Living With a Sense of Urgency

“Teach us to number our days, that we may gain a heart of wisdom.” Psalm 90:12

I asked my dear friend Caren Austen to write about the life-upending diagnosis that, in a single moment of time, changed absolutely everything about her life.

Cerebral atrophy.

That was the diagnosis resulting from a recent MRI. Deterioration of the brain.

After judiciously researching the diagnosis, a consultation with a friend in the medical field confirmed the most likely cause that my brain is shrinking: Alzheimer’s. A singular moment with horrific implications.

At 66, I was stung as the future I had anticipated seemed to be snatched away. The time I likely would not have with my children and grandchildren. I didn’t feel frightened as much as sad. I know that God is Lord of my past, present, and future, so I was secure in His will and His care.

Still, I had looked forward to more time on playgrounds, more snuggles with my youngest grandchild, my only grandson, Liam, who is, at eight, now my only snuggle bug. I had anticipated

more time. Time reading books by flashlight in tents made of blankets strung over tables. More tea parties with Katrin, my tomboy who, at 11, still loves to set up fancy teas for her "Glamma." I longed to continue sending and receiving just-home-from-school and late-night texts about their days. I wanted to cook again with my budding chef, Brigid, and see how she, now a teenager, grows – where her talents and interests take her. I wanted to hang out again with Murren, riding around in the old rusty farm truck she loves. I wanted to hear more of her music video analyses. I wanted to see this young woman on the cusp of adulthood mature and launch into the world on her own. I wanted to be fully present for proms, graduations, weddings, and more babies.

I had begun two books and had fallen into the writers' bane of procrastination. Now, I wondered if I would have time, if I would still remember all I needed to complete them. Suddenly, I craved time. I wanted more. I was frustrated by the mundane necessities that took me away from the activities that screamed for my time *now*.

I had only recently experienced God's miraculous healing after decades of dealing with a debilitating mental illness that had stolen so much time. Now, with my newfound peace, freedom, and joy, I wanted to live. I wanted to walk in that freedom. I longed to wake up with delight at each new morning. I wanted to share my freedom and my healing. Now, I wondered: would there be time?

I began to live with a sense of urgency. My life became laser focused. Not on a bucket list of places to go or experiences to enjoy. Instead, I felt driven to create a legacy for my children, my grandchildren, and for my friends and others who had lived through some of the same struggles I had. Thoughts and ideas of just how to do that occupied my mind during the day when I was not at work, in the evening when I sat alone at home, and at night when I lay in bed and sleep would not come.

My priorities changed. I didn’t want to spend my money or my time on material objects or activity that would not have a lasting impact for the people I loved. I wanted to conserve my time, energy, and resources for those activities that would leave an eternal imprint on those I cared for. I began to spend even more time in prayer for those I love, especially my children and grandchildren. I began to formulate in my mind the letters I would write to each one. I began to search the Scriptures for the verses that would offer them guidance, as well as those that were precious to me, so they could get to know me better even when my mind could no longer communicate my heart.

I spent time rededicating my two daughters to God and praying my own dedication of my children’s children to Him. I told God over and over, “As for me and my house, we will serve the Lord,” longing for assurance that even when my mind was gone, I had done all I could to leave behind a legacy that would point them to the Lord I love. A legacy that would ensure we would all be reunited one day in a world that shines with the light of the glory of God when my renewed mind would know and recognize them.

I didn’t worry too much about what my own surroundings would be as I declined. I thought I would most likely be squirreled away in a nursing home that took in those with few resources. Separated by hundreds of miles from my family, I knew my local friends would come to check on me. I felt sorrow at the thought of loneliness, isolation, and limited activities, and I wondered how it would feel to live the confusion of time and place I had witnessed with my mother. I reflected on the occasions she talked to me about me, as though I were a stranger. I grieved for the time that would come when I would not recognize my own daughters whom I love, the precious gifts of God I had carried, given birth to, and reared. I wept at the thought of losing the sweet memories of mothering them and the joys that were shared only between the three of us.

