Medical Xpress

Astrocytes affect brain's information signaling

June 14 2010

Astrocytes are the most common type of cell in the brain and play an important role in the function of neurons - nerve cells. New research from the University of Gothenburg, Sweden, shows that they are also directly involved in the regulation of signalling between neurons.

"Our results contribute to the insight that astrocytes can affect how the brain processes and stores information," says My Andersson, a researcher from the Department of Physiology at the Institute of Neuroscience and Physiology. "This means that astrocytes should be given more attention in future when looking for causes of diseases that affect signalling between neurons, such as epilepsy."

Besides neurons, the brain consists of a large number of astrocytes. These have previously been viewed primarily as the brain's housekeeping cells, whose roles include regulating blood flow in different parts of the brain. Previous research has also shown that astrocytes can respond to and communicate with neurons.

Our personality, thoughts and emotions are created by activity in different networks of nerve cells in the brain.

"This activity takes the form of electrical impulses which are transmitted between neurons via synapses," says Andersson. "In the synapses, transmitter substances are released, the most common being the amino acid glutamate, which helps to transfer signals from one neuron to another."

In studies of rats, the researchers were able to measure flows from the synapses in the hippocampus, a part of the brain that is important for memory and learning. They found that astrocytes affect how effectively signals are transferred between the synapses and how this signalling changes over time. What happens is that the astrocytes sense activity from the synapses and respond by reducing the release of glutamate.

The researchers' discovery could lead to a whole new understanding of how the transfer of information between synapses is regulated, and of the importance of astrocytes in this process.

Provided by University of Gothenburg

Citation: Astrocytes affect brain's information signaling (2010, June 14) retrieved 26 April 2024 from https://medicalxpress.com/news/2010-06-astrocytes-affect-brain.html