

Human embryonic stem cell research and ethics

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What is ethically at issue with embryo research where the fertilized egg has to be destroyed?

The moral status of the embryos used to derive stem cell lines is debatable (1). Embryonic stem cell research poses a moral problem, as it brings into tension two fundamental moral principles that we highly value: the duty to prevent or alleviate suffering, and the duty to respect the value of human life. The harvesting of human embryonic stem cells violates this second duty as it results in the destruction of a possible human life. Both principles cannot simultaneously be respected in the case of embryonic stem cell research. The question then is which principle ought to be given precedence in this conflict situation. Should we give more weight to the first, and permit destructive embryonic stem cell research because of its potential benefits? The aim of stem cell research (to cure diseases and relieve suffering) is universally recognized as a good aim (2). Or should we give more weight to the second, and prohibit destructive embryonic research because it violates respect for the value of the embryo as the very beginning of a possible human life (3)?

What moral status does the human embryo have?

The moral status that the human embryo is given varies. Three different main positions with variations can be separated.

1. Having full moral status after fertilization of the egg

This point of view can be divided into two: considering embryos *worthy of protection simply because they are human* or considering them as *potential persons*. Philosophers differ on this question. Whereas many philosophers, particularly utilitarians, do not consider a fertilized human egg before implantation to satisfy the criteria of personhood, others take a different view. However, the criteria of personhood are notoriously unclear. The perspective of the same point of view is that *fertilized eggs are worthy of protection simply because they are human*.

Arguments: There is no non-arbitrary point, a morally significant dividing line in the continuum of physical growth between an embryo and a developed human. Since a developmental point at which personhood is acquired cannot be pointed out, individuals are counted as human beings at their embryonic stage as well as their fully developed stage (3). If our lives are worthy of respect simply because we are human, it would be a mistake to think that at some younger age or earlier stage of development (e.g. when we began our lives as fertilized eggs) we were not worthy of respect (4). Therefore, if we do not accept fertilization as a morally decisive moment from which full protection should be guaranteed, there is no other similarly decisive moment. Human embryos differ from other human beings not in what they are, but in their stage of development. A human embryo is a human being in the embryonic stage, just as an infant or an adolescent is a human being in the infant or adolescent stage (5).

Counter-arguments: Even if it is not possible to point to an exact dividing line in human development at which personhood is acquired, it may be argued that whenever the transition occurs, early pre-implantation stage embryos do not have the psychological, physiological, emotional or intellectual properties that we associate with personhood (3). It, therefore, follows that if human embryo does not fulfill the criteria for personhood, it does not have any interests to be protected and thus may be used instrumentally for the benefit of those who are persons (6). The fact that every person began life as an embryo does not prove that embryos are persons either. For example, although every oak tree was once an acorn, it does not mean that acorns are oak trees or that we should treat the loss of an acorn

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as the same kind of loss as the death of an oak tree (4). There is an opinion that instead of the end of the process of fertilization of the egg, a human embryo becomes worthy of protection at around day 14 after the fertilization. There are several reasons for this opinion:

- It may be argued that it is the implantation of the blastocyst in the uterine wall that is the best landmark for the definition of human life. Indeed, this is the first stage at which the individual is defined because the embryo is past the stage in which it can split to form twins (1). The end of the possibility of twinning is around day 14 after fertilization. Before this time, a researcher in a laboratory could divide a four-cell embryo into four embryos and, on the other hand, fuse four early embryos into one. It is only after twinning is not possible any more, when the life of one individual starts as a recognizable one (7).
- It may also be argued that it is the formation of the nervous system that is the landmark for the definition of life, since this is then that the possibility of sensation first exists. Up to embryonic day 14, the blastocyst has no central nervous system and, therefore, cannot be considered sensate. If we can remove organs from patients who have been declared brain dead but are still alive in some sense in order to save the lives of those who are alive, we can use two hundred-cell embryos as cell donors at the same moral status as brain dead individuals (1). Embryological studies now show that fertilization is itself a process (not a "moment"). Therefore, it can be argued that an embryo in the earliest stages (including the blastocyst stage, when stem cells would be extracted for the purpose of the research) is not sufficiently individualized to have the moral weight of personhood (8).

