New discovery in nerve regrowth

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Faculty of Medicine scientists have discovered a way to enhance nerve regeneration in the peripheral nervous system. This important discovery could lead to new treatments for nerve damage caused by diabetes or traumatic injuries. Peripheral nerves connect the brain and spinal cord to the body, and without them, there is no movement or sensation. Peripheral nerve damage is common and often irreversible. This discovery is published in the July 7, 2010 edition of the *Journal of Neuroscience*.

Senior researcher on the study, Dr. Douglas Zochodne, is a neurologist and professor in the Department of Clinical Neurosciences. Kimberly Christie, lead author on the study and a PhD student in Dr. Zochodne's lab, along with Hotchkiss Brain Institute colleagues, used a rat model to examine a pathway that helps nerves to grow and survive. Within this pathway is a molecular brake, called PTEN, that helps to prevent excessive cell growth under normal conditions.

In addition to discovering for the first time that PTEN is found in the peripheral nervous system, Zochodne's team demonstrated that following nerve injury, PTEN prevents peripheral nerves from regenerating. The team was able to block PTEN, an approach that dramatically increased nerve outgrowth.

Kimberly Christie says, "We were amazed to see such a dramatic effect over such a short time period. No one knew that nerves in the peripheral system could regenerate in this way, nerves that can be damaged if someone has diabetes for example. This finding could eventually help

people who have lost feeling or motor skills recover and live with less pain."

Peripheral nerve damage can lead to pain, tingling, numbness or difficulty coordinating hands, feet, arms or legs. This can happen with diseases like diabetes, an injury due to a crushed or cut nerve, or other conditions known as neuropathy.

"Removing the brakes on regeneration offers us a new approach. Our next steps will be to find out if the exciting rise in nerve outgrowth we have observed will result in long term benefits," says Zochodne.

Provided by University of Calgary