

Stem Cell Wars

December 17, 2005

The political war over stem cell research is heating up as evidenced by two recent events in the media. For the last few weeks, Senate Democrats have blocked action on a bill that would allow the use of umbilical cord blood in stem cell research. Although the bill passed the House by a remarkable vote of 431-1, the democratic leadership in the Senate would not allow a vote on the measure. The bill was even endorsed by the Congressional Black Caucus due to the positive appeal from former basketball star Julius (Dr. J.) Erving.

Also in the news was the decision by University of Pittsburgh's Gerald Schatten to quit the human cloning project of South Korean scientist Dr. Hwang Woo Suk. Dr. Schatten cited ethical concerns about possible coercion in obtaining eggs from female project staffers. Dr. Schatten also demanded that his name be removed from an article he co-wrote with Dr. Hwang for the journal *Science* because he believes it used fraudulent photographs in the article.

Background

Stem cells are the basic cells in our body. They get their name from their similarity to the stem of a plant which gives rise to branches, bark, and every other part of a plant. Embryonic stem cells are the cells from which all 210 different kinds of tissue in the human body originate. As an embryo develops into a blastocyst, a few layers of cells surround a mass of stem cells. If these stem cells are removed from the blastocyst, they cannot develop as an embryo but can be cultured and grown into these different tissues.

Stem cells are undifferentiated and self-replicating cells that have the potential to become the other differentiated

cells in our body. And that is why there is so much scientific and political attention being paid to stem cells.

The potential for stem cell research is enormous and intoxicating. Nearly 100 million Americans have serious diseases that eventually may be treated or even cured by stem cell research. Many diseases (like Parkinson's, heart disease, diabetes) result from the death or dysfunction of a single cell type. Scientists hope that the introduction of healthy cells of this type will restore lost or compromised function.

Moral Perspective

The moral problem with the research is that to obtain human embryonic stem cells, the embryo is destroyed. Embryos needed for human embryonic stem cell research can be obtained from three sources: (1) in-vitro fertilization used to produce embryos, (2) frozen embryos which are spare embryos left over from in-vitro fertilization, or (3) human cloning of embryos.

In addition to the moral problem is the scientific reality that embryonic stem cell research has not been successful. Although human embryonic stem cells have the potential to become any type of human cell, no one has yet mastered the ability to direct these embryonic cells in a way that can provide possible therapy for humans afflicted with various diseases.

Numerous stories are surfacing of the problems with human embryonic stem cells. One example took place in China where scientists implanted human embryonic stem cells into a patient suffering from Parkinson's only to have them transform into a powerful tumor that eventually killed him.

Often the media has not been telling the truth about embryonic stem cell research. So why hasn't the media accurately covered this issue? "To start with, people need a fairy tale," said Ronald D.G. McKay, a stem cell researcher at the National Institute of Neurological Disorders and Stroke. "Maybe that's

unfair, but they need a story line that's relatively simple to understand."

What has been lost in all of this discussion is the humanity of the unborn. Proponents of embryonic stem cell research argue that an embryo or fetus is a "potential" human life. Yet at every stage in human development (embryo, fetus, child, adult), we retain our identity as human beings. We are humans from the moment of conception. We do not have the right to dismember a human embryo because it's unwanted or located in a test tube in a fertility clinic.

Also lost in this discussion is the success of using stem cells from sources other than embryos. Successful clinical trials have shown that adult stem cells as well as umbilical cord blood have been very effective. These sources may provide cures for such diseases as multiple sclerosis, rheumatoid arthritis, systematic lupus, etc. Some studies seem to indicate that adult stem cells create "fewer biological problems" than embryonic ones.

No moral concerns surround the use of human adult stem cells since they can be obtained from the individual requiring therapy. And using blood from umbilical cords of newborns does not raise any significant concerns because the newborn is not harmed in any way.

In the last few years, stem cells have also been found in tissues previously thought to be devoid of them (e.g., neural tissue, nasal passages). And human adult stem cells are also more malleable than previously thought. For example, bone marrow stem cells can produce skeletal muscle, neural, cardiac muscle, and liver cells. Bone marrow cells can even migrate to these tissues via the circulatory system in response to tissue damage and begin producing cells of the appropriate tissue type.

Human adult stem cell research is already effective and raises

none of the moral questions of human embryonic stem cell research. Even biotech industry proponents of embryonic stem cell research believe that we may be twenty years away from developing commercially available treatments using embryonic stem cells.

