Stem Cell Research Controversy

 There are many controversies currently active throughout the world, but maybe one of the most contestable is, the stem cell controversy. Stem cell research, by many, is considered a new hope for the future in medical practice and science because of the astonishing qualities that are held within the power of stem cells. This research has and will open up the possibilities in medicine, it may cure the incurable, and unfortunately not all agree with it. Many religious groups other individuals are against this research because of something that tests humanity's morals to the extreme; it uses an embryo, the beginning of a human life, from a woman’s womb or synthesized in this research, and destroys it for advancements in medical science.  The balance between scientific advancement and morality must be carefully walked as scientists bring about advancements in stem cell research.

                The question in this debate is whether an embryo is considered a person or merely a clump of cells without a soul. This question has been greatly discussed among many, even as far back to 1966, when the government came in and stirred up the debate even more.  In the year 1996, an amendment was passed called the Dickey-Wicker Amendment. This put a major limit to research and scientists' funding, saying that the government shall not use tax money to help pay for the destruction and/or creation of a human embryo for purposes of research. This limited stem cell research, but did not stop colleges or associations from funding the areas of stem cell research that the government refused to fund. Many labs were “funded on the dimes and quarters that people would put in jars at grocery stores”, says Dr. Willy Lensch, a stem cell researcher who has experienced the limitations put on him and his colleagues by the government and that amendment (Dr. Lensch). "The general prohibitions actually started in the presidency of Jimmy Carter," Dr. Lensch recollected, which shows us that the government has stepped in and made scientists and researchers jump through hoops before. Ever since the amendment, further limits have reached near preposterous standards and limits, making research something of a mere delusion (Lensch).

The more recent government limitation was set by President George Bush on October 9, 2001. He said that the government would no longer allow researchers to use federal funds for the destruction and creation of a new embryo(s). Bush found middle ground by saying the existing 60 stem cell lines have already had the death decision made for them so those only would be supported; the rest would not (Mann 4-6). In an article by Charles C. Mann he wrote, “…Bush argued, researchers would be able to ‘explore the promise and potential of stem cell research without crossing the fundamental moral line.’” (Mann 6). Many researchers were okay with this, like Dr. Lensch, until it made it a struggle for researchers to find a legal way to continue researching.

Finally in 2009, Barak Obama helped researchers by lifting some of the restrictions. Many were overjoyed that Obama finally agreed to allow federal funding for stem cell research, but there, like always, were new limits and conditions that scientists and researchers alike had to follow. The first; one out of every twenty second cell lines that were used must have been used from a discarded embryo or one used in Bush's term in office. The second term; the donors of the embryos shall not be paid under any circumstances. And the third and final: that the donors must know what exactly to, for, and what they are donating their embryo. Many researches and scientists were fine with this for it meant they could jump less hoops or see more light in the dark tunnel (Lensch).

 Knowledge and background on stem cells is an important part of understanding the debate. To start off, there are human embryonic stem cells (hESC's). Stem cells start by a zygote, the first cell that a sperm and egg create. After cell division of zygote becomes a blastomere, a cell essential for something called blastula formation, which is early development of stem cells, embryonic stem cells, it divides into other cells until it reaches between 150-200 cells, which are an embryo. There are also adult cells called Induced Pluripotent Stem Cells (iPSC's) which are genetically reprogrammed stem cells to mimic the acts of embryonic stem cells. These are *mainly* found in bone marrow, but they can be found in other locations in their body (BBC).

Stem cells are used to treat damaged tissue and to create new and healthy cells. The process starts with the cell. A single stem cell, also known as a somatic cell, can create an entire cell line. These are specified in a lab into cells that can be used to put in the human body. Cells are specified until they reach the exact cell the scientists want. Stem cells are immature and unspecified cells, meaning they have no specific duty or contribution yet. Scientists can specify them (mature them) into any cell they want, like a blood cell.

The main topic of controversy centers on embryos and their creation and destruction. The driving question is whether or not this embryo can be counted as person, has a soul, and other humanly attributes needed to classify a person as person. The opinions of the population count in major decisions such as this. Many support illegalizing this research for they believe embryos are persons. This is the constituent everyone focuses on. It is morally and emotionally hard to decide although we will never really know if an embryo has a soul (Lensch). The thought of creating an embryo for its destruction and thinking of it as a person is not only revolting but perverse in the eyes of opposers.