As I grieved the future I thought I would not see, I began to concentrate more on what I could leave behind. As I only shared this preliminary diagnosis with a few of my closest confidants, they helped me brainstorm ideas on how to share my legacy: passages of Scripture, poetry, music, videos, letters, photo albums, etc. would be the means I would use to reach out into the future to continue influencing those God had entrusted me with and whom I would leave behind. I experienced relief, pleasure, and even hope at each new idea that would allow me to continue to have influence and share my love and myself even when the part of me that is "me" was gone.

That was how I began living a life of urgency. I awoke daily with a purpose of doing something specific to leave a legacy, a trail those I loved could follow behind me to a growing and loving relationship with God.

Then, in another singularly memorable moment, my life shifted again.

A knowledgeable neurologist examined my MRI. In view of my heart-wrenching diagnosis he seemed crazily nonplussed. But he said that, while the MRI did show evidence of mild cerebral atrophy, it was exactly what he would expect of someone who was 66 years old, and it was certainly nothing of concern. *What??!!!* In one moment he erased my fears and sent me into near spasms of joy.

Since that sweet reprieve, I must admit, I have slipped a bit in my sense of urgency. The desire to sort through stacks of books that clutter my new apartment, the necessity of making a living, the need for rest after a day or work, and countless everyday nuisances crowd my life and scream for attention. However, the experience has changed me. I no longer take my days, my hours for granted. My desire to leave a legacy of worth has changed the way I pray and spend my time. I continue to plan ways to ensure that my faith will live beyond me. I pray that God will show Himself through me in my little sphere

of influence. I have not lessened the prayers for my family, especially my daughters, sons-in-law, and grandchildren. God put *me*, with all my flaws, talents, life experiences, joys, sorrows, and foibles onto this earth for a reason—a purpose that He designed *me* to fulfill. I seek to savor each moment God gives me to love and live for Him. That is my sense of urgency. It is my prayer every morning before my feet hit the floor that this day my life will not be spent in my own pursuits but will be only a conduit for Him to touch those He places in my path.

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What Do We Make of the Stem Cell Debate? A Biblical Perspective

Heather Zieger looks at the stem cell debate from a biblical worldview perspective. This Christian perspective recognizes the true source of life and the difficulties with destroying many young lives for the hope of being able to save a few older lives.

What Are Stem Cells?

If science had a tabloid magazine, then stem cells would grace the cover. And much like the Hollywood celebrities, stem cells are at the center of controversy. How is a Christian to

respond to conflicting reports and confusing science? In this article we will discuss the differences between adult and embryonic stem cells, look at some media myths, and evaluate the worldview issues behind the controversy.

First, let’s define stem cells. Stem cells are cells that serve as the body’s carpenters and mechanics to other cells. Their name comes from the stem of a plant. Think of a rose. From the stem grow the leaves, the thorns, and the flower. The flower does not produce leaves, nor do the thorns produce a flower, but the stem produces all of these things. However, the stem of the rose is still part of the plant. In the same way, stem cells are themselves cells and they produce other cells.

Stem cells can be found throughout our body. Think about when you give blood. Your body will resupply the blood that you lost. It does this by using blood stem cells. When your body needs more blood, signals tell the blood stem cells to make red blood cells, white blood cells and plasma cells. Another example is our skin. We lose skin every day, but our body has very active skin stem cells that grow new layers. Keep skin stem cells in mind, because scientists have been able to do some amazing things with skin stem cells.

Blood and skin stem cells are examples of adult stem cells, which are different from another type of stem cell called embryonic stem cells. Embryonic stem cells are only found in the inner cell mass of a 5- to 8-day-old embryo. These cells end up making every cell in the human body and can divide indefinitely. They are believed to be much more versatile than adult stem cells. Because of this ability, scientists describe embryonic stem cells as *pluripotent*. Adult stem cells are programmed to only make certain types of cells (like our example of blood stem cells), and adult stem cells have a limited number of cell divisions. Because of this, they are described as *multipotent*.