All of this, however, seems lost on some in Congress who continue to push for additional funding of embryonic stem cell research. When democratic leaders in the Senate hold up a cord blood bill that will help people just to get a vote on an embryonic stem cell bill, they clearly have the wrong priorities. Adult stem cell research is already effective. Embryonic stem cell research is not.

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“Your Position Against Stem Cell Research Disregards Diabetics”

I know that you don't think it's right to use stem cells and you have that right, it's granted to you in the constitution. But do you have diabetes? Do you know what it's like to have to get blood 4 times a day to know what your blood sugar is so that you can make good decisions so you don't die and every time you get in a car to drive? Then have to stick a needle into your skin to give yourself insulin to survive because your body does not produce insulin anymore. Do you know what that's like? Do you? The way I see it from your webpage you're not looking at the 16 million Americans with diabetes that

have to live with this. If the stem cell research was to succeed then there would be no more Diabetes, Parkinson's and many other diseases.

I appreciate your passion for a desire to cure diabetes. It is a difficult disease, and I am sorry to learn that you suffer from it. However, allow me to reframe the argument.

We need to make a distinction between embryonic stem cells and adult stem cells. We have no problem with using adult stem cells to research treatment and cures of disease. What if embryonic stem cell research *doesn't* succeed? There are no guarantees. We haven't even cured a mouse, let alone treated any human disease with embryonic stem cells. Then we have will have wasted thousands of human embryos for nothing. Not to mention all the women who had to endure hormonal treatments to obtain their eggs to make the embryos. How much is their sacrifice worth to you?

What if adult stem cell research (research with no ethical questions and much hope of success) achieves a treatment before embryonic stem cell research? Again, we will have wasted thousands of human embryos for nothing.

I have a genetic disease myself, hemochromatosis, excess iron in the blood and organs. When left untreated it can lead to liver disease and cancer. I simply need a pint of blood withdrawn every 2-3 months to keep my iron levels under control. This is not the inconvenience of diabetes. But I am not without understanding of the issues. My health and convenience is not worth the sacrifice of human embryos who have no option of informed consent. I refuse to sacrifice the next generation in any way for my convenience. It's always been the other way around, the current generation sacrificing for the next.

You are also entitled to your opinion. But don't assume I have callously tossed aside the suffering of others. I simply

choose the life of human embryos, embryos who have every potential to form a human being if left in their natural surroundings, over my convenience. To suggest that these early embryos are simply reproductive cells like sperm and egg is disingenuous and medically incorrect.

Respectfully,

Ray Bohlin
Probe Ministries

The Controversy Over Stem Cell Research

What Are Stem Cells and Why Are They Important?

President Bush recently decided to allow the use of federal funds to research the therapeutic properties of privately produced human embryonic stem cells (ES). President Bush clearly maintained the prohibited use of federal monies to produce human ES cells, since the procedure requires the destruction of the embryo to obtain them, which is currently prohibited by federal law. To fully understand the ramifications of this decision, I will discuss the nature of stem cells and their potential to treat disease.

Most of the more than one trillion cells that form the tissues of our bodies possess a limited potential to reproduce. If you remove some live human skin cells, they may divide in culture (laboratory conditions) five or six times and then die. Special cells in the underlying skin layers are what produce

new skin cells. These cells' sole function is to churn out replacement cells. These are known as stem cells. Most tissues of our bodies possess stem cells that can reproduce the different cells required in that tissue. Bone marrow stem cells can produce the many different cells of the blood. They are called stem cells, since they are seen as the stem of a plant that produces all the "branches and leaves" of that tissue.

What I've described is referred to as adult stem cells. There is no controversy revolving around the use of human adult stem cells in research, since they can be retrieved from the individual requiring the therapy. The promise of adult stem cells has increased dramatically in recent years. Stem cells have even been found in tissues previously thought to be devoid of them, such as neural tissue. It has recently been shown that certain types of stem cells are not limited to producing cells for the tissue in which they reside. For instance, bone marrow stem cells can produce skeletal muscle, neural, cardiac muscle, and liver cells. Bone marrow stem cells can even migrate to these tissues via the circulatory system in response to tissue damage and begin producing cells of the appropriate tissue type.[\[1\]](#)

In addition to the advantages of previously unknown adult stem cells and their unexpected ability to produce numerous types of cells, adult stem cells carry the added potential of not causing any immune complications. Conceivably adult stem cells could be harvested from the individual needing the therapy, grown in culture to increase their number, and then be reinserted back into the same individual. This means the treatment could be carried out with the patient's own cells, virtually eliminating any rejection problems. Adult stem cells may also be easier to control since they already possess the ability to produce the needed cells simply by being placed in the vicinity of the damaged tissue.

