.*), how *usul-al-fiqh* is classified, understood and applied. This is an area of difference with this present research.

In the literature of Al-Aqeel[20] entitled Human Cloning and Stem Cell Research an *Islamic* Law Perspective, in a Saudi medical journal held the opinion that cloning is a field of medical science that can both have an enormous potential impact on human health, and can lead to new basic research and discoveries. He classified human cloning into two categories: therapeutic and reproductive cloning. He analyzes that there could be an instance where therapeutic cloning may involve the use of an embryo.

[19] Ibid. p.49.
[20] Al-Aqeel A. I., Human Cloning, Stem cell research An Islamic perspective, Saudi Medical Journal, Riyahd, Kingdom of Saudi Arabia, 2009,30(12),1507-1514.

Al-Aqeel[21] is also of the view that there are some Islamic law principles governing medicine, which are authoritative and agreed precedent which include the following:

(a) Necessities override problems, '*Al Darurat Tubeeh Al mahzurat* الضرورات تبيح المحظرا.'

(b) Preventing harm is preferable to procuring benefit '*Daf'u al-mafaasid muqaddamun ala jalb al-manafi*'I دفع المفاسد مقدم على جلب المنافع.'

(c) The basic concept in useful matters is permissiveness, '*Al-Aslu fii al-manaafi'i al-ibaahah* الأصل في المنافع الإباحة.'

(d) The concept in harmful matters is prohibition, '*Al-aslu fii al- madaar tl-Tahreem* الأصل في المضار التحريم'.

(e)Human life protection is one of the main principles of the Shari'ah, '*Al-muhaazah ala al-Nafsi al-Bashariyyah Ahda Al-maqaasid Al-Shari'ah Ala Ru'usaa'iha* المحافظة على النفس البشرية أحد على المقاصد الشريعة على رءوس الأشهاد. God Almighty says: '*if any one saves one life, it would be as if he saved the lives of all mankind*.'[22]

The above *Islamic* principles would also be utilized by this research work in the course of discussion in the subsequent chapters.

Al-Aqeel maintaines the opinion that applying these *Islamic* principles to the field of cloning and stem cell research has some implications. It is his observation that to address the ethical, moral and religious concerns associated with therapeutic cloning, there must be an understanding of the timing of the onset of life and the rights of the embryo. To him although

[21] Ibid.
[22] Qur'an5:32.

cloning and stem cell research may have positive uses in serving to restore health (and in the process integrity), care must be taken to ensure that other Islamic principles are not violated.[23]

On the field of the stem cell therapy, he is of the view that the scientific community has a responsibility to engage the public in their support; policy makers should take into account public opinion; public education and information on the ethical and policy issues raised by stem cell research and its application is necessary. Given the promise of stem cell research, special effort should be made by international bodies to promote equitable access to the benefit derived from stem cell research; cooperations of scientists, ethicists, juristsprudence and Lawyers are essential for establishing a national well-controlled system with appropriate ethical guidance and so is the scientific supervision of the research program in all countries.[24]

The author classified cloning into reproductive and therapeutic cloning without even a mention of other categories. He discussed stem cells as cells from which all 210 different kinds of tissues in the human body originate, however the definition of stem cell, its types, what therapeutic cloning is, is not given in this literature. This is the lacuna which this research work seeks to fill.

On stem cell research Aksoy[25] in a journal entitled: Making Regulation and Drawing up Legislation in Islamic Countries under Conditions of Uncertainty, with Special Reference to Embryonic Stem Cell RAesearch,

[23] Al-Aqeel A. I., Op. cit., note 21.
[24] Ibid.
[25] Askoy S., Op. cit., note 5.

remarks that it is in no way to be disputed that the ability to treat or heal suffering people is a great good. However, he is of the view that it must also be recognized that not all methods of achieving a desired good are necessarily morally justifiable. He further articulates that when making regulation and drawing up legislation at either national or international level it helps to know the perspective of different cultures and faith traditions.

His write up is however, more concerned with some basic information about *Islam* to explain primary sources of *Islamic* laws and a mention of the secondary sources. It is of his conclusion that *Islam* has always encouraged man to contemplate, and explore new horizons. Stem cell research is one of those new horizons, and *Islam* does not object to this exploration.[26]

As far as the title of this journal is concerned stem cell is the focus of the author, however, he fails to provide what stem cell is, how it has been classified, how it is sourced from an embryo and how it functions in the human body. While from the *Islamic* perspective he defined what *Shari'ah* is and discussed its primary sources (*Qur'an* and *Sunnah*) and mentioned its secondary sources without explaining some basic information on well specified methodology known as *usul-al-fiqh* that is used to reach an opinion, such as the position of the issue at hand. These gaps are also the focus of this research work.

[26] Ibid.

Fadel[27]in his literature of Developments in Stem Cell Research and Therapeutic Cloning: *Islamic* Position, a Review, maintains that stem cell research is very promising. However, the use of human embryos has been confronted with objections based on ethical and religious positions. The recent production of reprogrammed adult (induced pluripotent*)* cell*s* does not in the opinion of scientists reduce the need to continue human embryonic stem cell research. So the debate continues.

He further discussed the status of human embryonic stem cell research and therapeutic cloning in different countries, especially in *Muslim* countries and the United State of America (USA).[28]

Taking the title and the scope of this literature and the discussions canvassed by the author into the consideration, the author insists that the issue of therapeutic cloning is still problamatic. Notwithstanding the discussion of the status of human embryonic stem cell research and therapeutic cloning; and the recent development of adult (induced pluripotent) cells by the author. It is obvious that the problem and challenges surrounding therapeutic cloning persist hence the debate continues. And this is the problem to be addressed by this research work.

Farooqui[29] in a journal: Ethics for Muslim Physicians in the Light of Recent Biomedical Advancements remarks that, the rapidly changing scenario of

[27] Fadel H. E., Developments in stem cell research and therapeutic cloning: Islamic Ethical Positions, a review, Blackwell Publishing Ltd., U.S.A,2012, 26,128-135, p.128.
[28] Ibid.
[29] Farooqui M. A., Ethics for Muslim Physicians in the Light of Recent Biomedical Advancements, Journal of Public Health in Developing Countries, 2015,Vol. 1, p. 31-39, available at http://www.jphdc.org/ visited on 5/11/2015.

modern healthcare because of scientific and technological advancements has generated a never ending debate among socio-religio-ethical segments of the society. Physicians working in traditional societies with religious inclination constantly face a dilemma due to the lack of guidelines on the issues of ethics of creation, therapeutic and reproductive cloning, assisted reproductive techniques, abortions, contraception, transplantation and euthanasia.

He opines that as in all other fields, *Islamic* teachings on ethics of patient care are primarily based on *Qur'anic* directives and the actions and guidance of the Prophet Muhammad (S.A.W) known as '*Sunnah*'.[30]

He also analyzes some of the religio-ethical issues surrounding the modern healthcare system in the light of recent biomedical improvements, with relevance to *Muslim* physicians. To him there is an urgent need to have clear local and national guidelines in addition to universal ethical codes on this subject.[31]

He further supports and stresses on the need for further discussion among the physician*s*, Islamic legal experts and the community at large to work in collaboration towards filling the gaps and finding solutions to the modern day challenges in line with Islamic principles.[32]

While discussing therapeutic cloning as it involves the use of an embryo the author only mentioned the pre-embryonic stage (conception to the

[30] Ibid. 36.
[31] Ibid.
[32] Ibid.

determination of primitive streak), i.e. 14th day. However, this research work would fill the gaps left by the author in relation to the stages of embryonic development by providing embryonic stages of development from both scientific fact and Islamic perspective. Furthermore, taking the title of the literature into cognisance it seems also that discussion would also focus on *Islamic* law principles. However, without discussing the *Islamic law principles* the author provided another gap which this research work seeks to fill.

In all these literatures, the authors have analyzed areas of concern to this research; however, in order to answer the research question gaps such as: meaning of cloning, mention of other categories of cloning as it differs from therapeutic cloning, history of cloning (i.e. how such practice come into existence), some basic information about *Islam* and methodology upon which *Islamic* law principles (*usul-al-fiqh*) and a comparative analysis of stages of the development of an embryo from both the scientific fact and *Islamic* law perspective are provided by this research to fill in the gaps.

Facts surrounding the practice of therapeutic cloning and the need for a legally binding framework on its position under Islamic law would be focused on, and the solutions that this research work hopes to find would stand out positively from the literature already in existence on therapeutic cloning.

1.9 ORGANIZATIONAL LAYOUT

The research work is broken down into various chapters to articulate the points in relation to the issue at hand:

Chapter one covers the general introduction which consists of: the background of the study that contains introduction of the subject matter; the problems of the study are stated under the statement of the problems The research question is also provided based on the problems stated under the statement of the problem; the aim and objectives of the research work are also stated, and then an attempt to justify the need for the research work. It further contains the scope of this research work. Then the methodology upon which the research work is carried on is provided and lastly comes the literature review of opinions of some writers on the subject matter of the research work.

Chapter two provides the introduction, meaning of cloning, meaning of therapeutic cloning, meaning of stem cell, classification of stem cell, the phases of embryonic developments, the significance of embryonic stem cell research, history of cloning and conclusion.

Chapter three focuses on the basic principles that would serve as yardstick for measuring the practice of therapeutic cloning under *Islamic* law. The chapter consists of: introduction, theory of *usul*, *Shari'ah and fiqh, usul-al-fiqh*, *hukm shar'I* (the *Islamic* law) and its classification, *hukm wad'i* (the declaratory rules) and its classification, *Qawa'id al-fiqh* (the legal maxim of *Islamic* law) and conclusion.

Chapter four contains how such practices affect humanity under Islamic law; and the position of therapeutic cloning, its permissibility or otherwise under Islamic law. The chapter consists of the following subdivisions:

introduction, *Islam* and science, when does the life of an embryo begin and what is its right under the *Shari'ah?*, benefit of therapeutic cloning under *Islamic* law, some opinions of the *Islamic* scholars in relation to the practice of therapeutic cloning and conclusion.

Chapter five provides the summary, conclusion, findings and recommendations.

CHAPTER TWO

CONCEPTUAL CLASSIFICATION AND HISTORY

2.1 INTRODUCTION

Cloning since its inception led to seemingly unending and controversial debate worldwide on a number of medico legal, ethical and social issues.[33]

This section will explain what human therapeutic cloning is and generally how it is done, it will touch on some of the differences between reproductive cloning and therapeutic cloning, and describe what stem cells as well as its types viz: embryonic stem cells, Adult stem cells and Induced pluripotent stem cells are; and how they are derived from the cloning process.

In this chapter also an overview of the historical development of mammalian, plant and human cloning starting as early as the year 1881, ending with events that have occurred within the current advances is given. Discussion on possible clinical applications of therapeutic cloning is given also. Also the fears and arguments of the moralists and the Christians are provided.

2.2 MEANING OF CLONING

The word "clone" is derived from a Greek word for taking a cutting from a plant.[34] Cloning is to make a duplicate copy of the original living thing such

[33] Kanchan T., Op. cit., note 2.
[34] Ibid. See Illmense K., Mammalian Cloning and Its Discussion on Applications in Medicine, Journal of Reproductive Medicine and Endrocrinology, Andronology Institute of America, Lexington, Kentucky, U.S.A., 2007, 4(1), 6-16, p.6, available at www.kup.at visited on 5/1/15. See also Matsuura K., Human Cloning Ethical Issues, United Nations Educational, Scientific and Cultural Organisetion, France, (2005), p.7.

as a plant, animal or human. Human cloning is to make a duplicate copy of the human himself.[35]

Scientists traditionally used the term "cloning" to describe different processes for duplicating biological material.[36] Clone also means one or a group of genetically identical cells, organisms or plants derived by vegetative reproduction from a single parent.[37] In other words, cloning is defined as the creation of a genetic copy of a strain of DNA or of an entire organism.[38] Over the last few years, cloning has come to mean any artificial, identical genetic copy of an existing life form.[39]

2.2.1 Meaning of Therapeutic Cloning

The word "therapy" is drieved from a greek word "*therapeia*" for treatment, is a branch of medical science dealing with the treatment of disease.[40] Therapeutic cloning refers to the removal of a nucleus, which contains the genetic material, from virtually any cell of the body (a somatic cell) and its transfer by injection into an unfertilised egg from which the nucleus has also been removed.[41]

Therapeutic cloning may be performed by utilizing donated preimplantation embryos from IVF and Intra-cytoplasmic sperm injection (ICSI) programs[42] or somatic cell nuclear transfer (SNCT) as the term 'cloning' is frequently

[35] Al- khalifa, Op. cit., note 14, p.11.
[36]Kanchan T., Op. cit., note 33, p.125
[37] Ibid. See also Matsuura K., Op. cit., note 34.
[38] Devolder K. and Savulescu J., A Defense of Stem Cell and Cloning Research, Center for Environmental Philosopy and Bioethics, Philosophy Department, Ghent University, Belgium, p.3. See also Serephin R., History of Cloning, p.1., available at www.cosmos.ucdavis.edu, visited on 16/12/2014.
[39] Matsuura K., Op. cit., note 37.
[40] Pokect medical dictionary. P.298.
[41] fact sheet 4, Therapuetic Cloning (Sometic Cell Nuclear Transfer), Australian Stem Cell Center, (2010), p.1, available at www.stemcellcenter.edu.au. Visited on 28/12/2014.
[42]Illmense K., Cloning in reproductive medicine, Journal of Assisted Reproduction and Genetics, 18, (2001) p. 457.

misunderstood by the general public. The word ‘cloning’ more often conjures up thoughts and beliefs about reproductive cloning.[43]

Therapeutic Cloning Technology also known as, "embryo cloning," is the production of human embryos for use in research with the goal of harvesting stem cells that can be used to study human development and treat diseases. Stem cells are extracted from the egg at blastocyst stage and can be used to generate any type of specialized cell in the human body.[44]

By the removal of a nucleus, which contains the genetic material, from virtually any cell of the body and its transfer by injection into an unfertilised egg from which the nucleus has also been removed, the newly reconstituted entity then starts dividing. After 4-5 days in culture, embryonic stem cells can then be removed and used to create many embryonic stem cells in culture. These embryonic stem cell ‘lines’ are genetically identical to the cell from which the DNA was originally removed.[45]

Biomedical researchers have focused their attention since Dolly’s birth on experimental, so-called “therapeutic” cloning, centering on the use of the cloning technique to obtain embryonic stem cells for research and potential therapeutic purposes. Since the notion “therapeutic” suggests possible beneficial applications of cloning, which at the present time seem completely unjustified (many has confused that therapeutic cloning carried out what human cloning has), it is more appropriate to change this positive connotation and use a more neutral wording, viz. research cloning.[46]

[43] Fact sheet 4, Op. cit., note 41.
[44] Kanchan T., Op. cit., note 37.
[45] Fact sheet 4, Op. cit., note 43.
[46] Mastuura K., Op. cit., note 39, p.12.

Researchers regard therapeutic cloning as an effective method for deriving human embryonic stem cells with specific characteristics, about which a great deal remains to be known and understood. The promise of therapeutic cloning is that it will be an effective way to derive embryonic stem cells which can then be used for the development of patient and disease specific cell based therapies as well as the production of stem cells with specific disease characteristics for research purposes.[47]

Many medical biologists consider this field vastly promising for future cures, since embryonic stem cells can be systematically "grown" in laboratory Petri dishes. One could, for example, transform a stem cell through laboratory cloning procedures into a blood cell or into a cardiac muscle cell, for injection into the heart of a cardiac patient, in order to reverse a malfunction. In this manner, researchers hope eventually to use these versatile cells to overcome chronic or degenerative diseases, such as Parkinson's disease, Alzheimer's disease or diabetes, which afflict millions of people.[48]

In the case of reproductive cloning, the aim of somatic cell nuclear transfer is to create an embryo carrying the same genetic information as the progenitor and to implant this embryo into a womb to generate a pregnancy, and from there to produce a baby. The goal of research cloning, however, is to create an embryo in the same manner as for reproductive cloning, not to produce a child but in order to derive embryonic stem cells which contain the same genetic characteristics as the progenitor. The embryo is unavoidably destroyed during this process.[49] Thus, therapeutic cloning

[47] Fact sheet 4, Op. cit., note 45, p.2.
[48] Mastuura K., Op. cit., note 45, p.13.
[49] Ibid., p.12-13.

differs from reproductive cloning in two respects: first, in regard to the motive for which the cloning process is carried out and secondly, because of the destruction of the embryo.[50]

However, it is obvious that the excesses of the colonist in respect to therapeutic cloning through the use of embryo is that therapeutic cloning is characterized as bringing human embryos into existence especially for research purposes with the long term objective to obtain pluripotent embryonic stem cells that could help to cure diseases involving the destruction of cell tissue, like Parkinson's disease. The embryonic stem cells are obtained from a certain cell type in the interior of the blastocyst (the so-called blastocyst stage is reached approximately four days after fertilization), a process which leads to the destruction of the embryo. The supposed advantage of the use of SCNTembryos over so-called 'spare' or surplus embryos, that have actually been generated in vitro to cause a pregnancy, but could, for different reasons, not be transferred to a uterus, consists in avoiding an immunological rejection of cell tissue by the employment of a nucleus of the patient to be treated.[51]

2.2.2 **Meaning of Stem Cells**

The desired outcome of therapeutic cloning is the production of an embryonic stem cell line that is genetically identical to the patient.[52] Stem cells are unspecialized cells that have the capacity for unlimited or prolonged self renewal, and, under the right conditions, for developing into

[50] Staudacher K. and Vossenkuhl W., Ethical problems of therapeutic cloning an argument from the embryonic potential, Munich Research Center in Ethics (MKE), Ludwig-Maximilians University (LMU), Munich, Germany, (2009) 24, p.91.
[51] Ibid, p.91.
[52] Mc Nally A., Scrivanich N., et el. Human Therapeutic Cloning was finally achieved this year: Does Anyone care? (unpublished), Faculty of Science, Worcester Polytecnic Institute, p.12, available at www.wpi.Educ/pubs/E.../IQP.pdf, visited on 5/1/2015.

one or several types of our body cells, such as liver cells or heart cells. These characteristics make them valuable means for research and therapy.[53]

Within the body, stem cells are long lived cells that help replace aged or damaged tissues. These cells originate from an initial pool of stem cells formed shortly after fertilization (the inner cell mass of the 5-6 day old blastocyst). Each stem cell can either divide to produce two more stem cells, or can differentiate to become another type of cell with a more specialized function. This allows stem cells to serve as an internal repair system in many tissues.[54]

Stem cells can sometimes undergo long periods of inactivity, but under specific physiological or experimental conditions, they can be induced to become mature, specialized cells that make up tissues and organs.[55]

Somatic cells usually show low level of telomerase, contain shortened telomeres after prolonged culture in vitro and finally terminate their proliferative divisions.[56]

However, stem cells that are derived from surplus embryos may cause immune rejection when transplanted to a patient, much as in organ transplants received by a third person. If the cells or tissues to be transplanted to a patient originate from the same patient, such problems do not arise. Therefore, some researchers believe that research cloning to create an embryo in order to derive genetically identical cells from a patient, to

[53] Devolder K., Op. cit., note 38.
[54] Mc Nally A., Op. cit., note 52.
[55] Ibid.
[56] Illmense K., Op. cit., note 42, p.457.

cultivate and develop them to targeting cells or tissues, then to transplant them to the patient, will help avoid immune rejection.[57]

2.2.3. CLASSIFICATION OF STEM CELLS

There are three main types of stem cells: embryonic stem cells (ESCs), adult stem cells (ASCs), and induced pluripotent stem cells (IPSCs).[58]

i) Embryonic stem cells (ESCs)

Cloned embryonic stem cells are the tools used for therapeutic cloning, which is designed to remedy disease, not as a means for reproduction.[59] To enable embryonic stem cells derivation, cloned human embryos have to be produced that not only develop to the morphological blastocyst stage, but also harbor a functional inner cell mass (ICM) capable of forming an epiblast.[60]

Embryonic stem cells are derived from the inner cell mass (ICM) of cultured human blastocysts produced by in vitro fertilization for clinical purposes in assisted reproduction and donated by patients. When blastocysts hatch from the *zona pellucida* and out grow with their externally surrounding trophoblast cells, internal clusters of ICM cells can be isolated and cultured separately.[61] Embryonic stem cells are therefore, present in the inner cell mass of a blastocyst. These cells are pluripotent, and can form any type of cell in the adult organism.[62]

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[57] Mastuura K., Op. cit., note 49, p.13-14.
[58] Mc Nally A., Op. cit., note 55, p.17.
[59] Boiani M., Cloning Human ES: a great leap forward, and still needed?, molecular human reproduction, Max-Plan-Institute for Molecular Biomedicine, Germany, Oxford Unversity Press, (2013), vol.0, 1-5, p.1.
[60] ibid.
[61] Illmense K., Op. cit., note 56, p.457.
[62] Mc Nally A., Op. cit., note 58.

In laboratories, blastocysts prepared by in vitro fertilization (IVF) procedures can be used with donor consent for isolating embryonic stem cells to be used for therapies. The embryos used for this purpose must be produced in a reproductive clinic, and only the excess embryos not used for reproduction can be used for research purposes.[63]

Thompson et al. (1998) were the first to isolate and grow embryonic stem cells lines from human blastocysts, and this advance opened the door for human stem cell treatments.[64]

Thompson grew IVF embryos in culture for 5-6 days to make a blastocyst, and then human embryonic stem cells were transferring cells from this pre-implantation-stage embryo into a plastic culture dish containing culture medium (nutrient) coated with a feeder layer of mouse embryonic skin cells.[65]

The mouse cells provide a scaffold for cell attachment and also release growth factors. After repeating the feeding for several passages, the cells that do not differentiate are considered embryonic stem cells. If the plated ESCs survive long term, they are continuously cultured to make an immortal ESC line to be used for therapy.[66]

[63] ibid.
[64] Ibid.
[65] Ibid.
[66] Mc Nally A., Scrivanich N., et el., Human Therapuetic cloning was finally achieved this year: Does Anyone care? (unpublished), Faculty of Science, Worcester Polytechnic Institute, p.125, at www.wpi.Educ/pubs/E.../lQP. pdf, visited 5/1/2015.p. 17.