As we look at some of the scientific research on stem cells, we will find that adult stem cells are more versatile than we once thought, and embryonic stem cells have limitations that scientists still need to overcome.{1}

Adult Stem Cells: The Underreported Medical Successes

Oneof the two main types of stem cells is adult stem cells. Adult stem cells are named for their abilities, not for their source. We find very helpful adult stem cells in umbilical cord blood and the placenta even though these sources are not from adults. One of the most studied adult stem cell sources is bone marrow. The first bone marrow transplant was performed in 1968. But it wasn't until 1988 that scientists identified the stem cells within bone marrow that caused the transplants to work.{2}

Bone marrow transplants demonstrate one of the biggest advantages of adult stem cells. Scientists did not know what a stem cell was, let alone how they worked, but the bone marrow transplants were still successful. The stem cells knew where to go in the body to repair the right tissues. This ability to automatically go to the location of repair is characteristic of all adult stem cells.

Bone marrow transplants also demonstrate one disadvantage to adult stem cell therapy. Just like an organ transplant, the stem cell donor must be an exact match to the patient. And the patient will need to take immuno-suppressant drugs for the rest of his life.

However, recent findings with umbilical cord blood have shown that the donor does not have to be an exact match when cord blood is used, meaning that a patient has a better chance of finding a donor. One of the first umbilical cord treatments was for sickle cell disease in a twelve-year-old boy.{3} He

responded so well to treatment that a year later doctors declared him cured of sickle cell disease. He does have to take immune suppressant drugs, but does not display sickle cell symptoms.

One way around the donor problem is to use the patient's own healthy stem cells to repair other damaged cells. Parents now have the choice to bank their child's umbilical cord blood in the event that the child may need it. This technique was successfully used to help a child with her cerebral palsy symptoms.{4} Other adult stem cell successes include rebuilding bone, alleviating some cancers and auto-immune diseases, relieving Parkinson's symptoms, and treatments for Type I diabetes.{5}

All of these therapies have happened in real people using stem cells that do not involve the destruction of an embryo, and would be perfectly ethical within a Christian worldview.

What is the Promise of Embryonic Stem Cells?

The second type of stem cell is embryonic stem cells. Embryonic stem cells come from the inner cell mass of a 5- to 8-day-old embryo. Embryos are formed after the egg and sperm have united, which initiates a directional process that, given proper conditions, can eventually form a baby. At the 5- to 8-day stage, there are only a few cells within the embryo, but these cells are capable of making all of the cells in the human body. To obtain these cells, scientists penetrate the outer protective layer of the embryo and remove the cells. This procedure destroys the embryo.

It is still only a theoretical possibility that human embryonic stem cells can cure diseases. There is one FDA approved human trial that was announced in January 2009 for patients with a recent spinal cord injury.{6} We will have to

wait to find out the results of this treatment. In other parts of the world, people have sought embryonic stem cell therapy as a desperate measure. One man in China had embryonic stem cells injected into his brain to relieve his Parkinson's symptoms. Unfortunately, the cells spun out of control and continued to make new cells of varying cell types. They eventually formed a large brain tumor consisting of different kinds of cells [a teratoma], such as skin cells, hair cells, and blood cells.{7} Another boy in Israel had a disease that attacked his spinal cord. His parents took him to Russia for several treatments with embryonic stem cells. Four years later, doctors found tumors in his spine that they confirmed came from the embryonic stem cell therapy.{8}

One of the most difficult hurdles for embryonic stem cell research is trying to program the stem cell to become the particular cell type that they need. The second hurdle is then telling the cell to stop multiplying before it forms a tumor. The signals and mechanisms for this are still being researched; however, one recent study involving the rebuilding of mouse muscles using embryonic stem cells shows some progress in this area.{9}

While embryonic stem cells may theoretically have promise, they have not shown this in reality. Time will tell if they actually deliver. However, the ethical issue from a Christian perspective is not whether this research has a practical use, but whether we want to go down the path of using the parts of one human being, deemed less worthy of life, for another.

Media Myths

Unfortunately, the stem cell debate has turned into a media poster child for the next big scientific miracle. And stem cells have been hot science topics in the political realm. What is striking in all of this are the misconceptions that are repeated in the media.

Let’s go over three media myths in the stem cell debate.

The first myth is that President Bush restricted stem cell research. Actually, President Bush was the first president to specifically allow federal funding for embryonic stem cell research.{10} However, he did put limits on how far they can take that funding. Furthermore, what is often omitted is that private companies have always been allowed to invest in embryonic stem cell research.