Human Embryonic Stem Cells

The advances in adult stem cell research has only come about in the last three years. Traditionally it was thought that ES cells carried the greatest potential to treat wide-ranging degenerative diseases such as diabetes, Parkinson's, multiple sclerosis, spinal chord injuries, and Alzheimer's. Since ES cells derive from the inner cell mass of the early embryo (5-7 day old blastocyst), they are capable of forming all the tissues of the body. Therefore, researchers have long felt that human ES cells hold the greatest potential for treatment of degenerative diseases.

While the potential has always existed, the problem has been that in order to obtain these human ES cells, the embryo is destroyed during the harvesting procedure. In addition, while ES cells had been obtained and grown successfully in culture from several mammals, including mice, efforts at producing ES cells from other mammals had failed. Nobody was sure human ES cells could even be successfully produced until November 1998 when James Thomson from the University of Wisconsin announced the establishment of five independent human ES cell lines.[\[2\]](#) (A cell line is a population of cells grown from a single cell that has been manipulated to continue growing indefinitely in culture, while maintaining its cellular integrity.) Geron Corporation funded Thomson's work, so it did not violate the federal ban on government funds being used for such purposes. But his announcement immediately opened up a desire by federally funded researchers to use his already established human ES cells.

But there are potential problems and uncertainties in both adult and ES cells. While the ethical difficulties are non-existent for adult stem cells, they may not prove as helpful as ES cells. ES cells have the potential for universal application, but this may not be realized. As stated earlier, establishing ES cell lines requires destruction of human

embryos. An ethical quagmire is unavoidable.

Whereas adult stem cells can be coaxed into producing the needed cells by proximity to the right tissue, the cues needed to get ES cells to produce the desired cells is not known yet. Some in the biotech industry estimate that we may be twenty years away from developing commercially available treatments using ES cells.^[3] Clinical trials using adult stem cells in humans are already under way.

In August of 2000, NIH announced new guidelines allowing federally funded researchers access to human ES cell lines produced through private funding. The Clinton administration hailed the new guidelines, but Congressional pro-life advocates vowed a legal confrontation claiming the new guidelines were illegal.

The Options for President Bush

This was the situation facing President Bush when he took office. The pressure to open up federally funded human ES cell research mounted from patient advocacy groups for diabetes, spinal chord injuries, Parkinson's disease, and Alzheimer's. Additional pressure to reject federal funding of human ES cell research came from traditional pro-life groups including National Right to Life and the Catholic Church, with personal lobbying from Pope John Paul II.

One option open to the President and advocated by the scientific community was to free up all research avenues to fully explore all possibilities from ES cells regardless of their source. This would include federal funding for ES cells derived from embryos specifically created for this purpose. Few openly advocated this, but the oldest fertility clinic in the U. S. (in Virginia) announced recently that they were doing just that. Few within the government or research communities offered much protest.

Another option on the opposite end of the spectrum would have been to not only prohibit all federal funding on the creation and use of ES cells, but to also propose a law which would effectively ban all such research in the U. S., regardless of the funding source. Because of my view of the sanctity of human life from the moment of conception, this would be the ideal solution. However, this is not practical, since Roe v. Wade still is the rule of law in the U. S. This means that by law, a mother can choose to do with her embryo whatever she wants. If she wishes to end its life by abortion or by donation for research as a source of ES cells, she is free to do so.

A third option open to the President, and the one advocated by most in the research community, was to open up federal funding for the use and creation of ES cells derived from leftover embryos destined for destruction at fertility clinics. Some have estimated that there are over 100,000 such embryos in frozen storage in the U. S. alone. The intent is to find some use or ascribe some value to these leftover embryos. It is common practice in fertility clinics to fertilize 8-9 eggs at a time to hedge your bet against failure and to minimize expenses. As many as half of these embryos are left over after a successful pregnancy is achieved. These embryos are either left in frozen storage or destroyed at the request of the parents. So why not use them for research?

Other Options Available to President Bush

Advocates for ES cell research argue that if the embryos left over from infertility clinics are going to be wasted anyway, why not put them to some use and allow their lives to be spent helping to save someone else? The first mistake was to generate extra embryos without a clear intent to use all of them or give them up for adoption. Second, these tiny embryos are already of infinite value to God. We're not going to redeem them by killing them for research. Each embryo is a

unique human being with the full potential to develop into an adult. Each of us is a former embryo. We are not former sperm cells or egg cells.

