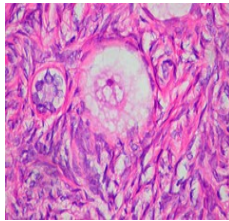


## Are there Viable Alternatives to Embryonic Stem Cells?

The 2006 General Assembly positively sought to “urge Her Majesty’s Government to encourage research into stem cells derived from adult tissues and placental cord blood, and to work to find therapeutic solutions which avoid embryo use.” The recent rise of an ethics free alternative to ES cells seems to largely obviate the need to use human embryos in research. These so called ‘induced pluripotent’ (IP) cells involve artificially ‘regressing’ specialised human cells - such as skin cells, so that they acquire the ability of stem cells to be reprogrammed into other cell types.



research. These so called ‘induced pluripotent’ (IP) cells involve artificially ‘regressing’ specialised human cells - such as skin cells, so that they acquire the ability of stem cells to be reprogrammed into other cell types.

Although IP cells have not yet achieved the gold standard set by true ES cells, the ease with which they can be generated and the rapid advance of the technology, coupled to the lack of ethical “baggage”, is causing great excitement in the stem cell research world.

Credits. Thanks are due to the following artists for their artwork facilitated under Creative Commons.  
Cloned Family=Vernhart. Human Cell=Euthman  
Needle in Petri Dishes= AdamJTaylor and Dolly the Sheep= Notcub DNA=Netefekt..

## The Society, Religion and Technology Project



The Society, Religion and Technology Project, (SRTP) was set up by the Church of Scotland in 1970 to examine vital issues in the intersection between science, technology and religion. Its multidisciplinary working groups provide a forum for interaction between scientists and specialists in ethics, theology and other fields to look at wider dimensions of emerging technologies.

### 40th Anniversary in 2010

A series of events are planned to celebrate the 40th anniversary of the project. If you want to be updated please email [srtp@cofscotland.org.uk](mailto:srtp@cofscotland.org.uk)

### The Church and Society Council

The Church and Society Council’s remit is to continue the tradition of engaging on behalf of the Church in the national, political and social issues affecting Scotland and the world today - from asylum seekers to ecological concerns. We can provide speakers on many current topics for your congregation. To receive our monthly e-newsletter please email

[icrosthwaite@cofscotland.org.uk](mailto:icrosthwaite@cofscotland.org.uk)

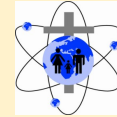
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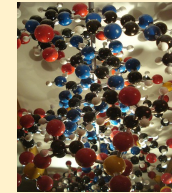


Church of Scotland

SRTP  
40th Anniversary 2010



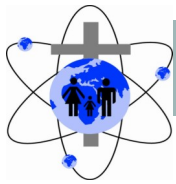
## Embryonic and Adult Stem Cells: Ethical Dilemmas



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# The vital ethical issues surrounding embryonic and adult stem cell research

Dolly the cloned sheep has become 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 yet materialised, despite a number of attempts. In the view of many, reproductive cloning of humans would be unacceptable both on ethical principles and the high risk of producing deformed babies. Now the focus is on the use of human stem cells, derived either from adult tissue or from "spare" *in vitro* fertilisation (IVF) embryos or from embryos specifically made for the purpose.



The Church of Scotland Society, Religion and Technology (SRT) project has been at the forefront of this ethical debate for over a decade. So what are the issues?

## What are Embryonic Stem Cells?

These are special cells found 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 the laboratory, scientists 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. The creation of embryonic stem (ES) cells raises deep concerns particularly in relation to the ethical evaluation of the human embryo.

## Ethical Issues surrounding Stem Cell Research?

Current ethical debate centres around the following topics: the status of the embryo, the use of 'spare embryos' and possible alternatives to embryonic stem cell research.

## What is the Status of the Embryo?

The UK Human Fertilisation & Embryology (HFE) Act of 2008 allows research on embryos up to 14 days, mainly for research into infertility. The embryo is seen as a reproductive entity, researched for the eventual benefit of other embryos. This position argues that any research on embryos is appropriate because they are undeveloped and would not survive out of the womb. The current situation is in contrast to the previous HFE Act of 1990 which accorded the human embryo a special status restricting the conditions under which embryos could be created or used. The current routine use of human embryos as a source of stem cells, implies for some a utilitarian view of the embryo as just a bag of cells and constitutes a downgrading of its previous legal status. At the other end of the spectrum, the Roman Catholic church and many individual Christians believe that from conception onwards the embryo has the full status of humanity. In principle, this allows no research at all. In 2006 the General Assembly of the Church of Scotland



took a middle position, which affirmed the special status of the embryo but also recognised potential benefits of embryo research under limited circumstances.



## Use of Spare Embryos?

Early IVF techniques fertilised eggs to create early embryos, which were then stored for possible future IVF cycles. Technology has moved on and it is now possible to freeze unfertilised eggs, so there is no need to generate spare IVF embryos. However, spare embryos exist as a residue of previous IVF treatments. These embryos are, in many cases, destined to be destroyed. Parents must choose either to donate them for research, have them destroyed, or allow them to be "adopted" and implanted in the womb of an unrelated woman. Many feel that it would be better to use spare embryos for stem cell research which seeks to find cures for incurable diseases rather than simply destroying them. For others, subjecting these embryos to research would compromise the status of the embryo. Due to the fact that fewer 'excess' embryos are being created, alternative sources of stem cells are now being sought.

The HFE (2008) Act allows the creation of human embryos specifically for research from donated eggs and sperm. It also allows the use of cloned human embryos for therapeutic purposes, and the generation of cytoplasmic hybrid embryos - cloned material derived from human sources to derive embryonic stem cells.