

Stroke: Researchers shed light on the brain recovery process and new treatment strategies

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Stroke is one of three leading causes of death in Canada and leads to permanent disability in about half of survivors. During an ischemic stroke, there is a blockage of blood flow which results in cell death in a specific area of the brain. Dr. Brian MacVicar at the University of British Columbia has recently discovered how two types of cells, called astrocytes and pericytes, work together to regenerate blood flow in the areas affected by these strokes (called ischemic areas). These results were presented at the 2018 Canadian Neuroscience Meeting, in Vancouver, May 16th, 2018.

Astrocytes are a class of [brain cells](#) that are known to proliferate and become active following brain injury. The role of a second class of cells, called pericytes, was not known. Pericytes are known to regulate blood flow in the smallest [blood vessels](#) of the body, capillaries. Now Dr. MacVicar's team has shown that following stroke, pericytes also proliferate and migrate to the damaged area of the brain, inside a region that is bordered by astrocytes.

His team also showed that new blood vessels were formed at the interface between astrocytes and pericytes, in a wave that goes from the edge of the injured region towards the centre, thereby re-establishing blood flow in the region.

"Our results show that these two types of cell cooperate to re-establish blood flow in the injured region, and that within a few weeks, the area is fully vascularized, meaning that normal [blood flow](#) is restored. Additionally, we showed that the blood brain barrier is also re-established."

The [blood-brain barrier](#) is a protective mechanism that makes capillaries in the brain less permeable than blood vessels in the rest of the body,

preventing the passage of bacteria and certain toxins that could be present in the blood, while allowing oxygen and nutrients to reach brain cells.

"Our work shows that pericytes are a dynamic population of cells in the brain, who become activated and proliferate in response to injury. This occurs through cross-talk between astrocytes and pericytes."

The Heart and Stroke foundation of Canada indicates there are 62,000 strokes in Canada each year, and that 80% of people survive stroke. The Public Health Agency of Canada estimates that close to 742 000 Canadians live with the effects of stroke. A better understanding of the ways the brain can repair itself following [stroke](#) has the potential to lead to the identification of new targets for treatments to prevent damage or repair the brain.

Provided by Canadian Association for Neuroscience

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