



RESEARCH ARTICLE

A Genetic Disaster of Human Cloning: Ethical and Scientific Implications

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ABSTRACT

Human cloning may become a viable possibility in the far future; it is no longer a spectacular science fiction wisdom. The method is accessible. The dilemma is whether it would be ethical and acceptable in society, considering any associated consequences related to human cloning. Unlike a normal embryo, this one is abnormal, which has a genome derived from a combination of six sources, a human cloned genome would have one source. This procedure would undoubtedly eliminate the distinct qualities that a real child possesses. Its short-term and long consequences, on the contrary, are currently unclear. Cell cloning of human research potentially changes the variety of medical diseases treatment in the soon future. Human cloning or non-sexual human reproduction is a multidisciplinary problem that has been studied by scholars from several perspectives, including ethical elements and science perspectives, religion, and health. Because some scientific discoveries, such as human simulation, are related to human beliefs, several religious scholars have demonstrated distinctive responsibility to religious doctrine and consider such investigations to be contrary to divine verses and religious beliefs; as a result, human cloning has been prohibited. As a result, it is vital to investigate and analyze the reasoning of their contravention to demonstrate that scientific discoveries might not only not diminish but also even deepen religion.

Keywords: Human cloning, genetic disaster, embryo, ethics, religion, and human health

INTRODUCTION

Human cloning is the technique of producing genetically identical individuals. Embryo splitting or nuclear transfer can be used to accomplish this cloning process.^[1] The process of separating a developing human being embryo into several parts is known as embryo splitting. Every one of those components can evolve toward a blastocyst or "late embryo," which, if implanted, might evolve into a child.^[2] Human cloning shares advantages and disadvantages as any developing theory and experiment, so advantages are solving infertility issues, replacing biological parts, developing genetic researches, selecting human characteristics, and developing humans. On the other hand, the disadvantages of human cloning that affects on ethics and safety are designing children, violating human right, degrading cells, identifying exclusive uniqueness, and observing psychological issues on individuals in society.^[3] Monozygotic twins are produced in this manner as Figure 1 illustrates the process of human cloning.^[4]

Artificial embryo splitting has been conducted successfully in cows, sheep, apes, and mice, but only up to the pre-implantation phase in human beings.^[5] The American Society for Reproductive Medicine (2012) recently published a paper stating that artificial embryo splitting to expand the proportion of implanted human being blastocysts used during various infertility therapies constituted an ethical technique. Embryo splitting, on the other hand, can only generate a finite number

of cloned human beings since the earliest embryo can only be divided so many times and the process never generate a clone of an already living adult. The second method for creating cloned humans is nuclear transfer and does not have the disadvantages of the embryo splitting approach. Most of the health problems, such as transplantation or rejection organs, can be treated by cloning the nucleus (nuclear mass/DNA) in somatic cells. Human cloning using somatic cell nuclear transfer is classified into two categories: Reproductive cloning and therapeutic cloning.^[6]

Due to the extreme, sociological and psychological considerations involved, human reproductive cloning remains categorically prohibited. A cloned embryo preparing for implantation into a womb must undergo comprehensive molecular testing to determine whether human cloning

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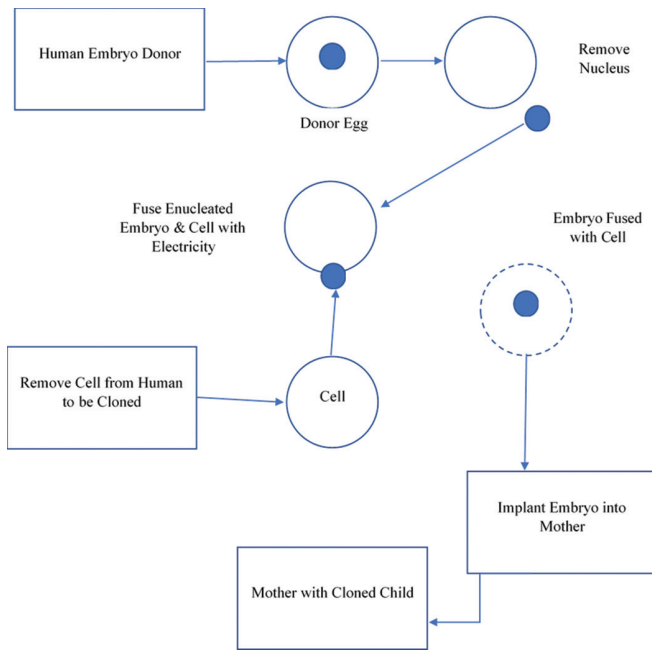


Figure 1: Human cloning process^[4]

procedure is healthy and accomplished.^[7] Human reproductive cloning is considered unethical according to the high risk of death. Several theoretical questions, such as the origin of reproduction and human identity, have been posed, which reproductive cloning may contradict. Overall, this research examines a variety of scientific and ethical challenges with embryo splitting or nuclear transfer human cloning.

