Northern Caribbean University

College of Natural and Applied Sciences

Department of Biology, Chemistry and Environmental Sciences

Saving Superman:
A Look into Stem Cell Research
In Partial Fulfilment of the Course

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Section A

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Stem cells are a large focus of study in today's biomedical world. They are cells that exist in an undifferentiated state, and transform into differing tissue types depending on what neighboring cells are. The different types of stem cells have the ability to repair many classes of damaged human tissue. There are typically 3 types of stems cells they are: embryonic stem cells (ESC's) which are primitive cells that can be coaxed into developing into any of the 220 types of cells found in the human body. Adult stem cells, these bear some similarities to ESC's. Potential treatments have already advanced to human trial stage. Induced pluripotent stem cells are specially treated ordinary cells for example skin cells that are specially processed to exhibit some of the properties of ESC's. Research in this area is just beginning. Only one type of stem cell promises to regenerate virtually any class of tissue. This is the highly controversial ESC. Unfortunately, there is a dark side to the ESC. To obtain these cells from embryos will ultimately kill it. By definition, the acquisition of the ESC includes performing an abortion. This has created a great stir in the public world, where abortion is such a hot topic that politicians are hesitant to take either side.

The ESC is today's Pandora's Box. With this option now accessible in the medical world, everyone concerned with this topic must make a difficult ethical choice: whether or not saving existing life is worth the termination of potential future life. Stem cell research is a major problem that the world is facing today. There is a large group of people that support both sides of stem cell research. As expected, most of America is torn down the middle because there are many reasons to support stem cell research and many that are against it. These testimonies have impacted me in a great way. As a learner I did not know many of the issues surrounding stem cell research. It has opened my eyes to the ills and positives that surround our world. I am now open to being a more prudent follower in the activities happening around us every day. It has

made me a more prudent follower of the issues of the world. I will be more vigilant as a student of science in the advances being made around me whether it is something that I support or not. These testimonies have shown me that I need to be more aware of what is happening in the world and immerse myself in all things science. Based on the testimonies heard at the public hearing as a legislator I cannot support ESC research the others are of no harm to anyone if done carefully is has no moral ill effects.

This stance can be backed from many angles as ESC research is not only immoral but it is a sin in the sight of God. In the process of harvesting ESC's, the embryo is destroyed. The primary ethical question raised is whether embryos are people or property. An embryo is considered human life, it follows the zygote stage. Advocates argue that embryo's feel no pain, are not aware of their surroundings, and are not living. Human development begins after the union of male and female gametes during a process known as fertilization. Hence at the embryo stage there is a complete set of human DNA that has all the genetic information to for human life. These embryos deserve the chance to live just like you and I. This should be considered first degree murder.

A second ethical issue lies in the extreme inefficiency of harvesting ESC's. Specifically, the process requires women's eggs. To treat, for example, the 17 million diabetes patients in the United States will require a minimum of 850 million to 1.7 billion human eggs. Collecting 10 eggs per donor will require a minimum of 85 to 170 million women. The total cost would be astronomical, at $100,000 to $200,000 for 50 to 100 human eggs per each patient. Even more important than the dollars and the difficulty is that the process of harvesting a woman's eggs for stem cells places that woman at risk. Superovulation regimens for fertility treatments would be used to obtain women's eggs. The risks associated with superovulation regimens or high-dose

hormone therapies are debated. But there is a growing body of evidence showing that these practices, when used for standard IVF, can cause a wide spectrum of problems including memory loss, seizure, stroke, infertility, cancer, and even death. This points to yet another ethical issue, the future commercial exploitation of women, and particularly poor women, to collect their eggs. It is also common for persons pro ESC research to argue that it will alleviate human suffering, but at what cost? ESC advocates argue that it is worth it, that taking the life of one to save a much larger group is a noble cause. These embryos aren't giving their consent to be sacrificed. This argument as previously stated is thrown out the door as it is just thrown out to the public to brainwash them into even thinking that a set of stem cells from one embryo can provide treatments for the masses; warping the minds of the public into making it an acceptable loss. Essentially it is an exchange of one life for another.

Researchers know that stems cells derived from blastocyst-stage are currently of no therapeutic value and may never actually be used in the treatment of diseases. In fact, there is not a single ESC therapy even in clinical trials. In contrast adult and umbilical cord stem cells are already being used in the treatment of 65 diseases. Anyone informed about embryonic stems cells know that they divide rapidly and uncontrollably and are a high risk for inducing malignant tumors in patients. However, studies have shown that tumor formation does not occur when this is done in lower level animals when embryos have been implanted and extracted after several weeks/months of development where gestation into late embryonic stages was allowed. This shows that the real potential for curing any diseases from ESC's lies within the practice of fetus farming.

Adult stem cells are typically drawn from the bone marrow of patients. They also have advantages and have been used clinically about 30,000 times. They do have some disadvantages,

however: there are risks to the donor during extraction; there is significant risk of transmission of infectious disease from donor to recipient; and the cells have the potential for fewer divisions. The advantages of stem cells derived from umbilical cord blood are becoming increasingly well documented. They include: collecting stem cells from a baby's umbilical cord presents no serious risk to either mom or baby as it is collected after birth, making them a non-controversial source of stem cells. Because cord blood stem cells are coming from the purest possible source, they are less likely to be rejected; the risk of infection is also significantly less.

If measures are not put in place to ban fetus farming, public opposition to the practice could erode. People now find it as revolting, but what will happen to public opinion if the research is allowed to go forward and in fact produces treatments for some awful diseases or afflictions? I suspect that those in the biotech industry who do look ahead to fetus farming are hoping that moral resistance will collapse when the realistic hope of cures is placed before the public. Researchers are filling the public's mind with false hope and are just looking to make an industry out of ESC research, numbing the public to the idea little by little. There are millions of Americans who do not want to fund destructive embryonic research for the same reason they don't want to fund abortions. Prohibition of federal funding is the right way to go,

In listening to the public hearing the most revealing thing in my opinion was discovering what some of these ESC researchers are really trying to do. When there are other ways of reaching the same goals that the ESC's would achieve. It would be expected that ESC researcher would be delighted by these developments. After all, they point to uncontroversial ways to obtain ESC's or their exact equivalent and to create new stem cell lines that are immediately eligible for federal funding. It is quite disturbing to know that people could have total disregard for life. All they are trying to do is make an extra buck.

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