

THE IRISH COUNCIL FOR

BIOETHICS

COMHAIRLE BITHEITICE NA HÉIREANN

Irish Council for Bioethics

Stem Cell Research: Hope or Hype? Exploration of the Ethical Questions

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Introduction

Adult stem cells can be obtained relatively safely from adults who have given consent for such procedures or from children whose parents/guardians have consented on their behalf. Consequently, the ethical challenges posed by stem cell research relate almost exclusively to embryonic stem cells. The harvesting of embryonic stem cells currently requires the destruction of embryos and this is unacceptable to those who believe life begins at conception. Therefore, this information leaflet will largely focus on the ethics of embryonic stem cell research.

Q1 Should stem cells from umbilical cord blood be stored?

As mentioned above, adult stem cell research is relatively uncontroversial. However, one area which has raised ethical questions is the storage of babies' umbilical cord blood.

Since 1988 it has been shown that adult stem cells present in the blood of the umbilical cord can be used for transplantation in a number of genetic and blood diseases as well as immune deficiencies e.g. leukaemia. After transplantation the stem cells repopulate the bone marrow of the patient, providing a source of blood cells. Blood from the umbilical cord and placenta can be collected during or immediately after the birth of a child. After collection the cord is reduced in volume, frozen at a controlled rate and stored in liquid nitrogen at -196°C. Commercial companies now offer parents the opportunity to store their own baby's cord blood, in case the child or his/her siblings ever develop a disease that could in the future be treated by cord blood stem cell transplantation. There is currently a debate about whether storing a child's umbilical cord blood is a worthwhile investment for future healthcare or an expensive procedure, which might never prove beneficial.

Concerns have been raised regarding the promises made about the potential for cord blood transplants to treat a number of diseases for which there is, at present, no medical evidence. Therefore, opponents argue that the State should not be paying for storage when there are no proven benefits. Opponents also argue that the chances of umbilical cord blood stem cells ever being needed by all of the families who store it are very small.

Therefore, they raise concerns regarding the commercial storage of umbilical cord blood. They state that allowing parents who can afford to pay for storage to do so would force those who cannot afford to store their babies' cord blood to feel unduly guilty.

Proponents argue that given the nature of recent scientific advances there is a reasonable likelihood that umbilical cord blood stem cells will become of significant medical value in the coming years. Some argue that the State should put resources into establishing a national umbilical cord blood bank, similar to the national blood bank, where everyone can donate their babies' cord blood and where cells are shared with patients based on medical need. Others argue that parents who wish to pay commercial companies to store umbilical cord blood should not be prevented from doing so. They state that umbilical cord blood storage is akin to other forms of medical insurance, which might never be needed, and that parents who can afford to do so should be free to make an autonomous decision i.e. a decision free from external influences.

Q2 What is the moral status of the embryo?

Moral status refers to the moral value we give to the various beings with which we share the world i.e. fellow humans and other animal species. Moral status also refers to the rights, if any, to which various beings are entitled.

There is a wide spectrum of opinions in relation to the moral status of embryos. There are those who believe that an embryo has full moral status and is deserving of the same rights, protection and respect as an adult human being from the moment of conception. Stem cell research involving the destruction of human embryos, therefore, is morally unacceptable for those who hold this view.

There are also those who believe that embryos gradually gain moral status as they develop (known as the gradualist approach). For instance, the implantation of an embryo into the mother's womb is regarded as a critical step. Others consider the appearance of a nervous system or the ability of the foetus to feel pain as critical points in development. Therefore, those who hold the gradualist view consider that the therapeutic possibilities offered by embryonic stem cell research may outweigh the infringements of the respect and dignity of the embryo.

Alternatively, there are those who consider embryos to be balls of cells, which do not have rights and require no legal protection. This group, therefore, have no moral objection to embryonic stem cell research being undertaken.

Q3 Is an embryo a person?

Related to the debate regarding the moral status of embryos is the debate about personhood. There are numerous opinions regarding its definition and onset. On one side there are those who argue that two conditions are required for personhood to be in place, namely the ability to reason and the capacity for self-awareness, which both require a certain level of brain function. They say that because embryos do not have such capacities, they should not be afforded personhood or full moral status. However, on the other side it has been argued that some people, e.g. the severely mentally incapacitated and very young babies, would not have the capabilities required for personhood, yet society still considers them worthy of full moral status.

Q4 Does the potential of embryos affect their moral status?