BIOETHICS OF HUMAN CLONING

Bioethics is concerned with the moral implications of using humans and animals in cloning research. It is a new and multidisciplinary area that aids in the understanding and resolution of a variety of ethical dilemmas that arise in the fields of food, medicine, and life sciences.^[8] It might be considered as a more effective and helpful method of protecting vulnerable species and reintroducing endangered species. Even though some groups argue that goods generated from cloned animals are hazardous, they lack supporting facts.^[9] One of the most significant goals of human cloning is to provide a child to a couple who cannot produce a biologically related child. One of the most important advantages of human cloning is that it aids in the elimination of illnesses that run-in families and is handed down through generations.^[10]

In consideration of recent advances in the field, it is critical to examine and evaluate the ethical implications of human cloning. As a result, stem cell research rules are founded on a cultural concept that provides particular protection to human embryos, but does not provide them the same moral or legal standing as fully formed persons.^[11] Ethical considerations about human cloning, as well as many religious references, indicate that the discipline of religious ethics is a relatively new development in Islam.^[12] Although Muslim researchers have spoken of ethical principles and created significant investigations on the refinement of human character ethics as moral behavior to guide legal judgments on

human cloning.^[13] Various moral and ethical standards reject human cloning such standards impacts on society, children, individuals, and families. These moral behaviors that are used in a particular context and govern a consecutive method of reply based on ethics.^[14] The national bioethics advisory commission contacted scientists, theologians, physicians, and others to gather data regarding ethical and moral principles as well as information concerning the safety of the organism generated through somatic cell nuclear transfer, which was the key concern.^[15] Due to the ethical concerns about cloning, any effort to create genetically identical embryos for clinical use in assisted reproduction, whether by embryo splitting or nuclear transfer from an existing embryo, is ultimately ruled illegal.

EMBRYO SPLITTING HUMAN CLONING APPROACH

As preliminary reports, embryo splitting was performed on the genetic abnormal human embryos in the past decades, but the split embryos succumbed after couple cell divisions. There was no further research on human embryo splitting until 2008 when scientists used blastomere biopsies to successfully develop divided human embryos to the blastocyst stage.^[16] The scientists divided the cell embryos into four stages, and the four blastomeres recovered were grown separately in an empty zona pellucida. The ontological status of the embryo is a dilemma about what kind of entity embryos are. Individual beings, biological humans, or individuals can all be considered embryos.^[17] Later, Illmensee succeeded in developing blastocysts using twin human embryos.^[18] Recently, nothing is known about the quality of the embryos produced in this manner, and the conclusions are contradictory.^[19]

Embryo splitting is the most standard technique of artificial cloning, in which the blastomeres of an early embryo are separated which forms two or smaller embryos. The first attempts to clone domestic beings included embryo splitting.^[20] As Keefer revealed that twins may be generated in sheep and cattle when cleavage stage embryos were separated; and demi embryos were transferred into donors.^[21] These experiments revealed that triplets and even quadruplets were possible, but only at lower frequencies due to cellular mass loss. Researchers have cloned humans by embryo splitting to improve artificial reproduction technologies, and the experiment has been approved by the American Society for Reproductive Medicine's Ethics Committee.^[16] The quantity of embryos put into the womb increases the likelihood of a successful pregnancy. This technique acceptance by a reputable ethical authority implies that the issue is not necessarily the duplication of human beings.^[21]

Most people believe that studying the causes of infertility and genetic diseases, for example, is values and moral that is likely to be achieved within existing ethical constraints. The use of human embryo models for reproduction, on the other hand, is far more difficult to justify; such applications are still a fair distance off. However, 1 day it may be possible to transplant an embryo produced from (genetically modified) stem cells to a woman's womb to treat infertility or to avoid genetic disorders.^[22] Cloning through embryo splitting has been widely utilized in sheep and cattle to improve the output of progeny from genetically high-grade parents, from the 2-cell

stage up to the blastocyst stage. Embryo splitting is significantly less effective in mice than sheep due to the distinct pattern of early development. From a scientific standpoint, it is unlikely to be particularly successful in humans, despite the fact that monozygotic twins and greater multiples occur naturally at a low rate.^[7] Many religions provide numerous guidelines or ideas on how to do things correctly, on how to live. Various philosophers presented several ethical principles or concepts, which can be divided into two categories: Secular and spiritual. Some ethical or moral concepts are classified as secular or western, whereas religion is classified as spiritual. According to Islamic religion research, to grasp natural occurrences and the secret truth underlying the universe, one must eventually uncover the truth and witness evidence of Allah's majesty.^[12]

A theologian and neo platonian philosopher had considerable power in the early Christian era. He stated that killing does not apply to animals because they do not object and are not like humans. He believes that because God created animals for the benefit of humans, people should likewise protect animals for their purposes.^[9] In previous amphibian cloning experiments, a modified form of the nuclear transfer method was utilized to circumvent the limitations of embryo-splitting cloning.^[21]