The second myth often repeated by the media is that embryonic stem cells have the potential to cure all types of diseases including spinal cord injuries,{11} Parkinson’s and Alzheimer’s. So far, the only successful stem cell treatments of spinal cord injuries or of Parkinson’s symptoms{12} have been with adult stem cells.

I want to emphasize that *Alzheimer’s will never be cured by stem cell therapy of any kind.* Alzheimer’s causes the death of many types of brain tissues. Stem cells might be able to replace some dead tissue, but tissue death is a symptom, not the cause. Alzheimer’s affects the whole brain so deeply and quickly that it really isn’t an issue of replacing cells. Therefore, scientists must look to other areas for cures for Alzheimer’s.{13} The perpetuation of the myth that stem cells will cure Alzheimer’s is either a cruel misrepresentation in order to sell a story, or else demonstrates a complete lack of understanding on the subject.

The third misrepresentation is the blatant lack of media coverage for adult stem cells. There have been over 70 different diseases, disorders, or injuries that have been helped or cured with adult stem cells in human trials,{14} yet this has hardly been covered by the media. We have discussed the successes of bone marrow and umbilical cord blood, but where is the media coverage of the latest findings with skin stem cells?{15} Scientists have found ways to coax a patient’s own skin stem cells into acting just like an embryonic stem

cell. In other words, these cells have the potential to become almost any cell in the body and they are from the patient's skin. No use of embryos, no immuno-suppressant drugs, and the technique has been refined for patient safety.{16}

Why this bias? There is a worldview issue at the heart of the matter.

Stem Cells from a Christian Worldview

We have looked at the differences between embryonic and adult stem cells. We have seen the double standard the media has in reporting these types. But the question remains, with all of the successes of adult stem cells, including the ability to create embryonic-like stem cells from the patient's own skin, why insist on continuing embryonic stem cell research? Why does the debate continue?

I believe a major part of the problem is the answer to the question, Who is in authority? There are two broad options: a God-centered authority or a man-centered authority. The man-centered authority in this case is called scientism. It is the idea that science will save us from our problems and tell what we need to know about life, including what is right and wrong.

Don't misunderstand me, I am trained as a scientist, and I think studying nature and pursuing scientific questions is important. But when we prioritize science as the only means of gaining knowledge and make it the guide for our lives and the decisions we make, we aren't studying the world around us, we have essentially invented a religion.

The other perspective is a God-centered authority. In this case all of nature, technology and our decisions are under God's authority. In other words, we determine what is right and wrong from the Bible because it is God's revealed word.

Scientists want to continue studying embryonic stem cells,

because they want to explore all possibilities, and they see no reason why they shouldn't. From their worldview, they are in authority. There is no reason to put moral limitations on research. Many people latch onto this idea because they believe science will save them. They have faith in science. Some even believe this to the point of claiming stem cells will cure diseases and ailments that no stem cell therapy could ever do.{17}

Some scientists argue that we need to study embryos to better understand how a disease can develop in the earliest cells. These studies have been done in animals, but scientists would prefer to use humans because there are several developmental differences between humans and other animals.{18}

As Christians, we believe scientific study and finding cures for diseases is a great endeavor. But just because we *can* do something, doesn't always mean we *should*. We know what we should do from God's word. He values the unborn, and values human beings as having inherent dignity because we are made in his image. We therefore cannot judge some humans less valuable than others, and we certainly cannot destroy them for research observations or for removal of their parts. From this perspective, adult stem cell research is ethical, but embryonic stem cell research is not.

Notes

1. An excellent documentary on the basics of stem cells and the controversy around embryonic and adult stem cells: *The Lines that Divide: The Great Stem Cell Debate*. Dir. Brian Godwana. The Center for Bioethics and Culture Network, 2009. See this link for a clip: www.thecbc.org/redesigned/research_display.php?id=373.
2. "Purification and characterization of mouse hematopoietic stem cells." GJ Spangrude, S Heimfild, IL Weissman, *Science* Vol. 241, Issue 4861, 58-62.
3. www.nationalcordbloodprogram.com