ESC lines prepared from random IVF embryos are not genetically identical to a patient, while those prepared from cloned embryos are genetically identical to the patient who provided the donor skin cell.[67]

ESCs are widely used for many purposes such as genetargeting, celltherapy, tissue repair, and organ regeneration. However, the use of ESCs is hampered by significant barriers including immune rejection, incorrect tissue regeneration, tumor formation, and ethical concerns relating to the destruction of human embryos.[68]

ii) Adult stem cells (ASCs)

Adult stem cells (ASCs) are rare undifferentiated cells found among differentiated cells in a tissue or organ. The primary roles of adult stem cells in a living organism are to maintain and repair the tissue in which they are found. Adult stem cells are multipotent; they can give rise to a few types of cells specific to the tissue in which they reside, but they are not pluripotent.[69]

Far more rarely, ASCs can Trans-differentiate into cell types seen in organs or tissues other than those expected from the cells' normal developmental lineage. Because they are rare, ASCs are hard to identify and isolate. Moreover, their capacity to divide is more limited than ESCs, making the generation of large quantities of ASCs in culture difficult.[70]

iii) Induced pluripotent stem cells (IPSCs)

[67] Ibid.
[68] Wan W., Cao L., et. el., Applications of Induced Pluripotent Stem Cells in Studying the Neurodegenerative Diseases, Hindawi Publishing Corporation, (2014), 1, p.2.
[69] Mc Nally A., Op. cit., note 67.
[70] ibid., p.18.

Induced pluripotent stem cells (IPSCs) are adult somatic cells (usually skin fibroblasts) reprogrammed to a pluripotent state by treating with specific transcription factors (or the genes encoding them). This process was first achieved in 2006 with mouse skin cells and one year later with human skin cells.[71]

For biomedicine and particularly for regenerative medicine the ability to clone human ESCs means that IPSC's quality can be tested against a reference within the realm of reprogramming. Without cloned human ESCs, the quality of human IPSCs can only be tested by epigenetic and gene expression markers, by cell differentiation in vitro, and by teratoma formation in mice.[72]

Although the exact level of potency may vary from experiment to experiment, most scientists believe that IPSCs are as potent as ESCs isolated from IVF embryos. And because IPSCs can be prepared without cloning, some individuals believe they should be used in human therapy experiments in place of nuclear transfer ESCs (NT-ESCs).[73]

The use of IPSCs is now permeating into many sectors of disease research. Patient sample-derived IPSCs can be used to construct patient-specific disease models to elucidate previously unknown pathogenic mechanisms of disease development and to test new therapeutic strategies.[74]

2.3 THE PHASES OF EMBRYONIC DEVELOPMENTS

[71] ibid.
[72] Bioani M., Op. cit., note 60, p 2.
[73] Mc Nally A., Op. cit., note 71.
[74] Wan W., Op. cit., note 68.

Here since focus of the research work is on therapeutic cloning in relation to embryonic stem cells, we are going to cast light on established scientific facts in each of the stages of an embryo.

The drop of semen consists of cells according to embryologists, from the testes that are situated in the lower part of the kidneys. It moves down to the lower part of the abdomen during the final weeks of pregnancy. The male semen mainly consists of component (spermatozoa). These spermatozoa rapidly move to fertilize the ovum. Their movement is aided by a substance called prostaglandin and this helps in leading the spermatozoon into the zone where fertilization takes place. Though millions (between 600 million and 700 million) of spermatozoa enter the vagina during sexual intercourse, it is only one spermatozoon that fertilizes the ovum after covering a long journey in order to reach the fallopian tube that attaches the ovum to the womb.[75]

As soon as fertilization takes place, a rapid change occurs on the membrane of the ovum which prevents the penetration of other spermatozoa.[76] About fifty hours after fertilization, the hereditary characteristics of the new creature that might not be seen on him but rather could be seen on his offspring and grandchildren are then formed. The fertilized ovum is then quickly broken into different shapes with no change in size. It then moves from the fallopian tube toward the uterus where it becomes implanted just as a seed is planted in the soil.[77] The uterus is the safest place for this process.[78]

[75] Ahmad Y. A., The Unchallengeable Miracles of The Qur'an, Maktaba Dar-us-Salam, Riyadh, 2010, p.179.
[76] Ibid p.181.
[77] Ibid.
[78] Ibid., p.182.

The process of fertilization and arrival of the fertilized ovum at the uterus takes around six days, and it continues to grow for about fifteen days when the stage of the "clinging clot" starts.[79]

Clot: The stage of clot starts from day 15 of conception and ends on day 23 or 24. Then the fetus appears in the shape of a water-dwelling leech.[80] It hangs on the wall of the uterus through the navel cord. The blood forms inside the blood vessel in the shape of closed islands. This makes the blood static in the vessels thereby giving it an appearance of clotted blood.[81]

It is worth mentioning here that the primitive streak is the first thing that forms in the fetus in the first 14 or 15 days of conception. Then the primitive node appears.[82]

It is from this streak that that stem cells, mesoderm[83], endoderm[84] and ectoderm[85] that would later form different parts and tissues of the body are made up. At the end of the third week of pregnancy, the first streak becomes hidden and whatever is left of it settles in the coccyx (tailbone) region at the tail end of the spinal cord surviving on the remnants of the major cell in this region. Some of the tumors of the coccyx region which are known as teratoma can contain different tissues such as muscles, skin, bones and sometime teeth, as opposed to tumors that come from other regions and which form only one tissue.[86]

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[79] Ibid.
[80] Ibid., p.187.
[81] Ibid.
[82] Ibid., p.187-188
[83] The middle of the three cell layers in an embryo, from which connective tissue, muscle, dermis and bone develop.
[84] The inner layer of cell in embryo that develops into the lining of the respiratory and digestive tracts.
[85] Outer of the three layer of an embryo, from which the epidermis, nervous tissue and sense organ develop.
[86] Ahmad Y.A., Op. cit. note 82, p.188.

Lump of flesh: The fetus changes from the stage of being a clot to that of a lump of flesh from day 24 of pregnancy to day 26. This is a short period, when compared to the time it takes to change from a drop into a clot.[87]

This stage starts with the appearance of body masses as somites on the 24th or 25th day on the upper part of the fetal scapula.[88] Then the stage starts with the appearance of these masses starts increasing gradually on the lower part of the fetus. On the 28th day, the fetus is formed into a number of crevices with ridges in-between them. This makes the fetus look like chewed gum. The fetus moves about in the uterus in this stage until the end of the sixth week.[89]

It is worth mentioning that the stage of being a lump of the flesh starts with a phase that is characterized by the development and increase in the size of cells by great numbers. This means, the fetus will be like a piece of meat with no distinct shape. After a few days, the second phase, which is the phase of shaping, starts. Some part of the body, such as the eyes and the tongue start to appear in the 4th week, and the two lips in the 5th week though the outline will not become clear until the end of the 8th week. In this phase, extremities such as the hand and feet start coming out.[90]

Bone phase: Within the 6th week of pregnancy, the skeletal cartilage starts to spread all over the body though outlines of human features are not yet seen on the fetus until the beginning of the 7th week. Then the fetus adopts the shape of a bone. Transformation of the fetal shape from a “lump of flesh” to the start of skeletal bone takes place during a short period within the end of

[87]Ibid., p. 191.
[88] Ibid.
[89] Ibid.
[90] Ibid.

the 6th week and the beginning of the seventh. This phase is characterized with the manifestation of skeletal bone that gives the fetus its human appearance.[91]

It is this skeletal bone that gives the human appearance after it is clothed with muscles, and the eyes, the lips and the nose become visible and the head becomes distinct.[92]

After the passage of 42 days (6 weeks) since conception, formation of different parts of the body is commenced in order to give it a human shape. Later (in week 10), the outer genitals start emerging.[93] On the 7th week, the appearance of human shape commences due to the appearance of skeletal bone. This week (between day 40 and day 45) represents the demarcation line between the state of being like "a lump of flesh" and having human shape.[94]

Stage of having muscles (clothing with 'flesh'): This stage is characterized by the covering of bones with muscles. With this covering, evenness of human shape of the fetus starts and the parts of the body are asymmetrically more connected with one another. It is after the completion of the formation of the muscles that the fetus can then move.[95]

The stage of formation of muscles starts at the end of the 7th week and continues through the 8th week. This stage closely follows the stage of formation of the bones.[96]

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[91] Ibid., p.195.
[92] Ibid., p.196.
[93] Ibid.
[94] Ibid.
[95] Ibid p.198
[96] Ibid.

In this stage, parts of the body and the organs are ready to start thier functions. The fetus becomes ready for life outside the womb between week 22 and 26 (i.e after the completion of six months of conception). Then the respiratory system is ready for its functions and the nervous system is also ready to control the fetus' temperature.[97]

Therefore, the stage that comes into conclusion with the end of the 8th week is regarded the final stage of physical formation according to the embryologists. Then the fetus transforms from being an "embryo" to being a "fetus".

After this, no more systems or organs are formed since systems formed are fully ready for functioning. The uterus provides nourishment and a suitable environment for the fetus' growth until the entire term of the pregnancy.[98]

2.4 THE BENEFIT AND HARM OF EMBRYONIC STEM CELL RESEARCH

Recent research involving cloning of human embryos is of enormous significance for humanity. These ES cells from patients with diseases have enormous significance for two reasons[99]:

1) Self-Transplantation

The first reason why this research is important is because it is a leap towards self-transplantation. The objective of what is often indicated as "therapeutic cloning" is to produce pluripotent stem cells that carry the nuclear genome of the patient and then induce them to differentiate into replacement cells,

[97] Ibid., p. 200.
[98] Ibid.
[99] Devolder K., Op. cit., note 53, p.4.

such as cardiomyocytes to replace damaged heart tissue or insulin producing beta-cells for patients with diabetes, or virtually any cell type, including sex cells.[100]

Dr. Hwang has shown that one day it may be able to take a skin cell from a patient with diabetes, clone it, derive ES cells, produce insulin producing cells from these and transfer the resulting cells back as a transplant. Because the cells would come from the patient, as in Hwang's experiment, there would be no need for drugs to prevent rejection, which can be lethal.[101]

Although cloning research is still in its infancy and much more research needs to be done, it may give us one day the possibility to produce "patient matched" tissue to repair damaged organs like the heart and brain, which have no capacity for regeneration, providing radical new treatments for stroke and heart attack, Parkinson's disease and many other diseases. This is regenerative medicine. It is the holy grail of medicine.[102]

Rideout and colleagues recently reported the cure of a genetic disease using therapeutic cloning. They created a mouse with the Severe Combined Immunodeficiency (commonly known as "bubble boy disease"). They took cells from the tail, subjected these to the cloning process, and produced ES cells in which the gene was introduced to correct the genetic defect. These were introduced back into the mouse, curing the disease. This is the proof of principle for the therapeutic benefits of cloning.[103]

Therapeutic cloning is important for several reasons which include:

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[100] Ibid.
[101] Ibid.
[102] Ibid.
[103] Devolder k. and Savulescu J., A Defense of Stem Cell and Cloning Research, Center for Environmental Philosopy and Bioethics, Philosophy Department, Ghent University, Belgium, p.4.

a. There is a shortage of tissue for transplantation. As few as 5% of the organs needed ever becoming available, with the discrepancy between the number of potential recipients and donor organs increasing by approximately 10-15% each year in the US.[104]

b. There are problems with compatibility of transplanted tissue requiring immunosuppressive therapy with serious side effects. Moreover, cloned tissue would be compatible without the infectious risks of *xenotransplants*.[105] *Xenotransplantation* is defined as the transplantation, implantation, or infusion into a human recipient of living xenogenic cells, tissues or organ, and human bodily fluids, cells, tissues or organs that have had *ex vivo* contact with these living *xenogenic* materials.[106] However, the risk of *xenotransplantation* is that its products contain benign genomic DNA that, on transfer into a human, express infectious *retrovirus* capable of infecting of creating active, persistent infection.[107]

c. The role of transplantation could be expanded to include common diseases like heart attack and stroke. After stroke, the dead part of the brain is replaced by scar tissue. It may be possible in the future to use therapeutic cloning to give stroke victims new brain tissue.[108]

2) Cellular Models of Human Disease

[104] Ibid.
[105] Ibid., p.5.
[106] Statement from the Xenotransplantation Advisory Consultation,World Health Organization, Geneva 18-20 2005. Available at www.who.int/transplantation/xeno. visitet 15/10/2016.
[107] Chapman L., Xenotransplantation: Benefits and Risks, CenterDCP,A,G, U.S.A., 7,2001,P.545. Available at wwwnc.cdc.gov/eid/…/01-7724.pdf… visited 20/10/2016.
[108]Devolder k. and Savulescu J., A Defense of Stem Cell and Cloning Research, Center for Environmental Philosopy and Bioethics, Philosophy Department, Ghent University, Belgium, p.5..

The second reason why cloning research is important is because it opens up a whole new avenue of medical research. It could be used to study in a radically new way any disease in a culture dish.[109]

Cloning of a single skin cell could be used to produce inexhaustible amounts of cells and tissue from a patient with a certain disease. This tissue could be experimented upon to understand why disease occurs. It could be used to understand the genetic contribution to disease and to test vast arrays of new drugs. This would enable research that cannot be done in patients themselves or where there are too few patients to work with in case of rare genetic diseases.[110]

At present, it is often impossible to safely take samples of affected cells from patients, especially those with genetic diseases that affect the brain or the heart. For instance, Ian Wilmut and his team wanted to create ES cell lines from embryos cloned from people with amyotropic lateral sclerosis (ALS), a currently incurable neurodegenerative condition. It is impossible to remove motor neurons from patients for study. Using cloning to create cultures of motor neurons from these patients would make it possible to investigate the cause of the disease and to test new therapies.[111]

Moreover, symptoms mostly develop after the disease has been progressing for some time, which makes the study of the cause of the disease more difficult. Cloning would facilitate this research by making it possible to monitor the progress of the disease as it develops inside the cells. It would

[109]Ibid, p.4.
[110] Ibid.
[111]Ibid.

also reduce the need for human and animal experimentation because human cells and tissues, not people or animals, could be used to test new drugs.[112]

Other areas where cloning would be very useful is the study of genetic variation and its interaction with environmental factors and the study of interactions between genes and drugs; the study of early human development and the underlying mechanisms regulating cell growth and differentiation, which would provide better knowledge and control over the manipulation and reprogramming of cells within patients; and the investigation of how pathogens interact with specific cell types, which would help to understand how to use viruses as a vehicle for reintroducing healthy genes to a damaged body.[113]

These two applications – self-transplantation and the development of cellular models of diseases mean that cloning may be viewed as a scientific accomplishment on par with splitting the atom.[114]

The goal of therapeutic cloning is to harvest stem cells that can be used to potentially treat disease, rather than creating cloned human beings. During therapeutic cloning, the nuclear transfer embryonic stem cells (NT-ESCs) are isolated from the cloned blastocyst (if it has survived 5-6 days), and the NT-ESCs are cultured to make an immortal NT-ESC line. The goal of therapeutic cloning is to prepare a NT-ESC line that is genetically identical to the patient from which the skin cell was taken. These isogenic NT-ESCs, in theory, would not be rejected by the patient's immune system when they are implanted into the patient.

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[112]Ibid.
[113] Devolder k. and Savulescu J., A Defense of Stem Cell and Cloning Research, Center for Environmental Philosopy and Bioethics, Philosophy Department, Ghent University, Belgium, p.4.
[114] Ibid., p.5.

A developed stem cell lines comes from a single embryo, becoming a colony of cells that reproduces indefinitely. Consider now the following problems with embryonic stem cell research:[115]

(1)There are no laws to protect pre-embryos (embryos under 14 days old) or that prohibit private individuals, research firms, or pharmaceutical companies from forming, manipulating, or destroying stem cells, human clones, or embryos.[116]

(2) One minor complication is that use of human embryonic stem cells requires lifelong use of drugs to prevent rejection of the tissue.[117]

(3) Another more serious disadvantage is that using embryonic stem cells can produce tumors from rapid growth when injected into adult patients.[118]

(4) Another disadvantage was reported in the March 8, 2001, New England Journal of Medicine was of tragic side effects from an experiment involving the insertion of fetal brain cells into the brains of Parkinson's disease patients. Results included uncontrollable movements: writhing, twisting, head jerking, arm-flailing, and constant chewing.[119]

(5) A recent report in the Journal Science reported that mice cloned from ESC were genetically defective. If human ESCs are also genetically unstable, that could materially compromise efforts to transform cells extracted from embryos into successful medical therapies.[120]

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[115] Hollowell K., Ten Problen with Embryonic Stem Cell Research, Vital Article on Science/Creation, Institute for Creation Research, El Cajon, 2002, p.1 available at www.icr.org/.../ten-problem-with... visited 20/10/2016.
[116] Ibid, p.3
[117] Ibid, p.4.
[118] Ibid.
[119] Ibid.
[120] Ibid.

(5) The research may be hampered because many of the existing stem cell lines were grown with the necessary help of mouse cells.[121]

2.5 HISTORY OF CLONING

The concept of cloning applies to unicellular organisms, plants, animals, and to human beings as well.[122] The word "clone" was not truly created until 1963 when J.B.S. Haldane was credited to have coined the actual word, taken from the Greek word for twig. The scientists up until this time were able to describe and complete this process without ever using the term "cloning." Haldane introduced this name in one of his final speeches "Biological Possibilities for the Human Species of the Next Ten Thousand Years".[123]

In 1958, F.C. Steward obtained cells from the roots of a mature carrot root, and was able to create a normal clone. He proved that the process of creating a normal organism by nuclear transfer using differentiated cells was possible, but for many years these results would only be replicated in plants.[124]

Reproductive cloning in mammalian animals can be traced back to 1981 when such experiments were performed successfully in mice using embryonic cell nuclei from the inner cell mass of blastocysts for their transplantation into enucleated egg cells. At that time, this discovery sparked a worldwide dispute with arguments for and against cloning. Many people probably do not know that the first instance of cloning dates back to over a

[121] Ibid.
[122] Illmense k., Op cit., note 61, p.451.
[123] Serephin R., History of Cloning, p.4, available at www.cosmos.ucdavis.edu. Visited on 16/12/2014.
[124] Ibid., p.3.

hundred years ago in 1885 with the cloning of a sea urchin[125] by Hans Adolf Edward Dreisch[126] by isolating blastomeres[127]. This experiment and others disproved Wilhelm Roux and August Weismann's theory that stated:

> *The egg and sperm contribute chromosomes equally to the zygote. The chromosomes are carriers of the hereditary potentials, and the germ cells (gametes) of the embryo are the only ones to carry the complete set of hereditary potentials (nuclear determinants), whereas each somatic (body) cell type contains only part of these potentials required for the specific cell type.*[128]

The method of cloning used by Dreisch is embryo twinning, a cloning which occurs naturally when a mammal gives birth to twins. He separated the two celled sea urchin embryo by shaking it until it split into two separate cells which then each grew into an independent organism.[129] By separating the cells of a single developing embryo to create two organisms, Dreisch proved that the somatic cell contains all hereditary information.[130]

In 1888, Roux tested the "germ plasm theory" for the first time. One cell of a two cell frog embryo was destroyed with a hot needle; the result was a half embryo. This led him to propose his "Mosaic" theory of epigenesis*:* after a few cell divisions the embryo would be like a mosaic, each cell playing its own unique part in the entire design.[131]

At the beginning of 20th century, Thomas Hunt Morgan showed that genes were units of inheritance from his studies on Drosophila melanogastes. This

[125]LeFebvre D., The History of Cloning Humans and Animal, (2009), p.1., available at www.cosmos.ucdavis.edu/.../royalallison, visited on 16/12/2014.
[126] Ibid., p.2.
[127] Seraphin R., Op. cit., note 124.
[128] Ibid.
[129] LeFebvre D., Op. cit., note 126.
[130] Seraphin R., Op. cit., note 128, p.2.
[131] Mandarich L., DNA cloning: the History of The Future, clon transgen, Institute of protein Biochemistry, National Research Council, Italy, 2, 106, p.1, at http://dx.doi.org, visited 28/12/2014.

concept was well described in the book "The theory of the gene" published in 1917.[132]

The next successful cloning experiment was conducted in 1902 by German Dr. Hans Spemann on salamander embryos, producing twins.[133] The scientist, Director of the Kaiser Wilhelm Institute of Biology in Berlin, also used embryo twinning to clone a salamander in 1902. This time the organism was more complex (it had a backbone) and the cells of the embryo were much harder to split; the cells could not be separated by shaking them. Spemann was able to split the cells by creating a noose out of a strand of baby hair.[134]

Spemann split the embryo using a strand of hair from his newborn son, and the two resulting cells grew into normal adult salamanders. These salamanders were artificially created identical twins. He repeated his experiments many times, and created mutant creatures. He concluded that in order to create a normal organism, the cloning process must be completed before what he called "determination," or the stage in growth where cells specialize into different cells for different parts of the body. This stage is completed in the early growth of an embryo.[135]

In 1928, Hans Spemann created yet another clone, except this time by the first ever conducted nuclear transfer.[136] This was done by taking the nucleus of a salamander embryonic cell into a cell with the nucleus removed. The cell was then allowed to divide and grow into a new organism. This

[132] ibid.
[133] Serapin R., Op. cit., note 130.
[134] LeFebvre D., Op. cit., note 129.
[135]Seraphin R., Op. cit., note 133, p.2.
[136] Ibid., "Ten years later…Spemann designed a 'fantastical experiment' that, although technically impossible at the time, became the basis for cloning".

experiment proved that the nucleus of an early embryo cell can lead to the growth of a separate organism, and therefore creating a clone of the DNA donor. His work was published in 1938 in his book, Embryonic Development and Induction. Spemann's "fantastical experiment" stated that it is possible to use a nucleus of a differentiated cell. However, he lacked the technology to prove his theory correct. [137]

The next recorded cloning was completed 24 years after Spemann's salamanders.[138]Although Dolly was the first mammal to be cloned using the process of nuclear transfer, there were many animals cloned before her using the same process.[139]

In 1952, the scientists Robert Briggs and Thomas King successfully cloned a common American frog. They did this through nuclear transfer; they removed the nucleus from a tadpole embryo and placed it in a recipient frog egg cell that had had its nucleus removed, a process called enucleation. Out of 197 reconstructed embryos, 104 began development, 35 became embryos, and 27 grew into tadpoles. During this experiment, King and Briggs removed the nucleus from a blastula cell. The nucleus then replaced the nucleus from an egg. However, most clones created from a differentiated cell were unable to develop, and the few that did were abnormal.[140] This emphasizes Spemann's theory that the cell must be obtained before determination.[141]

In 1962, John Gurdon had demonstrated Spemann's hypothesis about the possibility to clone an organism; in fact he announced that he had cloned

[137] Ibid., p.2-3.
[138] Ibid., p.3.
[139] LeFebvre D., Op. cit., note 129.
[140] Ibid.
[141] Seraphin R., Op. cit., note 138.

