

STEM CELL RESEARCH

The Nature of Stem Cells

Stem cells are what we might call *master cells*, which are found in many tissues of the body. They have the potential to produce that tissue. There are two main classes of stem cells, *embryonic* (stem cells derived from an embryo) and *adult* (stem cells derived from adult tissue). Embryonic stem cells are immature stem cells, which have the potential to produce any of the 210 types of body tissue, e.g., bone, skin, muscle and nerve. Adult stem cells are stem cells, which have become more mature, and, generally will only produce the tissue of that general type, i.e. blood stem cells will only produce blood cells, and skin stem cells will only produce skin cells. Stem Cell Research involves the collecting of stem cells, and by biochemical manipulation cause them to produce a particular tissue. Embryonic stem cells are potentially capable of becoming any tissue type, but increasingly scientists have been able, by manipulation, to cause adult stem cells to become a greater variety tissue.

The Potential uses of Stem Cells

Most diseases occur because some organ or tissue is damaged or destroyed, as a result of injury, infection or tumour. Many tissues and organs within the body, once damaged, have not the ability to grow again, and replace the damaged tissue, and so ill health or even death is the result. Because stem cells have the ability to produce specific tissue, they may hold the key to replacing tissue or even organs that have become damaged and are failing. When someone has a heart attack, some of his or her heart muscle dies. The heart has not the ability to replace that dead muscle, it is simply replaced by a fibrous scar, which does not contract like heart muscle and therefore the heart is always weaker. It is hoped that stem cells, injected into an area of the heart, damaged by a coronary, would produce new heart muscle cells, which would be fully functional, and therefore repair the heart and restore it to normal strength. Such experiments have already been undertaken in humans with encouraging results. Conditions like Parkinson's Disease, (where certain cells within the brain have ceased to function correctly), Diabetes, (where cells in the pancreas have failed), spinal cord injury, and many others have been the subject of stem cell treatment, with varying degrees of success.

Stem cell treatment promises cures to conditions, which up until now, physicians have only been able to alleviate some of the symptoms.

The Sources of Stem Cells

There are many sources of stem cells, and obviously the source will depend on the type.

Adult stem cells are derived from mature tissue. They can be extracted from many tissues such as blood, bone marrow, skin, brain, muscle and fat. They can also be obtained from the blood of the umbilical cord, following delivery, and from the placenta, (afterbirth).

Embryonic stem cells are, as the name suggests derived from embryonic tissue. The sources of embryonic tissue are, the remains of aborted fetuses, unwanted embryos created in IVF programs, and embryos specifically created for the purpose, which can be normal, or cloned.

The Morality of Stem Cell Research

Adult stem cells can be harvested from the patient, or another individual with virtually no risk to their life or health. Adult stem cells can, on occasions be harvested from bodies, post mortem, in a similar fashion to retrieval of organs for transplantation after death. Adult stem cell transplantation occurs daily in this country and around the world in the form of bone marrow transplantation. In a bone marrow transplant, bone marrow is harvested from a close relative or someone who is of similar tissue

type, that marrow is then transfused into the patient whose one bone marrow has ceased to function because of some tumour or other disease. As we have seen the bone marrow is a good source of adult stem cells. It is the stem cells within the harvested marrow that seed themselves in the patient and start producing the blood cells, which their own marrow had failed to do. So the use of adult stem cells in the treatment of disease is already far beyond the research stage and is a common treatment today which raises few if any moral dilemmas.

The whole question of morality in the field of Stem Cell Research centres entirely on the use of embryonic stem cells. In order to obtain embryonic stem cells, the embryo must die. In this age of political correctness and scientific expedience, the view that the embryo is a living person, is not generally accepted. De-personing the embryo and regarding it, at best, as human tissue with only the potential for life salve the conscience of those who have abortions and those who perform them. This perverted morality which permeates the ranks of scientific research, has opened the floodgates for experimentation with living embryos, and destroying them to produce what will effectively be a *spare parts* service.

In 1979 Clifford Gobstein, a frog embryologist, coined the terms, *pre-embryo*, and subsequently, *pre-person* in an article entitled *External Human Fertilization* in the journal, *Scientific American*. He later admitted that he had invented these terms to apply to an embryo before the 14th day after conception, in order to change or reduce the moral status of the embryo.

