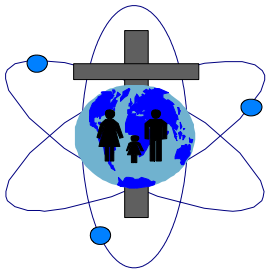
SOCIETY, RELIGION AND TECHNOLOGY PROJECT

Church of Scotland



Embryonic and Adult Stem Cells: Ethical Dilemmas

Dolly the cloned sheep has been an icon for biotechnology, representing both the hopes and the fears about where embryology and genetics might lead. To most people's relief, fears of cloned humans have not materialised. In our view this would be unacceptable both on ethical principle and the high risk of producing deformed babies. Now the focus is on the use of human stem cells, taken either from adult tissue or, controversially, from an IVF embryo or perhaps even a cloned embryo. The Church of Scotland has been at the forefront of the ethical debate since 1998. So what are the issues?

What are Embryonic Stem Cells?

They are special cells in the early embryo before it begins to differentiate. At this point, they can turn into any type of cell in the human body. In 1998 US scientists found a way to isolate them. Using special chemical treatments, scientists believe they can direct these cells to become any type of cell they choose - skin, heart muscle, nerve cells, etc. This opens up a possibility to create replacement cells to inject into patients suffering from a wide range of diseases which cause irreversible cell degeneration, like Parkinson's, some heart conditions and diabetes. This is not cloning, but it raises deep ethical concern whether it changes our view and ethical evaluation of the human embryo.

What is the Status of the Embryo?

There are three positions on this. For two of them, the vote is already quite clear. One extreme sees the early embryo as a ball of cells and nothing more. Because it is undeveloped and would not survive out of the womb, any research is permissible, including the new proposals. The medical benefits, remote as may be, wholly justify the action. At the opposite pole, the Roman Catholic church and many individual Christians of other denominations, believe that from conception onwards the embryo has the full status of humanity. On principle, this allows no research or use not for the benefit of that particular embryo, including both present and the new potential uses. In 1996 the Church of Scotland took a middle position, which affirms the special status as created by God but also recognises potential benefits of embryo research under limited circumstances.

Would Embryo Stem Cells Cross a New Ethical Barrier?

The UK Human Fertilisation and Embryology Act (HFE) of 1990 allowed research on embryos up to 14 days, mainly for research into infertility. The embryo was seen as a reproductive entity, researched for the eventual benefit of other embryos. To use of an embryo as a source of body cells is a different notion, scientifically and ethically. It treats the embryo more functionally, simply as a resource and no longer as a whole. The HFEAct gave the human embryo a 'special status', an ethical compromise which restricted the conditions under which embryos can be created or used. Any special status is lost if embryos are created just to be a routine resource for replacement cells. They are reduced to a ball of cells which no one respects. A 1998 Ministry of Agriculture report into animal cloning cautioned against seeing animals 'merely as means to an end'. Unless we regard human embryos of less intrinsic worth than animals, there should be ethical limits of what we may do to them, just as there are for animals. For some this is a strong argument against creating embryos just for stem cell use.

Using Spare Embryos?

Many thousands of "spare embryos" exist, no longer wanted after IVF treatments. They are destined to be destroyed. Many feel that while we should not *create* embryos for stem cells, it would be better

to use spare embryos for research into stem cells which seeks to find cures for incurable diseases than simply destroying them. For others, even this would compromise the status of the embryo. It also raises serious questions why so many excess embryos are allowed to be created.

Are there Viable Alternatives to Embryo Stem Cells?

There have been many statements claiming that there is a complete alternative by deriving stem cells from adults tissue or umbilical cord blood. A number of recent experiments suggest that these cells are indeed much more adaptable to producing different cell types than had been previously assumed. But this research is in its early days, and no one knows whether adult cells would prove sufficient to address the full range of diseases. Most researchers consider that embryos stem cells would still allow treatments for a wider range of diseases than adult cells, but advocate pursuing both paths in parallel. We have much sympathy for avoiding embryonic stem cells, but no one can claim at this stage on scientific grounds that here is the answer. If on ethical grounds a decision was made only to use adult cells, as things stand today, we would have to face the possibility that the range of treatable diseases might then be significantly limited. Each approach therefore poses scientific and ethical problems.

Where does Cloning come into it?

The main source for embryo stem cells would be so-called "spare" embryos left over after IVF treatments. By definition these cells would be of a different genetic type from the patient. For some diseases like Parkinson's this is not a problem. For others immune rejection might occur. To reduce this risk, cloning might be used to make replacement cells of the same genetic type as the patient. A skin or blood sample would be taken from the patient. The Dolly technique would be used to create a temporary cloned embryo, but instead of implanting it to make a cloned baby, it would be used to create genetically matched cells. This may not be practicable on a large scale, however, and it raises ethical objections. The European Parliament and the influential EC ethical advisory panel have drawn an ethical line at cloning embryos. They argue that it was instrumental to create embryos just to destroy them to make stem cells. It would also make reproductive human cloning more likely to be attempted by unscrupulous scientists. Some scientists say cloned embryos are unnecessary. A wide range of cell lines from using IVF embryos would achieve a close enough match without cloning. A more radical idea would be to reprogramme ordinary adult cells directly into the desired type of cell, without intermediate embryos. This is highly speculative, but merits investigation. It would probably mean limited embryo research as a bridge in understanding. For that one purpose perhaps one might countenance limited cloned embryo research, on condition that it avoids using embryos routinely.

Need for New Legislation on Embryology

The UK Act allowed embryo research for limited purposes mainly for infertility, but in 2000, MP's voted to allow research on human embryos as sources of stem cells for treating degenerative diseases. Parliament did not vote specifically cloned embryos even though they raise special issues. The change in regulation to allow embryo research into stem cells automatically allowed the cloning of embryos by the back door, because of the wording of the old Act. This was not a satisfactory way to address such an important ethical issue. The new regulations simply allow any use of the human embryo for "increasing knowledge about serious disease." This is too open ended for so sensitive a public issue. It puts too much at the discretion of the Human Fertilisation and Embryology Authority. It is essential that a strict "No, unless ..." approach for embryo research is maintained. A House of Lords committee said exceptional reasons would be needed for embryo cloning. Clear ethical guidelines are needed to assess what is a legitimate research proposal, and to restrict the circumstances under which embryos would be created. Four years after Dolly, the UK explicitly banned reproductive human cloning only in response to the political embarrassment of a legal loophole which many had pointed out in 1997. To reflect the range of new discoveries in embryology, including parthenogenesis, the time has surely come to revise the whole legislation to regulate the science of the 21st century not the 1980's.

For more information about this and other ethical issues in technology, contact :
Society, Religion and Technology Project, Church of Scotland, John Knox House, 45 High Street, Edinburgh EH1 1SR. Tel : 0131-556 2953, Fax : 0131-556 7478, email : srtp@srtp.org.uk
Or visit our Worldwide Website at : http://www.srtp.org.uk