

Harnessing the Body's Regenerative Capabilities to Transform Health Care

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There is no area of medical science as generally misunderstood by the public as "stem cell" research in its potential for transforming the health and welfare of our Nation. But, a seminal event occurred at the Vatican in early November that will change that, and do so very quickly.

Prominent scientists, ethicists, business and religious leaders from around the world gathered for the first ever international conference on "adult" stem cell research, co-hosted by Neostem, a publicly traded biosciences company who's board I sit on, and the Catholic Church! Cardinal Gianfranco Ravasi, President of the Pontifical Council for Culture opened the three day conference, with a declaration that the Church enthusiastically supports scientific research on non-embryonic, adult stem cells along with the exploration cultural, ethical, and human implications of their use. This breakthrough in making clear what the Church supports, and not only what it is against is the result of the efforts of two extraordinary individuals: Dr. Robin Smith, The President of The Stem For Life Foundation and CEO of NeoStem, and Father Tomasz Trafny of The Vatican's Pontifical Council For Culture.

The keynote speaker on the first day of the conference was Governor Tommy Thompson, the Secretary of Health and Human Services in the Bush Administration from 2001 to 2005. That's right! The key Cabinet Secretary from the Administration embroiled in controversy over Federal spending on embryonic stem cell research called for de-politicalizing stem cells. He spoke passionately about the urgent need to educate of the American public about the enormous potential that adult stem cells have for improving the lives of tens of millions of people in the U.S. and many, many more around the world. He called on President Obama to convene a Presidential Commission on Regenerative Medicine.

The conference ended with an extraordinary Papal audience at which Pope Benedict XVI spoke of our shared mission to 'wake up' the world to the here-and-now uses of adult stem cell therapies, and to form a collaborative network of scientists and doctors devoted to the advancement of adult stem cell therapies. He committed substantial Vatican funds to support this effort.

Stem cell therapy works, as we are learning from clinical trials around the world, and while the science is exquisitely complicated, why it works is easy to understand, and makes perfect sense. Frustratingly, there is much confusion and misinformation surrounding stem cells. What are they? How are they used? Why the controversy? Why the tremendous potential?

Think of stem cells as the master cells in our body from which all other cells are derived. They can produce any of the more than 220 kinds of cells that the body needs. Embryos are the first place we think to find them. This is because it is at the beginning of the life process that everything that will be needed to produce a person is under construction. But then, throughout our life span our body continues to pump out stem cells and distribute them throughout our body using our circulatory system as nature's highway for regenerating and repairing the body. There's a lot that can go wrong. Our body may not be able to produce enough. They may not be mobilized quickly enough. They may not be able to reach the site in sufficient quantity.

Today's medical science has three basic options for sourcing the stem cells needed to develop and implement life altering therapies that are designed to either help or correct the body's own regenerative processes: Live embryos, placental stem cells, and our own body's "adult" stem cells, which can be found in our bone marrow, blood and in most of our organs and tissues.

Using "embryonic" stem cells is abhorrent to many, and the Catholic Church, among many other groups opposes their use. As someone who has always respected a woman's right to choose, I've come away from this conference with a deeper philosophical understanding, and greater empathy for the great angst that those of religious conviction feel about the sacredness of life. Their issue

comes down to this: We diminish the value of all life when we fail to respect every life, and embryos are most certainly life. The Church would not be opposed to embryonic stem cell research if these cells could be obtained without destroying human embryos.

The Church does enthusiastically support the use of "placental" stem cells and "adult" stem cells. Most placentas and umbilical cords are disposed of at birth by the hospital. This is a real tragedy. The umbilical cord blood and placenta are loaded with stem cells. They belong to the parents, and the parents have the right to have these stored for future therapeutic use by the family, or donated to a public storage bank for use by others in need. You simply have to ask to have it done.

As we age, or perhaps the reason we age is that the number of adult stem cells our body produces in our bone marrow and other tissues, and than circulates through our body using the blood steam, is reduced significantly. At sixty year old we have perhaps only one quarter of the stem cells in our body as a twenty year old has. As we age, when we become sick or injured it becomes increasingly difficult for our body's own stem cells to reach the problem area in sufficient numbers to overcome the issue.

Over the last 30 years medical science has learned how to make our own bodies produce more adult stem cells... a lot more. Much has been learned about how to harvest them from the body's blood steam, and then use them in a wide variety of medical treatments. You can easily arrange to have your adult stem cells harvested and stored for your later therapeutic use. Think of this, and placenta/cord blood storage options as insurance policies against contracting diseases that may inhibit your body's ability to effectively use your own stem cells in the future.

Medical scientists are wary of the word "cure". They prefer to talk about long-term remission or quality of life improvements. But, the results of medical science's progress in stem cell research has been nothing less than astonishing, as has the pace of progress.

Presentations from doctors, as well as several clinical trial patients, at the Vatican conference were deeply moving. A man with congestive

heart failure who had been told to get his affairs in order a decade ago now lives a normal life. A woman with Lupus, a devastating autoimmune disease, who was at death's door six years ago, talked about going back to school, getting married and the children she now has.

Presentations from scientists and doctors, from world renowned clinics and hospitals, described how adult stem cells are now being used to re-grow new organs, such as bladders, and are being used to reboot immune systems, reverse heart disease, cancer and countless auto immune disorders that ravage hundreds of millions of people around the world. Compelling data was presented on clinical trials for a host of diseases, including diabetes, for which pancreatic function was restored in most of the patients and diabetes put into full remission. Eyesight restored, various cancers put into remission, Parkinson's effectively mitigated, auto immune disorders corrected, and on and on.

The data presented at the Vatican conference was overwhelming in both its efficacy and safety. Remission or cure? To the patients who spoke, and those of us with tears in our eyes the terms hardly seemed to matter. Today there are more than 3,500 clinical trials using stem cell going on all over the world, and 160 universities and companies engaged in stem cell research. Interestingly, only three of the clinical trials going on in the U.S. involve "embryonic" stem cells, and one of these was cancelled by its sponsor, Geron Corp., just three days after the Vatican conference ended.

Nothing could be more critical to the long-term welfare of our nation than the health of our people. Today one in eight Americans has diabetes, a scourge that is costing our nation \$200 billion dollars a year. By 2050 one in three Americans will have this disease. And the numbers are much worse for cardiac disease, the number one killer of Americans. A host of other maladies, such as cancer in its many forms, autoimmune diseases such as Multiple Sclerosis and Lupus, and many other diseases continue to plague our society, and the world generally. But, the devastating social and economic impact of these diseases can be greatly alleviated with a fundamental change in our national attitude and strategy.

That there is now broad agreement that we can and should use adult stem cells for regenerative therapies should create a renewed sense of optimism for mankind. The next step is to find the ways and means of transforming our national health care priorities from their focus on the maintenance of chronic disease, to the use of regenerative cell therapies to put these diseases into long-term remission. Tommy Thompson's call for a Presidential Commission on Regenerative Therapy is a great place to start.

Steven Myers is on the Board of Directors of the Pacific Council on International Policy, and Chairman of its National Security Member Committee. He is also a director of Neostem, Inc., a publicly traded biosciences company; co-host of the first international Adult Stem Cell conference held in Vatican City, November 9-11, 2011. For more information, go to www.stevenmyers.com.