

EMBRYONIC STEM CELL RESEARCH: IS IT ETHICAL?

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12/12/2011

What exactly is the definition of a human life? What makes human beings alive? Is it our ability to process information or perhaps our ability to feel emotional pain? Is it the ever flowing stream of neuron transmitters flowing through our very minds? More importantly at what point does life truly begin? Is it at the point of conception or after birth? These are just a few of the many questions that have been left unanswered for centuries. But in our world today, these questions are of greater importance than during the time of Aristotle and Hippocrates, because with modern scientific discoveries we finally stand a chance of answering these questions.

At the forefront of these new scientific discoveries that may serve to answer many of these questions is stem cell research. Stem cells were given their name in 1908 but were not researched until the 1960s. There are two types of stem cells: adult and embryonic. Adult stem cells are found in bone marrow. They are difficult to extract and are not found in great numbers. Embryonic stem cells are cells taken from human embryos. They are able to differentiate into any type of cell including muscle, cardiac, and blood cells. This quality in a cell is called pluripotent and stem cells are the only cells known to do this naturally and artificially (Sherwood, 376). These embryonic stem cells must be collected from embryos that are already five days old. The destruction of embryos has sparked a controversy between advocates of stem cell research and the opposing “pro-lifers.”

At the center of this debate is the question that has intrigued philosophers and scientists alike for centuries: what constitutes a human life? According to biology there are five traits an organism must have to be classified as living: the organism must be able to grow, adapt to its environment, respond to stimuli, and be composed of cells.

In a society where new forms of technology and science are constantly evolving, it is no surprise that the discovery of stem cells has led scientists to further understand the potential uses of these newly found cells. But with the use of new scientific discoveries, there is usually a beneficial or negative consequence that follows. In the debate of stem cell research, the controversy heavily focuses on a question of ethics. Stem cell research has risen to such a great debate, because of the methods used in obtaining stem cells for research. The most debatable method involves taking stem cells from fertilized human embryos, usually those left over from donors of in vitro fertilization. By performing this process the embryo usually ends up dying. This gives way to another major rising question; is stem cell research ethical?

As part of every health care profession, a Hippocratic Oath, or law of ethics is created for all health care workers to follow. This oath was first established by Hippocrates, “The Father of Medicine” and a primitive physician during the early 5th century B.C.E. He established a code of ethics that he personally promised to abide by. Those in the health care field abide by a similar more modernized version of this oath. As part of the modernized version it specifically states, “I will remember that I remain a member of society, with special obligations to all my fellow human beings, those sound of mind and body as well as the infirm” (Tyson, 2001). Therefore, because this code of ethics states this, many would argue that a fertilized embryo falls into the category of a “fellow human being.” But is an embryo a human being and should scientists treat it as such?

Those against stem cell research or “pro-lifers” believe that stem cell research is a violation of human life, unethical, and therefore unlawful (Holcberg, 1). ““We should not mess with human life,”” (Experiment Resources, 2008) is the main reply of the opposing side. However, the point in determining whether stem cell research is truly unethical is by determining

at which point a fertilized embryo is considered a living human being? A man by the name of David B. Resnick attempts to answer this question by arguing, "...gametes and genes may be treated as incomplete commodities (i.e., non-human beings), but whole genomes, zygotes and embryos should not be sold on the research market "(Meyer, 2000). Essentially parts of genes may be used, but ultimately full and potential living human beings, such as a zygote, should not be used as research material. Resnick's attempt still does not fully answer this question and even to this day this question is involved in increasing debate and controversy.

Typically those who are opposed to stem cell research do so because of religious beliefs. They see the destruction of a human embryo as a sin against God similar to that of abortion. In some religions abortion is seen as an abominable sin even murder. The pro-lifers uphold the Catholic Doctrine that every human embryo "is to be respected and treated as a person from the moment of conception; and therefore from that same moment his rights as a person must be recognized" (Holcberg, 1). The statement, "'Humans should not be trying to play God,'" (Experiment Resources, 2008) is often stated on the opposing side. It is believed that when scientists destroy fertilized human embryos not only are they committing murder but they are seen as having power over God in choosing to take away life that hasn't had time to fully develop. This is in order to satisfy research expansion and potentially save many lives.

Those for embryonic stem cells believe they have the potential to be a "cure-all" for most types of diseases (Sanzenbacher). Embryonic stem cells are one of the greatest scientific discoveries of the 21st century. Proponents for stem cells see their potential in improving human life. Those for stem cell research argue that an embryo is simply a mass of undifferentiated cells no "smaller than a grain of sand" (Holcberg, 1).

While embryos meet some of the five traits of human life this does not classify them as being alive as a person. Bacteria also meet those requirements and are commonly used in laboratory experiments. The question is, are embryonic stem cells closer to bacteria or humans? Physiologically they bear a closer resemblance to people. Pro-lifers would argue that embryos have the potential to become a human child which they would if they were brought to term. However, they have the same potential to become a neuron cell or a muscle cell. What a stem cell becomes is determined by the signals it receives. In the womb, stem cells receive signals to differentiate into the various cells that compose the human body.

In a Petri dish the cells differentiate into whatever cell they are signaled to become. This potential to differentiate is akin to potential energy in physics. Potential energy is the energy possessed by the object or organism that it has potential to use. It is unknown how the energy will be used at that moment but the potential is there.

Stem cells may be able to cure everything from Parkinson's to spinal cord injuries (Lunau, 124.45). Scientists understand this and wish to pursue the subject of stem cells but have been harried in their research.

Stem cells have been the topic for lawsuits, legislation, and even executive orders. In 2001, the Bush administration issued an executive order stating that federal funding would only be granted to stem cell research on previously harvested cells. The order also placed a ban on stem cells being taken after this date. This order was issued in direct response to the growing controversy between pro-lifers and proponents of stem cell research.