The potentiality of embryos is also an important consideration when discussing moral status. Some commentators have expressed the view that embryos are due considerable moral status. They state that while embryos are not yet considered persons, they are part of the human family and that, if not interfered with, they have the potential to develop into persons. Others who argue that a being's potential does not always translate into reality, dispute the potentiality argument. For example, many of us have the potential to become criminals, yet it would not be considered reasonable to treat us as such unless we actually fulfil that potential. This group argue that moral status and its associated rights and protections should be based on the actual rather than the potential properties of a being.

Others have argued that since the rate of natural embryo loss, before and after implantation in the womb is somewhere between 30-80%, the potential that embryos have to develop is not very strong. Consequently, it has been argued that this weakens the potentiality argument.

Q5 Should embryos produced but not used during IVF be used for stem cell research?

Embryos, which are produced during in-vitro fertilisation (IVF), may not always be implanted e.g. a couple may have completed their family or may have separated. These unused embryos might be placed in storage, allowed to perish, donated to other couples or donated

for research. Proponents of embryonic stem cell research argue that embryos produced but not used during IVF should be made available for use in research. They claim that there is a moral onus on society to use these embryos, which would otherwise be allowed to perish, for research into debilitating or life-threatening illnesses and injuries. However, those who afford full moral status to embryos reject this argument and compare research on embryos produced but not used during IVF to performing research on terminally ill people without their consent. They also argue that allowing embryos to perish is not equivalent to actively destroying them.

Q6 Should embryos be created specifically for stem cell research?

Therapeutic cloning is the process by which human embryos are created in order to obtain embryonic stem cells for research purposes. Proponents of embryonic stem cell research argue that the creation of embryos specifically for research should be permitted. Some argue that because sperm and egg are not combined to create these embryos, such embryos do not have the same moral status as embryos produced but not used during IVF. However, opponents say that the creation of embryos specifically for research represents disrespect for human life because creating embryos, which are never intended for implantation, treats the embryo merely as a means to an end. They also dismiss the creation of embryos specifically for research as premature when there are other more ethical sources of stem cells available e.g. adult stem cells. Others fear that allowing the use of therapeutic cloning to create embryos for research would set science on a "slippery slope" towards reproductive cloning.



Q7 Where will the eggs, necessary for conducting therapeutic cloning, come from?

In order to undertake therapeutic cloning scientists would need to have access to a supply of eggs. Concerns have been raised regarding the procurement of these eggs. The harvesting of eggs from women is a procedure not without risk, which could result in ovarian hyperstimulation syndrome i.e. ovaries become enlarged and fluid accumulates in the abdomen causing pain, nausea, breathing difficulties which can lead to hospitalisation and, in extreme cases, death. There are also fears that significant financial incentives may be offered to women in order to encourage them to donate their eggs for research. Opponents argue that paying women for egg donation would lead to the commercialisation of the human body by placing a monetary value on body parts. Furthermore, there are fears that paying women for their eggs could lead to the exploitation of the economically disadvantaged as only those in need would be persuaded to take risks for financial gain. However, others argue that in the interest of personal autonomy women should be free to choose whether or not they wish to undergo medical procedures in return for payment.

An alternative source of stem cells to adult tissue and embryos is the creation of human-animal hybrids or chimeras. The word chimera refers to a Greek mythological creature, which had the head of a lion, the body of a goat and the tail of a snake. Human-animal chimeras are created through the fusion of human cells and animal eggs. Proponents argue that using human-animal embryos, would negate the need to use eggs from women to produce embryos for stem cell research. Opponents raise concerns that the creation of chimeras for the purpose of stem cell research will blur the distinction between humans and animals. They say that there is a significant “yuk” factor associated with mixing elements of humans and animals and that the public might view the research as “Frankenstein science”. There are also concerns that the mixing of different species will increase the risk of transferring animal diseases to humans.

Q8 Should the Irish Health Service provide possible future treatments developed from embryonic stem cell research to Irish citizens?

There is currently a debate regarding the decisions faced by future policy makers in the event of therapies being developed from embryonic stem cell research. Some people argue that it would be morally inconsistent for future Governments to provide treatments derived from embryonic stem cell research when the research itself is not permitted here. They argue that making treatments available here would be akin to being complicit in the destruction of the embryos used for the research. On the other hand, some argue that if treatments become available the damage will have already been done and that the therapies could be used to treat sick members of society. They argue that it would be unethical of society not to provide the treatments. Proponents also argue that the provision of treatments derived from embryonic stem cell research would depend on how far removed the treatments would be from the initial research e.g. whether the treatment consisted of embryonic stem cells or was a synthetic product based on research involving embryonic stem cell research.

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