Stem Cells Divide the World

Michael Gross

Researchers who are keen to develop new embryonic stem (ES) cell lines from early, undifferentiated human embryos must have a fairly good grasp of geography. Because at the moment, there are almost as many different approaches to stem cell ethics as there are countries in the United Nations, so what is encouraged in one country may be strictly forbidden in another one, even if it is a close ally in political questions. For instance, Israel is among the pioneering nations for new cell lines, while the US have restricted researchers to using existing ones. Similar divisions run right across the European Union, where there is a colourful patchwork of different government positions, not to mention lively debate and dissent within each country. The EU now aims at reaching a unified compromise position by the end of this year, when a moratorium set in September 2002 runs out.

Germany insists that any state or EU research funding should be limited to research using already existing stem cell lines, a position roughly equivalent to the current US approach, and supported by some of the EU member states. Even importing existing cell lines into Germany has only become possible after a long political battle spearheaded by the Deutsche Forschungsgemeinschaft (DFG) and medical researcher Oliver Brüstle from the University of Bonn. Other EU members including the UK aim for a more permissive approach where state-funded research could be allowed to create new cell lines from human embryos left over after IVF treatment (which would otherwise be discarded).

Israel remains the most enthusiastic producer of new cell lines. As Judaism does not regard 8-cell embryos as human beings any more than sperms or egg cells, there is virtually no religious opposition against their use for research. The stem cells that German researchers like Oliver Brüstle would like to use, but have to fight hard for permission to import, typically come from Israel. The Technion at Haifa, where Joseph Iskovitz-Eldor nucleated stem cell research after taking part in the production of the first-ever human ES cell line in the US, is one of the centres where researchers from less liberal countries go shopping.

Next to Israel, the UK may emerge as one of the countries where research can proceed relatively unhindered. This prospect was first brought to the public awareness in 2001 when Roger Pedersen moved from the University of California at San Francisco to Cambridge University for this reason. The role of the UK in stem cell research was strengthened earlier this year, when the Human Fertilisation and Embryo Authority (HFEA, www.hfea.gov.uk) granted the Roslin Institute – the place where Dolly the sheep was cloned – a one-year permission to generate human embryonic stem cells from embryos left over after IVF treatment, with the informed consent of the embryo donors. The institute will also be allowed to stimulate unfertilized egg cells into embryonal development, a process known as parthenogenesis. For the Roslin institute, whose main expertise is in the embryology and cloning of mammals, this may be a first step into the promising domain of medical applications derived from human stem cells. Studies of early human embryos, combined with the vast body of experience the institute has gathered with other mammals, could also serve to improve the understanding of some of the complications and difficulties in early pregnancy.

Another centre of stem cell research is Kings College London, which was granted a similar license in March 2002, only a few days after the House of Lords paved the way for creating stem cells in the UK. On August 13th, 2003, Kings researchers Susan Pickering and Stephen Minger reported the first new ES cell line created in the UK. The cell cultures were derived from blastocysts of 60–100 cells which failed to be selected for re-implantation after pre-implantation diagnostics (PID) and would otherwise have been discarded.

The UK is also involved in a recent international effort to coordinate stem cell research, in order to avoid unnecessary duplication of experiments and make the best possible use of the stem cell lines already available. Britain's Medical Research Council, the MRC, chaired a 12 country stem cell forum on July 11th, where international coordination was agreed. It is hoped that the work of the forum will foster data sharing and close collaborarions between countries. The countries already involved include the US, Canada, Australia, Germany, France, Japan, Israel, Singapore, Finland, The Netherlands and Sweden. International research organisations can also join the forum, as the the Juvenile Diabetes Research Foundation has already done.

Across Europe, legislators are struggling to catch up with the progress in research. In some places, embryo research is allowed simply because nobody has thought of making a law against it, while in others, hasty laws resulting in blanket bans may have to be revised to allow some research. In the current European patchwork situation, Sweden is closest to the UK approach, while Italy joins Germany in rejecting the production of new cell lines. Spain is processing legislation to allow production of new cell lines.

Among the Eastern European countries set to join the EU, the Czech Republic has recently become the first to produce new stem cell lines. As Nature reported in August, researchers at the Centre for Cell Therapy and Tissue Repair at the Charles University Prague have derived three ES cell lines from spare embryos with the informed consent of the donor couples who had received the IVF treatment.

It remains to be seen how the negociations over the new EU regulations will change the world map of stem cell research. It appears, however, that the largely irrational, religiously motivated point of view which effectively allows researchers to throw leftover embryos in the dustbin, but not to use them for life-saving research will remain influential in Europe. Thus, for the foreseeable future, most stem cell researchers may have to travel and do their shopping abroad, and many will view Israel as the land where milk and honey flow.

Michael Gross
He is a science writer in residence at the school of crystallography, Birkbeck College, London. He can be contacted via his web page at www.proseandpassion.com.

BIOforum Europe 05/2003, p 244, GIT VERLAG GmbH & Co. KG, Darmstadt, Germany, www.gitverlag.com/go/bioint