South African frogs using the nucleus of fully differentiated adult intestinal cells.[142]

Derek Bromhall then applied the process of nuclear transfer to the rabbit, a mammalian organism whose cells are smaller and more complex than those of a salamander or frog, in 1975. He was able to develop an advanced embryo after a few days but not yet an entire organism.[143]

In the scientific journal Nature on March, 1985, Steen Willadsen announced his successful cloning of sheep by nuclear transfer. This only differs from the Dolly cloning in the age of the nucleus used. Nuclear transfer was then used in a larger mammal, the cow, by scientists Neal First, Randal Prather, and Willard Eyestone. These calves, named Fusion and Copy, were cloned still using only embryonic nuclei.[144]

Another sheep to be cloned was Tracy, who was born in 1990 at the Roslin Institute. The purpose of this cloning was to produce "genetically transformed sheep that would express valuable pharmaceutical products in their milk". In order to change the sheep's genetic traits, Tracy was injected with DNA constructs into her pronuclei while still an egg, which is much easier to accomplish using cloning technology. The protein that Tracy and her offspring are prized for is their high levels of 1 antitrypsin in their milk, a drug used to treat cystic fibrosis, emphysema, and other diseases. This development was a major breakthrough in cloning, not necessarily in the

[142] Mandarich L., Op. cit., note 134, p.4.
[143] LeFebvre D., Op. cit., note 140, p.2-3.
[144] Ibid., p.3.

technology of cloning itself, but what therapeutic possibilities that are produced through cloning.[145]

Contrary to popular belief, Dolly the sheep was not the first animal to be cloned by differentiated cells. This honor truly belongs to Megan and Morag, cloned 19 June 1995 by Ian Wilmut and Keith Campbell in the Roslin Institute at Edenburgh, United Kingdom. The secret to cloning using differentiated embryo cells was found to be starving the differentiated cell of nutrients, causing it to enter a suspended state of cell division known as the G0 state. Then the nucleus is fused with the enucleated egg using an electric current. Because the cell cycle of the nucleus was frozen, the two cell cycles are synchronized, and the egg's cytoplasm can, in essence, reprogram the nucleus and both begin growing at the same rate as the other, and grow as a normal embryo.[146]

The most famous cloning event in history may be the cloning of the first mammal, Dolly the sheep; this cloning was much more complicated than that done by Hans Spemann and it helped launch the modern cloning age. Dolly, named because the cell she was cloned from was received from the udder of six year old ewe Finn Dorset which reminded Wilmut of Dolly Parton and her large chest was the first clone from an adult cell.[147]

Dolly was born in 1996 after having been successfully cloned at the Roslin Institute in Scotland by the scientist Ian Wilmut.[148] The success of this

[145] Seraphin R., Op. cit., note 141, p.5.
[146]Ibid. p.6.
[147] Ibid.
[148] LeFebvre D., Op. cit., note 144.

experiment sparked more ideas for the uses of cloning.[149] Her existence was not announced to the world until March 1997 in the science journal Nature.[150]

Ian Wilmut stresses that Dolly was more important than other clones at that time because "she was the first animal of any kind ever to be created from cultured, differentiated cells taken from an adult". Many, somewhat skeptical of the success of the cloning, made dire predictions about Dolly; some thought she would be sterile and one American newspaper announced that Dolly was a carnivore that ate her flockmates.[151]

In reality, Dolly turned out to be an ordinary sheep. The only problem that could take away from this success was in 1999 when structures at the end of her chromosomes known as telomeres, which become shorter with age, were more typical of a much older animal. Dolly herself showed no signs of premature aging and in 1998 gave birth to her first lamb Bonnie, putting the sterility rumors to rest.[152]

One year later, Wilmut and his team cloned yet another sheep named Polly. What made Polly unique was every cell had human DNA present. Reasons for this experiment are for producing human proteins to cure human diseases, as well as organs for transplantations. Because of the human gene factor in this new development, the ethics debate elevated even further, becoming a main issue in the modern world.[153]

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[149]Serapin R., Op. Cit., note 147. "It could be used to mass produce genetically identical animals for research on human diseases. This technique may also help xenotransplantation, and preserve wild or endangered species".
[150]LeFebvre D., Op. cit., note 148.
[151]Ibid.
[152] Ibid., p.3-4.
[153] Seraphin R., Op. cit., note 149, p.7.

After Wilmut's successes with cloning using adult cells, a plethora of cloned animals was created within only a few years. Examples of these animals include CC the cat in 2001, rabbits in 2002, human embryos for stem cells in Korea in 2004, and a dog in 2005. These and other cloning advances continue to appear in news headlines as new developments occur in the science field with more and more clones. The idea of cloning has been developed centuries, while actual research and cloning has occurred for over a century. These milestones will continue to appear for many years, with the rate of the successes possibly continuing on its exponential increase.[154]

Today, many different types of animals are being cloned and some scientists propose cloning as a type of immortality. Ideas such as the use of cloning as a means of immortality are modern ideas and cloning as a whole is fairly modern compared to other sciences, but in its short time it has developed a rich history.[155]

Currently, cell replacement therapies using allogeneic human embryonic stem cells (HESCs) have been thwarted by the host immune response, which can only be overcome by administering long term immunosuppressive drug therapy.[156]

It was proposed to utilize rhesus monkey embryonic stem (ES) cells lines as model system to investigate human differentiation and develop therapeutic cloning strategies for human diseases. In the mouse system, ES cell

[154]Ibid.
[155] Mc Nally A., Op. cit., note 73. See also LeFebvre D., Op. cit., note 152.
[156] Hall V. J., Stojkovic P., et. el., Using Therapeutic Cloning to Fight Human Disease: A Conundrum or Reality?, aNeuronal Survival Unit, Department of Experimental Medical Science, Wallenberg Neuroscience Centre, Lund University, Lund, Sweden; bCellular Reprogramming Laboratory, Centro de Investigacion Principe Felipe, Valencia, Spain, (2006), 26, 1628-1637,p.1628, available at www.stemcell.com, Visited on 13/1/2015.

technology had been pioneered already 20 years ago and effectively applied to examine a variety of aspects of mammalian development.[157]

However, due to a number of signi□cant differences between mouse and human development, nonhuman primate embryonic stem cells re□ect much more favorably our own cellular behavior and will provide a unique opportunity to test the safety and efficiency of therapeutic cloning for the treatment of speci□c diseases or organic lesions through in situ transplantation and application of clonally derived embryonic stem cells. Having safely developed the various strategies for therapeutic cloning in model systems, there will be visaged for the future a wide range of applications for human reproductive medicine that ultimately will help establish novel approaches for the treatment of patients via stem cell therapy.*158*

As pointed out for future opportunities in therapeutic medicine, the ability to rejuvenate human cells with telomerase may provide new applications in the context of therapeutic cloning.[159]In addition, further progress in microsurgical procedures on mammalian preimplantation embryos has opened up new avenues for a wide range of applications in reproductive medicine.[160]

[157] Illmense k., Op. cit., note 122, p.450.
[158] Ibid., p.450-460.
[159] Ibid. p.454.
[160] Ibid.

One major reason for developing cloning in animals is said to be to permit the study of genetic diseases and indeed genetic development more generally.[161]

Human embryonic stem cells were established for the first time in 1998. Since then, the interest in embryonic stem cell research has increased significantly and, worldwide, researchers are investigating their potential and how to control their differentiation to specific types of body cells.[162]

The possibility of human therapeutic cloning was first discussed in 1999 by scientists at Advanced Cell Technology.[163] The world's first "successful" human therapeutic cloning was achieved in 2011 in Dieter Egli's lab at the New York Stem Cell Foundation.[164] Human therapeutic cloning has only recently been achieved in 2013 with fetal and infant skin cells, and in 2014 with adult skin cells.[165]

However, in 2016 despite the afore mentioned achievement in therapeutic cloning, some countries are of the opinion that medical research involving embryonic stem cell are still conjectural. For example the United States prohibits public funding of human cloning and destruction of an embryo.[166]

2.6 MORALIST ARGUEMENT

According to the argument from potential this potential of a human embryo is morally central. Other arguments have also been put forward in order to

[161] Harris J., "Goodbye Dolly" The ethics of human cloning, journal of Medical Ethics, The Institute of Medical, Law and Bioethics, University of Manchester, 1997, 23: 353-360, p.357.
[162] Devolder k., Op cit. note 110,
[163]Mc Nally A., Op. cit., note 144, p.20.
[164] Ibid., p.27.
[165] Ibid., p.16.
[166] See Prohibition on Public Funding of Human Cloning and Destructive Embryo Research Act, 2016.

support the view that human embryos have the same or at least nearly the same moral status as postnatal human beings.[167]

The most important of these arguments are the continuity argument, which states that all post fertilization events comprise a continuum of developmental changes in a way that makes it impossible to mark breaks in the developmental process, and thus isolating any one stage at which to attribute the attainment of moral status would be arbitrary; the identity argument, according to which it is the numeric and/or genetic identity of the embryo with the postnatal human being into which it can develop that is morally relevant; and the genetic argument which considers the embryo to have personal qualities because it possesses (at least at the 4-8-cell stage of preimplantation development, when human gene expression first occurs) the complete and unique genetic information that already contains all essential and characteristic features of the human being into which it can develop.[168]

The argument from potential can be characterized as holding that an embryo's potential for acquiring morally significant qualities is itself morally significant. The structure of the argument is as follows:[169]

It is morally wrong to kill a potential person and Human embryos are potential persons.[170]Most people accept that human embryos have a moral significance that distinguishes them from all other human cells and for this reason deserve a certain level of protection.[171] some with another view hold

[167] Staudacher K., Op cit note 51, P.92.
[168] Ibid.
[169] Ibid.
[170] Ibid.
[171] Murieal F.M., A Critique on the Application of the Principle of Subsidiarity Concerning Human Embryonic Stem Cell Research in South Africa, Journal of Pharmacy and Pharmacology,4, Wiwatersand University, Parktown, Johannesburg, South Africa, 2016,472-485, p.474, available at available at Fm mnisi-journal of Pharmacy and Pharmacology, 2016-davidpublishers.org 20/11/2016.

that the embryo from the moment of fertilization is a person created by God with its own right and with the same moral status as an adult human being. Therefore, an embryo has a "right to be born" as it is a "potential" person.[172]

From the moral philosophical ideas, Devolder and Harris are of the view that, personhood can be distinguished by possessing both intrinsic and symbolic values. It is held that an embryo has intrinsic values (values in themselves). Based on this, many people accept that it merits the embryo with some special respect and that due to its symbolic value it must be protected. Intrinsic values include the notion that an embryo can develop into a human being (i.e., potentiality) and that it possesses inherent human dignity.[173]

Symbolic value includes the impact it has on certain practices in the respect for human life or expressions of societal views that regard embryos as the initial form of human life. The idea of potentiality is central in the ethics of using embryos for research and therapy. Potentiality is the feature that the human embryo possesses that other members of the species do not, namely to ultimately become a complex, intelligent, self-conscious, multifaceted creature typical of the human species, i.e., a "fully-developed" human being. As a result of these features, a "fully-developed" human being can not be instrumentalized.[174]

2.7 CHRISTIAN VIEW

[172] Ibid.
[173]Ibid.
[174] Ibid.

When it comes to ethical thinking and decision making, most people are often guided by their religious beliefs. It is these religious influences that often shape their ethical values about issues.[175]

God's involvement in the creation of the human being in a mother's womb is evident in the Christian scriptures. Thus, the responsibilities towards the embryo are invoked and the consideration of its rights as well. However, this scripture does not clearly address when human life begins though the bible does make reference to the origin of human life at the first breath and not at conception.[176]

Christians believe that human beings have been individually created by God and derive their integrity and worth from the fact that they are made in the image of God. God's image is endowed by grace; conferred from outside, and therefore not contingent on any intrinsic properties the embryo may or may not possess. That is, genotype, age, size, location or degree of dependence and disability.[177]

As is the case with most ethical issues, Christians hold a range of views about the status of human embryos. All Christians agree that a person's life is a gift from God but when it comes to the status of the embryo, there are different views held by each Christian group. Christians who believe that the full status of a human embryo begins at fertilization point to verses in the

[175] Opoku J. K.,The Status of the Human Embryo: An Analysis from the Christian and Islamic Viewpoints, Eurapian J ournal of Biology and Medical Science Research, P.26, available at www.eajournals.org, visited on 5/11/2016.
[176] Ibid.
[177] Ibid.

Old Testament that talk of God watching, caring for and nurturing a person as the person grows in the womb.[178]

"Your eyes looked upon my embryo, and everything was recorded in your book. The days scheduled for my formation were inscribed, even though not one of them had come yet".[179]

According to them this verse affirms God's creation of and communion with the embryo in the womb as well as implying continuity between life before and after birth. God calls Isaiah and Jeremiah before birth and forms Job 'in the womb' as well as bringing him out of it.[180]

The idea that God cares about us as we grow in the womb indicates that Christianity teaches that all humans should show the same care. The embryo must be treated as a full human with full rights from the moment the sperm and egg combine. This view is mostly held by the Roman Catholic Church. Meanwhile, other Christian groups add that life in the womb is about human relationships, and this starts when the embryo becomes implanted in the mother's womb.[181]

The Roman Catholic Church is of the view that an embryo should be given full human status the moment a human egg and sperm combine.[182]

The official position (the Magisterium) of the church is that the human person begins at conception, and that, the human embryo has the same moral status as the human person. An embryo, therefore, must be respected and

[178] Ibid.
[179] International Standard Version, Paslm 136 vrs 16.
[180] Ibid, Op cit note 178.
[181] Ibid.
[182] Ibid.

treated as a human person with dignity and rights, particularly the right to life.[183]

The Donum Vitae quoting the 'Declaration of Procured Abortion' teaches that;[184]

From the time that the ovum is fertilized, a new life is begun which is neither that of the father nor of the mother; it is rather the life of a new human being with his own growth. It would never be made human if it were not human already. To this perpetual evidence... modern genetic science brings valuable confirmation. It has demonstrated that, from the first instant, the programme is fixed as to what this living being will be: a man, this individual-man with his characteristic aspects already well determined. Right from fertilization is begun the adventure of a human life, and each of its great capacities requires time to find its place and to be in a position to act.

Thus, from the moment the embryo has been formed, unconditional respect that is morally due the human being in his bodily and spiritual totality must be accorded. The being is to be respected and treated as a person from the moment of conception; and therefore from that same moment his rights as a person must be recognized, among which in the first place is the sacred right of every innocent human being to life.[185]

This doctrinal teaching forms the basis for solutions to the problem posed by the development of the biomedical services. Since the embryo must be treated as a person, it must also be defended in its integrity, tended and cared

[183]Ibid, p.28.
[184] Ibid.
[185] Ibid.

for, to the extent possible, in the same way as any other human being as far as assistance is concerned. Due to this, most reproductive techniques are greatly condemned.[186]

Amniocentesis for the purpose of genetic screening is apparently morally objectionable because abortion is wrong. Likewise, the use of embryos for experiment is condemned because it violates human dignity, reducing embryos to objects and instruments of scientific knowledge.[187]

According to Birkhäuser, Protestantism is not a centralized religion and it comprises of many independent Churches having different moral and ethical standards. In contrast to the Roman Catholic Church where interpretation of scripture is carried out by the Pope and his Bishops, Protestantism encourages individuals to do their own Bible study and interpretation.[188]

It is part of the Protestant ethos that moral questions are determined by individual conscience. Thus, unlike the Catholic Church with a Magisterium, the Protestant Churches do not have an 'official position' on such bio-medical issues. There is no complete agreement among all Protestants on ethics or on any other issue. Among Protestants, each Christian is personally responsible for all his acts, including his or her ethical behaviour.[189]

The status of the embryo is the basis for the ethical consideration of all methods employed in assisted reproductive technologies but Protestants as a whole have no standard position regarding the status of embryos. In Protestant thought as a matter of fact, Christians may therefore have very differing views on the issues of the status of the embryo. Notwithstanding,

[186] Ibid.
[187] Ibid.
[188] Ibid.
[189]Ibid, P.29.

human dignity, personal rights and self-determination have to be respected in each ethical consideration.[190]

Concerning the status of the embryo, all Protestant Churches basically those of Western Europe, consider the human embryo to be a potential and evolving human person. For this reason it has a true right from its conception. However, as regards to the way in which an embryo should be treated or whether it should be considered as a human person there exist diverse views.[191]

Most representatives of modern Protestant theology and bioethics defend the opinion that the embryo is not an independent human being as is the newborn child.[192]

Other Protestants also hold the view that, as long as an embryo has no nervous system, no organs and no pain receptors, it cannot be seen as a human being. Hence, the ethical right to be protected prenatally increases gradually with the age and the development of the embryo. This group considers that full human status is acquired gradually and therefore might not be present in the early embryo. Consequently, the use of embryos for research purposes among this group is permissible, since at this early stage of development the embryos do not possess the same moral status as that of a developed foetus or a full-born person.[193]

Conservative Protestants believe that the embryo has the status of a human from conception and so it must not be subjected to any treatment like a mere commodity. This group opposes researches such as embryonic stem cell

[190] Ibid.
[191] Ibid.
[192] Ibid.
[193] Ibid.

research on the basis that the Bible teaches that "human beings are made in the image and likeness of God and protectable human life begins at fertilization".[194]

However, the acceptance or rejection of the status of the embryo largely depends on the method of reproductive medicine that a person chooses. Thus, some individual protestant reject embryonic research; and some do not. Some also accept the sanctity of the human embryo from conception but grant limited circumstances under which researches (embryonic stem cell research) might be allowed.[195]

2.7 CONLCUSION

Therapeutic cloning involves the duplicate copy of the part of human body. It can therefore be said right from the history of cloning; therapeutic cloning aims at harvesting stem cells that will help in establishing novel approaches for the treatment of patient's diseases via stem cell therapy; rather than creating a human being. Its processes could be carried out through the use of: Embryonic Stem Cells (ESCs), Adult Stem Cells (ASCs) or Induced Pluripotent Stem Cells (IPSCs).

Based on the above, I am of the opinion that the moral and the Christian philosophical notion of personhood based on potentiality does not provide reasonable and justifiable arguments for not being able to harvest and culture human embryos for stem cell research and therapy. I will now proceed in the next chapter to elucidate on the *Islamic* Law views of personhood and whether an embryo is regarded as a person or potential person or not, with specific reference to the *Qur'an*, *Hadith* and *Islamic* juristic view.

[194] Ibid.
[195] Ibid, P.26.

CHAPTER THREE

THE ISLAMIC LAW LEGAL FRAME WORK

3.1 INTRODUCTION

The previous chapter discussed the historical background of cloning; meaning of certain terms such as: cloning, therapeutic cloning, stem cell, its types and its processes as a newly emerging technology that promises a wide variety of benefits to humanity.

However, the task of this research work is to examine the permissibility of the practice of therapeutic cloning under Islamic law. Therefore, some basic information about *Islam* to explain how Islamic law principles are drawn up, upon which the laws and regulations are based will be briefly discussed.

Islam literally means submission to the will of God, obeying His commands and abstaining from what He prohibited.[196] This means that all the messages sent to the various prophets were sent to them to establish one and the same religion. Therefore, they are links of one chain of the God's message to humanity.[197]

Therefore, God's religion is the same in essence, and the source of unity is the revelation from God. In *Islam* it is "established'' as an institution, and does not remain merely a vague suggestion.[198]

[196] Fadel H. E., Op. cit. note 32, P.129.
[197] Qur'an 42:13.
[198] Ali A.Y., The Holy Qur'an Text Translation And Commentary, The Islamic Foundation 223 London Road, Leicester,U.K., 1975, footnote 4541, p. 1308.

The essential core of *Islamic* teaching is the perfection of the ethical conduct of a human being.[199]The seekers after God must satisfy two (2) conditions: their actions must be governed by the prescriptions or ordinances of the "divine law", and they must ensure God is constantly present in their heart. [200] On the other hand, God gave humans life, and with that also gave humans the freedom and the authority to do good or evil.[201]

With this *Muslims* believe that *Islam* controls their actions in both the spiritual and the material spheres of life. Therefore, *Muslims* in performing any act should ask themselves whether it is permissible or not. The permissible and prohibited actions are embodied in the *Islamic* law or *shari'ah*. The primary sources of *Islamic* law are the *Quran* and the *Hadith*.[202]

New rulings about contemporary issues (such as the issue at hand) that do not have speci□c reference in these two sources are to be derived by a process of *ijtihad* الإجتهاد (independent judgment). This is to be done by *Islamic* legal scholars فقهاء (*fuqaha*') or jurists. And there is a certain well speci□ed methodology known as *usul al-fiqh* أصول الفقه that is used to reach an opinion or *alfatwa* الفتوى,[203]and corresponding secondary principles[204]. These include *ijma* الإجماع (consensus), *qiyas* القياس

[199] Al-Aqeel A.I. ,Op. cit. note 24.
[200] Ibid.
[201] Qur'an 91:7-10.
[202] Fadel H. E., Op. cit. note 196.
[203] However, these fatawas are not binding by law, and every country has its own legislation.
[204] Stokke O. M. B, The Construction of Modern Islamic Authority, Analyzing the Medical Ethics of the Islamic Organization for Medical Sciences (Unpublished), department of Culture Studies and Oriental Languages, The Faculty of Humanities, University of Oslo,2014, P.16, available at http://www.duo.uio.no visited on 23/4/2015.

