Cells of Life

By Luke Davis, English 102

Human embryonic stem cell (HESC) research is a recent development in the field of medicine. Human embryos contain versatile stem cells that can be manipulated to become any type of cell. They are thought to have endless possibilities in the field of medicine. Scientists believe they may be able to help treat or even cure degenerative diseases that are currently incurable, such as diabetes, Parkinson's disease, congestive heart failure, and cancer. Given these benefits, stem cell research should not only remain legal but also should continue to be funded by the United States federal government.

Human embryonic stem cells are critical in the future of the treatment of degenerative diseases. According to medical definitions presented by the Mayo Clinic, stem cells are the basic cells of the human body which can divide into daughter cells, which turn into "new stem cells (self-renewal) or become specialized cells (differentiation) with a more specific function" (Mayo Clinic Staff). There are several different types of stem cells, but the most commonly researched is the embryonic stem cell. Embryonic stem cells come from a blastocyst, an embryo that is three to five days old and has about 150 cells. They are what the medical community calls pluripotent stem cells, meaning they are versatile and can multiply easily. Embryonic stem cells can be taken from aborted fetuses, but it is much more common to collect them from embryos created in in vitro fertilization clinics. Because so many embryos are made, there are almost always extra embryos left over. The people for whom the embryos were made can decide whether to destroy the extra embryos or to donate them to stem cell research. Other stem cells include adult stem cells which are found in adults' bodies in small numbers.

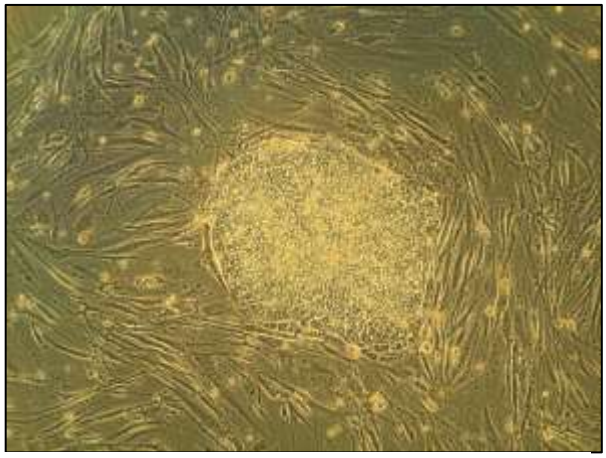

Figure 1 A colony of embryonic stem cells, from the H9 cell line (NIH code: WA09). Viewed at 10X with Carl Zeiss Axiovert scope. Image by Ryddragyn, 2006. Image available at Wikimedia Commons.

Adult stem cells are not versatile, as they usually cannot change into specialized cells. Scientists have recently begun to change adult stem cells into more versatile cells, called induced pluripotent stem cells, but researchers do not know if using these induced cells from adults might have harmful side effects in humans (Mayo Clinic Staff). Stem cell therapy, also known as regenerative medicine, can help to repair damaged cells or organs. While organ transplants are often a better way to help a patient, there is a limited supply of organs available. Stem cells are manipulated to become different types of cells, such as heart cells or nerve cells. When they are implanted into the damaged area, the healthy stem cells can work to repair the hurt tissue around them. Stem cell therapy to regrow bone marrow, used to treat leukemia and other blood-related diseases, is being applied today.

Because of its importance in the future of medicine, HESC research needs funding. The Alliance for Aging Research argues in its article "Embryonic Stem Cell Research to Save the Lives of Millions" that embryonic stem cell research, despite the moral ambiguity of using embryos, needs to be federally funded, not developed exclusively by private companies, in order to support the academic research that is necessary to unleash the full potential of embryonic stem cells. After explaining the vast benefits, the author contends that curtailing government funding for stem cell research could be devastating for its future. While the private sector would still be able to carry it out, public universities would not. The author quotes Dr. James Thomson as saying, "The best minds in this research are still in academia, not industry. . . . To exclude the best minds in the whole field would set back the effort tremendously" ("Embryonic Stem Cell"). The research would also be much less transparent if it were privately funded. If funded by the government,

the people of the United States would be able to direct the research in the path they thought to be most important, but the same would not be true with private funding ("Embryonic Stem Cell"). This article nearly perfectly embodies my viewpoint on HESC research. Clearly, HESC research has the potential to have immense health benefits for currently incurable diseases. In addition, although HESC research could progress while limited to the private sector, the most effective and transparent way to continue the research would be in public institutions of higher education and research. Federal funding would allow the most intelligent people in medicine to research applications of embryonic stem cells and then to integrate that into medical treatment.

The main concession of the Alliance for Aging Research to critics of HESC research is that it could be considered abortion because it intentionally terminates an embryo's life. However, few embryos would be affected. The author glosses over the negative effects of HESC research, but I agree with what they are saying. Because embryonic stem cells can divide indefinitely, "a small number of fertilized eggs could produce all the stem cells researchers will ever need" (Alliance for Aging Research). The death of embryos, while unfortunate, has such great life-saving potential. In addition, stem cells are taken from embryos created outside the human body in laboratories. Stem cells extracted from a very limited supply of these embryos could potentially save or improve millions of people's lives.

