The egg makes sure that sperm don't get too old

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In contrast to women, men are fertile throughout life, but research at the Sahlgrenska Academy, University of Gothenburg, Sweden, has now shown that a fertilising sperm can get help from the egg to rejuvenate. The result is an important step towards future stem cell therapy.

The risk of chromosomal abnormalities in the foetus is highly correlated to the age of the mother, but is nearly independent of the age of the father. One possible explanation is that egg cells have a unique ability to reset the age of a sperm.

"We are the first to show that egg cells have the ability to rejuvenate other cells, and this is an important result for future stem cell research", says Associate Professor Tomas Simonsson, who leads the research group at the Sahlgrenska Academy that has made this discovery.

Each time a cell divides, the genetic material at the ends of the chromosomes becomes shorter. The ends of the chromosomes, known as "telomeres", are important for the genetic stability of the cell and they act as a DNA clock that measures the age of the cell. The cell stops dividing and dies when the telomeres become too short.

The discovery that the egg cell can extend the telomeres of a fertilising sperm cell is important in the development of stem cell therapy. Stem cell therapy involves replacing the cell nucleus in unfertilised egg with a nucleus from a somatic cell that has come from a patient who needs a stem cell transplantation. As soon as the cell has divided a few times, it

is possible to harvest stem cells that are then allowed to mature to the cell type that the recipient needs.

"The genetic stability of the transplanted cells has been a serious concern up until now, and it was feared that the lifetime of these cells would depend on the age of the cell nucleus that was transferred. Our results suggest that this is not the case", says Tomas Simonsson.

Stem cell therapy

Stem cell therapy is based on the transfer of cells to replace cells that have become diseased or died. Reprogrammed stem cells have so far only been used in animal experiments. Much research remains to be done, but it is considered to be only a question of time before stem cell therapy becomes a possible treatment for diseases such as Parkinson disease, diabetes type I, muscular dystrophy and hereditary immune deficiency.

Source: University of Gothenburg (news : web)