(analogy), *istihsan* استحسان[205] (juristic preference), *maslaha* مصلحة,[206] etc.[207]

3.2 THEORY OF USUL

In new rulings about contemporary issues such as therapeutic cloning, before one arrives at a conclusion that is prohibited, permissible or otherwise under Islamic law; one has to understand the methodology that is used to reach an opinion known as *usul al-fiqh*.

A reader embarking upon the study of Islamic law must first understand the meaning of essential terms like: *shari'ah*, *fiqh*, *usul al-fiqh*, *Maqasid Al-Shari'ah*, *Qawa'id Al-lugawiyyah*, *hukum shar'i* and its classification, *Hukm Wad'i* and its classification and *Qawa'id al-fiqh*. These terms have to be understood in the precise meanings that the jurists assign them, i.e, their legal meaning. This we are doing in the subsequent paragraphs. It is this explanation that would lead some to focus more on specific evidence.

3.2.1 SHARI'AH AND FIQH

It is of utmost importance to be able to distinguish between *shari'ah* and *Fiqh*. There is a difference between the meaning of the terms *shari'ah* and *fiqh*. Yet, these two terms are often used interchangeably.[208] The Arabic word *Shari'a* means whatever God has Establish for His worshippers to perform as an act of faith, or whatever He has laid down as a part of religion

[205] ''Istihsan'' literally means to deem something preferable. In its juristic sense, istihsan is a method of exercising personal opinion in order to avoid any rigidity and unfairness that might result from literal application of the law.

[206] Maslaha- literally means benefit or interest. In the opinion of Al- Ghazali maslaha consists of considerations which secure a benefit, or prevent harm. It includes also, protection of life, religion, intellect, lineage and property.

[207] Fadel H. E., Op. cit. note 202, P.129-130.

[208] Hilal I., studies in usul ul fiqh, p.4. available at www.khilafahbooks.com/wp/.../studies-usul-fiqh-iyad-hilal.pdf. visited on 7/9/15.

such as fasting, prayer, pilgrimage, regular charity and other good deeds. The root of this word originally meant to "explain" or to "clarify" and is related to the word for a place where there is a spring that provides abundant water year round.[209] Sometime the word *Shari'a* means "path" or "way".[210]

Al-Fiqh is from the Arabic word meaning a deep understanding through which the rational of speech or action is understood.[211] From the technical meaning (according to *Islamic* law jurist) is not out of the ambit notwithstanding it can be specify from its generality, is the knowledge of the practical rules of *Shari'a* from *adullatul tafsiliyyah*, from its clear evidances.[212]

The *Shari'a* is the total of firm judgments revealed by God in the *Qur'an* and *Sunnah*, and whatever is drived from these judgments through jurisprudence. Jurisprudence is the method of discovering detailed legal provisions from specific evidence drawn from the Qur'an and Sunnah.[213] The real distinction between *shari'ah* and *fiqh,* however, is that *shari'ah* is the goal while *fiqh* (jurisprudence) is the road to it.[214]

3.2.2 USUL AL-FIQH

[209] Al-Qardawi Y., Islamic Law in the Modern World, Wamy House International for Printing Publishing and Distributing Riyadh, Ssaudi Arabia, 2000, p.1.
[210] ibid.
[211] Muhammad Abu Zahrah,Usul Al-Fiqh,1958,p.6.
[212] Ibid.
[213] Ibid,p.2.
[214]Ibid.

Islamic Law is religious law based on the text of the *Qur'an* and the *sunnah*.[215]

The discipline that tells us how this law is derived from these texts, and how it is classified, understood and applied, is called *usul-al-fiqh*.[216]It is a method under which one reaches *Fiqh* in the true way, by preparing its premises for *Fiqh* through the bases of *Fiqh.*

Fiqh, commonly referred to as "Islamic jurisprudence", thus attains a dual character. On the one hand there is the *fiqh* serving as components in the creation of ethical guidelines: the institutionalized precedence of earlier cases and "rulings". This conception of *fiqh* may conflict with normative statements of *Islamic* ethics, for example if medical ethics are calling for a more contextually based ruling than what is prescribed in the traditional works of *fiqh*.[217]

Traditionally, the Usul al-Fiqh are (1) the *Quran*, (2) the *Sunnah* (comprised mostly of the *Hadiths*, reports on the practices and sayings of the prophet Muhammad), (3) *Ijma* (the consensus of the *Muslims*), and (4) the principle of analogy, *Qiyas*.[218] Therefore, the four *Shari'ah* bases are the Book, the *Sunnah*, *Ijma* and *Qiyas*, as they are termed as the *Shari'ah* evidences.[219]

Traditional *fiqh* has also been developed to include other "secondary" principles. Depending on the traditional allegiance of the *fuqaha* (jurists), a varying degree of importance is given to what is described as the

[215] Nyazee I. A. K.,Islamic Jurisprudence (Usul al-Fiqh), Adam Publishers & Distributors,1542, Pataudi House Darya Ganji, New Delhi, 2006, p.17.
[216] Ibid.
[217] Stokke O. M. B., Op. cit. note 204, p. 15-16.
[218] Ibid.
[219] Qadri A. A., Islamic Jurisprudence in the Modern World, Adam Publication and Distributors, New Delhi, India, 2007, p. 234.

goals/purposes of the Shari'ah, *maqasid al-sharia* مقاصدالشريعة[220] and its stages which consist of: (1) *Daruriyyaat* (necessary interests), this comprises life, religion, intellect, lineage and property,[221](2) *Haajiyyat* (supporting needs)[222] and (3) *Tahsinaat* (complementary interests).[223] When no clear solution or ruling is obvious, or in some cases possible, secondary principles of *fiqh* are invoked in order to reach the *maqasids* in a "ruling".[224]

We would now focus our discussion on these goals/purposes of Shari'ah one after the other.

(1) *Daruriyyat* (necessary interests). Necessary interests are those without the protection of which there would be anarchy and chaos in the society. The absence of protection for these interests would mean the loss of everything that we hold dear. These prized social interests are five in number:[225]

(a)Preservation and protection of religion.

(b)Preservation and protection of life.

(c)Preservation and protection of intellect.

(d)Preservation and protection of progeny.

(e)Preservation and protection of wealth.

Preservation and protection of religion: First of all there must be a religion which is the one that gives an individual the name human being which differentiate him from being an animal, but the religion must be free from all

[220] Stokke O. M.B., Op. cit. note 218.
[221]Muhammad Abu zahrah, Op cit note211, p.370-371.
[222] ibid, p.371-372.
[223] Ibid, p.372-373.
[224] Stokke O. M. B., Op. cit. note 220.
[225] Nyazee I.A.K., Op cit note 216,p.199.

transgressions, *Islam* has protected freedom of religion.[226]Also Allah considers *fitnah* فتنة (confusion in religion) in religion to be more offensive than murder. It is because of the protection of religion and life, the *shari'ah* provides for all act of worship (عبادات) because of purity of soul تزكيت النفس and the development of religious spirit.[227]

Preservation and protection of life: This is the protection of right to life and protection of life is refers to its protection from any transgression be it killing, mutilation and causing injury. It is part of human's dignity protection that protects man from defamation or insult and likewise from what infringes his dignity, or to limit his social life without any legal backing. Therefore, *Islam* protects freedom of employment, freedom of thought and opinion, freedom of domicile and likewise those rights that makes the man's welfare in the society without transgression.[228]

Preservation and protection of intellect: Refers to protection of the intellect from calamity which would make the person to become useless, evil and harmful in the society. Intellect has different dimensions:[229]

(i) To make a person one of the society's organ, to become a good person that brings goodness and benefit to the society. Because the intellect of each organ in the society is not his only peculiar right, rather to the society a well considering every individual is a brisk that builds the society. Because he uses his intellect to block a

[226] Q2:256.
[227] Muhammad Abu zahrah, Op cit note 223, p.367.
[228] Ibid, p.367.
[229] Ibid, p.367.

particular gap. So it is the right of the society to take care of the safety of individuals' intellect.[230]

(ii) That he whose intellect is affected with diseases which would become a disaster or calamity to the society must be taken care of by the society. If it is because of his act (wrong doing) he must be abide by the provision of law, which prohibit him from injuring his intellect.[231]

(iii) He whose intellect is affected by disaster would become an evil to the society and would bring disaster and transgression to the society. That is why it is the right of the Law giver to protect intellect. Because it is the protection of evil and sins, and religion is focus on the prevention like how it works in the case of cure. Because of this, the *Shari'ah* punishes one that takes alcohol, or any intoxication.[232]

(4) Preservation and protection of progeny. This is the protection of human species, and taking care of it which would bring familiarity and identification among individuals. And this should be through the taking care of each child by his parent and the child should have guardian that is taking care of him, that should be through the marriage planning. And prohibit transgression against marriage life and human dignity either through defamation or sinful.[233]

This is a transgression against trust of humanity *amaanah al-Insaaniyyah* أمانة الإنسانية which Allah has given it to the body of a man and a woman,

[230]Ibid, p.367-368.
[231] Ibid, p.368
[232] Ibid, p.368.
[233] Ibid, p.368.

in order to get progeny and reproduction which will prevent the finality of human specie, and would make him to live a simple and easy life. Thereafter, the progeny would increase, become strong, fit for familiarity and love between each other in the society where they live. Is because of this that the punishment of adultery and punishment of defamation is provided and the like among the deterrence punishment *ta'azir* (discretionary punishment).[234]

(5) Preservation and protection of wealth. It is the protection against property both theft or extortion/robbery and the like; the formation of contract base on justice and mutual consent, likewise the working towards its development, putting it in the hands which would take care and protect it and look after it. Wealth in the hand of individuals is a power to the entire society. Is because of this that it becomes obligatory to be taken care of through its distribution by weighing it with a right balance, taking care of the producers' product and preventing people from illegal taking of one's property and without any justification. [235]

Protection of wealth extends to any contract between individuals allowed by *Shari'ah* be it contract of sale or hire purchase and the like among monetary contract.[236]

According to *Imam* Ghazali commenting on the above is of the opinion that, derivation of benefit and prevention of *haram* is aim of the creatures and it is the interest of the society *maslahatul ummah* مصلحة العمة public interest by

[234] Ibid, p.368
[235] Ibid, p.368
[236]Ibid, p.369.

obtaining their needs. But what it means by *maslaha* here is taking of the objective of law it is to protect: their religion, one's self, intellect, leanage and property. Anything that includes taking care of any of these five is what is considered as *maslaha* in *Shari'ah*. Negating any one of these five is considered as *haram* and its protection becomes *maslaha*.[237]

(2) *Haajiyyat*: are not for the protection of any of the five mentioned above. But is aim at protection of hardship and loss of the performance of social functions. For examole, the prohibition of alcohol transaction in order not to be easily accessible, glancing of a woman's private part, e.t.c.[238]

It is inclusive in *haajiyyat* that permitting a lot of contracts which in needs of the individuals like the contract of advance payment, protection of freedom of individuals and freedom of religion. Because the life of an individual could be even without these, not withstanding individual's life would be in a difficult condition.[239]

Haajiyyat in relation to progeny provides the prohibition of hugging between opposite sex (for non-*muharram*). While in relation to property provides for the prohibition of extortion and robbery, because it does not do away with the main property (subject matter) since it could be restorated. The reason being that it takes place in public. Also *haajiyyat* in relation to protection of intellect is the prohibition of taking little of whatever it large quantity intoxicates.[240]

[237] Ibid, p.369.
[238] Ibid, p.371
[239] Ibid, p.371
[240] Ibid, p.372

(3) *Tahsiniyyaat*/*Kamaliyyaat* (complementary interests): it is not aim at establishing any of the five mentioned in *daruriyyaat* , or even to protect them (as in the case of *haajiyyat*). It upgrades and protects one's dignity, and takes care of the five mentioned *daruriyyaat*.[241]

With regard to protection of self it protects it from defamation, insult and the like that would not affect one's life directly. *Tahsiniyyaat* is not part of *haajiyyat* but it compliments it. Therefore it complements the two mentioned stages (*daruriyyaat* and *haajiyyat*).[242]

In relation to property *tahsiniyyaat* prohibits deception and fraud. This does not affect the property itself but partially and indirectly. Because it touches the ability of control in the property with regard to its identification and understanding whether there is lost or profit. Because this is not a transgression against property itself, but a transgression against the ability of owner of the property to control. In relation to protection of progeny is the prohibition of women's out door with adornments.[243]

All of these are part of *tahsiniyyaat* because it protects the complementation of the first and second stages mentioned. It also respects dignity, prevents degrading and indecency that is affecting women in today's life.[244]

[241]Ibid, p.372.
[242] Ibid, p. 372.
[243] Ibid, p.372
[244]Ibid, p.372

With regard to protection of religion it prohibits wrong propagation which is not affecting one's belief directly, but it creates doubtfulness on *Islamic* provisions when it becomes rampant. It also prohibits reading of other scriptures for one who has no ability to compare and contrast the religious reality intellectually. It promotes covering of private part, avoiding of impurity and promotes adornment while going to mosque (for men).[245]

Some of the *tahsiniyyaat* are obligatory, while some are recommended. Therefore, some of the *tahsinyyaat* can be obligatory.[246]

With regard to protection of intellect it prohibits *dhimmi* (a non-Muslim living under the government of *Islamic* state) from taking such prohibited things in public or selling it within the Muslims even if the buyer is *dhimmi*.[247]

3.2.2 QAWA'IDUL LUGAWIYYAH

Since the primary sources (*Qur'an* and *Sunnah*) appears in Arabic text, in order to appreciate or understand the Arabic language one has to understand the established principles that are provided in the content of *Qur'an* and *Sunnah* thoroughly. One must refer to the literal meaning of the language, this includes grammar and figure of speech. Therefore, it is very important to mention the jurisprudential principle of the language which has been categorized into seven as follows:[248]

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[245]Ibid, p.373.
[246] Ibid, p.373.
[247] Ibid, P.373.
[248] Abdulwahhaab Khalaaf, Ulumul Usul Al-Fiqh Maktaba Al-Taufiqiyyah Pulishers, Al-Azhar, 2014, p.126.

(1) procedure of understanding the meaning of the source طريق دلالة النص which is subdivided into: (a) syntax of the source عبارة النص, (b) sign/gesture of the source إشارة النص (c) rational meaning of the source دلالة النص and اقتضاء النص;[249] (2) understanding of antonym words مفهوم المخالفة , this also divided into: (a)understanding through description مفهوم بالوصف, (b) understanding to the core مفهم الغاية, (c) understanding of condition مفهم الشرط, (d) understanding of quantity مفهم العدد and (e) understanding of nickname مفهم اللقب;[250] (3) unambiguous meaning of the syntax and its four stages: (a) obvious or apparent meaning الظاهر, (b) self explanatory النص, (c) interpretation within the content المفسر في اصطلاح الأصلب and (d) final decision المحكم;[251] (4) ambiguous meaning of the syntax and its four stages: (a) hidden meaning الخفي, (b) miscellaneous meaning المشكل, (c)incomprehensive المجمل, and (d) meaning which is not clear and is difficult to understand المتشابه;[252] (5)words that have common meaning المشترك;[253] (6) words that have general meaning العام and its three categories: (a) definite general meaning العام القطعي الدلالة, (b) definite specific meaning الخاص القطعي الدلالة and (c) specific general meaning العام المخصص;[254] (7) specific meaning الخاص.[255]

The function of *usul al Fiqh* is thus to prepare premises to be used in establishing *Shari'ah* values or *Ahkam* أحكام, in respect to particular cases in detail.[256]Thus, *Usul al-Fiqh* provides for *Fiqh* as premises certain universal

[249] Ibid, P.126-131.
[250] Ibid, p.134-137.
[251] Ibid, P.141-146.
[252] Ibid, P.148-150.
[253]Ibid, P.154.
[254] Ibid, p.157.
[255] Ibid, p.165.
[256] Qadri A. A., Op. cit. note 219.

propositions or *Qawa'id kulliyyah* قواعدالكلية to be used by *Fiqh* in deriving the proposition of the law applicable to particular cases.[257]

3.2.3 AL AHKAM AL SHARIYYAH الأحكام الشرعي (THE ISLAMIC LAW)

The purpose of studying the *hukm shar'i* is to understand the conceptual part of Islamic law. This study provides the framework within which the meaning of *Islamic* law is understood, the nature of its rules is grabed, and the operation of the legal system is seen.[258]

The *Arabic* word *hukm* حكم in its literal sense means a command. In its technical sense it means a "rule". This may be a rule of any kind.[259]Here, however, we are concerned with the legal rule, which is called the *hukm shar'i.*[260]

The *Muslim* jurists give us a definition of the *hukm shar'i* when they attempt to answer the question: what is Islamic law? They define it as:[261]

خطا ??الله تعا??لمتعلق بأفعا??لمكلفين بالإقتضا?????لتخي?????لوضع

> *A communication from Allah, the Exalted, related to the acts of the subjects through a demand or option or through a declaration*[262]

The rules which are used to differentiate the types of *Hukm Shar'i* are again related to *Usul al Fiqh*. The *hukm shar'i* has two main categories: the first is

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[257] Ibid.
[258] Nyazee I. A. K.,Op. cit., note 225, p. 45.
[259]Ibid. p. 46.
[260] Ibid.
[261] Ibid.
[262] Ibid. p. 47.

called the *hukm taklifi* or the obligation creating *hukm;* the second category is called the *hukm wad'i* or the declaratory *hukm.*[263] Our discussion here is going to focus on these categories.

In reality, the *Hukm Shar'i* in relation to *hukm taklifi* can be understood in five general ways:

(a) Wajib واجب (0bligatory Act):

The term *Wajib* means an act the performance of which is obligatory for the subject. In the technical sense, it is an act whose commission is demanded by the Lawgiver in certain and binding terms. The binding and certain nature of the demand may be inferred from the syntax of the statement in which the demand is expressed. It may also be inferred from an evidence external to the syntax, for example, the existence of a consequential punishment for omission.[264]

The rule for *wajib* is that it must be brought by the subject and for so doing so there is reward ثواب (*thawab*) for him, while omitting it, without a legal exsecuse, entails a penalty. The rule further says that a person who denies the legality of *wajib* when it is based on definitive قطعي (*qat'i*) evidence is to be imputed with *kufr* كفر (infidelity). This is the rule according to *Sunni* majority.[265]

If the request to do an action is decisive طلب جازم (*Talab Jazim*) then it is a *Fard* or *Wajib*; both have the same meaning. Therefore, a person who

[263] Ibid. p.50.
[264]Ibid. p. 57-58.
[265] Ibid.

complies with a *Fard* will be rewarded, while one who disobeys will be punished. Example: Performing and establishing *Salah*, paying *Zakah*.[266]

(b) Haram حرام (Prohibited Act)

The prohibited act (*haram*) is one whose omission is required by the Lawgiver in binding and certain terms. According to the majority of the jurists (*jumhur)*, it does not matter whether the evidence informing us of this omission is difinitetive or probable.[267]

According to the Hanafis, however, the act that is *haram* is based upon a definite evidence. The prohibited act that is based on a probable evidence expressed in binding terms, falls within the category of abominable act that is closer to prohibition مكروه كراهة التحريم (*makruh karahat al-tahrim*). The rule for the prohibited act in their view is the imputation of *kufr* for the person who denies its legal validity. The rule according to the majority is also the same, that is, the imputation of *kufr* is applicable when the prohibition arises from a definitive evidence.[268]

Thus, the binding and certain terms in which the demand is expressed are understood either from the syntax of the text alone or from other supporting evidence.[269]

If the instruction is connected with a decisive command of refraining from an action then it is *Haram* or *Mahdhur*. If the *Haram* is committed, then the person will be punished, but if the *Haram* action is avoided, the person will

[266] Hilal I., Op. cit. note 265, p.5.
[267] Nyazee I. A. K., Op. cit., note 183, p.68
[268] Ibid.
[269] Ibid.

be rewarded. For example: dealing in *Riba* (interest), gambling, promoting nationalism or democracy, etc.[270]

(c) Mandub مندوب (Recommended Act)

Mandub is defined as "a demand by the Lawgiver for the commission of an act without making it binding and without assigning any blame for its omission." The non-binding nature of the demand can be inferred from the syntax. Sometimes the syntax may indicate that the demand is binding, but there may be related evidence showing that the demand is non-binding. The related evidence may be a text or a general principle of the *Shari'ah* or some other indication, like the absence of a penalty for non-performance.[271]

If the instruction to do an action is not firm, then it is considered *Mandub*, The one who performs it is praised and rewarded; however, the one who abstains from it is neither blamed nor punished. Example: Attending to the sick, giving alms to the poor, fasting Mondays and Thursdays.[272]

(d) Makruh مكروه (Disapproved Act):

The *makruh* (disapproved act) is a single category according to the majority of the jurists, but is divided by the Hanafis into two types*: makruh tahriman* مكروه تحريما and *makruh tanzihan* مكروه تنزيها. The first is what has been called reprehensible as it is closer to the category of *Haram*. This type of act is the opposite of *wajib*, according to the Hanafis. It is an act whose omission has been demanded by the Lawgiver in certain terms through a probable evidence, like making a proposal for marriage where the proposal of another is awaiting response or even making an offer for sale where the

[270] Hilal I., Op. cit. note 266.
[271] Nyazee I. A. K., Op. cit., note 269, p.65.
[272] Hilal I., Op. cit., note 270.

offer of another is pending. The rule for this type of *makruh* is punishment for the person denying it, though he is not imputed with *kufr*.[273]

The simple *makruh* (disapproved) act is one whose omission is demanded by the Lawgiver in non-binding terms whatever the type of evidence from which it arises. It is one for which omission is better than commission.[274]

The majority of the jurists place *makruh* into the category of *haram* insofar as it is a demand for omission expressed in binding terms.[275]

If the instruction of refraining from an action is not firm, then it is considered *Makruh*. The one who abstains is praised and rewarded while the one who does it is neither punished nor blamed. Example: performing *Salah* between the *Fajr Salah* and sunrise, eating garlic before going to the *Masjid* for *Salah*, etc.[276]

(e) Mubah مباح (Permitted Act)

The *mubah* or permissible act is one in which the Lawgiver has granted a choice of commission or omission, without blame or praise for omission or commission. It is also called *halal* حلال.[277]

The *mubah* that is mentioned in the texts is usually expressed in words like "there is no *harm*…," or "it is no sin for you" and so on. The *mubah* is also understood through the principle of *istishab*[278] استصحاب (Presumption of

[273] Nyazee I. A. K., Op. cit. note 271, p.71-72.
[274] Ibid. p. 72.
[275] Ibid.
[276] Hilal I., Op. cit. note 272.
[277] Nyazee I. A. K., Op. cit. note 275.
[278] Ibid.