I believe it is moral to carry out HESC research because of its potential benefits in medicine. John Harris argues in "Stem Cells, Sex, and Procreation" that stem cell research is ethical. After explaining the benefits of stem cell research, he states his "principle of waste avoidance": if good can be done with existing resources, it should be done if the resources would be wasted otherwise. In this case, he is referring to frozen embryos from infertility clinics and aborted fetuses. Often, doctors and/or donors have to decide whether to let unused frozen embryos, which were intended for in vitro fertilization, die or whether to use them for research. He believes it is unethical to waste the embryos when they have such a great life-saving potential. He also believes that once a fetus is aborted, it is immoral to let the stem cells present go to waste for the same reason. I agree that embryos left over from in vitro fertilization should be used. The frozen embryos will die eventually, so what harm is done if they expire sooner rather than later? If their stem cells are extracted, the embryos can be put to good use, but the stem cells will simply be wasted if the embryo is never implanted in a woman's uterus. In order to appease those against using embryos, however, the parents of the embryos should be able to choose whether to donate the extra embryos to HESC research or let them die a natural death. I believe that it should not be legal to use aborted fetuses for HESC research, however. If that were allowed, there would be a potential that people would abuse the system by conceiving a baby for the sole purpose of aborting it and extracting its stem cells. Using aborted fetuses for HESC research would compromise the importance of human life.

James Delaney wrote "Embryo Loss in Natural Procreation and Stem Cell Research: How the Two Are Different" in direct response to Harris' "Stem Cells, Sex, and Procreation," focusing on the Catholic perspective. He explains that in vitro fertilization is unacceptable under the Catholic belief because it intentionally sacrifices or destroys some embryos so that another may live. Because it is immoral to destroy an embryo, such as through abortion, it is therefore immoral to destroy embryos by extracting their stem cells. For Delaney, it follows that HESC research, despite its potential benefits to medicine, is unethical solely because it sacrifices an embryo. While I understand that it is not ideal to sacrifice an embryo, I believe that the benefits of HESC research greatly outweigh the negatives. Very few embryos are needed in order to sustain HESC research, so one single embryo could eventually save or improve millions of lives. Is it fair to say that the life of one three-day old embryo created in a laboratory, not in a human uterus, is more important than the lives of millions? If even two people could be helped with one embryo, it would be worth the unfortunate cost that extracting stem cells causes.

Although there are great potential benefits that could arise from HESC research, some believe it is unethical. Dr. J.C. Wilke argues in "I'm Pro-Life and Oppose Embryonic Stem-Cell Research" that HESC research is immoral. He begins by explaining his opinion on the difference between experimenting on human tissue and human beings themselves. He says that it is ethical to carry out research on human tissue, but it is unethical to do the same on human beings. Wilke reasons that an embryo is a human being: human life begins when a sperm and an egg unite, which he says forms a fertilized egg. They

become a blastocyst within a week, when they consist of several hundred cells. He elaborates on his opinion that an embryo is human: "At the first cell stage, you were everything you are today. You were already male or female. You were alive, not dead. You were certainly human as you had 46 human chromosomes." An embryo, Wilke claims, is a human no matter what form it takes. For Wilke, when a frozen embryo is used for stem-cell research instead of being allowed to develop and die a natural death, it is "cut open" by a researcher, "thereby killing" the embryo in order to extract stem cells. I understand that Wilke is concerned with respecting the human body, but I do not believe his viewpoint properly achieves that goal. Although a blastocyst is a human genetically, the blastocysts involved in the HESC research debate have no potential to be a human being unless they are successfully implanted into a woman's body where they could develop into the specialized cells that make up the human body. If the embryos are not used for HESC research, they will die a natural death in a laboratory. It follows that the blastocyst would never live out life as a human being or anything close to it, as it has not grown any semblance of organs.

Is the quality of life of a blastocyst just as important, or, as Wilke contends, more important than the quality of life of an ailing patient? A person with diabetes, Parkinson's disease, or congestive heart failure presently has no hope of being cured. The stem cells from just a handful of blastocysts could eventually cure every person who has nearly any degenerative disease such as those. Because of that, I believe it would actually be immoral to let the opportunity HESC research offers to cure degenerative diseases go to waste.

The United States government should continue funding human embryonic stem cell research because of its life-saving potential. HESC research has nearly unlimited potential in curing degenerative diseases including cancer, diabetes, Parkinson's disease, and congestive heart failure. Although it requires the sacrifice of a limited number of human embryos, it could save the lives of millions of people in the future. Without federal funding, HESC research would not be able to continue efficiently or transparently. Could the United States really feel proud if we let those with degenerative diseases die needlessly? Human embryonic stem-cell research could be the next great breakthrough in the field of medicine, so we need to support it however possible.

Works Cited

Delaney, James J. "Embryo Loss in Natural Procreation and Stem Cell Research: How the Two Are Different." *National Catholic Bioethics Quarterly* 12.3 (2012): 461-76. *EBSCOhost*. Web. 1 Oct. 2013.

"Embryonic Stem Cell Research to Save the Lives of Millions." *Alliance for Aging Research Newsletters*. Alliance for Aging Research, 1 May 2001. Web. 1 Oct. 2013.

Harris, John. "Stem Cells, Sex, and Procreation." *Cambridge Quarterly of Healthcare Ethics* (2003): 353-71. Print.

Mayo Clinic Staff. "Stem Cells: What They Are and What They Do." *Mayo Clinic*. Mayo Foundation for Medical Education and Research, 23 Mar. 2013. Web. 03 Oct. 2013.

Wilke, J.C. "I'm Pro-Life and Oppose Embryonic Stem-Cell Research." *Life Issues Institute*. Life Issues Institute, n.d. Web. 07 Oct. 2013.