4. www.foxnews.com/story/0,2933,392061,00.html
5. www.stemcellresearch.org
6. www.geron.com/grnopc1clearance/
7. “Survival and proliferation of non neural tissues, with obstruction of cerebral ventricles in a Parkinsonian patient treated with fetal allografts.” *Neurology*, Vol 46, Issue 5, May 1, 1996.
8. www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.1000029
9. “Functional skeletal muscle regeneration from differentiating embryonic stem cells.” *Nature Medicine* 14, 134-143, 2008.
10. See Executive Order 13435; for an excellent article on the politics of stem cell research from a Christian worldview, see “Responsible Science & ESCR” by Greg Koukl in *Solid Ground* May/June 2009 (a publication of Stand to Reason).
11. www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1864811 (*Journal of Spinal Cord Medicine* 29, 191-203, July 2006).
12. www.lifenews.com/bio2751.html; www.bio-medicine.org/medicine-technology-1/Groundbreaking-Paper-Publishes-Long-Term-Results-of-a-Successful-Phase-I-Clinical-Trial-Using-Autologous-Neural-Stem-Cells-to-Treat-Parkinsons-Disease-3848-1/; www.bentham-open.org/pages/content.php?TOSCJ/2009/00000001/00000001/20TOSCJ.PDF
13. For an excellent overview of Alzheimer’s, see the Alzheimer’s association website at www.alz.org; for their statement on stem cell research see: www.alz.org/national/documents/statements_stemcell.pdf.
14. “A 37-year-old-spinal-cord-injured female patient, transplanted of multipotent stem cells from hum UC blood, with improved sensory perception and mobility, both functionally and morphologically: a case study.” *Cythotherapy* 7, Issue 4, 368-373, 2005.
15. One person in the popular media who did mention skin stem cells was Dr. Mehmet Oz on the Oprah Winfrey Show:

www.youtube.com/watch?v=lDFJOzu9SyM.
16. K. Takahashi, et al., *Cell* doi: 10.1016/j.cell. 2007.11.019; 2007; J. Yu, et al., *Science* doi: 10.1126/Science. 1151526; 2007.
17. See Joseph Bottum and Ryan T. Anderson's article in *First Things* for an excellent reference on the history of stem cell research: www.firstthings.com/article.php?year=2008&month=10&title_link=001-stem-cells-a-political-history-27. Also see Anderson's article in the *Weekly Standard* for reasons scientists still want to study embryonic stem cell research: www.weeklystandard.com/Content/Public/Articles/000/000/016/258hdaij.asp?pg=1.
18. The scientists who conducted the research on skin stem cells that were coaxed into acting like embryonic stem cells did use knowledge from embryonic stem cell research to help identify the general markers for pluripotency. However, it is unclear that it is necessary to use human embryonic stem cells for this, because the markers for pluripotency were first identified in mouse embryonic stem cells.

"How Can Dementia Turn a Mature Christian So Ugly?"

I am worried by the behaviour of Christians I know who suffer from dementia. I have frequently seen them displaying racism, sexually suggestive behaviour, and generally rude and difficult behaviour unthinkable to their pre-dementia selves. How does this tie up with the idea of a Christian being transformed within? I am bothered by the thought that

sanctification is only skin deep, as it were—a learned veneer.

That’s an excellent question!

I too have seen incredibly godly, mature Christians heartbreakingly transformed by Alzheimer’s and dementia into ugly caricatures of their former selves. I believe the answer lies in the nature of the two kinds of “flesh” the Bible talks about. Our “new creation” is housed in a body of physical flesh that has been impacted by the fall and marred by sin. The fall makes our brains subject to decay and disease which leads to the tragic behavior you describe. The other flesh—not our physical bodies, but that part of us which operates in our own strength, apart from God (see Romans 7:18, 8:8, 13:14; Galatians 3:3, 5:17)—is never transformed, which is why we have to crucify it and die to self. The transformation of sanctification happens to our souls and in our spirits, but our flesh is unredeemable and still occupies a place in our physical bodies. Racism, sexually suggestive behavior, and rude and difficult behavior are all fruits of the flesh (Galatians 5:19-21). Praise God, the flesh will fall away when we die or are taken up to heaven!

Hope you find this helpful.

