

# Astrocytes control the generation of new neurons from neural stem cells

August 24 2012

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Astrocytes are cells that have many functions in the central nervous system, such as the control of neuronal synapses, blood flow, or the brain's response to neurotrauma or stroke.

Prof. Pekny's laboratory together with collaborators have earlier demonstrated that astrocytes reduce the brain tissue damage after stroke and that the integration of transplanted neural stem cells can be largely improved by modulating the activity of astrocytes.

## Generation of new neurons

In their current study, the Sahlgrenska Academy researchers show how astrocytes control the generation of new neurons in the brain. An important contribution to this project came from Åbo Academy, one of Sahlgrenska's traditional collaborative partners.

"In the brain, astrocytes control how many new neurons are formed from neural stem cells and survive to integrate into the existing [neuronal networks](#). Astrocytes do this by secreting specific molecules but also by much less understood direct cell-cell interactions with stem cells", says Prof. Milos Pekny.

## Important regulator

"Astrocytes are in physical contact with [neural stem cells](#) and we have

shown that they signal through the [Notch pathway](#) to stem cells to keep the birth rate of new neurons low. We have also shown that the intermediate filament system of astrocytes is an important regulator of this process. It seems that astrocyte intermediate filaments can be used as a target to increase the birthrate of new neurons."

## Target for future therapies

"We are starting to understand some of the cellular and [molecular mechanisms](#) behind the control of neurogenesis. Neurogenesis is one of the components of [brain plasticity](#), which plays a role in the learning process as well as in the recovery after brain injury or stroke. This work helps us to understand how plasticity and regenerative response can be therapeutically promoted in the future", says Prof. Milos Pekny.

Provided by University of Gothenburg

Citation: Astrocytes control the generation of new neurons from neural stem cells (2012, August 24) retrieved 27 April 2024 from <https://medicalxpress.com/news/2012-08-astrocytes-neurons-neural-stem-cells.html>

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