Opposers to stem cell research, including many religious groups, deem that an embryo is or should be treated as a person and not be tested on. There are some who believe that the churches should be left completely out of this, however, Lensch believes " In the debates in which I have participated, I have always welcomed religious views, except when they attempt to replace science, such as when a given individual says, based on religious grounds, that a certain area of research is not valuable scientifically based on a specific religious view they hold. I would feel the same way if a scientist attempted to put down an argument that was clearly religious in nature by misrepresenting science.", Lensch overall says the church is such an important part of society it should have its views on this and be able to participate. Many religions do not oppose all stem cell research though, instead they are against the creation and destruction of an embryo only for means of research. They believe it not only de-values life now, but will encourage further research to de-value life and morality (Murnaghan).

Another argument against stem cell research is that scientists have yet to fully "master" stem cell research. Because of this, mistakes can be made or something could go wrong in the cellular process. About 20 percent of mice we have tested on with Parkinson's disease have developed brain tumors. Sometimes test animals' can develop brain tumors or other tumors all around the body pending in what region the stem cells were treated in. Sometimes test animals' cells have also been known to develop what's known as "Chromosomal anomalies" where the DNA starts to change and/or become unusable. Scientists can also make mistakes. For although our knowledge on this subject spans quite a far, we still don't know enough to not make mistakes. For example, in 2001 a group of scientists programmed stem cells to produce insulin for someone with diabetes. It turned out that the stem cells were merely exposed to the insulin and absorbed some of it instead of producing it. One huge problem with stem cells is that they can carry viruses and diseases form one host to another. Consequently, before a patient is able to have the stem cells surgically put into their body they must take medicine that wipes out the immune system lowering. This lowers the odds of their body rejecting the transplant, but their body is vulnerable. A disease has a good chance of killing them or harming their body. Scientists do test stem cells on animals, but screening tests for animals is not always sufficient and unknown diseases could be passed on by the animal itself. Science in this area, and generally all areas, still have room for growth. In stem cell research we know a lot but still make mistakes in stem cell research (genome).

 Despite the risks, many arguments can be made in support of stem cell research. Researchers note that stem cell advances can make a good impact on someone's life, even saving it. Curing, reversing diseases, advancing evolution, and helping many kinds of both cancer patients and injured patients are part of the many things that stem cells can do. Many believe that stem cell research is for the best of man including Dr. Lensch in his statement after I asked him the question, he said "It very much is. My own motivation, and the motivation of every other scientist I’ve personally known, is to LEARN about the world, to add information to the lexicon of knowledge, and to make the world a better place for it. I know there are radical people out there who have different motivations, but me and my colleagues; we want the world to be better. We want to understand disease and development. We want to improve clinical practice. We want people to live the type of life they hope for and for their kids to do the same." (Lensch E).

Curing and reversing diseases sounds like something from a science fiction movie when in fact the cure the Parkinson's or reversing many diseases and disorders people have is not all far away. Researchers have been using stem cells to discover new information in the brain and around Parkinson's disease. By specializing stem cells, scientists can create new neurons and help rebuild the brain. They also use stem cells to put dopamine in the brain to learn more about this curious disease. Parkinson's isn't the only disease they can be cured or reversed; Type 1 diabetes, Arthritis, Burn victims, and ALL Cardiovascular diseases. Stem cell research holds new promises for many different medical practices. These cells grant renewable cells for people with the need of them. Many things can go awry at birth causing disease and disabilities. Researchers have found that before birth they can genetically implant stem cells to stop diabetes or these anomalies. By replacing the defective cells with highly specialized cells, researchers can seek out and eventually end diabetes to a certain level, mental defects, and eventually genetically perfect/enhance humans faster and with more potential than even the promise of today (Watson).

People with tissues and organs that are harmed rely on donors to live, but donors for anything are hard to get, the supply is much shorter than the high demand, so many are dying because of this. It's a tragic end when all they needed was a simple transplant from a donor and researchers have found a way to save many lives: stem cells. We harness these young cells to regenerate the dead cells with new and better cells in damaged tissue and organs. This will allow for fewer people to die from failure of a donor or transplant. Burn patients go through extreme pain and suffering from these burns and we can transfer stem cells and trigger them as specific cells in important areas where they can grow at a rapid rate allowing scientists to cover bigger burn or damaged areas with fewer cells, completely regenerating skin or others. Much like bone marrow transplants, scientists can locate and trigger specific stem cells out of body and put them back in after heavy specification of the cells and replace the tissue or organ. This is something many realize that we have already begun to utilize this awe inspiring and lifesaving power (Murnaghan).