Continuity)[279], which states that anything that is not expressly prohibited or considered abominable by the *shari'ah* is permissible.[280]

If the choice to do or not to do an action is left up to the person, then the action is called *Mubah*. One will neither be rewarded nor punished for an action falling under this category. Example: Eating lamb or chicken, marrying up to four wives, etc.[281]

3.2.4 HUKM WAD'I حكم الوضعية(THE DECLARATORY RULE)

The *hukm wad'i* does not create an obligation; it is a rule that facilitates the operation of the obligation-creating rule or it explains the relationship between different obligation-creating rules. The major classifications are:[282]

(a) *Sabab* سبب, *shart* شرط and mani' مانع;
(b) *Sihhah* صحة, *fasid* فاسد and *butlan* باطل; and
(c) *Azimah* عزيمة and *rukhsah* رخصة .

We shall now proceed to discuss each of the varieties of *hukm wada'i* separately.

Sabab سبب (cause)

Sabab is the cause on the basis of which a primary rule or *hukm takalifi* is invoked or is established. The literal meaning of *sabab* is the means to a thing. In its technical meaning it is what the lawgiver has determined to be the identifier of a legal rule so that its existence means the presence of the rule, while its absence means the absence of the rule.[283] The cause (*sabab*) is

[279] Ibid. p. 236.
[280] Ibid. p. 72.
[281] Hilal I., Op. cit. note 276.
[282] Nyazee I. A. K., Op. cit. note 280, p.74.
[283] Ibid.

divided with respect to the act of the subject into two types:[284]A *sabab* may be an act which is within the power of the subject, such as murder and theft in their status as the causes of retaliation قصاص (*qisas*) and a *hadd* حد penalty respectively. Alternatively, the *sabab* may be beyond the control of the subject such as minority being the cause of guardianship over the person and property of a minor.[285]

shart شرط (Condition)

The Lawgiver may declare that a set of facts must exist or an act must take place before the cause can take effect and invoke the related *hukm*. The existence of such a set of facts is called a *shart* or condition for the *hukm*. A *shart* or condition then is a sign or an indication on which the existence of another depends, but the existence of this sign does not necessarily mean the existence of this sign does not necessarily mean the existence of that thing; however, its absence does mean the non-existance of the other thing. By existence and non-existence of the *hukm* here is meant something of which the *shari'ah* will take cognizance and to which it will also assign legal effects.[286]

In its technical sense, however, it implies a necessary condition for a *hukm*. Ablution is a condition for prayer and the presence of witnesses a condition for marriage contract.[287] A condition normally complements the cause and gives it its full effect.[288] The existence of witnesses, however, does not

[284] Ibid.
[285] Kamali M. H., Principles of Islamic Jurisprudence, Islamic Texts Society, Cambridge, 1991, p.291.
[286] Nyazee I. A. K., Op. cit. note 284, p.76.
[287] Ibid.
[288] Kamali M. H., Op. cit. note 285, p.292.

necessarily mean that a marriage has taken place, yet without witnesses a marriage would not be valid.[289]

Mani'مانع (Obstacle/Hindrance)

A mani` is defined as an act or an attribute whose presence either nullifies the *hukm* or the cause of the *hukm*.[290] A condition or set of facts may exist that prevent the *hukm* from being applied even if the cause is found and the condition is met. For example, difference of religion, and killing, are both obstacles to inheritance between a legal heir and his deceased relative, despite the fact that there may exist a valid tie of kinship قربة(*qarabah*) between them: when the obstacle is present, the *hukm*, which is inheritance, is absent.[291]

(b) *Sihhah* صحة (validity) *fasad* فساد (vitiation) and *butlan* بطلان (nullity)

These are *Shari'ah* values which describe and evaluate legal acts incurred by the subject.[292] An act that is obligatory, recommended, or permissible may be required to be performed in a certain manner by the Law giver. When the act is performed properly it is deemed as valid (*sahih*) otherwise it is null and void (*batil*). Here too the Hanafites add another category called irregular or vitiated (*fasid*). Such an act can become valid if the cause of the irregularity is removed, otherwise it stays suspended. It may, however, have some legal effects.[293]

[289] Nyazee I. A. K., Op. cit. note 287.
[290] Kamali M. H., Op. cit. note 288, p.293.
[291] Ibid.
[292] Ibid., p.295.
[293] Nyazee I. A. K., Op. cit. note 289, p.77.

Therefore, to evaluate an act according to these criteria depends on whether or not the act in question fulfils the essential requirements أركان(*arkan*) and conditions شروط (*shurut*) that the *Shari'ah* has laid down for it, as well as to ensure that there exist no obstacles to hinder its proper conclusion.[294]

(c) *Azimah* عزيمة and *rukhsah* رخصة (initial rules and exemptions)

A law, or *hukm*, is an '*azimah* when it is in its primary and unabated rigour without reference to any attenuating circumstances which may soften its original force or even entirely suspend it. It is, in other words, a law as the Lawgiver had intended it in the first place. For example, *salah*, *zakah*, the *hajj*, *jihad*, etc., which God has enjoined upon all competent individuals, are classified under '*azimah*.[295]

A law, or *hukm*, is a *rukhsah*, by contrast, when it is considered in conjunction with attenuating circumstances. Whereas `*azimah* is the law in its normal state, *rukhsah* embodies the exceptions, if any, that the Lawgiver has granted with a view to bringing facility and ease in difficult circumstances.[296]

Drinking of wine is prohibited as a general rule. In cases of duress (*idtirar*), however, one is allowed to consume it, if it saves one from dying of thirst. This is a *rukhsah*.[297]

Rukhsah occurs to any of four varieties: Firstly, in the form of permitting a prohibited act on grounds of necessity, such as eating the flesh of a carcass, and drinking wine at the point of starvation or extreme thirst.[298]

[294] Kamali M. H., Op. cit. note 292.
[295] Ibid. p.293.
[296]Ibid., p. 293-294.
[297] Nyazee I. A. K., Op. cit. note 293.

Secondly, *rukhsah* may occur in the form of omitting a *wajib* when conformity to that *wajib* causes hardship, such as the concession granted to the traveler to shorten the quadruple *salah*, or not to observe the fasting of Ramadan.[299]

Thirdly, in the area of transactions, *rukhsah* occurs in the form of validating contracts which would normally be disallowed. For example, lease and hire إجارة(*ijarah*), advance sale سلم (*salam*) and order for the manufacture of goods إستصناع (*istisna`*) are all anomalous, as the object of contract therein is non-existent at the time of contract, but they have been exceptionally permitted in order to accommodate the public need for such transactions.[300]

And lastly, *rukhsah* occurs in the form of concessions to the Muslim ummah from certain rigorous laws which were imposed under previous revelations. For example, *zakah* to the extent of one-quarter of one's property, the impermissibility of *salah* outside a mosque, and the illegality of taking booty i.e. غنيمة (ghanimah), which were imposed on people under previous religions, have been removed by the *Shari'ah* of *Islam*.[301]

3.2.5 QAWA‘ID AL-FIQH: (THE LEGAL MAXIMS OF ISLAMIC LAW)

This research provides a brief introduction to legal maxims, an evidently important chapter of the juristic literature of Islam, that is particularly useful

[298] Kamali M. H., Op. cit. note 296.
[299] Ibid.
[300] Ibid.
[301] Ibid.

in depicting a general picture of the nature, goals and objectives of the *Shari'ah*.

Legal maxims قواعد الكلية الفقهية (*qawa'id al-kulliyah al-fiqhiyyah*) are theoretical abstractions, usually in the form of short epithetical statements, that are expressive, often in a few words, of the goals and objectives of the *Shari'ah*. This is so much so that many scholars have treated them as a branch of the *maqasid* (goals and objectives) literature.[302]

The legal maxims of *fiqh* are statements of principles that are derived from the detailed reading of the rules of *fiqh* on various themes. The *fiqh* has generally been developed by individual jurists in relation to particular themes and issues in the course of history and differs, in this sense, from modern statutory rules which are concise and devoid of detail. The detailed expositions of *fiqh* enabled the jurists, at a later stage of development, to reduce them into abstract statements of principles. Legal maxims represent, in many ways, the apex of cumulative progress, which could not have been expected to take place at the formative stages of the development of *fiqh*.[303]

The actual wordings of the maxims are occasionally taken from the *Qur'an* or *Hadith* but are more often the work of leading jurists and *mujtahids* that have subsequently been refined by others throughout the ages. It has often been a matter of currency and usage that the wordings of certain maxims are taken to greater refinement and perfection.[304]

The science of legal maxims is different from the science of *usul al-fiqh* (methodology in Islamic jurisprudence) in that the maxims are based on the

[302] Kamali M. H., Qawa'id Al-Fiqh: The Legal Maxims of Islamic Law, The Association of Muslim Lawyers UK, P.1, available at www.sunnah.com/fiqh/usul/kamali-qawaid-al-fiqh.pdf, visited on 7/9/2015.
[303] Ibid.
[304] Ibid.

fiqh itself. *Usul al-fiqh* is concerned with the methodology of legal reasoning and the rules of interpretation, the meaning and implication of commands and prohibitions, and so forth. A maxim is defined as "a general rule which applies to all of its related particulars".[305]

A legal maxim is reflective of a consolidated reading of the *fiqh* and it is in this sense different from what is known as *ad-dabitah* الضابطة (a precept) which is somewhat limited in scope and controls the particulars of a single theme or chapter of *fiqh*. *Dabitah* is thus confined to individual topics such as cleanliness طهارة (*taharah*), maintenance نفقة (*nafaqh*), paternity and fosterage الرضاعة (*ar- ridaa'*), and as such does not apply to other subjects.[306]

An example of a *dabitah* is the statement: "Marriage does not carry suspension"; and with reference to cleanliness: "When the water reaches two feet,[307] it does not carry dirt". An example of a legal maxim is the statement: "The affairs of the imam concerning his people are judged by reference to *maslahah*" أمر الإمام في شؤن الرعية منوط بالمصلحة (*Amr al-Imami fi shu'un ar-ra'iyyati manutun bil-maslahah*). The theme here is more general without any specification of the affairs of the people or the activities of the *imam* (leader).[308]

Legal maxims also vary concerning the level of abstraction and the scope that they cover. Some legal maxims are of general application, whereas

[305] Ibid.
[306] Ibid.
[307] Ibid.
[308] Ibid.

others might apply to a particular area of *fiqh*, such as *ibadah* (worship), *mu'amalah* (transactions), contracts, litigation and court proceedings.[309]

The *madhahib* (the *Islamic* schools of Law) are generally in agreement over them.[310] The jurists have generally considered the maxims of *fiqh* to be significantly conducive to *ijtihad*, and they may naturally be utilised by the *mujtahid* and judge as persuasive evidence. It is just that they are broad guidelines, whereas judicial orders need to be founded in specific evidence that is directly relevant to the subject of adjudication. Since most of the legal maxims are expounded in the form of generalised statements, they hardly apply in an exclusive sense and often admit exceptions and particularisation.[311]

Instances of this had often been noted by the jurists, especially in cases when a particular legal maxim had failed to apply to a situation that evidently fell within its ambit. They then attempted to formulate a subsidiary maxim to cover that particular case.[312]

The development of this branch of *fiqh* is in many ways related to the general awareness of the jurists that the *fiqh* literature is of a piecemeal and fragmented style, which, somewhat like Roman juristic writings, is on the whole issue-oriented and short of theoretical exposition of the governing principles. This is, in turn, attributed to the history of the development of *fiqh*, where private jurists made their contributions independent of any government and institutions that might have exerted a unifying influence. They often wrote in response to issues as and when encountered, and we

[309] Ibid., p.2.
[310] Ibid.
[311] Ibid.
[312] Ibid.

consequently note that theoretical abstraction was not a well- developed feature of their work.[313]

The legal maxims fils gaps to some extent and provide a set of general guidelines for an otherwise diverse discipline that combined an impressive variety of schools and influences into its fold.[314]

Many *Muslims* are too quick to conclude that something is either *Haram* حرام (prohibited) or *Fard* فرض (compulsory) after a quick reading of an *Ayah* or a *Hadith*. The same thing applies to contemporary issues such as the issue at hand (therapeutic cloning), people are rushing in making suggestions without knowing the full meaning and implication of f*ard* or *haram* talkless of knowing the other general ways of understanding the *Hukm Shar'i* and other *Islamic* law principles.

This is the reason why we deem it necessary to discuss these ways here, so that it would help as guidelines in understanding and regularizing the practice of therapeutic cloning.

3.3 CONCLUSION

Fiqh as a methodology can therefore be understood as the method of elaborating on which *Islamic* grounds ethics can be legitimized, along with their applications. That it is not all commands in the legislative sources are *Fard* or *Haram*. In addition to this, the classifications help us understand how *maqasid al- Shari'ah*, *qawa'id al-lugawiyyah* the *taklifi* and *wad'i* rules interact to create obligations and determine the operation of law. The

[313] Ibid., p.4.
[314] Ibid.

declaratory rules interact to create facilitate, so to say, the application of the obligation-creating or *taklifi* rules. The maxims of *fiqh* are significantly conducive to *ijtihad*, and they may be utilised as persuasive evidence.

Therapeutic cloning by means of developing cloned embryos in assisted reproduction, a novel discipline of biotechnology dedicated to stem cell therapy in regenerative medicine for a variety of human diseases emerged for the benefit of patients' health. As regards this, therefore, the society will have to set up the proper scientific, legal and ethical rules concerning cloning with its multiple applications and far reaching consequences in medicine.

Weighing the technology as to whether something is right or wrong, taking the aforementioned principles of Islamic law into consideration on the *Shri'ah* scale from the Islamic perspective, this we are doing in the next chapter.

CHAPTER FOUR

THE POSITION OF THERAPEUTIC CLONING UNDER ISLAMIC LAW:

4.1 INTRODUCTION

The previous chapter concentrated on discussing definitions of some basic information about *Islam* to explain how *Islamic* Law principles are drawn up, upon which the laws and regulations are based. This chapter seeks to use the sources of Islamic law principles as our guidelines in examining the practice of therapeutic cloning. It also seeks to discuss the view of the

Shari'ah on *science, Qur'anic* verses, *Hadiths* and juristic opinion dealing with the life of the human embryo, *medicine* and therapeutic cloning. But first, it is important to look at the relationship between Islam and Science.

4.2 ISLAM AND SCIENCE

For many centuries, humankind was unable to study certain data contained in the verses of the *Qur'an* because they did not possess sufficient scientific means. It is only today that numerous verses of the *Qur'an* dealing with natural phenomena have become comprehensible. A reading of old commentaries on the *Qur'an*, however knowledgeable their authors may have been in their day, bears solemn witness to a total inability to grasp the depth of meaning in such verses.[315]

In the 20th century, with its compartmentalization of ever increasing knowledge, it is still not easy for the average scientist to understand everything he reads in the *Qur'an* on such subjects, without having recourse to specialized research. This means that to understand all such verses of the *Qur'an*, one is nowadays required to have an absolutely encyclopedic knowledge embracing many scientific disciplines. [316]

In the development of science and technology which now we see as modern civilization, to some extent it is the pioneer of most of the field, hence it does not leave a single stoned unturned, as far as human endeavour is concerned and even beyond that. *Qur'an* could be said to be the book of science[317]

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[315] Boucaille M., The Qur'an and Modern Science, p.5. available at sunnahonline.com/ilm/quran/qms visited on 2/9/2015.
[316] Ibid.
[317] Qur'an 6:38, 2:269.

The Glorious *Qur'an* has illustrated manifestations of this universe and invited human mind to reflect on its wonderful creation. It presents an illustration of the earth, and the mountains that are fixed upon it and the seas that run beneath it.[318]

It also illustrates the sea and what benefits man is endowed with from it,[319] the miracle phenomena of the seas,[320] the natural phenomena of the heaven and its relationship with the earth,[321] the picture of the heaven and what is in its space of planets and stars,[322] water and plants and their relationship with human and animal life,[323] pictures of botanical life and development,[324] it mentions the different kinds of fruits,[325] it then illustrates human life and its phases[326] and how to live a healthy life by prohibiting excessiveness in eating and drinking,[327] e.t.c.

Al-Madni is of the opinion that:[328]

> *One of the blessings of Islam is that it never abstracts scientific programs or narrows the scope of the mind in the field of science and technology. Unlike other religions, there is no conflict between science and religion in Islam. Christian clergy opposed scientists, thinkers and pioneers of technology that we take for granted today. Many were punished, tortured and sentenced to death.*

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[318] Ahmad Y. A., Op. cit. note 98, p.14. see also Qur'an 16:15, 78:6-7.
[319] Qur'an 16:14 and 35:12.
[320] Ibid. 25:35 and 55:19-21.
[321] Ibid. 30:24 and 13:12-13.
[322] Ibid. 15:16, 6:97, 17:12, and 35:13
[323] Ibid. 32:27.
[324] Ibid. 39:21.
[325] Ibid. 6:141 and 16:10-11.
[326] Ibid. 23:12-14 and 22:5.
[327] Ibid 7:31. Maintaining moderation in eating and drinking leads to a healthy life while excessiveness in them leads to illness. The Verses thereby laid the foundation for the science of medicine.
[328] Munirah S., Zainul Ibrahim Z., Rozlin A. R. at el., Exploring the Islamic Perspective on Tissue Engineering Principles and Practice, journal of the committee on publication ethics (COPE),2014, 4, p.31, available at www.gjat.my visited on 17/5/2015.

Science is part of knowledge acquisition of which was the subject of the first revelation.[329] Many Quranic verses tell people to explore new horizons.[330] Then therapeutic cloning is part of these new horizons which ought to be looked upon. And the *Shari'ah* has made teaching and learning science a mandatory communal duty فرض كفاية (*fard kifaayah*).[331]

Islam embraces scientific progress and research, and that no time during the *Islamic* history has there ever been a conflict between *Islam* and science. The fisrt verse in the Holy Qur'an which was revealed to Prophet Muhammad says "Read" إقرأ (*iqra*').[332] God Almighty also says:

He has taught man that which he knew not.[333]

Islam contributed greatly in the field of science, with great scientists; in the field of medicine[334]: Ibn Sahda, Jabril Ibn Bakhtyshu, Salmawaih Ibn Buan, Ibn Masawaih,[335]Ali Ibn Ridwan,[336]Ibn Sina,[337] Al-Rhazi,[338] Abu Othman,[339] Al-Farabi[340] e.t.c.; in the field of chemistry: Al-jahiz, Al-Rhazi;[341]e.t.c.; in

[329] Qur'an. 96:1-5.
[330] Ibid. 29:20, 35:29-30 and 7:185.
[331] Lawan M.A., Scaling Somatic Cell Reproduction: Human Right and Shari'ah Perspective (unpublished), University of Warwick, 2003, p.33.
[332] Al-Aqeel A. I., op cit. note 200, P.1513.
[333] Qur'an 96:5.
[334] Qur'an 16:69.
[335] Sarton G., Introduction to the History of science, P.16. available at www.usc.edu/.../history-of-islamic-sc..., visited on 2/9/2015.
[336] Ibid. P.46.
[337] Ibid. P.47.
[338] Ibid. P.19.
[339] Ibid. P.26.
[340] Ahmad Y. A., Op. cit. note 318, p.28.
[341] Sarton G., Op. cit. note 339, P.19.

the field of astronomy[342]: Ibrahim Al-Fazari, Ya'qub Ibn Tariq, Muhammad Ibn Ibrahim Al-Farazi,[343]Al-Hajjaj Bn Yusuf Ibn Matar, Al-Abbas Ibn Sa'id, Abu Sa'id Al-Darir,[344] Abu As-Salt Al-Andalusi,[345]e.t.c.; in the field of agriculture: Ibn Washiya,[346]while in the field of geography[347] and geology[348]: Al-Ma'mun, Al-Khwarizmi, Sulaiman,[349]Al-Rhazi, Al-Jahiz[350]e.t.c.; and in the field of mathematics: Ibn Al-Adami, Ibn Amajur, Abu Kamil, Abu Othman,[351]e.t.c. and many more in various scientific fields.

4.3 STAGES AND RIGHTS OF AN EMBRYO UNDER ISLAMIC LAW

The human embryo has been broadly defined as "the developing human during its early stages of development".[352] Basically, an embryo is formed from the union of an egg and sperm which are collectively referred to as "gametes." These gametes contain all the genetic information inherited from parents.[353]

Biologically, at conception, a human egg and sperm become a zygote, which begins to divide, becomes an embryo and rapidly becomes a cluster of cells. As the day passes by, it develops into the foetus, while the other cells become the placenta, umbilical cord and other supporting structures for the

[342] Qur'an 78:12-13, 86:3, 37:6, 21:33, 21:30,39:5, 36:8, 55:33, 31:219, 79:30, 25:61, 10:5, 71:15-16, 36:40, 36:38, 25:59 and 51:47.
[343] Sarton G., Op.cit. note 341, P.4.
[344] Ibid. P.12.
[345] Ahmad Y. A., Op. cit. note 340. p.28.
[346] Ibid. P.27.
[347] Qur'an 7:54, 20:4, 41:11, 21:30, 25:59, 39:21, 30:24, 23:18, 15:22, 30:48, 3:9, 7:57, 13:17, 25:48-49, 36:34, 50:9-11, 56:68-70, 67:30 and 86:11.
[348] Ibid. 39:21, 78:6-7, 21:31 and 79:32.
[349] Sarton G., Op.cit. note 344, P.14.
[350] Ibid. p.19.
[351] Ibid.P.26
[352] Opoku J. K.,Manu E., The Status of the Human Embryo: An Analysis from the Christian and Islamic Viewpoints, European Journal of Biology and Medical Science Research, 2015,3, 24-60, p.25, at www.eajuornal visited on 5/11/2015.
[353] Ibid. p.25-26.

embryo-foetus. This is, for many, a significant biological factor in determining the status of the embryo.[354]

There is, however, a biological differentiation between 'zygote', 'embryo' and 'foetus'. The zygote is the fertilized egg cell. During the first stage of development of a baby from the moment of fertilization, it is referred to as an embryo and it is called a foetus from the eighth week after conception.[355]

The discovery of the various and successive stages of human development has been complex and difficult throughout the history of embryology. This is due to the extremely small size of the embryo, especially in early weeks of pregnancy. Moreverer, the necessary technology to see and study the embryo in the uterus was not available. Not to mention that there was a lack of understanding in the middle ages, before the invention of the microscope in the 17th century, of the real role of both the male and female in human development.[356]

The evolution of scientific developments has generated controversial subjects which have attracted wide ethical concerns and public debate. These developments which are aimed at addressing different forms of human suffering, such as reproduction and treatment of degenerative diseases (like Parkinson*'s* and Alzheime*r's*), have made the status of the human embryo a great concern and a debatable issue.[357]

There is substantial debate regarding the start of life, and at which specific stage dignity is conferred on the individual during the course of development

[354] Ibid.
[355] Ibid.
[356] Zindani A. A., J. E. Marshall, et al. Human Development As Described in the Qur'an and Sunnah Correlation with Modern Embryology, Muslim World League Printing Press, Makka Al-Mukkarramah Saudi Arabia,2000, p.33.
[357] Opoku J. K., Op. cit. note 355.