The inevitable move towards Human Cloning

While there are a multitude of adults from which to obtain adult stem cells, the availability of embryos is limited. Occasionally embryonic stem cells are harvested from aborted fetuses. Many researchers believe that the cloning of embryos is the only way to produce the numbers of embryonic stem cells that are needed. The whole area of tissue rejection when stem cells from one individual are transplanted into another is a major down side to the development of effective treatments with stem cells. However with human cloning, theoretically, an embryo can be “produced” with the identical genetic makeup of the patient. This is achieved, in the cloning process, by replacing the DNA of the human egg cell, with the DNA of the patient, thus the resulting embryo will have the same genetic makeup as the patient to be treated and will circumvent the problem of rejection. At present the legal position in the United Kingdom is as follows. On 4th December 2001 the Human Reproductive Cloning Act passed, forbidding the implantation of embryos produced by cloning, but it does permit research on the cloned embryos up until the 14th day of their development.

The Myths of Stem Cell Research

Embryonic Stem Cell Research has received the greatest attention. It is presented as the only real way forward with regard to the advancement of cures for many diseases. Adult Stem Cell Research is looked on as a poor relation and one, which will not produce as good results. These are all myths propagated by those who want to go down the line of cloning and ultimately *designer babies*, and *spare parts*.

The fact is, to date there have been no human clinical trials of treatment with embryonic stem cells. Major difficulties have been encountered in the research, which has been based on animal trials. Embryonic stem cells are unpredictable, frequently developing into the wrong tissue. Nerve stem cells injected into animal brains to cure certain neurological conditions, have turned into hair and teeth rather than nerve cells. Embryonic stem cells are prone to random uncontrollable growth -this has not proved a major problem with adult stem cells. All these problems, added to the fact that embryos must be killed to fuel their research.

On the other hand adult stem cell research has already gone far beyond the stage of animal trials. Human clinical trials are well under way, with some encouraging success. Bone marrow transplantation, which is stem cell treatment, is an accepted and very successful treatment. There has been some success in the treatment of Parkinson’s disease, damaged heart muscle after a heart attack,

Multiple Sclerosis, Crohn's Disease, many leukemias including Hodgkin's Disease. Another very interesting and promising area is in that of spinal cord injury. In December 6, 2004 the Russian news agency Novosti reported that Russian scientists had succeeded in treating six individuals bed-ridden with spinal cord damage using non-embryonic stem cells derived from the patient's own nasal tissues. All six were learning to walk again. It was reported 30th November 2004 in Kwangju, South Korea that a 37-year-old South Korean woman, paralysed 20 years ago as a result of a spinal injury, is walking again. This is the first recorded recovery of a spinal injury from the use of stem cells -her doctors used umbilical cord-blood stem cells.

Stem Cell Research has been very promising, but only that conducted with adult stem cells. Embryonic Stem Cell Research has met with many more problems

The Biblical position on Stem Cell Research

The whole debate on Stem Cell Research raises many moral and spiritual issues, but absolutely central is the question, when does life begin? As can be appreciated for the explanation above, the difficulties are in the area of *embryonic* stem cell research. Harvesting of *adult* stem cells does not involve the death of an individual, and poses little or no risk to the health of the donor; in fact the donors can often be the patients themselves.

The Law of God expressly forbids the wilful taking of human life, (6th commandment); therefore to do anything with a human embryo rather than protect and preserve it, runs contrary to the Law of God. Embryonic Stem Cell Research denies the embryo the full status of life that God has given it, and reduces it to a commodity. Harvesting stem cells from embryos, inevitably causes their death, and must therefore be seen as the taking of a life -murder. No amount of reasoning as to the potential health benefits can ever justify the taking of life. The end does *not* justify the means.

From a Biblical standpoint we must totally, and without reserve, reject embryonic Stem Cell Research regardless of what it may promise. On the other hand the use of adult stem cells raises no moral or ethical concerns. In fact adult stem cell research, as we have noted, has already brought great benefit to certain conditions.

Stem cell research is to be encouraged, so long as the stem cells are not derived from human embryos.

CONCLUSION

Life is sacred. The Lord makes it clear in His Word that life begins at conception. Apart from three specific exclusions, there is no right to take life, from the moment of conception until that time when the Lord Himself has appointed the time of our death.

The Bible is our only rule of faith and practice. We ought to learn its unalterable principles first, and then weigh man's inventions against them. Then we will not be guilty of wresting the Scriptures, in order to accommodate our own point of view.