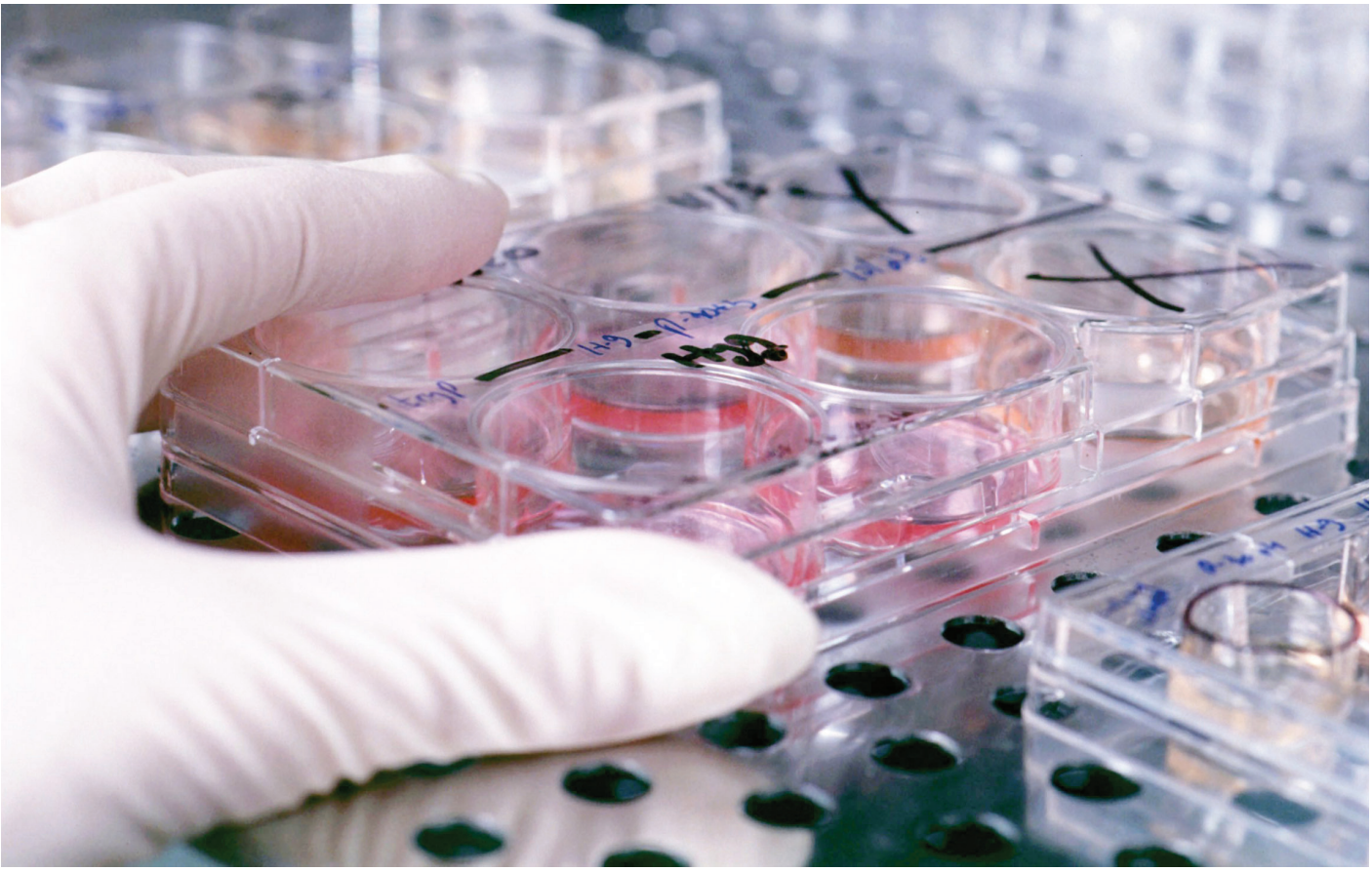

A stem turn

A growing number of countries have come to embrace stem cell research, as the Karolinska Institute's Professor Outi Hovatta explains to *Public Service Review*...

The subject of regenerative medicine is proving to be one of the most controversial scientific developments of the 21st Century so far. The use of human stem cells to repair or replace tissue or organ functions has many supporters, but myriad opponents of the practice have cited ethical and religious concerns. A new report from the European Science Foundation examines the scientific, ethical and legal issues in human stem cell research. Professor Outi Hovatta, of Sweden's Karolinska Institute, carried out the report, and speaks to *Public Service Review* about this contentious regenerative research method.

How has the landscape in Europe altered as far as stem cell research is concerned?

It has changed vastly during the last few years. Now many more countries have become permissive – there are still some countries that don't allow embryonic stem cell research, but only three now. Many countries have changed their legislation to allow the establishment of new embryonic stem cell lines from supernumerary fertilisation embryos.

Why is regenerative research important?

Regenerative medicine could be used to treat many very severe diseases. Stem cells are now the best source of cells for forming new tissues. The promising gene-modified adult stem cells now provide good models for diseases, but until important safety issues have been resolved, human embryonic stem cells will remain important research tools only.

What are the risks accompanying stem cell research?

The research isn't risky at all, but stem cell treatment may be, because all cells in culture undergo mutations and these mutations tend to give a great advantage to the cells, causing the number of cells in the culture to multiply and take over. Culture conditions are very important to these modified cells and therefore young passage cells must be used, cells that haven't been cultured for many, many generations before being used in possible cell transplantation to cure diseases. Before use, it is important

A number of countries in recent years have relaxed legislation regarding embryonic stem cell research

to make sure they are genetically normal without forming too many mutations. Of course, good practice in cleanliness is extremely important in laboratories in helping to reduce infections through the cells. Adult stem cells are safer, and are already used in clinical trials.

How do opinions on stem cell research differ throughout Europe?

Embryonic stem cell research is more advanced in countries where it has been legal for a long time. There are some countries, however, that have yet to really begin proper stem cell research because of the controversies surrounding the issue, which creates problems, and it's actually quite difficult to say why.

Is there scope for further collaboration throughout Europe for this type of research?

There have been major collaborations throughout Europe that have helped to advance stem cell reseach, so yes, increasing collaboration is important and those who don't participate will fall behind. It's so complicated, demands so many skills and there is so much to develop that all research teams can pass information to each other. It's like building a big house – everybody is building a small part.

Which nations are leading the way in stem cell research?

In Europe there are many leading countries, for instance the United Kingdom and Sweden, and in advanced stem cells, Germany and France, and many other countries are catching up. Switzerland, which was conservative before accepting embryonic stem cell research, is quite advanced today. But in the United States where you can patent everything (unlike in Europe), it's so much easier, and they have more money for research.

Do you think there is sufficient funding available for this kind of research?

Any researcher in any field would say no, but Europe would definitely benefit from getting more funding for stem cell research, because it's moving so quickly and there are so many potential benefits. There are new treatments for very severe and disabling diseases, which are extremely expensive for patients and for society. So I would say yes, we would definitely need more funding for regenerative research.

What would be your priorities for stem cell research in the next few years?

The most basic research and clinical research needs support. It would have to be universal, using all possible types of stem cells. The research supports all aspects of this area, so these researchers support each other.

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