

Origins, ethics and embryos: the sources of human embryonic stem cells

What do we know?

Human embryonic stem cells (ESCs) are created from a small number of cells found in a blastula, a very early human embryo. Single cells taken from the blastula are grown into large numbers of cells to create ESC 'lines'.

ESC lines used by most researchers are already existing stem cell lines. Most new ESC lines are made from spare blastulas from fertility treatments. The ability of ESCs to self-replicate allows huge numbers of cells to be grown from a stem cell line and shared with laboratories around the globe for many years, which minimises the need for making new ESCs from blastula.



Human blastocyst at six days old.

Image: Jenny Nichols, MRC Centre for Regenerative Medicine, University of Edinburgh.

What issues are being discussed?

Although some people disagree with using any embryonic stem cells, the use of ESC lines previously created is generally accepted because no further embryos are damaged.

The ethical debate about making new ESC lines out of spare blastocysts from fertility clinics is primarily due to a disagreement of how blastocysts should be treated. Some people see destroying blastocysts as killing human life.

An often overlooked concern about ESCs is who will and will not benefit from ESC treatments e.g. ESC treatments may not be affordable for poor people and poor countries.