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The Importance of Stem Cell Research to Improve the Future of Medicine and Science

Cells are the building blocks of life. They have many types, but one form especially important in the science and medical field, is stem cells. Stem cells have the potential to treat and cure life-threatening diseases. As research and knowledge continue to grow, so do the possibilities of stem cells to revolutionize the medical and science industries. The treatments and research on these cells can provide numerous benefits for even the most malignant diseases and injuries. However, even though stem cells positively affect people and animals, some people still believe that the use of stem cells is unethical. The contrasting views on this topic have caused much controversy amongst people from different perspectives including; religious, moral, and economic. Ultimately, the funding, research, and use of stem cells in the medical field is necessary because of its medical and scientific benefits.

Stem cell procedures are quite complicated and intricate, but the concept is simple. Stem cells are cells in the most rudimentary form. These cells have the capability to transform into specific types of cells in the body and this can be done in different ways. The most common forms of stem cells are embryonic and somatic. Embryonic stem cells are cells taken from an embryo. There are around two hundred different kinds of cells, and embryonic stem cells have the possibility of transforming into any type of cell in the body. Somatic stem cells, also known as adult stem cells, are cells taken from a child or adult. These types of cells are explained further in the article, "Stem Cells" by Adam Piore. He explains that, "They have less flexibility and

‘stemness’ to change into different cell types, but they can still produce new cells, specialized to become part of a particular organ or tissue” (45). Because of this, embryonic stem cells are the most used and favored type, and this is what causes controversy.

The debate on stem cells has been ongoing for many years. The dispute occurs on a social, economic, and even political level. In fact, stem cells have been an exigent topic discussed in politics over the years. All disagreements derive from embryonic stem cells. Piore reports that this began in 1998 when scientists discovered how to obtain stem cells from human embryos and use them for medical research and procedures (43). This finding sparked the condemnation of the use embryonic stem cell. People oppose them because they feel it was unethical and immoral because of the procedure in which scientists extract the cells. Piore explains the reason for such beliefs when he informs, “Researchers puncture the outer walls of early stage embryos, known as blastocysts, and reach into the inner cell mass to extract them — a process that destroys the rest of the embryo” (43). On a social level, this causes controversy because people believe terminating the embryo is killing a human life. They view human embryo as equivalent to a functioning, adult human. They also believe that creating embryos for the sole purpose of medical research is not morally acceptable.

These opinionated differences on stem cells across the world caused the debate to enter politics. Since the discovery of stem cells, it has been a prominent topic amongst politics, not just in America, but all around the globe as well. The political debate has always been challenging because it derives from the ethical aspects of stem cells so politicians must establish regulations and laws based on subjectivity. The book, *Human Stem Cell Research: Opportunities for Health and Ethical Perspectives*, states that expert groups in areas such as North America, Continental Europe, and the Pacific Nations, have all studied, done thorough consultation, and generated

legislation based on the issue (Rossant 10). However, the most important to us Americans are the regulations and legislations constructed here in the United States because it directly affects us. The issue of stem cells is present on both a state and federal level. The article, “The New Federalism: State Policies Regarding Embryonic Stem Cell Research”, states that “American policy regarding the experimental use of human embryonic stem cells was forged in the period 2001–2006” (Acosta 419). This was when the stem cells truly became a prevalent topic in politics. This period was during George Bush’s presidency, he constructed many regulations during this time. Regulations were based upon both implementation and funding. George Bush developed most limitations of stem cells on the federal funding of stem cells. However, the article explains, “funding limitations govern what can be done scientifically. For example, research in which human embryos are either created or destroyed has been precluded from federal funding since 1995” (Acosta 420). Although scientists were not limited experimentally, their funds were, and this inhibited them from conducting experiments to gain more knowledge on the stem cells. Research on stem cells must be funded for scientists to learn more, and in turn, benefit the lives of those in need of medical treatment.

When people believe that embryonic stem cell extraction is immoral, they picture a human life that has the potential to develop into a human being. However, that is not always the case in the science and medical industry. Many embryos created for such purposes are done so through somatic nuclear transfer. The article titled, “The Ethics of Stem Cells Revisited” explains that this is used by taking cells from an adult and creating an embryo from them; the same technique for cloning organisms, like the famous sheep, Dolly (de Miguel-Beriain). However, this technique is used for the sole purpose of creating an embryo to extract stem cells, not for cloning. The same article states, “The first and principal ethical objection against somatic

cell nuclear transfer as a stem cell source is based on the idea that cloned embryos and natural embryos share a common moral status” (de Miguel-Berriain). However, this idea is irrelevant when dealing with such embryos created for stem cells extraction. A cloned embryo was not conceived by loving parents who want a baby. The cloned embryo is not even capable of growing into an adult under its circumstances. The article, “Embryonic Stem Cell Research: An Ethical Dilemma” explains this when it states, “The embryo cannot develop into a child without being transferred to a woman’s uterus. It needs external help to develop. Even then, the probability that embryos used for in vitro fertilization will develop into full-term successful births is low” (Hugs). These embryos will never be transferred into a woman’s uterus and do not have the physical ability to develop into a human. Thus, they should not be viewed as humans.