(conception, primitive streak development, implantation, ensoulment or birth).[358]

When exploring the morality behind scientific technologies, such as embryonic stem cell research, in vitro fertilization and ethical issues such as abortion, the status of the embryo is extremely important. Even with the potential benefits of these scientific researches, they involve the destruction of the human embryo and this has put the status of the human embryo into question. Questions that are usually asked centers on whether or not the human embryo should be given an unconditional or a conditional respect, and at what stage has the embryo attained personhood?[359]

With regards to the status of the human embryo, different views have emerged ranging from regarding the embryo as having merely human properties to being a potential person.[360]

Authors like Helga Kuhse and Peter Singer, based on in vitro fertilization, are of the view that there is no moral obstacle to the destruction of unwanted embryos. Hence, a human embryo is not a human being with rights, and can therefore be treated as a means to an end.[361]

In medical ethics, human life from conception is supposed to be preserved. The International Code of Medical Ethics of the World Medical Association (WMA) states clearly that, "a doctor must always bear in mind the obligation of preserving human life from conception…." In like manner, the Declaration of Geneva (1948) stipulates that doctors maintain the utmost respect for human life from the time of conception, even under threat. To

[358] Al-Aqeel A. I., Op. cit. note 332, p. 1509.
[359] Opoku J. K., Op. cit. note 355, p.25.
[360] Ibid.
[361] Ibid.

this extent, human embryos, therefore, should not be used as means to an end; not even for good ends such as cures for diseases to save another human life.[362]

However, the Qur'an, which was revealed in the 7th century, represents the first available reference that mentions distinct stages of the embryo and provides nomenclature and terminology descriptive of its outward appearance and the main processes and events of each stage. These *Qur'anic* terms remarkably fulfills the prerequisites of scientific terminology.[363]

When it comes to ethical thinking and decision making, most people are often guided by their religious beliefs. It is these religious influences that often shape their ethical values about issues. Most world religions teach that all human life is sacred. However, when it comes to determining the status of the human embryo in relation to the evolvement and usage of the scientific reproductive assisted technologies, various religions have a view on whether or not, or at what point an embryo is considered a human being.[364]

For some religions, the human embryo is a human person from the moment of conception, while, for others, the important moment is the moment of ensoulment, when the embryo or foetus develops or obtains a soul. Ensoulment is sometimes thought to occur weeks or months after conception. These differing opinions reflect diverse views held by and within the major world religions.[365]

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[362] Ibid.
[363] Zindani A. A., Op. cit. note 356.
[364] Opoku J.K.,Op. cit. note 362.
[365] Ibid.

To address the ethical, moral and religious concerns associated with therapeutic cloning, we must understand the timing of the onset of life and the rights of an embryo; therefore we must know when the ensoulment (inspiration of the soul) in *Islam* is.[366] Based on these views, the status of the human embryo will be assessed from the *Islamic* point of view.

Islam has its own perspective on the status of embryo. *Islam* considers human life as valuable and as deserving of protection from conception onwards.[367]

According to the *shari'ah*, we should make a distinction between the actual life and potential life. Also, we should make a clear distinction between the fertilized ovum in the dish and the fertilized ovum in the womb.[368]

Both the *Qur'an* and the prophet's *Hadith* use the term "*nutfah*" to describe the first embryonic stage. *Nutfah* denotes a drop or a small amount of fluid.[369]

The *Qur'an* mentions that human beings are created from a mixture of the male and female secretions and that after fertilization, the resulting organism settles in the mother's uterus like a seed.[370] The Qur'an provides that:

> *And He that (Allah) creates the pairs, male and female, from Nutfah (mixed drop of male and female sexual discharge) when it is emitted*.[371]

[366] Al-Aqeel A.I., Op. cit. note 358, p. 1511.
[367] Abdul Rahman R., Op. cit. note 19, p.51.
[368] Ibid.
[369] Zindani A. A., Op. cit. note 363, p. 50.
[370] Ibid. p.26.

Reference is also made to other stages in development, some of which are the '*alaqah* علقة which means that the embryo appears leech-like, the *mudghah* مضغة which indicates a chewed-like substance, i.e. somites, and the development of the skeletal and muscular systems. The *Qur'an* also refers to the timing of sexual development, fetal development and the aquition of human appearance.[372] The *Qur'an* has given a special name to each stage:

وَلَقَدْ خَلَقْنَا الْإِنسَانَ مِن سُلَالَةٍ مِّن طِينٍ ثُمَّ جَعَلْنَاهُ نُطْفَةً فِي قَرَارٍ مَّكِينٍ ثُمَّ خَلَقْنَا النُّطْفَةَ عَلَقَةً فَخَلَقْنَا الْعَلَقَةَ مُضْغَةً فَخَلَقْنَا الْمُضْغَةَ عِظَامًا فَكَسَوْنَا الْعِظَامَ لَحْمًا ثُمَّ أَنشَأْنَاهُ خَلْقًا آخَرَ فَتَبَارَكَ اللَّهُ أَحْسَنُ الْخَالِقِينَ

> *And indeed We created man (Adam) out of an extract of clay (water and earth). Thereafter We made him (the offspring of Adam) as a Nutfah (mixed drops of male and female sexual discharge and lodged it) in a safe lodging (womb of the woman). Then We made the Nutfah 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. So, blessed is Allah, the Best of creators.*[373]

The sperm looks like an elongated fish. This is one of the meanings of the word "*sulalah*" used in the *Qur'an* to describe this stage. Another meaning of the word refers to the "gentle extraction," and this meaning applies to both male and female fluids.[374] The Qur'an states, regarding fertilization:

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[371] Qur'an 53:45-46.
[372] Zindani A. A., Op. cit. note 370.
[373] Qur'an 23:12-14.
[374] Zindani A. A., Op. cit. note 372. p.26

ثم جعل نسله من سلالة من ماء مهين

Then He made his offspring from a semen of despised water (male and female sexual discharge).[375]

With the fertilization of the ovum by the sperm, the embryo takes the form of a *nutfah*, which consists of the male and female discharge mixtures, including the mingled genetic material. This is referred to in the *Qur'an* by "*nutfah amshaj*," which expressed the form of a drop (*qatrah*), the singular form (hence it is *nutfah*) and the mixtures contained therein (*amshaj*). As God says in the *Qur'an*:

إنا خلقنا الإنسان من نطفة أمشاج نبتليه فجعلناه سميعا بصيرا

Verily, We have created man from Nutfah (mixed drops of male and female sexual discharge), in order to try him, so we made him hearer and seer.[376]

The *Qur'an* further indicates that the female is the place of tilth. This indicates that the *nutfah* implants in the uterus. At that point, the *nutfah* begins to transform into an '*alaqah* (leech and blood clot).[377]

Then the *Qur'an* states that the *nutfah* settles in the uterus, which is given the two most important descriptions, "*qarar*" and "*makin*" which fully describe the main uterine characteristics.[378]

ثم جعلناه نطفة في قرار مكين

[375] Qur'an 32:8.
[376] Ibid. 76:2
[377] Zindani A.A., Op. cit. note 374.
[378] Ibid.

> *Thereafter We made him (the offspring of Adam) as a Nutfah (mixed drops of male and female sexual discharge and loged it) in a safe logging (womb of the woman).*[379]

The role of *Hadith* in *Islamic* teaching is to help us better understand and interpret the verses of the *Qur'an*, since Prophet Muhammad (peace be upon Him) is the ultimate interpreter of the *Qur'an*. Prophet Muhammad (peace be upon Him) was not only a religious or political leader for his nation, but also a guide who would teach the *Muslims* to understand the *Qur'anic* verses.[380]

It is reported in a *Hadith* that when the Prophet (peace be upon him) was asked by a jewish person:

يا ?محمد مم ?خلق?لإنسا? قا? يا يهو? ? من كل ?خلق من نطفة?لرجل ?من نطفة?لمر??

> *O, Muhammad, what is man created from?' the Prophet answered, 'O, Jew, he is created from both: from the fluid (nutfah) of the man and the fluid (nutfah) of the woman.*[381]

Thus, the embryo's creation begins from a tiny amount of the male and female discharge. It takes the form of a drop (zygote) during the fertilization, after the sperm is extracted from the "despised fluid." Therefore, man's progeny is made from a quintessence of the nature of a fluid despised, as the *Qur'an* states.[382]

The identity for the timing of ensoulment is based on following prophetic hadith:

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[379] Qur'an 23:13.
[380] Al-Aqeel A. I., Op. cit. note 366.
[381] Ahmad Ibn Hambal, Musnad Ahmad Bin Hambal (Musnad Abdullahi Bin Mas'ud), Mu'assatul Qurtibah, Al-Qahira.
[382] Zindani A. A., Op. cit. note 378.

؟؟؟حدكم ؟مع خلقه ؟ بطن ؟مه؟؟بعين يوما نطفة ؟ يكو؟ علقة مثل ؟لك ؟ يكو؟ مضغة مثل ؟لك ؟ يرسل ؟ليه ؟للك فينفخ فيه ؟لر؟ ؟ ؟يؤمر بأ؟بع كلما ؟ : بكتب ؟؟قه ؟؟جله ؟عمله ؟شقي؟؟ سعيد...

> Each one of you is collected in the *womb* of his mother for forty days then turns into a clot (*alaqa*) just like that (*mithla dhalika*), and turns into a lump (*mudgha*) just like that, and then Allah (God) sends an angel, then the angel breathes the soul into him and orders him to write four things: i.e. his career, his provision, his life duration, and whether he will be wretched or blessed (in the Hereafter)... [383]

Thus, the *Qur'an* and *Sunnah* used, well over a thousand years ago, a terminology that describes the fetal stages. These terms are consistent with present day rules of terminology. Each stage is described in a manner according to its appearance and developmental event at that particular stage.

Muslim scholars, on the basis of *Qur'an* 23:12-14 (aforementioned), described early life as occurring in two phases: biological and human. They generally agree that ensoulment, the breathing of God's spirit into the fetus, differentiates biological life that starts at fertilization from human life. This concept is an old one. A famous Muslim jurist of the fourteenth century, Ibn al-Qayyim, in his book *al-Tibyaan fi'aqsam* al-Qur'an التبيان في أقسام القرآن stated that the embryo and fetus before ensoulment has the life of growth and nourishment like a plant; but once the spirit is breathed into it, it

[383] Abi Abdullahi Muhammad Bin Isma'il Al-Bukhari, 256 H., Sahih Bukhari, Darul Ibn Hazam, Beirut, 2009, First Edition.

acquires personhood. This view was expressed more recently by contemporary *Muslim* scholars.[384]

The second *Hadith* mentions three 40-day stages of embryonic development before ensoulment occurs. Many scholars understand this to mean that ensoulment occurs at 120 days after conception. However some scholars understand the 'just like that' (*mithla dhalika*) to indicate that these three stages occur within the same time period, i.e. 40 days, at the end of which time ensoulment occurs.[385]

Another interesting argument supporting the differentiation of biological from human life is linguistic. The Arabic word for the embryo is *janın* جنين which means a hidden thing, as the embryo is hidden in the woman's uterus. Imam al-Sha□'ı, founder of one of the four *Sunni* schools of jurisprudence, has stated that the term *janın* (*embryo*) should be applied to the conceptus only after the *mudgha* stage.[386]

Muslims believe that the embryo is an individual once it is ensouled. Although the *Quran* does not give a precise indication as to the exact point in time when the ensoulment occurs, debates occurring among the *Islamic* community have resulted in two differing opinions. That is, while some *Muslims* believe that it occurs as early as 40 days after fertilization, others say as late as 120 days which is dependent on a varied interpretation of the *Hadith* narrated.[387]

Before this 'ensoulment' the embryo is not seen as a completely formed human but all scholars agree that life is entitled to respect even before

[384] Fadel H.E.,Op. cit. note 166.
[385] Ibid.
[386] Ibid.
[387] Opoku J.K., Op. cit. note 2365, p.30-31.

ensoulment but becomes more so after it occurs. Due to this, there are various conditions regarding the use of human embryos in assisted reproductive techniques such as in vitro fertilisation and stem cell research.[388]

Generally, *Islamic* scholars emphasize the belief that all knowledge emanates from God and that, as such; human beings have an obligation to use that knowledge to serve society. In *Islam*, research on stem cells is therefore regarded as an act of faith in the ultimate will of God, as long as such an intervention is undertaken with the purpose of improving human health. In their view, creating human embryos solely for research is prohibited.[389]

On the basis of the concept that human life does not start until ensoulment the great majority of *Muslim* scholars agree that research on the pre-embryo, especially the pre-implantation embryo as it cannot grow independently outside the uterus is permissible, provided that these pre-embryos were legitimately developed.[390]

The permissibility is also conditioned on the fact that these embryos are not produced specifically for research. Supernumerary embryos produced at infertility clinics are considered legitimate. Several embryos are usually produced during the procedure of in vitro fertilization (IVF) for the treatment of infertility of a couple who are legally married at the time. Many of them are not implanted in the wife's uterus. These are usually

[388] Ibid.
[389] Ibid.
[390] Fadel H. E., Op. cit. note 207.

cryopreserved for possible future use if this cycle was not successful or if this couple wants to try another pregnancy.[391]

In *Islam* these extra embryos cannot be implanted into another woman's uterus nor can they be used by either spouse if they get divorced or if one of the spouses dies, as preservation of lineage is of prime importance in *Islamic* law. If this couple later on decides not to use their cryopreserved embryos, the frozen embryos are thawed and either left to die or destroyed. So the great majority of *Muslim* scholars agree that their use for research, which may bring potential therapeutic bene□t, is better than letting them go to waste.[392]

A minority of *Islamic* jurists hold that "ensoulment" takes place during the first 40 days of embryo development, and therefore the 40-day limit is preferred to be on the safe side. This also implies that research that utilizes 5-day old embryos is not held as being unethical. A survey of *Muslim* scholars by Eich also found that the majority do not consider embryos in early developmental stage as a human person.[393]The importance of saving lives is an *Islamic* thought as is provided in the following verse:

مِنْ أَجْلِ ذَٰلِكَ كَتَبْنَا عَلَىٰ بَنِي إِسْرَائِيلَ أَنَّهُ مَن قَتَلَ نَفْسًا بِغَيْرِ نَفْسٍ أَوْ فَسَادٍ فِي الْأَرْضِ فَكَأَنَّمَا قَتَلَ النَّاسَ جَمِيعًا وَمَنْ أَحْيَاهَا فَكَأَنَّمَا أَحْيَا النَّاسَ جَمِيعًا

> *Because of that, We ordained for the Children of Israel that if anyone killed a person not in retaliation of murder, or to spread mischief in the land – it would be as if he killed all*

[391] Ibid. p.131.
[392] Ibid.
[393] Sivaraman M. A. F. and Noor S. N. M., Ethics of embryonic stem cell research according to Buddhist, Hindu, Catholic, and Islamic religions: perspective from Malaysia, Asian Biomedicne, 2014, 8, 43-52, p.46.

mankind, and if anyone saved a life, it would be as he saved the life of all mankind[394]

Research may be conducted on surplus embryos created from IVF that otherwise would be discarded. Letting the surplus embryos die without utilizing them when able to do so, and save potential human lives, is a form of killing by itself. Protecting and saving the life of a human outweighs any ethical conscience associated with the use of the human embryo, which will die in the process.[395] This is also in compliance with the maxim, "harm is eliminated to the extent that is possible"(*Ad – dararu yud fa'u bi qadar al - imkaan*)[396] الضرر يدفع بقدر الإمكان.

Other legitimate sources would be legally aborted fetuses, although it is almost impossible to grow stem cell lines from them. [397]

If embryonic stem cell research (ESCR) can relieve suffering of people, then it is conceived an obligation or *fardhu kifayah*. Also the legal maxisms "harm must be eliminated" (*Ad – dararu yuzal*)[398] الضرر يزال and "a specific harm is tolerated in order to prevent a more general one" (*Yutahammal ad – darar al – khaas li daf' al – darar al'aam*)[399] يتحمل الضرر الخاص لدفع الضرر العام. According to this, it becomes a duty for the scholars and scientists to assist those in society who can benefit from that knowledge, as it is provides "harm may neither be inflicted nor reciprocated

[394] Qur'an 5:32.
[395] Sivaraman M. A. F., Op. cit. note 393.
[396] Kamali M. H., Op. cit note 302, P.3.
[397] Fadel H. E., Op cit. note 392.
[398] Kamali M. H., Op. cit. note 396.
[399] Ibid.

in *Islam*" (*La darara wa la dirara fil Islam*)[400] لا ضرر ولا ضرار في الإسلام. Delivering good deeds is in accordance with the principle of *maslaha*.[401]

All *Muslim* scholars agree that embryonic life is entitled to respect even before ensoulment, becomes progressively more deserving of rights as the development proceeds and de nitely acquires full rights after ensoulment.[402]

4.4 A COMPARATIVE ANALYSIS ON THE STAGES OF EMBRYONIC DEVELOPMENT BETWEEN QUR'AN, HADITH (SUNNAH) AND SCIENCE.

We are going to discuss the fetal stages as explained by the *Qur'an*, *Hadith* and science in each of the stages.

Nutfah means a small drop (of fluid) but its composition is of mixed substance. This corresponds with the scientific observation that the combination of ovum and spermatozoon after their coming together has the shape of a drop of fluid. At the same time, it's a mixture of a man's and a woman's chromosomes.

The interesting point is, as we have earlier mentioned that spermatozoa are formed in the testicles, and the testicles according to embryology, are formed from cells situated at the lower part of two kidneys in loins. During final stage of gestation, the lightening occurs. This is confirm in Q7:71-72. The verse is a clear indication that the very origin of man is the region of loins where the embryonic testicles form.

[400] Ibid.
[401] Sivaraman M. A. F., Op. cit. note 395, p.47.
[402] Fadel H. E., Op. cit. note 397, p.131.

From the scientific fact it is mentioned that the fertilized ovum moves from the fallopian tube toward the uterus where it becomes implanted just as a seed is planted in the soil. The Qur'an also mentions that human beings are created from a mixture of the male and female secretions and that after fertilization, the resulting organism settles in the mother's uterus like a seed.

We have mentioned that the uterus is regarded as the safest place for growth and development of the fetus, the Glorious *Qur'an* also clearly mentioned that. Allah the Almighty says:

فَجَعَلْنَاهُ فِي قَرَارٍ مَّكِينٍ إِلَىٰ قَدَرٍ مَّعْلُومٍ فَقَدَرْنَا فَنِعْمَ الْقَادِرُونَ

Then We placed it in a place of safety (womb), for a known period (determined by gestation)? So We did measure; and We are the best to measure (the things)[403]

The process of transformation of the fetus from a seminal drop to the clot takes more than ten days so that the drop mixture (fertilized ovum) can be attached to the placenta through a connecting cord that would later become known as the umbilical cord. It is in the light of this that the Qur'an uses the conjunction 'ثم' in the noble verse:

ثُمَّ خَلَقْنَا النُّطْفَةَ عَلَقَةً

Then We made the Nutfah into a clot (a piece of thick coagulated boold)

The word "*Alaqah*" in *Arabic* has a number of meanings:

Leech that lives in ponds and sucks blood of other creatures

[403] Qur'an 77:21-23.

Something that clings to another

Static or frozen blood

All these meanings apply to the situation of the human fetus after it settles down on the wall of the uterus. It looks like a leech; it clings on the wall of the uterus through the umbilical cord and blood vessels emerge from its interior like the shape of a network of closed islands thereby giving it an appearance of a frozen clinging clot of blood.

If we take the issue of the first streak that is the first thing created in a fetus and from which major cells, part of the body and different tissue are formed. At the end of the third week of pregnancy, the first streak become hidden and whatever is left of it settles in the coccyx region at the end of the spinal cord surviving on the remnants of the major cells in this region. This attests to the saying of the Prophet, peace be upon him, according to what *Imam* Ahmad recorded in his *Musnad*, on the authority of Abu Huraira, may Allah be pleased with him: "Every son of Adam shall decay and be eaten up by the earth except the tailbone. His creation and composition started from it."[404] i.e., the cells that form tissues and body are situated in the coccyx. It is from this tailbone that man is created.

The stage of "lump of flesh" comes after the state of "clot". This succession corresponds with what the *Qur'an* says:

فَخَلَقْنَا الْعَلَقَةَ مُضْغَةً

Then We made the clot into a little lump of flesh

[404] Ahmad Bin Hambal, Op. cit. note 381.

The fetus moves within the uterus as a chewed morsel is moved about in the mouth. Also, the word "Mudghah" means a substance chewed with the teeth. This word gives an apt description of the fetus' appearance in this stage.

The formation of the bones is the prominent formation of the bone phase for it is then the fetus changes from being like "a lump of flesh". It is the skeletal bone that gives the fetus the human appearance. The Qur'an also used the term "bones", in the bones phase. The term that exactly and aptly describes the situation of this stage of fetal life. It is the most important physical change in the fetus and it is clearly different from the "lump of flesh stage". Allah, the most High says:

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

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. So, blessed is Allah, the Best of creators.

