EuroStemCell

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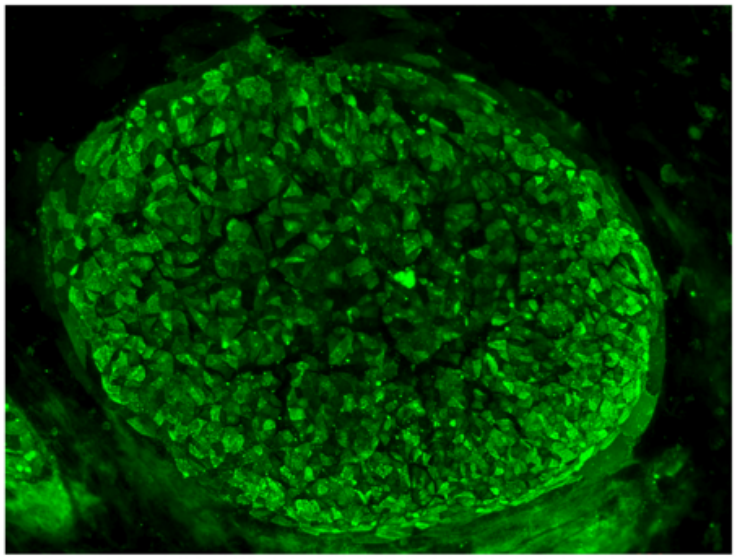
Ethics and reprogramming: ethical questions after the discovery of iPS cells

What are the issues being discussed?

Use of human embryonic stem cells (ESCs) for medical treatment and research is debated because of the moral implications of using human embryos. In 2006, a method was developed for artificially transforming skin cells (and other cell types) into 'induced pluripotent stem cells' (iPSCs), cells that have similar abilities as ESCs.

Do we still need ESCs? Should researchers switch to using iPSCs to avoid moral issues? What moral issues do iPSCs pose?

iPSC treatments will likely require donor's cells to undergo genetic alterations. Will it be acceptable to people that their cells have been modified?



Human iPS cell colony with a green label used to mark pluripotent cells.

Photo: Daniela Evers, Institute of Reconstructive Biology, University of Bonn

What still needs clarification?

Many questions still remain about how cell reprogramming works and how closely/exactly iPSCs resemble ESCs.

Researchers believe that both iPSCs and ESCs are important in answering how stem cells grow, replicate and create specific types of cells.

Research on ESCs has lead to the discovery of iPSCs and has greatly helped understand how iPSCs work. In turn, iPSCs offer new insights into how ESCs naturally control pluripotency and differentiation. Knowing more about both iPSCs and ESCs will greatly help researchers develop reliable methods to control the cells and use them in medical treatments.

What are the benefits & challenges?

One benefit to developing treatments with iPSCs is that transplanted iPSCs (made from a patient's own cells) will not be rejected by the immune system.

A challenge to developing iPSCs treatments is that procedures to make iPSCs will require tailoring to each patient's genetic background and needs, making iPSC treatments labour intensive and expensive.

The practicality of getting iPSC or ESC cell therapies to patients will be challenging. Specialists will need to be hired to deliver treatments and laboratories will need to be built to create and distribute large amounts of cells for treatments.

For more information visit: **www.eurostemcell.org/ethics**