

Stem Cell Debate

Jennifer Tarner

Helena College University of Montana

Stem Cell Debate

Science has always been on the cutting edge in medicine, and with that comes major debates on many moral issues. Advancements in medicine happen everyday, and in 2017, one of the biggest ones is Stem Cell Research (SCR). With its complexity and enormous range of categories, including autologous adult stem cells, allogeneic stem cells, and umbilical cord blood stem cells, the ones that seem to be attracting the most contention are Embryonic Stem Cells (ESC). This cutting edge research has stirred up controversy in regards to using ESC to either save lives or, what others believe, destroy them. With everyone having different views on when life begins, this is the ethical dilemma of whether scientists should be able to use ESC that could potentially one day save the vulnerable and dying.

Embryonic Stem Cell Research (ESCR) has the potential to help with the advancements in innovative techniques for treatments of incurable diseases. Alzheimer's, liver disease, kidney disease, and many more are thought to have great potential in the future for treatments made from ESCR. However, the moral questions pertaining to ESCR are the creation and destruction of human embryos and fetuses for research. Carvalho and Ramalho-Santos (2013) in their article "How Can Ethics Relate to Science?" discuss the essential characteristics of stem cells and how they develop. They start by explaining that the embryonic stem cell starts off as the fertilized human egg cell, which then divides into two blastomeres. They then divide to form four and eight cell embryos. After a week of developing, the first specification starts to form which is known as the peripheral layer. This layer is responsible for the embryo joining to the placenta, the cells of the inner cell mass, called the pluripotent embryonic stem cells. After they

continue to develop and implant, they then differentiate into committed cells with specific lineages and particular functions. When the pluripotent cell lines derived from the inner cell mass is removed from the biological context, the embryo becomes the embryonic stem cell (ESC). To obtain ESC in large numbers, researchers need to use either frozen or aborted embryos for research purposes. This is where many face dilemmas surrounding ESCR since they are arguing on whether the embryo is a human being (Carvalho & Ramalho-Santos, 2013, p.592).

Manzar (2013) in his article “The Ethical Dilemma of Embryonic Stem Cell Research” discusses the attitudes and moral concerns of medical students and graduates over the use of ESCR. Manzar conducted his survey at the Civil Hospital Karachi (CHK), Pakistan. He based his findings from a questionnaire he had them all take which included their demographic profile and questions from the study. The most shocking was their take on when life begins. The following answers from the study are given: “The majority considered that life begins at fertilization, since they view the embryo as being made up as living cells which can in future give rise to a life form” (p. 103). Manzar then states his findings from the second majority whose “view was that 120 days was the time period that the embryo took to develop a similarity to a human form and the process of organogenesis began” (p. 103). Lastly was the minority; they believed “that the beating of a human heart signified life” (p. 103). These questions were the most important to the whole ESCR debate because if one considers the embryo to be a life form when fertilized, then using it for research is morally wrong, since they are killing a human life. However, if one believed that the embryo did not become a life form until 120 days, then ethically the usage of those embryos would be permitted for research, since the

destroying of an embryo would not be the same as killing a human being, as the embryo is not considered a life form yet.

Manzar's (2013) findings on when life begins demonstrates the deliberation on whether to use ESCR, and the fight continues on. He also discusses alternatives in his article on whether parents would consider abortion if the embryo was proven to be genetically defective; however, many participants were against the embryo being used for research, despite the fact that the embryos were being discarded anyways. People don't always understand the life-saving potential that embryos could provide (p. 103).

The only other opportunity for regenerative medicine would be to use frozen embryos that are held for In Vitro Fertilization (IVF). Moen (2016) in his article "Review: Katrien Devolder. The Ethics of Embryonic Stem Cell Research" argues a great case. He states that if researchers can use the discarded embryos, which will be essentially discarded anyway, that some good can come from the loss. We can use the embryos for research. He states, "Researchers who use discarded embryos are helping to save lives" (p. 58). This is just another way ESCR can be used to help break through the barrier of regenerative medicine; however, the debate about when life begins is an argument that continues, but meanwhile many people with degenerative diseases suffer and die everyday.

In the United States, one name is being added to the organ transplant waiting list every 15 minutes (Mandrycky, 2016, p.422). With the list growing rapidly, only one-third of waiting patients are receiving matched organs from donors. Mandrycky (2016) in his article "3D Bioprinting for Engineering Complex Tissues" argues how this rising issue could be addressed by tissue engineering. They combine cells, engineering, and use

material methods to generate artificial tissues and organs that can save many lives. The only issue is obtaining the embryonic stem cells in order to make this new and upcoming approach a life saving mechanism. Other options are possible, such as other stem cells and using lab grown organs, but with more complex organs being needed, such as heart, liver, and kidneys, it's the embryonic stem cells that offer more potential. ESCR is important because of the potential, benefits, and direct need for the many people on the transplant list. Putting a human face on this issue by suggesting that those people could be anyone's mother or father, sister or brother, or even a child, helps put it into an ethical perspective.

Many people who oppose ESCR have sincere convictions that life begins at conception, and those derive from their religious beliefs. Those convictions deserve respect and consideration. The Ethics Review Committee (ERC) would ensure that this research would not promote or increase the number of abortions or IVF. Nevertheless, while the debate rages on, people continue to suffer and die and hundreds of potentially life-saving embryos are being discarded everyday.

Ultimately, what is at stake here is our future for regenerative medicine. With incurable diseases and organ failure on the rise it's important to have this cutting edge research used to expand our knowledge on what could ideally save our lives. Even though everyone has different views on when life begins, knowing the value and life-saving results that could be obtained may well one day save the vulnerable and dying.

References

- Carvalho, A.S., & Ramalho-Santos, J. (2013). How can ethics relate to science? The case of stem cell research. *European Journal of Human Genetics*, *21*(6), 591-595. doi: 10.1038/ejhg.2012.232.
- Mandrycky, C., Wang, Z., Kim, K., & Kim, D.H. (2016). 3D bioprinting for engineering complex tissues. *Biotechnology Advances*, *34*(4), 422-434. doi: 10.1016/j.biotechadv.2015.12.011
- Manzar, N., Manzar, B., Hussain, N., Hussain, M., & Raza, S. (2013). The ethical dilemma of embryonic stem cell research. *Science & Engineering Ethics*, *19*(1), 97-106. doi: 10.1007/s11948-011-9326-7.
- Moen, B. (2016). Review: Katrien Devolder. The ethics of embryonic stem cell research. *Philosophical Forum*, *47*(1), 55-66. doi: 10.1111/phil.12097.