NUCLEAR TRANSFER HUMAN CLONING APPROACH

Nuclear transfer is the second to clone human beings the entire controversy began with the nuclear transfer cloning of a non-human animal, a simple technique that has created no additional issues. Following Dolly, scientists cloned at least cows, mice, rats, goats, pigs, bunnies, cats, horses, and dogs using the same technique, generally without chuckling. This technique implies that the issue cannot be found in the utilization of nuclear transfer as such.^[16] Dolly was an ovine clone who provided somatic cell nuclear transfer (SCNT) to an embryo in which the nucleus was removed, and genetic material was introduced. The ethical debate had already begun before successful animal cloning, but it sparked a significant debate and calls for constitutional restrictions on human cloning. One of the major ethical problems raised by successful animal cloning is whether and under what conditions human emulation is permissible.^[8] A related topic is the medical use of human cloning for stem cell research. This approach raises difficult ethical and political problems.^[23]

Reproductive cloning is described as using SCNT and other technologies to generate offspring within the original person's shared genetic code. These same experimental approaches are used in therapeutic cloning for treatments other than reproduction such as embryonic stem cell lines or the creation of solid organs for transplant.^[6] SCNT for therapeutic purposes, in which embryos are not transferred for pregnancy, may provide the data necessary to make reproductive SCNT safe and successful.^[24] The nuclear transfer technique can be used in a strategy known as therapeutic cloning, which involves the use of embryos in therapy and research. Human embryos may be produced to perform a study on anomalies, illnesses, and medication effects. This technique offers up a wide range of options for performing stem cell-related research that would otherwise be impossible to conduct on regular people. A study

finding that might be utilized for therapeutic reasons could be the discovery of how to create cloned stem cells that could be used to regenerate damaged tissue in a patient.^[25]

Human embryo research, within nuclear transfer clones, is commonly permitted for the period of 14 days following conception, subsequent culture, and scientific, and clinical usage of human embryonic stem cells is largely authorized in most nations. In terms of ethics, reproduction of humans is at the core of the cloning debate, with the concepts of design notion of enhancing individuals and advancing the human being race.^[16] Cloning is the process of producing genetic clones of individual organisms by nuclear transfer in animal and human biology. Animal clones need advanced reproductive procedures such as microsurgery, embryo culture, and transfer into recipients (surrogate mothers), as depicted in Figure 1. More specifically, a nucleus from the donor's cell is placed in an embryo that its own nuclear DNA had extracted (enucleation). This rebuilt embryo is triggered, allowing embryonic development to proceed. Embryos created by this method have the potential to produce a living, genetically identical person the following transfer into a recipient, but at low efficiency.^[21]

FUTURE OF HUMAN CLONING

Philosophical perspectives various arguments take place over time to examine the legitimacy of animal cloning. These arguments have ended to prohibit the use of cloned animal products and to prohibit the use of animal cloning.^[9] Because of the significant risk of mortality, human being reproductive cloning procedure is considered unethical. Numerous conceptual problems have been raised, such as the origin of reproduction and human identity, which reproductive cloning may challenge.

Considering the practically power growth of society and law with technology, innovation can provide us a foretaste of human cloning. Because of the enormous therapeutic benefits of this approach, it is being studied all over the globe, despite the deepest ethical concerns that if recognized and perfected, this technology may be exploited for non-medical purposes as well.^[26] Since there is no federal legislation prohibiting human reproductive cloning in the United States; rapid progress is predicted soon, particularly in therapeutic cloning. For current therapeutic cloning research in regenerative medicine, organ transplantation is a viable medicinal and ethical justification. In the United States alone, over 114,000 individuals are waiting for organ transplants, with one candidate added every 10 min and 20 people on the waiting list dying every day.^[7] Nevertheless, the human race comes to whether or not to authorize human cloning, the UK government's decision to authorize mitochondrial DNA transfer was preceded by an open, early discussion including scientists, bioethicists, regulators, and the general public.

CONCLUSION

Overall, a variety of scientific and ethical challenges with embryo splitting or nuclear transfer human cloning emerges three aspects: (1) Risk assessment, which entails performing the advantages and drawbacks study of cloning in its many

forms, as well as their possibilities. This aspect may be a not possible job, but even if it is, scientists must be aware that ethical parameters appeal to expectations and concerns rather than realistic appraisals of well-being; (2) justice, critical assessments of cloning frequently note would benefit couple individuals that it is not worth the expenditure. This aspect might be accurate. However, scientists should look into cloning in light of many ideas of justice; (3) meanings, scientists must closely review the meanings of words and occurrences, as unnaturalness.

Society considers the benefits of human cloning as another significant element that many people overlook, first, it allows an individual to reproduce and, second, allows experts in the area to create organs that are genetically similar and suitable for any type of transplantation. Considering the hazards that human reproductive cloning can pose to the resultant person and society, human being reproductive cloning should be restricted. According to the researchers, if cloning is conducted for medical purposes, it will be deemed an ethical condition and allowed to proceed unless it poses harm to humans or animals. However, if cloning methods are used just for testing and experimentation, they must be prohibited and regarded unethical and illegal.

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