Sue Bohlin

The Continuing Controversy over Stem Cells: A Christian

View

Dr. Ray Bohlin brings a biblical worldview to this intersection of ethics and science. From a Christian perspective, is it right to harvest and destroy embryonic stem cells for the hope of possible finding a treatment for some diseases?

Different Kinds of Stem Cells

Stem cell research grew into a major issue in the 2004 election and will continue to be discussed and argued for years to come as research continues to make progress. Unfortunately, most people continue to be misinformed about the real issues in the discussion.

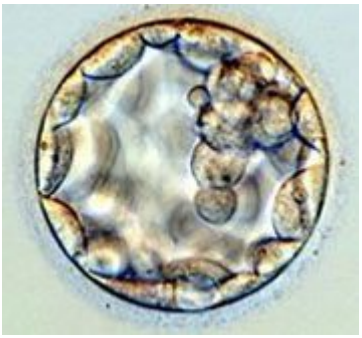
Most articles in the media fail to distinguish between the different kinds of stem cells and the different ethical questions each of them presents. Several states either already have or are working to get around federal restrictions on embryonic stem cell research in order to keep the research dollars at their state research universities.

So the controversy has far from abated. In order to think our way through this we will need some basic information. First, we need to understand some things about stem cells in general and the types of stem cells available for research.

What are stem cells? Stem cells are specialized cells that can produce several different kinds of cells in your body. Just like the stem of a plant will produce branches, leaves, and flowers, so stem cells can usually produce many different kinds of cells within a particular tissue.

There are over one trillion cells in your body. Most will only divide a few times. For instance, when you were born you basically already had all the brain and neural cells you would need. As you grew, those cells simply got bigger. However,

other tissues need a constant renewing of cells. The lining of your intestines, stomach, skin, and lungs constantly slough old cells and need replacements. Your blood cells constantly need replacing. In these kinds of tissues, specialized stem cells continually produce new cells.



There are skin, bone marrow, liver, muscle, and other types of stem cells in your body. These are referred to as *adult* stem cells. Other common types of stem cells are those found in umbilical cord blood. Even though these are fetal tissues, they are referred to as adult stem cells because they are already differentiated to a large degree. There are no ethical difficulties in using these stem cells for research and therapy.

Now, what are *embryonic* stem cells? Embryonic stem cells exist only in the earliest embryo just a few days after fertilization. This is referred to as the *blastocyst*. The blastocyst contains a small cluster of identical cells called the inner cell mass. These cells eventually form the baby and therefore can produce all the cells of the body. These are embryonic stem cells (ESC). In order to retrieve them, the embryo is destroyed.

Here then is the problem. While adult stem cells offer no ethical difficulties—but are not likely to be as versatile as embryonic stem cells—embryonic stem cells can only be obtained by destroying the embryo.

The Promise of Adult Stem Cells

What is the overall hope for stem cells? Why are they so sought after?

Essentially, it is hoped that stem cells can be used to treat and even cure diseases like diabetes, Parkinson’s,

Alzheimer’s, and brain and spinal injuries. These are primarily degenerative diseases where certain cells no longer function as designed due to genetic defects or injuries. Generally it has been believed that embryonic stem cells offer the most hope since we know they can become any cell in the body.

But embryonic stem cells require the destruction of the embryo where adult stem cells can be harvested from the individual that needs to be treated. First, this involves only informed consent and is ethically non-controversial. Second, since the person’s own cells are used, there is no chance of rejection of the cells by the patient’s immune system.

In the last few years important discoveries have been made concerning certain types of adult stem cells. Essentially, we have learned that adult stem cells can switch tissues. Bone marrow stem cells seem to be the most versatile. They have been coaxed to generate new muscle, neural, lung and other tissues.

Additionally, we have learned that adult stem cells migrate throughout the body in the blood. It appears that adult stem cells are somehow informed of injury in the cell and can migrate from their source to the injury and begin at least modest repairs.

In January 2002, a group from the University of Minnesota announced what they called the ultimate adult stem cell. In creating an
immortal cell line from bone marrow stem cells, early tests showed that these stem cells could become either of the three early tissues in an embryo that eventually lead to all the cell types of the body. This showed that adult stem cells are far more versatile then previously believed.