This is also the confirmation of the Prophet's saying:

When forty nights pass after the semen gets into the womb, Allah sends the angel to give (the fetus) its shape. Then it is given ears, eyes, skin, flesh, and bones, and the angel then says: My Lord, would he be male or female?[405]

On the covering the bones with flesh (muscles), this stage is characterized by the covering of bones with muscles as a garment covers its wearer. With this covering, evenness of the human shape of the fetus starts and the parts of the body are asymmetrically more connected with one another. It is after the completion of the formation of the muscles that the fetus can move. The

[405] Muslim Bin Hajaj, Sahih Muslim, Darul Jaleel Beirut, Darul Afaaq Jadeed Publishers.

fetus then transforms from an embryo to being a fetus, a designation that fits its new phase according to Allah (S.W.A)'s statement:

فَكَسَوْنَا الْعِظَامَ لَحْمًا

Then We clothed the bones with flesh

Then after the development of the skeletal cartilage and its covering with muscles, the fetus transforms into a complete human being, clearly distinct from other beings. This is what Allah (S.W.A) refers to in His verse saying:

ثُمَّ أَنشَأْنَاهُ خَلْقًا آخَرَ فَتَبَارَكَ اللَّهُ أَحْسَنُ الْخَالِقِينَ

And then We brought it forth as another creation. So, blessed is Allah, the Best of creators

4.5 BENEFITS OF THERAPEUTIC CLONING UNDER ISLAMIC LAW

The most important factor in the concept of "*Islamic* Medicine" (IM) is its perspective on the history, theory and practice of medicine as pertaining to an *Islamic* tradition and an *Islamic* civilization.[406] In other words, *Islamic* Medicine is the practice of a specific and unique system of medicine, which is contained in or otherwise based on the teachings of *Islam*.[407]

Islamic medicine is therefore a specific way (an *Islamic* way) of practicing medicine in general. Ethics, deemed as *Islamic* conduct, are thus also a part of an *Islamic* medical system.[408] Prophet Muhammad (peace be upon Him)

[406] Stokke O. M. B., Op. cit. note 224.
[407] Ibid.
[408] Ibid.

ordered *Muslims* to get treated when they fall ill and to seek cures for all diseases. He is reported to have said:

[illegible]

> *God did not create a disease without creating its cure except senility (death). So children of Adam, seek cures but do not use haram (forbidden things) in the treatment*.[409]

So there is a clear directive for *Muslims* to engage in research in general and in medical research in particular.[410]

Health is considered among God's most important bounties. The person is not the real owner of his/her body. It belongs to God. It is a trust and one has to preserve it. Some *Islamic* scholars tend to consider medical research directed toward new treatments as a collective religious duty فـرض كفـاية (*fardh kifaya*).[411]

Health is the most precious gift from Allah (S.W.T). Therefore, taking care of our health is a priority. People will live happily in this world when they are healthy, peaceful and have fulfilled their basic needs.[412]

That is why the Prophet (Peace be upon him) had reminded *Muslims* to take advantage of five crucial things in life before they are gone.

?غتنم ?سا قبل ?س شبابك قبل هرمك ? صحتك قبل سقمك ? غنا ? قبل فقر ? ? فر?غك

قبل شغلك ? حياتك قبل موتك

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[409]Abu Dawuda Sulaiman Bin Al-Ash'ath Al-Sajistani, Sunan Abu Dawud, Darul Kitab Al-Arabi, Beirut.
[410] Fadel H. E., Op. cit. note 402, p. 130.
[411] ibid.
[412] Asmak A., et al., Is our Medicine Lawful (Halal)?, middle-east Jorunal of Scientific Research, IDOSI Publications,2015, 23 (3), 367-373, 367, available at http://www.idosi.org, visited on 23/4/2015.

> *Try to make use of five things before five things: make full use of young age before getting old, benefit your healthy body before getting sick, be generous while you are rich before becoming poor and leading good life before death*.[413]

It is important for particularly *Muslim* consumers to know the necessary medications and its ingredients whether it is categorized as *halal* or non *halal*. Searching for *halal* is the duty of every *Muslim* as dictated by *Islam* and is not only limited to food and drink but also covers the entire life of a *Muslim* including medicine or pharmaceutical products.[414]

The role of the *Qur'an* and the *Sunnah* can be summarized as central to the common perspective on *Islam* as a "total" or "complete" way of life. It is also noted several times that the *Qur'an* is viewed as a book of guidance in life, and not one of detailed science, and must be treated accordingly as a tool in the re-contextualization of *Islamic* heritage. Others point to the ability of adaptation through the use of Ijtihad, using the *Qur'an* and the *Sunnah* as the framework for harmonizing *Islam* to its contemporary context.[415]

A number of references to tradition are presented as essential to the development of a past *Islamic* hegemony, and consequently to the development of contemporary modern science and medicine. Especially two prophetic traditions (*Hadiths*) are seen as elementary:

ما?نز ??الله ??لا?نز ? له شفا?

> *God did not send down a disease without also sending down its cure*.[416]

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[413] Baihaqi Abubakar Bin Ahmad, Sha'abul Iman, Darul Kutub Al-Ilimiyya Beirut, 1410 A. H., First Edition, p.263.
[414] Asmak A., Op. cit. note 412.
[415] Stoke O.M.B., Op. cit. note 408, p.64.
[416] Bukhari, Op. cit. note 383.

and;

لِكُلِّ دَاءٍ دَوَاءٌ فَإِذَا أُصِيبَ دَوَاءُ الدَّاءِ بَرَأَ الدَّاءُ بِإِذْنِ اللَّهِ عَزَّ وَجَلَّ

Every illness has a cure, and when the cure is administered, the disease is healed by God's Will.[417]

These teachings are stated to[418] have been the prime motivators of earlier *Muslim* scientists and should within the program of renewal and resurgence be the motivators of the following generations as well. This teaching implies that every available and useful treatment known to us should be utilized, and that if a treatment for a certain illness is not yet known to us, it is our duty to search for it until we find it.[419]

Another central reference to the *Islamic* tradition is that the coming of *Islam* forbade rites of magic, superstitions and "mythological" elements in the field of science and medicine.[420] The *hadith*:

مَنْ أَتَى كَاهِنًا فَصَدَّقَهُ بِمَا يَقُولُ فَقَدْ كَفَرَ بِمَا أُنْزِلَ عَلَى مُحَمَّدٍ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ

He who goes to fortune teller or sorcerer (knowingly) and beliefs what he says, there is no doubt that he disbeliefs what is revealed to Prophet Muhammad (S.A.W.) .[421]

According to the participants of the first two Codes of the *Islamic* Code of Medical Ethics (the Code of '81) ratified at the First International Conference of *Islamic* Medicine (the Conference of '81) held in Kuwait in 1981, this tradition was what enabled the development of a rational,

[417] Muslim Bin Hajaj, Op. cit. note 405, p. 21,
[418] Stoke O.M.B., Op. cit. note 415.
[419] Ibid. p.66.
[420] Ibid.
[421] Baihaqi, Op. cit. note 337, Muslim Op. cit. note 414.

scientific methodology and what is largely considered as the method of modern science among the participants, as it forbade superstition, forcing the use of sensory perception in medical practice.[422]

This in turn implies that medical education should be taught to *Muslims* by "good *Muslims*" capable of presenting "praiseworthy examples" as role-models.[423]

Islam has encouraged its followers to help people. According to the above discussion, it is clear that religion of *Islam* highly appreciate their followers to help people.

4.6 JURISTIC VIEWS ON THERAPEUTIC CLONING.

When it comes to human embryonic stem cell (HESC) research where there is no precedent, scholars have to exert *ijtihad* utilizing the general principles of *qh* (Islamic law) such as: [424]

a. All actions are in principle permissible as long as they are not categorically prohibited.
b. In matters in which other invocations are silent the concept of *maslaha* (public interest) applies. 'Where the welfare of the people resides there resides the statute of God.'

There is a rather general acceptance of human embryonic stem cell research by *Islamic* scholars. This is based on the distinction they make between biological and human life coupled with the perception of its therapeutic potential. The latter is a signi cant consideration based on the *Islamic*

[422] Stoke O.M.B., Op.cit. note 420, p.65.
[423] Ibid. p.66.
[424] Fadel H. E., Op. cit. note 411.

Shari'ah's rule of public interest. Some scholars are so positive about this research that they believe that if the therapeutic use of embryos saves human life, then such research is a collective religious obligation (*fard kifaya*).[425]

There are several religious scholars and institutions that made official statements or issued position papers relating to the *Islamic* point of view in relation to human embryonic stem cell research. I will cite only some examples:

Because of the complexity of modern medical bioethical issues, a new *modus operandi* has been developed to help *Muslim* scholars to perform *ijtihad*: convening conferences including *Islamic* scholars as well as physicians and scientists of different backgrounds when discussing medical issues. The *Islamic* Organization for Medical sciences (IOMS) was established in *Kuwait* in the 1980s.[426]

This organization conducts conferences periodically to discuss and make rulings on contemporary issues. Similar organizations have been established since then, for example, the Society for *Islamic* Medical Sciences in *Jordan*. Many conferences have been convened by these two organizations as well as by the *al-Azhar* University in Cairo, Egypt.[427]

As early as the 1989 IOMS meeting, Shaikh Yaseen argued that while biological life starts at fertilization, human life does not start till ensoulment occurs at 120 days. He thus argued for the use of extra frozen embryos for medical research under certain conditions. This view was also supported by Shaikh Yusuf al-Qaradawi. A statement issued by the conference included

[425] Ibid.
[426] Ibid. p.131.
[427] Ibid.

this sentence: 'The opinion of the majority is that there is no reason to forbid scientific research on the supernumerary fertilized eggs before their nidation in the uterus.'[428]

Shi'ite Clergy also generally support and encourage SC research including human embryonic stem cell research. In 2002 Iran's Supreme leader Ayatollah Khamenie publicly supported human embryo research.[429]

The *Muslim* World League's *Islamic* Jurisprudence Council conference in December 2003 held in *Mecca*, *Saudi Arabia* issued this *fatwa* (religious opinion):[430]

> *It is permissible to use stem cells for either legitimate scientific research or for therapy as long as its sources are legitimate for example, adults if they give permission as long as it does not inflict harm on them; children with their guardian's permission for a legal benefit without inflicting harm on them; placenta or umbilical cord blood with the permission of the parents; spontaneously aborted embryos or those aborted for a legally acceptable cause and with the permission of the parents; excess fertilized eggs produced during the course of IVF and donated by the parents with assurance that they are not to be used to produce an illegal pregnancy. It is forbidden to obtain or use stem cells if its source is illegitimate as, for example, intentionally aborted fetuses (abortion without a legal medical reason); intentional fertilization between a donated ovum and sperm; and therapeutic cloning.*

A *fatwa* by the Egyptian *Mufti* Dr. al-Tayyib in January 2003 stated that therapeutic cloning is lawful. The Malaysian National *Fatwa* Council issued a *fatwa* in the same year allowing human therapeutic cloning. Aksoy

[428] Ibid. p.131-132.
[429] Saniei M. & De Vries R. Embryonic Stem Cell Research in Iran: Status and Ethics. Indian J Med Ethics 2008; 5: 181–184.
[430] Fadel H. E., Op. cit. note 428.

maintains that therapeutic cloning is acceptable to most *Islamic* scholars. *Shi'ite* clerics also support therapeutic cloning.[431]

A later IOMS meeting held in Cairo 2006 included presentations by physicians who concluded that embryonic research for therapeutic purposes, including non-reproductive cloning, is *Islamically* permitted and encouraged. The Fiqh Council of North America in 2007 affirmed its earlier position of support for human embryonic stem cell research.[432]

The *Islamic Medical* Association of North America (IMANA) Ethics Committee published a position paper on stem cell research and added its approval. Both the *Islamic* Institute of Turkey and the Malaysian National *Fatwa* Council also supported human embryonic stem cell research.[433]

Musa quoted a remark on the issue of cloning by a highly respected and contemporary *Muslim* scholar, Al-Qardawi:[434]

> *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.*

Professor Abdulaziz Sachedina, at the University of Virginia, USA stated: [435]

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[431] Ibid. p.133.
[432] Ibid. p.132.
[433] Ibid.
[434] Abdul Rahman R., Op. cit. note 19, p.53.
[435] Sachedina A., 2000, Testimony in Ethical Issues in Human Stem Cell Research Vol. III, Religious Perspectives. National Bioethics Advisory Commission, ed. Rockville, MD: National Bioethics Advisory

> *Research on stem cells made possible by biotechnical intervention is regarded as an act of faith in the ultimate will of God as the Giver of all life as long as such an intervention is undertaken with the purpose of improving human health.*

While almost all *Islamic* jurists permit human embryonic stem cell research, all agree that, creating embryos for the sole purpose of research is prohibited. They all agree that there should be strict guidelines for the use of human embryos for research. These guidelines should limit their use to research with reasonable promise of alleviating serious human disease, and there should be procedures and laws to ensure that these guidelines are followed.[436]

Muslim jurists have made a clear distinction between the stages before and after ensoulment[437] (when God says, "then, We (Allah) brought it forth as another creation") by applying the rule of "the basic concept of in useful matters is permissiveness" (which indicates that everything is lawful "*Halal*"),as long as it is useful to people, unless otherwise stipulated in religious prevision, or could be judged by analogy (*Qiyas*) with unlawful things (*Haram*), it is quite clear that *Muslims* consider an embryo to acquire human status at the time when the soul is breathed into it.[438]

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 embryos may be obtained and the inherent risks to women who would be the source of such embryos pose serious and social problems. The use of embryo for therapeutic or research purposes

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Com- mission: G, 1–6. Available at: http://bioethics.georgetown.edu/nbac/ stemcell3.pdf. visited on 13/1/2015.

[436] Fadel H.E., Op. cit. note 433.

[437] Al-Aqeel A. I., Op. cit. note 300, p.1512.

[438] Ibid.

may be acceptable under necessity, if it takes place before the point, at which the embryo is ensouled in its early stages of development (before 40-45 days of gestation). The source has to be legitimate; as such cells could be used to save lives.[439]

Therefore, stem cell therapy is allowed if the soruce of the cell is legitimate; including left-over zygotes, or excess embryo (from in vitro fertilization laboratories) in the early stages of development (before 40-45 days of gestation), and if the parents have consented to its use.[440]

When it comes to treatment modalities, *Muslim* scholars hold that *halal* (permissible) practices should be used to heal given diseases, however, in the cases whereby the *halal* methods cannot help, then for the sake of life saving and based on the principles of necessity, it is permissible to adopt prohibited treatments, so that lives are saved or harms are alleviated. Hence, in the *Islamic* ethical system, extraordinary circumstances allow exceptional measures, based on the principle: "necessity makes the unlawful lawful" (*ad-daruratu tubeeh al- mahzurat*)[441] الضرورة تبيح المحذورة. The substance, which is the foetus, in the stem cell case, is considered *taahir* طاهر (clean; pure).[442]

It is believed that advanced knowledge and application in tissue engineering and regenerative medicine such as cloning of cell or tissue is permissible from the eyeglass of *Islam* as long as it is not for the human cloning purposes.[443]

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[439] Ibid.
[440] Ibid. p.1513.
[441] Kamali M. H. Op. cit. note 400.
[442] Abdul Rahman R., Op. cit. note 368, p.52.
[443] Ibid. p.53.

Therefore, stem cell research for therapeutic purposes is permitted with full consideration and all possible precautions in the pre-ensoulment stages of early featus development.[444]

4.7 CONCLUSION

Islam is a religion which is in agreement with science and has not narrowed the scope of the mind in the field of science and technology.

Therapeutic cloning is carried out through the use of nuclear transfer or of an embryo. However, the concern of this research work is on therapeutic cloning that is carried out through the use of an embryo. And also to examine its position under *Islamic* law.

While having a good untroubled life is a dream of everyone, as we all know Allah the Almighty would some time put a test on the life of His servant in the form of disease. It has some wisdom as to expiate, to repent, to test the patience and to elevate the status of the individuals. Therefore, it is our responsibility to find treatment as healing. In doing this therefore, it is important to know the necessary medications and its ingredient whether it is permissible or otherwise in *Islam*.

The Prophet (S.A.W) had encouraged the *Muslims* to take the advantage of healthy body before getting sick and to search for medication/treatment in healing diseases.

From the aforementioned discussion of the noble verses and scientific analysis of fetal phases, it becomes clear to us that the *Qur'anic* verses give an apt description of major phases that a human fetus passes through right

[444] Al-Aqeel A. I., Op. cit. note 440.

from its conception. We would also realize these *Qur'anic* expressions fully agree with the observations of modern embryologist (as discussed in chapter two) and shows manifestations of external changes that occur as a result of the internal changes. At the time the *Qur'an* was revealed, it informed mankind about the stages of human formation using the exact terms that agree with modern scientific rules and affirming that the formation and development of the fetus occur in phases and stages (as discussed in this chapter). Clearly they have the additional advantage of being unambiguous and indicating recognizable beginning and ending points.

It is obvious that therapeutic cloning is sourced from an embryo, the use of which is regarded as lawful (*Halal*) by the application of the rules of *Islamic* law. Its practice is permissible under *Islamic* law as long as it is useful to people. Unless otherwise, there is stipulated religious provision that prohibits it or is associated with unlawful things, as we discussed these issues under *hukm shar'i*. While under the *hukm wad'i* for intance, the course of therapeutic cloning is disease/illness, its condition is that it has to be from a legitimate embryo created for the purpose of treating diseases and its hindrance is, it should not be created for research purposes.

However, where *Halal* methods cannot help then based on the principle of necessity it is permissible to use prohibited treatments, based on the principle that "necessity makes the unlawful lawful".

Also looking at daruriyyaat, therapeutic cloning has a lot to do with its protection for these interests would mean so many things that we hold in our entire life; while *haajiyyaat* provides consensus on what individuals may arise, even necessity therefore therapeutic cloning has a lot to do with

Haajiyyaat and lastly *tahsiniyyaat* this would enable individuals to do something sensitive.

This was what this chapter sought to achieve.

CHAPTER FIVE

CONCLUSION

5.1 SUMMARY

This work is about an examination of the position of therapeutic cloning under Islamic law. Therefore it restricted itself to Islamic law principles after examining the scientific advances of therapeutic cloning.

Chapter one reveals the general introduction of the research work. It consists of the background of the study, statement of problem i.e. the problems that surround therapeutic cloning which ranges from the problem that man is

playing the role of God in discharging medical responsibility; risk of harm to the embryo and killing the value *Islamic* moral in the society.

The chapter also poses the research question on *Islamic* law position on therapeutic cloning, the aim and objective of the research work, justification of the research work i.e. reasons in conducting the research, the method adopted in collecting information and a review on the opinions of some writers in the area and finally, the enumeration of the chapters under which the research work concretized its conception. Each chapter consists sub-heading.

Chapter two reveals the meaning of cloning, meaning of therapeutic cloning, meaning of stem cell and its classification, the development of an embryo and its stages, the significance of embryonic stem cell research and the history of cloning, i.e. how the concept of cloning came into existence ranging from the cloning of plant to reproductive cloning in mammalian animals.

In history, the most famous cloning event may be the Dolly the sheep, (although there were many animals cloned before her using the same process) and this cloning was much more complicated than that done on other animals. The cloning of Polly made through cell that had human DNA, the experiment that produced human proteins to cure human diseases as well as organs transplantation was introduced.

The cloning of Dolly and that of Polly's have caused a great deal of ethical, legal and theological discussions and debates. As regard the later, because of the human gene factor in this new development, the ethics debate elevates further, and becomes a main issue in the modern world.

Therefore, there is a broad consensus among members of the lay public, various legislative bodies, and the scientific community that cloning should be banned because there is something deeply immoral about it. With the development of the various strategies for therapeutic cloning in model system, the research work is of the opinion that, therapeutic cloning should be considerate as there will be a visage in future a wide range application for human reproductive medicine that ultimately will help establish novel approaches for the treatment of patient via stem cell therapy. Because, the process in microsurgical procedures on mammalian pre-implantation embryos has opened up new avenue for a wide range of application in reproductive medicine.

From the aforementioned controversies and ambiguities on the practice of therapeutic cloning there comes the question: what is the rationale behind therapeutic cloning? The answer is in affirmative. The first reason why this research is important is because it is a leap towards self-transplantation. The second reason why cloning research is important is because it opens up a whole new avenue of medical research. It could be used to study in a radically new way any disease in a culture dish.

What benefit can we drive from therapeutic cloning as a means of treating human disease? The benefit to be derived from therapeutic cloning cannot be over emphasized, to mention but few:

Availability of tissue for transplantation. This will prevent the shortage of tissue for transplantation.

Cloned tissue would be compatible without the infectious risks of xenotransplant. This will prevent the serious cause of side effect.

As regard diseases like heart attack, stroke, cystic fibrosis, emphysema and other diseases, it may be possible in the future to use therapeutic cloning to give victims with such diseases a new tissue.

Chapter three focuses on the basic principles that would regulate the practice of therapeutic cloning under Islamic law. The research work defined the term *Shari'ah* briefly. It also pointed out that, the true source for the *ahkam* of Islamic law, as already stated in the chapter, is Allah Almighty. The *ahkam* of Allah, however, are discovered through evidences leading to the *ahkam*. These evidences are the sources of Islamic law. These sources are to be consulted in order of priority that the first source to be approached is the *Qur'an*, the second is the *Sunnah*, the third is *ijma*(consensus of legal opinion) and the fourth is analogy.

The research work further examines *usul-al-fiqh* as the discipline that tells us how Islamic law is derived from these sources, and how it is classified, understood and applied, and pointed out that it is the task of *usul al-fiqh* to unravel the practice of therapeutic cloning.

Chapter four focuses on a religious law perspective. In this chapter, the research work uses the sources of Islamic law principles; i.e., *Qur'an*, *Hadith* (*Sunnah*), *Ijma* (consensus of legal opinion jurist) and their anology to weigh and find out whether *Shari'ah* permits the practice of therapeutic cloning.

In talking about the relationship between Islam and science, a question may be asked as whether there is relationship between the two? The question is answered in affirmative that, Islam is a religion which is in agreement with

scientific reasons and reflection, and also figured out some contribution which Islam has made in various scientific field.