HIV is constantly changing its DNA to counter act medicine for helping those who have it. One day HIV won't be affected by antibiotics, so our last resort will be stem cells. They can create maybe the last hope we have of defense against this disease. Because no vaccines are available to protect them, patients rely on their immune system which cannot protect itself. But stem cells can help renew the cells in their bodies creating a strong and lasting defense against it. It will provide longer and better lives for those who have HIV (it could be these patients best defense they will ever have against it) (Watson).

Stem cells will also allow human and animal testing of different drugs on these cells. An example of how this works is; a cancer cell line can be used to test anti-tumor drugs on. If the cells are specified enough, the results on whether the drug does or does not work will be extremely accurate. This is making stem cells very popular in the pharmaceutical field and offers a new, less harmful path, to experiment and even pave new paths in the medical field. Stem cells are not only saving human lives directly, but also can be used to enhance and test drugs so that those may save lives (MIT).

Using alternatives to embryonic stem cell research maybe a solution to some of the debate. Embryonic stem cells are not the only source of stem cells, in fact there are three main sources; umbilical cord stem cells, adult stem cells, and embryonic stem cells. The major conflict is about the use of embryos, but embryos are the best stem cell source for research (Murnaghan).

Adult stem cells are found in bone marrow and can be used almost exactly like an embryo's, except it has a certain DNA nucleus that can only be used by people with a similar type of stem cells. If not else they will be rejected from the body of the other. But, their benefits are quite respected and useful. They can be used directly for the person if they need the cells and the cells come from their own bone marrow. This does not require destroying an embryo. This is called an Altered Nuclear Transfer (Ant) where an embryo is not created nor destroyed to fix the problem (Utah).

The umbilical cord can be extracted before birth and frozen (Murnaghan). This makes for an easily accessible source of stem cells for the family to use if something happened. It is widely accepted and used by many. It can also be a source for research. It is considered one an alternative that is as close researchers can use than embryonic stem cells.

Human embryonic stem cells (hESC’s) that would otherwise be aborted can be used towards research that is already advancing us in medical and biological studies, as well as human pluripotent stem cells (hPSC's, these are unspecified stem cells in an adults bone marrow ). Employing stem cells will take science to an entire new level of research and practice. Regeneration has been using stem cells has already (Genome).

An alternative is where an embryo is extracted directly from the womb in the case of an abortion. This allows an embryo to not be created in a lab but more of an accident and someone doesn't want to bear a child (Utah). If they would give up the embryo, wouldn't it be better to put it towards science? Many believe so and that this could be a better alternative than creating an embryo for purpose of destruction and nearly an accident and turning it into progress (Genome).

 The question I mentioned previously that is really the basis of the opposing side of stem cell research; are embryos a person? What you consider a person or *when* you consider a person a person, probably greatly affects your opinion on whether or not stem cell embryonic research should be allowed. Many people and cultures alike have such different views of when a person truly comes to be, even the government. Although we all have different opinions we must all accept that others have different opinions on this and other matters, this can include church goers and even the church itself for religion is such a big part of our society, to exclude it would be unconscionable. The fact is we don't and will never know if in fact an embryo has a soul. If it does, does that mean that scientists *are* killing human beings?. Upon asking Dr. Lensch about this, he gave me an interesting answer that gave me insight into this important question in the debate; "In the area of human embryo research, there is no scientific data on whether a 'soul' exists. There is no scale on which you can put an embryo and say whether it is a person. What we have instead is a vast compendium of differing views about what it means to be a person, when that happens, and then how 'people' should be treated."(Lensch).

Many different cultures see life differently. For example, the Navajo belief is that a child cannot be named nor considered a person until one year of age, for in that year the "child" is too susceptible to diseases and things that could kill them. So once a year passes, if the baby is alive, it may be named and considered a person (Lensch C). The Greeks thought a person was a person when a woman finally felt it kick in the womb, otherwise it was not considered a person, for who could know if it was even alive? The Jewish belief is that it is a person after 40 days of known pregnancy (Lensch C). All religions, cultures and peoples have their point of view on it. Even the government decides when it thinks a person is a person. At birth, the government gives the parents a tax deduction, so the parents can have some more money to fully raise the child. Parents get this only when this baby is born, when the government says they are raising another *person.* So "...legally the government decides it's a person at birth." (Lensch C).

Stem cells have the potential to save many lives, but at the costs of embryos which contain the richest and most stem cells, and the question that's on everyone's mind is whether it is a human and can be created just to be destroyed for scientific purposes. These questions can't always be answered by others but only what you believe. The history of how everything came to be in this research and the alternatives can give us insight on what we can choose or even do to help that choice. Stem cells researcher is a very heated and complicated debate, and this may just be the debate that can truly change the world.

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