Third, this is essentially using the dangerous ethical maxim that "the end justifies the means." A noble end or purpose does not justify the crime. Just because a bank robber wants to donate all the money to charity doesn't make the bank heist right. Nazi researchers gained valuable information through their many life-threatening experiments on Jews and other "undesirables" in the concentration camps of WWII. But most would not dignify these experiments by examining and using their findings.

A fourth option that I prefer is to close off all federal funding for human ES cell research. This would allow private dollars to fund human ES cell research, and federal dollars can be used to vigorously pursue the ethically preferable alternative offered by adult stem cells, which have shown great promise of late.

This would undoubtedly slow the progress on human ES cells and some researchers. Because of their dependence on federal research grants, they would not be able to pursue this line of research. But nowhere is it written that scientists have a right to pursue whatever research goals they conceive as long as they see a benefit to it. For years the U. S. Congress passed the Hyde Amendment that prohibited the use of federal funds for abortions, even though abortions were legal. The creation of human ES cells may be legal in the U. S. but that doesn't mean researchers have a right to government monies to do so.

The President did decide to allow the use of federal funds only for research involving the 60 already existing human ES cell lines. The President expressly prohibited the use of government dollars to create new ES cell lines, even from leftover embryos. Researchers and patient advocates are

unhappy, because this will limit the available research if these already existing ES cell lines don't work out. Pro-life groups are unhappy, because the decision implicitly approves of the destruction of the embryos used to create these ES cell lines.

Stem Cells in the News Since the President's Decision

When the President decided to open up federal funding for research on already existing human embryonic stem cell lines, just about everybody was unhappy. Researchers and patient advocates were unhappy, because this will limit the available research if these already existing cell lines don't work out. The supply just might not meet the research demand. Pro-life groups were unhappy, including myself, because the decision implicitly approves of the destruction of the embryos used to create these ES cell lines. They will cost researchers at least \$5,000 per cell line. Therefore, to purchase them for research indirectly supports their creation. Since both sides are unhappy, it was probably a good political decision even if it was not the right decision.

We certainly haven't heard the end of this debate. Members of Congress are already positioning to strengthen or weaken the ban by law. Either way, the policy of the United States has clearly stated that innocent human life can be sacrificed without its consent, if the common good is deemed significant enough to warrant its destruction. I fully believe that this is a dangerous precedent that we will come to regret, if not now, then decades into the future. The long predicted ethical slippery slope from the abortion decision continues to threaten and gobble up the weak, the voiceless, and the defenseless of our society.

What has alarmed me the most since the President's decision is the full assault in the media by scientists to gain even

greater access to more human embryonic stem cells, regardless of how they are produced. The ethical question virtually dropped from the radar screen as scientists debated whether the existing cell lines would be enough.

This attitude is reflected in the increasing attention given to potential benefits, while downplaying the setbacks and problems. The scientists speaking through the media emphasize the new therapies as if they are only a few years down the road. The more likely scenario is that they are decades away. Your grandmother isn't likely to be helped by this research.

Virtually nobody knows about the failure of human fetal cells to reverse the effects of Parkinson's disease in adults. About 15 percent of patients from a recent trial were left with uncontrollable writhing and jerking movements that appear irreversible. The others in the study weren't helped at all.[{4}](#) Chinese scientists implanted human embryonic stem cells into a suffering Parkinson's patient's brain only to have them transform into a powerful tumor that eventually killed him.[{5}](#)

Research with mouse embryonic stem cells has not fared much better. Scientists from the University of Wisconsin recently announced success in tricking human embryonic stem cells into forming blood cell-producing stem cells. Enthusiastic claims of future therapies overshadowed the reality that the same procedure has been successful in mice, except that when these cells are transplanted into mice, nothing happens. They don't start producing blood cells and nobody knows why.[{6}](#)

This debate will continue. Stay tuned.

Notes

1. H. M. Blau, T. R. Brazelton, and J. M. Weiman, 2001, "The evolving concept of a stem cell: entity or function," *Cell* Vol. 105 (June 29, 2001), p. 829-841.

2. James A. Thomson, et al., 1998, "Embryonic stem cell lines derived from human blastocysts." *Science* Vol. 282 (November 6, 1998): 1145-1147. Also in same issue see Perspective article by John Gearhart, "New potential for human embryonic stem cells," p. 1061-1062.