Arguments: Although embryos do not *currently* exhibit the properties of personhood, they *will*, if allowed to develop and fulfill their potential. Since embryos are *potential persons*, they ought to be accorded the moral respect and dignity that personhood requires. For example, we still treat unconscious individuals as persons even though they are not able to exercise the properties of personhood in their present state. But we know that these people *will* be able to when they become conscious again (3).

Counter-arguments: The embryo in itself cannot develop into a child without being transferred to a woman's uterus. It needs external aid to enable its development and hence it does not have an active potentiality to develop into a human being without help (9). Even with the external aid provided, the probability that embryos used for *in vitro* fertilization will develop into full-term successful births is low. This probability is also very much context-dependent: e.g. on the quality of external human intervention, such as transferal to uterus, and on other factors such as whether the embryo will implant and grow to term or even on the conditions of giving birth. Thus something that could potentially become a person should not be morally regarded as if it actually *were* a person. Contrary to the previous statement, the temporarily unconscious persons already had all the properties of personhood *before* falling into unconsciousness and will have them again when they come out of it (3).

2. Having a moral status that begins with deserving protection and increases as the fertilized egg becomes more human-like

Arguments: The main point of the gradual view is that the moral status and the protection of the embryo should increase as the fertilized egg becomes more human-like. There are several reasons for such a position:

- There are degrees of value of a life depending on the stage of that life. Consequently, there are degrees of respect that ought to be shown to that life at those stages. They can be identified as follows: the implantation after the sixth day, the appearance of the primitive streak at the end of the second week, the viability phase or even birth itself (10). At different stages of the end of life we tend to make different judgments of how great that loss is,

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depending on the stage of the lost life. Thus a fertilized egg before implantation in the uterus could be granted a lesser degree of respect than a human fetus or a born baby (3).

- There is a natural embryo loss in pregnancy, where more than half of all fertilized eggs either fail to implant or are otherwise lost. Therefore, if natural process entails the loss of some embryos for every successful birth, the loss of embryos that occurs in stem cell research should not worry us either. Those who view embryos as persons might reply that high infant mortality would not justify infanticide. But the way we respond to the natural loss of embryos suggests that we do not regard this event in the same way as the death of an infant (4).

Counter-arguments: However, there are also several reasons why human embryos at the very beginning of their existence should have the same protection as more developed embryos or fetuses:

- Whatever moral status does the human embryos have, the *life that it lives has a value to the one who lives this life*. We protect a person's life and interests not because those interests are valuable from the point of view of the universe, but *because they are important to the entity concerned*. Therefore, the life of the human embryo should be protected because it has a value to the embryo itself (3).
- We should be cautious and refrain from destruction of fertilized eggs even if we are not sure about their dignity, simply because being uncertain as to whether a particular organism is a human being, it would be more reasonable to refrain from destroying it. For example, a hunter refrains from shooting if he is not sure whether the particular object at which he is aiming is a deer or a man (11).
- Judging the moral status of the embryo from its age is making arbitrary definitions of who is human. For example, even if we consider that the appearance of the primitive streak at day 14 after the fertilization of the egg is the threshold of when the embryo acquires moral worthiness, we must still acknowledge that patients who have lost part of their cortex from a stroke or Alzheimer's disease are no less human than they were before (12).

3. Having no moral status at all, regarded as organic material, with a status no different from other body parts

Arguments: Fertilized human eggs are merely parts of other people's bodies until they reach a certain autonomous or independent developmental stage. Accordingly, they have no independent moral status at all, and are merely the property of the people from whose body they came. The only respect due to these blastocysts is the respect that should be shown to other people's property (3). The blastocysts before implantation cannot be harmed by being destroyed. To be harmed means to have an interest or interests defeated. For a being to have an interest, this being must have beliefs, desires, expectations, aims, and purposes. The nervous system of such early embryos is not developed enough for this. Because they are not the subjects of interests, such early embryos cannot be the subjects of basic rights that protect interests (3). A pre-implantation embryo contains potentially all the cells of the human body, and by conducting research one is not destroying it, but merely directing it to become certain cells and not others, since the cells of such an embryo are still totipotent (e.g. they are still capable of multiplying into twins) (13). It can also be argued that a new human organism (at the embryo stage) is only the predecessor of the organism that the human being ultimately born will be (11).

Counter-arguments: By directing an embryo to "become certain cells", the embryo is prevented from developing in its normal complete fashion. It is completely reprogramming an embryo and thus preventing it from becoming what it was programmed to become – a human being (14).

