

Understanding stem cell science

WITH PETER HOLLANDS, PH.D.



Peter Hollands Ph.D.(Cantab), C.Sci., FIBMS has worked in stem cell technology for nearly 30 years. His current interest lies in the use of cord blood stem cells in the treatment of blood disorders and regenerative medicine.

Embryonic stem cell clinical trials: Confusion, hype and unnecessary risk

The ingenuity of the human race is amazing—from the wheel to the steam train, from the Wright brothers to the moon landing, from crude amputations to major surgery using “keyhole” technology. However, when it comes to stem cell technology, we seem to get embroiled in politics, profit, media hype, celebrity endorsements and—perhaps worst of all—the idea that embryonic stem cells will allow the “advancement” of science and medicine.

In January 2009, the Food and Drug Administration gave permission to American biotech company Geron to run a phase I clinical trial using embryonic stem cells, derived from “spare” human embryos from IVF clinics, to assess their safety when grafted into patients suffering spinal damage. The patients are to be people who have suffered traumatic spinal damage within the preceding seven to 14 days. The primary purpose of the trial is to assess safety, but “*researchers also will look for any signs that the therapy restored sensation or movement.*” The recipient patients will be given immunosuppressive medication from which they will be “weaned off” at the end of the trial. The Christopher Reeve Foundation applauds the work. Despite the “excitement,” there are many objections to this work:

- The use of human embryonic stem cells, which has serious ethical, moral and religious objections. The concept that these cells come from “spare” unwanted embryos from IVF clinics is very questionable.
- The involvement of a very desperate group of patients who have very recently suffered traumatic spinal damage. Informed consent to take part in the trial in such patients is virtually impossible to obtain at that stage of their illness, as they are likely to agree to any form of treatment regardless of risk or efficacy.
- The potential safety implications, despite the claim that animal experiments appeared safe, are enormous. Embryonic cells are well known to be capable of forming tumors called teratocarcinomas. This is a major safety concern and would be catastrophic to a patient who has just suffered spinal damage. A boy in Moscow, treated for the neurodegenerative disease ataxia-telangiectasia by using cells derived from an aborted baby, has developed multiple tumors in his brain and spinal cord, derived from the transplanted fetal cells.

- Failure of this trial could create a negative impact on all stem cell technology, which could be very damaging to other safe, clinically effective stem cell therapies, such as those using bone marrow and cord blood stem cells.
- If the embryonic stem cells do provide any beneficial effects to these desperate patients, then these benefits will be potentially lost when the immunosuppressive medication is reduced, resulting in the destruction of the embryonic cells by the recipient patients' immune system.

Perhaps the most worrying observation in the context of this clinical trial is that a stem cell treatment for spinal damage *currently exists* and has already been used to successfully treat patients. There are groups in Australia and Portugal who take olfactory cells from the nose of the patient and transplant them into the same patient's spine. Patients have achieved a restoration of both sensation and movement using this technology. It is a safe and effective technology using the patients' own cells. It does not require the destruction of human embryos or a multimillion-dollar clinical trial!

While this seemingly pointless—and to some people, offensive—clinical trial gets underway, other workers in the rest of the world are investigating much more promising and less controversial potential stem cell therapies by means of clinical trial.

In India, for example, there is one assessing the use of bone marrow-derived stem cells in the treatment of limb ischemia and heart attack. The stem cells in this case are obtained from normal adult bone marrow donors.

A successful clinical trial has taken place in Los Angeles using stem cells derived from the heart attack patient's own heart to repair the damage done by the heart attack.

There is a clear pattern developing in the medical literature for the investigation of stem cell technology based on the stem cells we all carry around with us for the whole of our lives. Five years ago, we did not know that there were stem cells present in the heart. Today we are using them in a clinical trial.

Autologous stem cells (those derived from the patient's own body) clearly have massive current and future clinical uses. They have the advantages of being readily available and a perfect match for the patient. Future technologies may even be able to use medication to mobilize or activate autologous stem cells to allow them to repair damaged tissue without any further intervention. This will be the ultimate achievement of stem cell technology...when a simple tablet or injection is all that is needed to treat both degenerative disease and traumatic injury.

We do not want or need embryonic stem cell clinical trials. We do want and need funding, expertise, basic research and clinical trials in all other aspects of stem cell technology. Perhaps one day, all of the confusion, hype and unnecessary clinical trials will stop. When that happens, we will start to see the true benefits of stem cell technology.

Dr. Peter Hollands is a senior lecturer in biomedical science at the University of Westminster in London.

Don't you wish you were part of the fastest growing grassroots pro-life program in America?

Become an American Life League Associate and you can enjoy the following benefits:

- Access a fully interactive and steady stream of valuable, time-saving pro-life information.
- Access ALL's staff of experts for research, speaking engagements, media consultation and assistance on a wide range of pro-life topics.
- Maintain your group's total independence while gaining national recognition by identifying your group as an ALL Associate.

If you or someone you know would like more information about our Associate Program, please call Leslie Tignor at 540-659-4171 or visit www.ALL.org/Associates