3. David Hamilton and Antonio Regaldo, 2001, "Biotech industry – unfettered, but possibly unfulfilled," *Wall Street Journal*, August 13, 2001, p. B1.

4. Tracy Maddox, 2001, Fetal tissue fails to cure Parkinson's patients. http://www.pointofview.net/ar_fetal.html. 3/21/01.

5. Charles Krauthammer, 2001, "The great stem cell hoax," *The Weekly Standard*, August 20/August 27, 2001, p. 12

6. Nicholas Wade, 2001, "Blood cells from stem cells," *Dallas Morning News*, September 4, 2001, p. A1. The article was a New York Times News Service report.

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A War of Words in Bioethics

Political battles are often won or lost with definitions. Proponents of abortion learned this lesson well. They didn't want to be described as those who were willing to kill innocent life. So they changed the focus from the baby to the woman and emphasized her personal choice. Those who are pro-abortion called themselves "pro-choice" and supported "a woman's right to choose." Changing the words and modifying the definitions allowed them to be more successful and more socially acceptable.

Homosexuals learned the same lesson. If the focus was on their

sexual activity, the public would not be on their side. So they began to talk about sexual orientation and alternate lifestyles. Then they began to focus on attacks on homosexuals and argue that teaching tolerance of homosexuality was important to the safety of homosexuals. Again, changing the words and the debate made the issue more socially acceptable.

Now this same war of words is being waged over cloning and stem cell research. The recent debate in Congress about cloning introduced a new term: therapeutic cloning. Those who want to use cloning argued that there are really two kinds of cloning. One is reproductive cloning which involves the creation of a child. The other is called therapeutic cloning which involves cloning human embryos which are eventually destroyed rather than implanted in a mother's womb.

Representative Jim Greenwood (R-PA) sponsored a bill that would permit this second form of human cloning for embryonic stem cell research while outlawing the first form of cloning to produce children. Although it was put forward as a compromise, pro-life advocates rightly called his legislation a "clone and kill bill." Fortunately, the Greenwood bill was defeated, and a bill banning all cloning sponsored by Representative Dave Weldon (R-FL) passed the House and was sent to the Senate.

Another example of this war of words can be seen in the floor debate over these two bills. The opponents of the "clone and kill bill" were subjected to harsh criticism and stereotypes. Both the debate on cloning and the debate on stem cells has often been presented as a battle between compassion and conservatives or between science and religion. Here are just a few of the statements made during the House debate on cloning:

Anna Eshoo (D-CA): "As we stand on the brink of finding the cures to diseases that have plagued so many millions of Americans, unfortunately, the Congress today in my view is on the brink of prohibiting this critical research."

Zoe Lofgren (D-CA): "If your religious beliefs will not let you accept a cure for your child's cancer, so be it. But do not expect the rest of America to let their loved ones suffer without cure."

Jerold Nadler (D-NY): "We must not say to millions of sick or injured human beings, 'go ahead and die, stay paralyzed, because we believe the blastocyst, the clump of cells, is more important than you are.' . . . It is a sentence of death to millions of Americans."

Notice too how a human embryo is merely called a blastocyst. Though a correct biological term, it is used to diminish the humanity of the unborn. In the stem cell debate, it was disturbing to see how much attention was given to those who might potentially benefit from the research and how little attention was given to the reality that human beings would be destroyed to pursue the research.

Moreover, the claims of immediate success were mostly hype and hyperbole. Columnist Charles Krauthammer called it "The Great Stem Cell Hoax." He believes that any significant cures are decades away.

He also points out how it has become politically correct to "sugarcoat the news." The most notorious case was the article in the prestigious scientific journal *Science*. The authors' research showed that embryonic stem cells of mice were genetically unstable. Their article concluded by saying that this research might put into question the clinical applicability of stem cell research.

Well, such a critical statement just couldn't be allowed to be stated publicly. So in a highly unusual move, the authors withdrew the phrase that the genetic instability of stem cells "might limit their use in clinical applications" just days before publication.

Charles Krauthammer says, "This change in text represents a

corruption of science that mirrors the corruption of language in the congressional debate. It is corrupting because this study might have helped to undermine the extravagant claims made by stem cell advocates that a cure for Parkinson's or spinal cord injury or Alzheimer's is in the laboratory and just around the corner, if only those right-wing, antiabortion nuts would let it go forward."

So the current debate in bioethics not only brings in Huxley's *Brave New World*, but also George Orwell's newspeak. The debate about cloning and stem cells is not only a debate about the issues but a war of words where words and concepts are redefined.

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