canada.com
WHERE PERSPECTIVES CONNECT

Stem cells used to fight Parkinson's

Reprogrammed skin cells ease symptoms in rats

MAGGIE FOX

Skin cells reprogrammed to act like embryonic stem cells eased symptoms of Parkinson's disease in rats, researchers reported Monday in a first step toward tailored treatments for people that bypass concerns about using human embryos.

The experiment suggests it may be possible to take a small sample of skin and turn it into a transplant perfectly matched to patients with Parkinson's and other diseases, the researchers reported in the Proceedings of the National Academy of Sciences.

A worker feeds white rats at an animal laboratory of a medical school. Skin cells reprogrammed to act like embryonic stem cells eased symptoms of Parkinson's disease in rats.

It also supports the usefulness of newly created cells that resemble powerful embryonic stem cells. The stem cell experts used so-called induced pluripotent stem cells, which are skin cells reprogrammed to act like embryonic stem cells.

"It's a proof of principle experiment that argues, yes, these cells may have the therapeutic promise that people ascribe to them," said Rudolf Jaenisch, a stem cell expert at the Whitehead Institute and the Massachusetts Institute of Technology.

Researchers are trying to find ways to harness stem cells, the body's master cells, to treat patients with serious injuries, brain diseases and organ damage caused by conditions such as diabetes.

Stem cells taken from very early embryos appear to be the most malleable and the most powerful. But many people object to their use because the embryo usually must be destroyed to extract them.

Several teams have reported a way to re-program ordinary skin cells to act like embryonic stem cells by adding several genes. Jaenisch's team tested some of these cells in rats and mice. They first got such cells to take up residence in the brains of unborn mice.

They then damaged the brains of rats to resemble Parkinson's, which is caused by the destruction of brain cells that produce a message-carrying chemical called dopamine. Patients lose abilities associated with movement, and progress from a type of shakiness to paralysis and death.

There is no cure. Transplants of cells from fetuses offer some relief from symptoms in a few people. In rats, the cell transplants improved symptoms markedly, researchers said.

"This is the first demonstration that re-programmed cells can integrate into the neural system or positively affect neurodegenerative disease," said MIT's Marius Wernig.

One problem with transplanting these powerful but immature cells is that they can differentiate into undesired tissues. The study used protein to mark the cells that became dopamine-making neurons, so only these cells were transplanted.

Safety issues must be addressed before the method is tested in people.