If stem cells are funded and researched, numerous possibilities and opportunities will arise for scientists and doctors to use this knowledge and implement them into the medical field. Stem cells can provide treatment for many diseases and injuries, and they are a gateway to improving people’s understanding of how such diseases work. Heart disease is among one of the many harmful diseases that stem cells can be used to treat. A report from the American Heart Association in 2016 states that about 85.6 million American adults have one or more types of cardiovascular disease, and about 2200 Americans die each day because of it (Mozzafarian). Heart disease is a very prevalent illness in the United States and stem cells can provide the possibility to provide care to those suffering from this disease and decrease the number of people affected and killed by this disease. An article titled “Stem cells: An insight into the therapeutic aspects from medical and dental perspectives”, by Muniapillai Sivakumar, explains that they can do this by extracting cardiomyocytes from embryos or bone marrow. These can be transplanted into a person’s diseased heart and restore and improve cardiac function (365). This shows just how

much stem cells can benefit and improve many people's health problems. If the use of stem cells were banned, it would put an end to the treatments that help so many people and the opportunities for new discoveries and improvements.

Another fatal disease stem cells are used to treat is muscular dystrophy. I know, personally, the terrible effects of this disease because my grandmother suffers from it. Her muscles are slowly, but progressively, deteriorating. This disease currently has no cure, but there are ways to help it and slow down the deterioration, especially using stem cells. Muniapillai Sivakumar also explains these ways in his article. He explains that stem cells can help counter the effects of muscular dystrophy by aiding the regeneration of muscle fibers (365). I see the struggles that my grandmother faces every day. Muscular dystrophy affects almost every physical aspect of a person; many that healthy people take for granted. Right now, she even needs assistance going to the bathroom and showering, and she uses an electric wheelchair because she cannot walk. Right now, stem cells cannot completely cure the disease but they can greatly improve the condition. If stem cell research is funded and continued, there are many opportunities for research to develop and improve upon their treatments. By doing so, it could greatly benefit my grandmother's health.

The debate on stem cells involves proponents and opponents on their uses, so it is important to try and think of resolutions that could be provide both groups of people with satisfaction. People who oppose stem cell research are against the destruction of human embryos. However, that is not the only source of stem cells that are used in the industry. Stem cells are derived in other different ways. Currently, embryonic stem cells provide the most beneficial results. However, if stem cells are continually funded and researched, scientist can develop new procedures in which stem cells are obtained in other ways that are equally or more beneficial.

One extremely beneficial alternative source of stem cells is umbilical cord blood. One important aspect of umbilical cord blood is explained in the article, “Umbilical cord blood stem cells: interesting history tainted with debate and controversy”. It states that “Umbilical cord blood has always been seen as a waste product and was discarded after delivery. It is therefore readily available and it has a relatively low cost of acquisition” (van der Merwe 7). Many people were against the idea of creating embryos solely for stem cell extraction, but umbilical cord blood from a living baby is disposed of anyway. It would be illogical to not use them for procedures that can treat people with diseases. The article also reports, “it is estimated that more than 30,000 transplants have been performed in children and adults for the correction of inborn errors” (van der Merwe). This shows that stem cells are very advantageous and deserving of research and funding.

Another benefit of stem cells that would not be controversial is the understanding of diseases and development of drugs. In a TED Talk with Susan Solomon, she gives an important lecture about the future and possibilities of stem cells. She explains that the development of drugs and understanding of diseases can be done with the utilization of induced-pluripotent stem, or, IPS cells. These are cells that are taken from a live human and reverted to a stem cell (Solomon). Nobody is harmed during this procedure and it provides promising results. She explains that scientists can take cells from a diseased person and turn them into IPS cells. Scientists can then watch the disease progress from that cell and give them a much better understanding of how the disease works and how to treat it (Solomon). By understanding such diseases, scientists also use this information to develop drugs to treat them. The article “Advancing drug discovery for neuropsychiatric disorders using patient-specific stem cell models” further explains the use of stem cells for drug discovery. It explains that these “drug

discovery screening efforts have higher probabilities of identifying effective disease-modifying and preventive therapeutics.” Stem cells have a lot of promise in the industry to develop sufficient drugs that incomparably treat their corresponding illness or disease, especially because science and people’s knowledge always continue to grow throughout the years.

Stem cells are undoubtedly a beneficial source to treat diseases that affect people around the world. It is important to continue their research and funding to brighten the future of medicine and science. Science and medicine are important aspects of everyday life because it affects everyone. Although controversy exists, the amount of benefits and important new discoveries that can arise from stem cell research ultimately outweighs their minor negative facets of the arguments. The future of science and medicine is the future of people.

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