However, the order failed to placate the pro-lifers and certainly did not satisfy researchers. It also failed to address the ethics of embryonic stem cell research. If anything, the Bush administration created more questions than answers such as, "Why is it ethical to use stem cells made from human embryos before August 9, 2001, but not after?" (Torr)

The order was made in attempt to pacify both sides. However, it seemed to have a clear bias towards the pro-lifers side. This was not a surprise considering Bush's personal views on stem cell research that he had expressed during his time as governor. Bush had "consistently opposed federal funding for research that requires embryos to be discarded or destroyed," according to his spokesman (Torr). This idea in itself is absurd. Extra fertilized embryos are frequently thrown away after successful artificial insemination. By the standards of pro-lifers this is seen as acceptable because it was done for the purpose of creating a new life and not for scientific study. But these embryos could easily be used in stem cell research, they have already been extracted, fertilized, and will simply be discarded if not put to use (Torr). This shows yet again a flaw in the argument of the pro-lifers. If one opposes the discarding or destroying of embryos then would it not make sense to oppose birth control and contraceptives as well? (Torr)

In March of the year 2009, President Obama lifted restrictions set by the ban established by the Bush administration. The original ban was put in place as an attempt to hinder the progression of "human embryonic stem cell (hESC) research." (Jenna Jadin, 2009) The issued lifting of the ban is known as the Executive Order 13505 and with this order followed new guidelines. Many guidelines came with the new order but essentially it states, "...that the Secretary of Health and Human Services, through the Director of

NIH, may support and conduct responsible, scientifically worthy human stem cell research, including human embryonic stem cell (hESC) research, to the extent permitted by law.” (Bethesda, MD) A lawsuit against stem cell research occurred in July 2011. A group of pro-lifers attempted to put a ban on government funding of embryonic stem cell research. This was done in response to President Obama lifting “restrictions on federal funding for embryonic stem cell research through an executive order”. (Carolyn Y. Johnson, pg. A.2) The case was dismissed by the judge much to the relief of the researchers and proponents of stem cell research. (Johnson, A.2)

"On behalf of the more than 100 million Americans who suffer from cancer, Alzheimer's, Parkinson's, juvenile diabetes, spinal cord injuries, and other debilitating diseases and disorders, we are thrilled this important biomedical research can move forward and that the science will continue to get us closer to better treatments and cures," said Lisa Hughes, president of the Coalition for the Advancement of Medical Research.
(Johnson, A.2)

According to Catholic doctrine an embryo becomes “alive” upon the moment of conception. If this is to be believed than through the use of birth control thousands of lives would be destroyed each year. If pro-lifers are against stem cells, then it seems only natural that they should oppose birth control as well. Both “kill” or destroy an embryo. With these in congruencies in the pro-lifers and scientists determination continue stem cell research it may seem as though this debate may never be reconciled.

It seems like an impossibility to get these two opposing sides to reconcile but there may be a solution that will eliminate the stem cell controversy altogether. Induced pluripotent stem cells are one of the latest discoveries of science. Induced pluripotent stem cells were discovered by a team of scientists in 2007. As they are a newer scientific discovery scientists are still trying

to figure out how they work and exactly what they can do. However, if they prove to be successful they may be able to solve the ethical dilemma surrounding stem cell research.

Induced pluripotent cells are derived from adult cells which have been triggered to express a certain gene or differentiate into a specific type of cell. As they are not taken from embryos but adult cells they are less controversial than embryonic stem cells. Many Christian groups and pro-lifers who oppose embryonic cell research are now turning to induced pluripotent stem cells for the answer. As these cells are “created” from adult skins cells they do not see an ethical dilemma that would hinder this research.

Could this be the solution to the stem cell controversy? Many believe that it is. “This process, if continued to be proven successful, would be a clear victory for science, human life, and Christian advocacy,” said one Andy Lewis, an editor for the Ethics & Religious Liberty Commission (Lewis). This statement may very well prove to be true. While this alternative of stem cell research has received support from the pro-lifers it also proving to be a promising alternative for scientists as well.

In 2007, a Japanese research team was able to mimic the reproduction of stem cells and create more. They also isolated and eliminated one of the four most potent cancer causing genes. Cancer had been a detrimental side effect in previous experiments on induced pluripotent stem cells. The team was able to create more of these stem cells without creating cancer (Lewis). These scientific experiments are significant evidence of the amazing potential induced pluripotent stem possess. Indeed, these experiments are only the beginning of the amazing discoveries to come.

In conclusion, there is a growing controversy over stem cells between proponents of stem cells and pro-lifers. This controversy is centered on embryonic stem cells in particular.

Embryonic stem cells are derived from fertilized embryos. They are pluripotent which means they can differentiate into any type of cell in the human body. Embryonic stem cells hold great promise in the field of scientific study. In time they may be used to cure Alzheimer's and Parkinson's. However, the pro-lifers oppose embryonic stem cell research on the basis that is morally wrong because it involves a destruction of a human life. In an attempt to pacify the two sides of this debate, the Bush administration issued an executive order banning the harvesting of stem cells after August 9, 2001. This order failed to solve the controversy and merely put almost a complete stop to a promising field of scientific study. These bans were later lifted during the beginning of the Obama administration allowing stem cell research to move forward with renewed fervor. While it seems as though the two opposing sides will never see eye to eye a new scientific discovery may be able to make the issue virtually obsolete. Induced pluripotent stem cell marks the future of stem cell research. These new stem cells are not extracted from embryos and have proven to be more potent than embryonic stem cells. With the controversy in the past, stem cell research will be able to move forward unmarred by political and social unrest and more advancement can be made. With stem cell research free of controversy who knows what can be accomplished?