

Noted neurologists reveal new insights into glia cell role in brain function

January 11 2013, by Bob Yirka

(Medical Xpress)—Adriano Aguzzi, Ben Barres and Mariko Bennett, noted American neurologists for their research into the role glia cells play in brain function, have written a review paper for the journal *Science*. In it, they assert that it is their belief that glia cells play a far more important role in brain function than is commonly believed.

In the brain and the rest of the central nervous system, there are two main kinds of cells: [nerve cells](#), and the 90 percent of cells that are not nerve cells, collectively called glia – the gelatinous part of our brains, or as its name implies, the glue that holds everything in our skull together. That everything of course, includes the electrical network that allows us to do the myriad of things that we are capable of doing.

In their review, the researchers point out that as more research is done on non-neural cells in the nervous system, the more it is discovered that the neural cells would not be able to do their job were it not for the microglia. As one example, in research performed by Barres and other colleagues in a study published in 2005, it was found that astrocytes – the most common type of [glia cells](#) – are actually responsible for determining when and where synapses form. Prior to that it was believed they did little more than mop up after neural cells.

More importantly, the team suggests that more recent research has revealed that the brain may have a different type of inflammation than has been previously known. Instead, of familiar symptoms, such as swelling, redness, heat and pain, they suggest that a new word be coined

"neuroinflammation" to describe what goes on during some viral infections of the [central nervous system](#) or when an [autoimmune diseases](#) strikes. They also suggest that instead of deeming some diseases as degenerative, they should be classified and viewed as a new type of neural specific inflammation.

The trio also point out that recent research has shown microglia tend to serve as a [surveillance system](#) for the brain, sounding the alarm when things go wrong and ushering in systems to mount a response if attacked or to get to work on performing repair work. Because of this, they suggest that some diseases that are attributed to other causes, may in fact be similar to autoimmune diseases that get out of hand. Instead of protecting the neural system, the microglia may wind up slowly eating it away.

In summation, the team suggests that that the research and medical community cease thinking of neural and glial cells as separate entities with [neural cells](#) getting the bulk of attention and instead focus more attention on the roles they all play together in providing us human beings with the ability to think, move and function as the complex biological specimens we all are.

More information: Microglia: Scapegoat, Saboteur, or Something Else? *Science* 11 January 2013: Vol. 339 no. 6116 pp. 156-161 [DOI: 10.1126/science.1227901](#)

Abstract

Microglia are resident immune cells in the brain and spinal cord. These cells provide immune surveillance and are mobilized in response to disparate diseases and injuries. Although microglial activation is often considered neurotoxic, microglia are essential defenders against many neurodegenerative diseases. It also seems increasingly likely that microglial dysfunction can underlie certain neurological diseases without

an obvious immune component.

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