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Blocking single gene aids spinal cord injuries: researchers

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Shutting off the function of a single gene in the body could someday help victims of spinal cord injuries avoid paralysis, researchers announced Wednesday.

The discovery potentially opens the door to new treatments and improved long-term recovery from such injuries which often result in life-long damage and sky-high rehabilitation and hospitalization costs.

Researchers said they administered a drug to lab mice and rats that shut off a specific gene which kicks in after a spinal cord injury.

The gene, Abcc8, is part of the body's protective reaction in the event of spinal cord damage.

The gene activates the Sulfonylurea receptor-1 (Sur1) protein, which can paradoxically end up inflicting more damage to the spinal cord's own cells, according to lead researcher Marc Simard of the University of Maryland School of Medicine.

Sur1 uses sodium to protect cells from an excess of calcium that floods a severely injured area, but the defense mechanism sends the protein molecule into overdrive, allowing an unchecked influx of sodium into the cells, which can lead to cell death.

"By shutting down the Abcc8 gene that encodes the Sur1 protein the researchers were able to halt the self-destructive process and improve

long-term recovery in spinal cord injured mice," according to a summary of the report published in *Science Translational Medicine*.

Simard's team studied spinal cord tissue from humans, mice and rats and found that the same process of cell death and destruction brought on by Sur1 was present in each of the species.

Shutting the gene off allowed researchers to preserve neurological function in the mice, with lesions between one-third and one-fourth the size of those in the control animals.

Researchers neutralized Abcc8 in mice using oligodeoxynucleotide, a short, single strand of DNA which clings to genes and temporarily blocks their activation.

About half of people with spinal cord injuries become paraplegic.

A sharp blow on the spine can fracture or dislocate the vertebrae, which in turn can crush and destroy the branches of neurons in the spinal cord which send signals to and from the brain.

Simard's research, which would still need years of clinical trials before a drug using the Abcc8 neutralizer can be sold publicly, lead to treatment which significantly reduces the destruction of nerve tissue in the aftermath of a spinal cord injury.