Last year the National Institutes of Health spent $190 million on adult stem cell research and $25 million on embryonic stem

cell
research. Clinical trials are already underway using bone marrow (adult) stem cells for treatment of heart attacks, liver disease, diabetes, bone and cartilage disease, and brain disorders. Adult stem cells can even be injected intravenously in large quantities, and they will migrate to where the injury is located. With such promise coming from adult stem cells it is hard to justify the use of problematic embryonic stem cells.

The Promise and Peril of Embryonic Stem Cells

Embryonic stem cells have always held the greatest promise for research and therapies because we know for certain that they can become any of the over 200 types of cells in the body. All we needed to do was learn how to control their destiny and their potential for unlimited growth.

As mentioned previously, the major ethical problem with embryonic stem cells is that the early embryo, the blastocyst, must be
destroyed in order to retrieve these cells. It is my firm conviction that this earliest embryo is human life worthy of protection. Once the nucleus from sperm and egg unite in the newly fertilized egg, a biochemical cascade begins that leads inevitably to a baby nine months later as long as the embryo is in the proper environment.

But there are other problems aside from the ethical barrier. The proper chemical signals to direct stem cells to turn into the cells you want are unknown. This is certainly the goal of research. Human embryonic stem cells have been coaxed to differentiate but since nearly all of the experimental work to date has been done with embryonic stem cells from embryos leftover in fertility clinics there are immune rejection problems. These foreign cells are treated like they were from

an organ donation.

Additionally, these cells are programmed to undergo rapid cell division. In China a man with Parkinson's was treated with human embryonic stem cells which turned into a tumor (teratoma) in his brain that killed him. The power of these cells is also a source of their peril.

In summary, embryonic stem cells possess uncertain promise. They require the death of the embryo. All therapies with any kind of stem cell are experimental and may not work. Right now, too much is being promised, and coverage in the media has been biased toward embryonic stem cells and is inaccurate.

When these difficulties and question marks are considered in the light of the exciting promise of adult stem cells, which are already producing positive results in human clinical trials, the pursuit of embryonic stem cell research is questionable at best. Just recently a major U.S. journal reported that bone marrow stem cells show great promise in treating the diseased lungs of cystic fibrosis patients.{1} CF is the most common fatal genetic disorder in the Caucasian population. Adult stem cells continue to outperform embryonic stem cells.

Stem Cells and the Last Election

The first human embryonic stem cells were isolated from embryos donated from fertility clinics in 1998. Prior to that, Congress had passed—and President Clinton had signed—legislation that prohibited the use of federal money for the destruction or use of human embryos for research purposes. This was seen as worthy even for pro-choice advocates because no one wanted to go down the road of using even the earliest human life for research purposes.

When President Bush took office in January 2001, pressure had already come from the medical research community to revise

this restriction so federal grants could be used to explore this promising research avenue. Adult stem cells were still viewed as being too restricted for general research use in humans. In August 2001, President Bush issued his now famous compromise
of allowing federal funds to be used to research embryonic stem cells already isolated from human embryos, but keeping in place the restriction for using federal dollars for destroying human embryos to obtain additional cell lines.

The National Institutes of Health estimated that there were already over sixty human embryonic stem cell lines isolated around the world that would be available for research purposes. The President was criticized by pro-life advocates for allowing any federal money for research on embryonic stem cell lines, and the medical research community criticized the President for not allowing federal research money for the creation of new embryonic stem cell lines. If everybody is unhappy, it sounds like a good compromise!

The events of September 11, 2001 quickly removed this controversy from the public's attention, but the 2004 presidential election
brought it back front and center. The Bush administration, supported by the President's Council for Bioethics, continued to argue against federal money for the destruction of embryos.

The Kerry campaign seized what they saw as an opening and began claiming that they would lift the ban on stem cell research. They enlisted Ron Reagan to deliver this message at the Democratic National Convention in July, 2004. Ronald Reagan had recently passed away from Alzheimer's, and many were claiming that embryonic stem cell research could bring a cure for Alzheimer's disease.

There were several problems with this message. First, President Bush never banned stem cell research. The Administration was funding adult stem cell research at about

$190 million a year and embryonic stem cell research at about $25 million a year. Private money was always legal to use, but private investors were staying away because of the ethical problems and the
lack of progress.

