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Spinal Cord Stem Cells May Act as Nerve Repair System

Adult stem cells that may prove valuable in efforts to develop nonsurgical treatments for spinal cord injuries have been identified by researchers in the United States and Sweden.

They say it may be possible to develop drugs that boost the ability of these stem cells to repair damaged nerve cells.

An adult's spinal cord contains only a small number of stem cells, which proliferate slowly or rarely and don't promote regeneration on their own. But some research has shown that spinal cord stem cells grown in the lab and returned to the injury site can restore some physical function in paralyzed rodents and primates.

In this new study, scientists at MIT's Picower Institute for Learning and Memory in Cambridge, Mass., and at the Karolinska Institute in Stockholm found that neural stem cells in the adult spinal cord are limited to a layer of cells called ependymal cells, which make up the thin membrane lining the inner-brain ventricles and the connecting central column of the spinal cord.

We have been able to genetically mark this neural stem cell population and then follow their behavior. We find that these cells proliferate upon spinal cord injury, migrate toward the injury site and differentiate over several months," study author Konstantinos Meletis said in an MIT news release.

"The ependymal cells' ability to turn into several different cell types upon injury makes them very interesting from an intervention aspect. Imagine if we could regulate the behavior of this stem cell population to repair damaged nerve cells," Meletis said.

The research was published in the July issue of PLoS Medicine.