We also examine the concept of Islamic medicine in relation to its perspective in history, theory and practice of medicine as pertaining to an Islamic tradition and Islamic civilization. Hence, it is also figured out that Islam embraces scientific progress and research.

It is obvious that therapeutic cloning is carried out via the use of nuclear transfer or of an embryo. However, a serious concern and debate is more on the later, more especially regarding the start of life. A question is usually posed on when the life of an embryo begins, what is its right and whether it can be used as a means of medication under the shari'a? This is answered in the affirmative that, we examine the status of an embryo from the Islamic perspective, and the opinion of some jurist is discussed as regarding the permissibility or validity of it in relation to therapeutic cloning in Islam.

5.2 CONCLUSION

Conclusively, the goal in all this research is not to use cloning as a form of assisted reproduction to create human being, but to advance understanding of the causes and treatment of a whole range of currently incurable diseases and conditions.

Despite the widely ranging bio-religio-ethical problems and dilemmas posed by these emerging biotechnologies, Islamic bioethics has provided an approach moderating between the extremes of conservatism and contemporaries.

Islam has always encouraged man to contemplate, and explore, new horizons. Stem cell research is one of those new horizons, and Islam does not object to this exploration. The aforementioned discussion has indicated that stem cell research is permissible in Islam as long as it is carried out with the purpose of improving human health. The discussions so far canvassed by the research work have thrown some light on the thinking and approaches of Islamic researchers and scholars, which will help all scholars and researchers to reach a consensus on this controversial issue.

The research work used a collective approach to produce *fatwa* on the issues related to the application of modern science and technology. This approach involves the prior brie□ngs and discussions with selected experts from related □elds of science, technology and religion (Islam). In order to declare *fatwa* relating to application of biological sciences, the research work had reviewed the basic guidelines in the main references of *shari'ah*. The research work has taken all factors into consideration and given priority to the general aim of *shari'ah* which to serve the interests of mankind and to save them from harm.

5.3 FINDINGS/OBSERVATIONS

5.3.1 The use of the term "cloning" as it relates to its meaning in general without clarification on the details of its content, (for example, whether it refers to reproductive or therapeutic cloning) makes the whole thing loop up when discussing therapeutic cloning in society at large. Because, whenever the term "cloning" is used people quickly jump to the conclusion that it is something sinful without considering that the two (reproductive and

therapeutic cloning) differ in meaning, processes in which they are carried on, their objectives, legal position e.t.c.

5.3.2 The research work found that therapeutic cloning involves the use of: adult stem cells (ASCs), induced pluripotent stem cells (IPSCs) and embryonic stem cell (ESCs). However, it found that the controversy is more on the embryonic stem cell as regard the status of the life of an embryo.

The research work also found that, the definition of therapeutic cloning has not precisely mentioned protection of right to life and right to health, i.e. it never directly mentioned the issue of right. This does not suggest lack of legal basis for these rights under *Islamic* law.

It further found that, although the Qur'an has not directly mentioned the exact time on when the life of an embryo commences, however this does not suggest that the life of an embryo lacks time in Islam. Fundamental rights exist as right under *Islamic* law. These include right to life, right to health, right to dignity of human person e.t.c. in so far these rights are protected, the right of individuals are protected.

5.3.3 The research work found that *Islamic* Law principles from the primary as well as the secondary sources are invoked in order to serve as guidance in carrying out the practice of therapeutic cloning. Thus, the research work finally found the position of therapeutic cloning under the *Islamic* Law as permissible.

5.3.4 The research work found also that, the modern world is dependable on the modern technology. Ethical assessment of or pertaining regenerative medicine and tissue engineering is a complex matter, depending on the applied techniques. The Muslim Jurist's attention focuses more on the

religious implications of this technology. Thus, it is observed that it is deemed necessary for a Muslim, before embarking on any activity a Muslim must know the verdict of Islamic law thereon and the proceed there from before concluding the permissibility or otherwise of therapeutic cloning.

5.4 RECOMMENDATION

5.4.1 Since, diseases cause hardship to people this therapeutic cloning aimed at the removal of hardship and diseases from individuals. So many diseases could be healed through the use of therapeutic cloning and it is the Shari'ah principle that "harm must be eliminated"الضرر يزال. Thus, everything that is based on this has become the aim of the Law Giver.

5.4.2 Neglecting the carrying out of therapeutic cloning would result in loss of lives, causes of diseases and injuries to people. In carrying out this technology there is a social benefit i.e, *maslahatul khalq* مصلحة الخلق. And also *Shari'ah* is aimed at the safety of the body i.e, *salamatul badan* سلامة البدن through the prescription of medicine and derivation of benefit i.e, *jalabul masalih* جلب المصالح. Moreover, therapeutic cloning has legal backing because of the saying "*Al-Darurat Tubeeh Al-mahzurat*" الضرورات تبيح المحظورات necessity overrides problems. The risk and effect of therapeutic cloning is lesser than its benefits. Therefore it should be allowed hence human life protection is one of the main principles of *shari'ah*, that if any one saves life, it would be as if he saves the lives of all mankind.

5.4.3 Promotion of the practice of therapeutic cloning in the society may also serve a great purpose in changing peoples' view and perception on the subject matter. As one of the factors for the problem is idiosyncrasy, using

this method will go a long way to reduce or eliminate the problem, by understanding that Islam has made several provisions in guiding and protecting the day to day activities of the people. And also it is the principle of *Islamic* Law that, the basic concept in useful matters is permissible *Al-asalu fii al-manaafi'I al-ibaahah* الأصل في المنافع الإباحة.

5.4.4 In trying to identify a spited practice as regard the usage on the modern technology pertaining regenerative medicine and tissue engineering, which entails therapeutic cloning depending on the techniques applied there should be governmental approval. i.e, there has to be regulations that would give access to proper rules. Creation of a specific and special legal regime will be a big step towards effective recognition, preservation, protection and promotion of therapeutic cloning. Thus, it must have a legal backing. With this, there would be a loop up in carrying out therapeutic cloning.

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GLOSSORY

Allogeneic: genetically different, describes tissues that are genetically different and therefore incompatible when transplanted.

Alzheimer's disease: medical disorder causing dementia: a degenerative disorder that affects the brain and causes dementia, especially late in life.

Amyotrophic lateral sclerosis (ALS): nervous system disease, a fatal degenerative disease of the nervous system marked by progressive muscle weakness and atrophy.

Antitrypsin: a substance that inhibits action of trysin.

Atom: the smallest form of an element consisting of a protons, neutrons and electrons.

Bacteria: a group of micro-organism.

Beta:

Binary fission: the reproduction of a cell or a one-celled organism by division into two nearly equal parts.

Biological: relating to living organisms or to the science of biology.

Biomedicine: the employing of the principles of biology, biochemistry, physiology, and other basic sciences to solve problems in clinical medicine.

Biotechnology: the use of biological processes in industrial production.

Blastocyst: a mammalian embryo at the stage when it is implanted in the wall of the womb.

Blastomere: a cell of an animal embryo blastula formed by the division of a fertilized egg cell.

Blastula: an embryo at an early stage of development, consisting of a hollow ball of cells.

Cardiac: relating to or affecting the heart.

Cardiomyocytes: a cell of muscular tissue in the heart.

Carnivore: (flesh eating animal) an animal that eats other animals.

Cell: the smallest independently functioning unit in the structure of an organism, usually consisting of one or more nuclei surrounded by cytoplasm and enclosed by a membrane.

Cellular: relating to or consisting of living cells.

Chromosome: a rod-shaped structure usually found in pairs in a cell nucleus, that carries the genes that determine sex and the organism inherits from its parents

Clinic: a medical center for outpatients, attached to a hospital or forming part of it, or a center specializes in a particular condition or area of medicine.

Clone:	genetically identical organism; a plant, animal, or other organism that is genetically identical to its parent, having developed by vegetative reproduction from a bulb, cutting, or other part, or, in experimental conditions, from a single cell.
Culture:	the growing of biological material, especially plants, microorganism, or animal tissue, in a nutrient substance culture medium in specially controlled conditions for scientific, medical, or commercial purposes.
Culture medium:	substance for growing microorganisms: a nutrient substance such as a broth or an agar gel in which scientists grow selected microorganisms, fungi, cells, or tissue in a laboratory.
Cystic fibrosis:	a hereditary disease stating in infancy that affects various glands and results in secretion of thick mucus that blocks internal passages, including these of the lungs, causing respiratory infections.
Cytoplasm cell:	(cell material excluding nucleus) the complex of chemical compounds and structures within a plant or animal cell excluding the nucleus.

Diabetes: a medical disorder, especially diabetes mellitus, that causes the body to produce an excessive amount of urine.

Diagonis: the identifying of an illness or disorder in a patient through physical examination, medical tests, or other procedures.

Dish: a shallow open container as used in laboratories or hospitals.

DNA: a nucleic acid molecule in the form of a twisted double strand double helix that is the major component of chromosomes and carries genetic information. DNA, which is found in all living organisms except some viruses, reproduces itself and is the means by which hereditary characteristics pass from one generation to the next.

Egg: a female reproductive cell

Embryo: a human offspring in the early stages following conception up to the end of the eighth week, after which it is classified as a fetus.

Emphysema: a chronic medical disorder of the lungs in which the air sacs are dilated or enlarged and lack flexibility, so that breathing is impaired and infection sometimes occurs.

Encode: provide genetic information.

Enucleation: to remove the nucleus of a cell or to remove something surgically.

Epiblast: the outer layer of cells of an early embryo blastula.

Epigenetic: relating to control of changes in gene function that do not involve changes in DNA sequences.

Eukaryotic: relating to any organism with one or more cells that have visible nuclei and organelles.

Euthanasia: the act or practice of killing somebody who has an incurable illness or injury, or of assisting that person to die.

Experiment: a test, especially a scientific one, carried out in order to discover whether a theory is correct or what the result of a particular course of action would be.

Fertilization:	the union of male and female reproductive cells gametes to produce a fertilized reproductive cell zygote. Fertilization can take place inside the female's body, as in humans, or outside the body, as in fish.
fibroblasts :	a cell found in connective tissue that produces fibers, such as collagen.
Fibrosis:	a thickening and scarring of connective tissue most often following injury, infection, lack of oxygen, or surgery.
Gamete:	Ova and spermatozoa are gametes that unite to produce a cell zygote that may develop into an embryo.
Gene:	the basic unit capable of transmitting characteristics from one generation to the next. It consists of a specific sequence of DNA or RNA that occupies a fixed position locus on a chromosome.

Genome: the full complement of genetic information that an organism inherits from its parents, especially the set of chromosomes and the genes they carry.

Genetics: The branch of biology that deals with heredity and genetic variations.

Genetic engineering: the alteration and recombination of genetic material by technological means, resulting in transgenic organisms.

Heart attack: a sudden, serious, painful, and sometimes fatal interruption of the heart's normal functioning, especially due to a blockage in the coronary artery.

Hypothesis: a tentative explanation for a phenomenon, used as a basis for further investigation.

Immune: relating to or involved in a body's resistance to disease or the creation of this resistance.

Immunodeficiency: the inability, either inborn or acquired, of the body to produce an adequate immune response to fight disease.

Immunosuppressive: the inhibition of the immune response, usually deliberately by administering drugs to prevent

	rejection of transplanted organs, but sometimes resulting from disease, as in the case of AIDS.
Implantation:	the process by which or stage at which an embryo becomes embedded in the lining of the womb.
Insulin:	a hormone produced in the pancreas that regulates the level of glucose in the blood.
Isogenic:	having identical genes.
IVF:	in vitro fertilization, fertilization of an ovum by sperm outside the body when normal conception is not achievable because of a woman's low fertility
Laboratory:	a place where research and testing is carried out.
Mammal:	a class of warm-blooded vertebrate animals that have, in the female, milk-secreting organs for feeding the young. The class includes human beings, apes, many four-legged animals, whales, dolphins, and bats.
Medico:	a doctor or medical student.

Microsurgery: surgery performed with the aid of miniaturized precision instruments, including scalpels, needles, and a specially designed optical microscope.

Mitosis: cell division: the process by which a cell divides into two daughter cells, each of which has the same number of chromosomes as the original cell.

Morphological: the form and structure of an organism or of a part of an organism.

Mosaic: an organism, or part of one, with at least two genetically different tissues resulting from mutation, the grafting of plants, or the insertion of foreign cells into an embryo.

Moto neuron: a nerve cell neuron that conveys nerve impulses from the spinal cord or brainstem away from the central nervous system toward a muscle or gland.

Multipotent: capable of developing into various types of cells, depending on the surrounding conditions.

Muscle: a tissue that can undergo repeated contraction and relaxation, so that it is able to produce movement of body parts, maintain tension, or pump fluids within the body.

Mutant: something that has mutated: an animal, organism, cell, or gene that has mutated.

Neuron: nerve cell, a cell usually consisting of a cell body, axon, and dendrites, that transmits nerve impulses and is the basic functional unit of the nervous system.

Nuclear: relating to, involving, or contained in the nucleus of a cell.

Nucleus: the central body, usually spherical, within a eukaryotic cell, that is a membrane-encased mass of protoplasm containing the chromosomes and other genetic information necessary to control cell growth and reproduction.

Nutrient: a substance that provides nourishment, e.g. the minerals that a plant takes from the soil or the constituents in food that keep a human body healthy and help it to grow.

Organ: a part of the body, a complete and independent part of a plant or animal that has a specific function.

Organism: a living thing, e.g. a plant, animal, virus, or bacterium.

Ovum:	a female reproductive cell.
Parkinson's disease:	a progressive nervous disorder marked by symptoms of trembling hands, lifeless face, monotone voice, and a slow shuffling walk. It is generally caused by the degeneration of dopamine-producing brain cells, and is the commonest form of Parkinsonism.
Pathogenesis:	the cause, development, and effects of a disease.
Pathophysiology:	changes caused by disease: the disturbance of function that a disease causes in an organ, as distinct from any changes in structure that might be caused.
Petri dish:	a shallow flat-bottomed dish with a loose cover, used especially to grow bacterial cultures in the laboratory.
Pharmaceutics:	the science of the preparation and dispensing of prescribed drugs.
Physiological:	relating to the way that living things function, rather than to their shape or structure.

Placenta: a vascular organ that develops inside the uterus of most pregnant mammals to supply food and oxygen to the fetus through the umbilical cord.

Plasmid: a small circle of DNA that replicates itself independently of chromosomal DNA, especially in the cells of bacteria. Plasmids often contain genes for drug resistance and are used in genetic engineering, since they can be transmitted between bacteria of the same and different species.

Plethora: an excess of blood in a part of the body, especially in the facial veins, causing a ruddy complexion.

Pluripotent: to enable develop into more than one mature cell or tissue type, but not all.

Potency: the strength of something such as a drug or alcoholic drink.

Primate: a member of an order of mammals with a large brain and complex hands and feet, including humans, apes, and monkeys.

Prokaryote: simple organism without nucleus, an organism whose DNA is not contained within a nucleus.

Proliferate:	to multiply cells in the process of reproducing new cells, offspring, or parts, as in the budding of plants, or be multiplied in this way.
Pronucleus:	the nucleus of a fully matured ovum or spermatozoan before the nuclei are fused during fertilization.
Regenerative medicine:	the branch of medicine that deals with repairing or replacing tissues and organs by using advanced materials and methodologies such as cloning.
Replica:	an accurate reproduction of an object.
Reproduction:	the production of offspring or new individuals through a sexual or asexual process.
Reproductive cloning:	producing new organisms by cloning: the use of cloning to produce a new genetically identical human or animal from the cells of another human or animal.
Scientist:	somebody who has scientific training or works in one of the sciences.
Sex cell:	Gamete.
Sometic cell:	Any body cell except a reproductive cell.

Somite:	Embryo cell pair forming vertebrae, one of a series of paired blocks of cells that develop along the back of a vertebrate embryo, giving rise to the vertebral column and most of the skeletal muscles.
Sporadic:	Describes a disease that appears in scattered or isolated instances or locations.
Stem cell:	An undifferentiated cell that can give rise to other cells of the same type indefinitely or from which specialized cells such as blood cells develop.
Stroke:	A sudden blockage or rupture of a blood vessel in the brain resulting in, e.g. loss of consciousness, partial loss of movement, or loss of speech.
Symptom:	An indication of a disease or other disorder, especially one experienced by the patient, e.g. pain, dizziness, or itching, as opposed to one observed by the doctor sign.
Teratoma:	a tumor composed of various tissues such as bone, hair, and teeth not normally found together at the site of origin and probably derived from embryonic remnants. They most often occur in the

ovary, where they are benign, and in the testis, where they are malignant.

Therapy: Treatment of physical, mental, or behavioral problems that is meant to cure or rehabilitate somebody.

Tissue: Group of cells in organism; organic body material in animals and plants made up of large numbers of cells that are similar in form and function and their related intercellular substances.

Transplant: Transfer body organ: to transfer an organ or tissue from one body to another or from one place in somebody's body to another.

Trophoblast: Embryo's outer layer: a thin outer layer ectoderm that encloses the embryo of mammals, attaches the fertilized ovum to the wall of the womb, and absorbs nutrients.

Tumor: An uncontrolled growth or mass of body cells, which may be malignant or benign and has no physiological function.

Umbilical code: Tube connecting fetus to placenta; the flexible, often spirally twisted tube that connects the

abdomen of a fetus to the mother's placenta in the womb, and through which nutrients are delivered and waste expelled.

Unicellular: Consisting of a single cell.

Vector: An agent such as a plasmid or bacteriophage that is used in genetic modification to transfer a segment of foreign DNA into a bacterium or other cell.

Vegetative: Relating to persistent coma characterized by the reduction or absence of the usual mental or physical functions, often as a result of injury to the brain.

Viral: Relating to, typical of, or caused by a virus.

Viruses: A submicroscopic parasitic particle of a nucleic acid surrounded by protein that can only replicate within a host cell.

Xenotransplant: To transfer a tissue or organ between members of different species.

Yeast: A small single-celled fungus that ferments sugars and other carbohydrates and reproduces by budding.

Zona pellucid: A thick transparent envelope that surrounds a developing ovum, allowing only one sperm cell through to fertilize the ovum.

Zygote: An ovum that has been fertilized by a spermatozoon.

Ahkam أحكام : "Legal status", according to Islamic law.

Al	ال :	The definitive article, corresponding to "the" in English; however it has a wider range in Arabic, since in some contexts it means that the noun to which it is attached refers to every individual to which the name applies, making it one of the main ways of indicating generality.
Arkan	أركان:	Essential requirement.
Ayah	آية:	Sing, proof, evidence, verse.
Fajr	فجر	Dawn, Morning prayer.
Fard Kifaya	فرض كفاية :	It is a collective duty – an obligation which, if performed by one person, suffices for the rest; as it does not have to be performed essentially by all.
Fiqh	فقه:	'Understanding'; Islamically, it refers to knowledge of the detailed laws of the Shari'ah related to people''s action, along with the detailed evidence for those laws. Fihq is a human effort to understand how to apply the divine Shari'ah to the constantly changing circumstances of life.
Hadith	حديث:	Sayings, deeds and approvals accurately narrated from the Prophet.

Halal	حلال :	Lawful things, things permitted in Islam.
Haram	حرام:	Unlawful, forbidden and punishable from the viewpoint of religion.
Hukm	حكم:	Judgment of legal decision (especially by Allah).
Ijma	إجماع :	Consensus of all Muslim scholars qualified to make ijtihad on a Shari'ah law in any era after the death of the prophet.
Ijtihad	إجتهاد :	The exertion of effort on the part of a qualified Islamic scholar to deduce a fiqh law for an issue about which there is no clear, specific text.
Imam	إمام:	The person who leads others in the salat (prayer) or the Muslim caliph (or ruler).
Istihsan	إستحسان :	to give a verdict with a proof from one's heart (only) with satisfaction, and one cannot express it [only Abu Hanifa and his pupils say so but the rest of the Muslim religious scholars of sunnah(and they are the majority) do not agree to it].
Jumhur	جمهور :	Majority of the Jurists.
Janin	جنين:	Embryo

Kufr كفر: It is basically disbelief in any of the articles of Islamic Faith and they are: to believe in Allah (God), His angels, His Messengers, His revealed Books, the Day of Resurrection and Al-Qadar (i.e, Divine Preordainments whatever Allah has ordained must come to pass).

Madhahib مذاهب: It is most frequently used for Schools of thought in Islamic law, the four major ones being the Hanafi, the Maliki, yhe Shafi'I and the Hambali.

Makruh مكروه : not approved of, undesirable from the point of view of religion, although not punishable.

Masjid مسجد: Mosque, the place for the congregational Prayer.

Mubah مباح : An action which is lawful, but carries no special reward.

Qiyas قياس: Verdicts and judgements given by the Islamic religious scholars. These are given on the following proofs respectively: from the Qur'an, sunnah, unanimously accepted verdict of the Mujtahidun and qiyas i.e. the verdict given by a Mujtahid who considered

		the case similar in comparison with a case judged by the prophet. Qiyas is not to be practiced except if the judgement of the case is not found in the fisrt three above mentioned proofs.
Riba	ربا :	Usury, interest. Even the slightest percentage of interest on a loan is prohibited in Islamic law.
Rida'ah	رضاعة:	The period of suckling lasts up to two years.
Sallah	صلاة:	Prayer (obligatory and optional)
Shari'ah	شريعة:	Islamic law
Shard	شرط:	A condition.
Shi'ah	شيعة :	"A faction or schismatic group"; In Islamic civilization, the term was applied to a variety of dissident groups united by their believe that the Prophet's cousin Ali ibn Abi Talib and his descendants were divinely appointed to lead the Muslims spiritually and politically.
Sunnah	سنة:	legal way(s), orders, acts of worship and statements of the prophet, that have come models to be followed by the Muslims.

Taahir	طاهر:	Pure.
Usul fiqh a	أصول فقه :	The principles of Islamic jurisprudence; system of rules developed by generations of Islamic scholars for the correct deduction of laws from the texts of the Qur'an and Sunnah.
Waajib	واجب :	An obligatory act. A reward is promise for performing it properly and punishment is threatened for one who does not do it.
Zakah	زكاة:	(obligatory charity) A certain fixed proportion of the wealth and of every kind of property liable to zakah of a Muslim to be paid yearly for the benefit of poor in the Muslim community.