

New research findings on the brain's guardian cells

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The central nervous system's mop-up crew, microglia, play an important role in protecting the brain against disease and injury. A research group at Lund University in Sweden has now developed a method that makes it possible to follow the behaviour of these support cells at close quarters. Increased knowledge about the specific role of microglia could open the door to new research avenues on several different neurological conditions, such as Parkinson's disease and stroke.

Researcher Johan Jakobsson and his colleagues have now published their results in *Nature Communications*.

"At present, researchers know very little about exactly how microglia work. At the same time, there is a lot of curiosity and high hopes among brain researchers that greater understanding of microglia could lead to entirely new drug development strategies for various [brain diseases](#)", says Johan Jakobsson, research group leader at the Division of Molecular Neurogenetics at Lund University.

What the researchers have now succeeded in identifying is a deviation in the structure of the microglia cells, which makes it possible to visualise them and study their behaviour. By inserting a luminescent protein controlled by a microscopic molecule, microRNA-9, the researchers can now distinguish the microglia and monitor their function over time in the brains of rats and mice.

It has long been known that microglia form the first line of defence of

the immune system in diseases of the brain. They move quickly to the affected area and release an arsenal of molecules that protect the [nerve cells](#) and clear away damaged tissue.

New research also suggests that microglia not only guard the nerve cells but also play an important role in their basic function.

"This represents a real step forward in technological development. Now we can view microglia in a way that has not been possible before. We and our colleagues now hope to be able to use this technique to study the role of the [cells](#) in different [disease models](#), for example Parkinson's disease and stroke, in which microglia are believed to play an important role", explains Johan Jakobsson.

More information: Akerblom, M. et al. Visualization and genetic modification of resident brain microglia using lentiviral vectors regulated by microRNA-9, *Nature Communications*, April 2013. www.nature.com/ncomms/journal/.../full/ncomms2801.html

Provided by Lund University

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