Second, researchers had already testified on Capital Hill that Alzheimer's was likely not curable by treating the brain with stem cells since it was considered a whole brain disease and cell replacement would not do much good. The media just couldn't get it right.

The Distortion and the Hype of Embryonic Stem Cells

Those of us who are opposed to the use of embryonic stem cells for research are routinely accused of being hard-hearted toward those whose maladies can be addressed with stem cell research. Of course, this is not the case. We fully support adult stem cell research, but even if adult stem cells prove problematic in some cases I would still not support embryonic stem cell research when the embryo must be destroyed to obtain them.

When we think about saving lives we must count the cost. Is relieving the symptoms of disease worth the cost of the lives of the weakest and most defenseless members of society? Treating embryos with careless disregard will lead to further abuses down the road.

One of the problems with embryonic stem cells was the possibility of immune rejection. To avoid this, many want to clone the affected individual and use the embryonic stem cells from the clone. But this treats the human embryo as a thing, a clump of cells. The basis of this ethic is strictly "the end justifies the means." Even the term "therapeutic" is problematic. The subject is destroyed.

Many try to get around the destruction of the embryo problem by claiming the blastocyst is just reproductive cells and not a person. Medical mystery writer Robin Cook gave us an example in his most recent thriller, *Seizure.*{2}. In the book a medical researcher appears before a Senate committee and says, "Blastocysts have a potential to form a viable embryo, but only if implanted in a uterus. In therapeutic cloning, they are never allowed to form embryos. . . . Embryos are not involved in therapeutic cloning."{3} Hm!

Later in the epilogue, Cook, who is an MD, says, "Senator Butler, like other opponents of stem-cell and therapeutic cloning research, suggests that the procedure requires the dismemberment of embryos. As Daniel points out to no avail, this is false. The cloned stem-cells in therapeutic cloning are harvested from the blastocyst stage well before any embryo forms. The fact is that in therapeutic cloning, an embryo is never allowed to form and nothing is ever implanted into a uterus."{4}

Cook is greatly mistaken. A 1997 embryology text states plainly that "The study of animal development has traditionally been called embryology, referring to the fact that between fertilization and birth the developing organism is known as an embryo."{5} So let's be very careful and pay attention to what is said. Some are trying to manipulate the debate by changing the "facts." We must promote the incredible success and continued promise of adult stem cells while continuing to spell out the long term peril of embryonic stem cells.

Notes

1. Wang, Guoshun, Bruce A. Bunnell, Richard G. Painter, Blesilda C. Quiniones, Nicholas A. Lanson Jr., Jeffrey L. Spees, Daniel J. Weiss, Vincent G. Valentine, Darwin J. Prockop, "Adult stem cells from bone marrow stroma differentiate into airway epithelial cells: Potential therapy

for cystic fibrosis" PNAS online, www.pnas.org (accessed December 22, 2004).

2. Robin Cook, *Seizure* (New York: Berkeley Books, 2003), 429.

3. Ibid, 32-33.

4. Ibid, 428.

5. Scott F. Gilbert, *Developmental Biology*, 5th ed. (Sunderland, Mass.: Sinauer Associates, Inc., 1997), 3. Later in the same text, Gilbert clearly equates the blastocyst and embryo when he says on page 185, "While the embryo is moving through the oviduct en route to the uterus, the blastocyst expands within the zona pellucida." Gilbert seems to have had a change of heart between his fifth edition and the sixth. In the sixth edition of his textbook Gilbert defines embryology differently. "The study of animal development has traditionally been called embryology, from that phase of organisms that exists between fertilization and birth." This is on page 4 of the new edition and curiously leaves the word embryo out of the definition of embryology. Perhaps Cook and Gilbert know each other!

See Also:

- The Controversy Over Stem Cell Research [2001]
- Putting the Brakes on Human Genetic Engineering
- Stem Cells and the Controversy Over Therapeutic Cloning
- Probe Answers Our E-Mail: "Your Anti-Stem Cell Research Position Disregards Diabetics"

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 faired 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 unfilfulled," *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.

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.