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Embryonic stem cell research and religion

The view concerning the moral status of the early human embryo before the time of its implantation in the uterus differs depending on religion.

- **Roman Catholic, Orthodox, conservative Protestant Churches:** Since a human embryo is believed to have a status of a human individual from the moment of the fertilization of the egg, it has the right to its own life, and every intervention not in favor of the embryo is a violation of that right. No end believed to be good (e.g. using stem cells to prepare other differentiated cells to be applied in what look to be promising therapeutic procedures) can justify the destruction of the embryo, which is believed to be a wrong action (15). The Orthodox Christians as well as Roman Catholics and Conservative Protestants affirm the sanctity of human life at all stages of development and believe that the process toward authentic human personhood begins with the zygote, which is committed to a developmental course that will ultimately lead to a human person.
- **Less conservative Protestant Churches** believe that the embryo has a potential human status, reflecting its gradual development from basic cells to a fetus. Thus some embryo research may be permitted. The life of the embryo is weighed against the possible benefit for the society from embryo research. The life of the human embryo is sacred from conception, but there are circumstances under which embryo research might be allowed prior to the “primitive streak” stage (around 14th day after the fertilization), bearing in mind the seriousness of certain medical conditions that could possibly be treated.
- **Judaism:** The Jewish religious tradition emphasizes the importance of the saving of life and considers the ultimate goal of human embryonic stem cell research to be life saving. Healing in Judaism is not only permitted, it is required to be an active partner in the world’s repair and perfection (8). Man is obliged to build and develop the world in every direction favorable to humanity. Therefore, any activity that contributes to advancements in the world cannot be considered as contradicting God’s decrees (16). It is also believed that it is God who has given the power to create new technologies (10). Anything, which has no reason to be prohibited is permitted without having to find a reason for its permissibility (16). In Judaism the human fetus less than 40 days old (10) and certainly the pre-implantation embryo does not have a full human status (17). After those first 40 days the embryo in the uterus is considered a part of the woman until birth (9).
- **Islam:** The majority of Muslim thinkers through the ages have accepted the morality of abortion through either the fortieth day or the fourth month of pregnancy (8). It is believed that the soul is “breathed in” to the human embryo on the 40th day after fertilization and this is when life becomes sacred (18). All schools of thought in Islam accept that the fetus is accorded the status of a legal person only at later stages of its development, when perceptible form and voluntary movements appear. The thinkers make a distinction between a biological and a moral person, placing the stage of the moral person after the first trimester of pregnancy (8). However, Muslim jurists differ over whether “breathing-in” of the soul takes place in 40 or 120 days (10). Also, it is believed that there is no disease that does not have a cure, and therefore the cure should be sought. Medical progress is a strong value and stem cell research is acceptable due to its therapeutic benefits. According to the Muslim faith, the supernumerary embryos cannot be donated to other couples, as the lineage of the father must be respected. In this view, conducting research on supernumerary embryos that will no longer be used for *in vitro* fertilization purposes rather than destroying them is choosing the lesser of two evils (18).

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- **Buddhism and Hinduism:** Buddhism prohibits harm to any sentient beings, which presents possible restrictions on embryo and animal research (17). Also, every action (e.g. killing) that treats human beings as non-humans is considered immoral. For Buddhists, however, not all areas of medical biotechnology lead to ethical problems: more advanced medical biotechnology (where research is conducted on molecular level) is likely to be acceptable. Molecular human parts, such as cells, are hardly seen as human beings, thus their destruction in the process of research is not likely to be seen as morally wrong (19). Regarding the research on human stem cells, the intention is important. If the intention of the research is to help and benefit humankind, such research is considered ethical. On the contrary, if the research is done just for the sake of making money out of it, it is considered as unethical. But since Buddhism places great importance on the principle of non-harming, it has grave reservations about any scientific technique or procedure that involves the destruction of life, whether human or animal. However, the principle of non-harming can be interpreted as prohibiting only the harm on sentient beings that is those who are able to feel. Therefore, Buddhism could accept research on non-sentient embryos before the day 14 of their development (8). Hinduism, like Buddhism prohibits injuring sentient beings. The Hindu tradition rejects both animal research and the destruction of sentient embryos (17).

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