Better understanding of potential regeneration after brain/spinal cord injury

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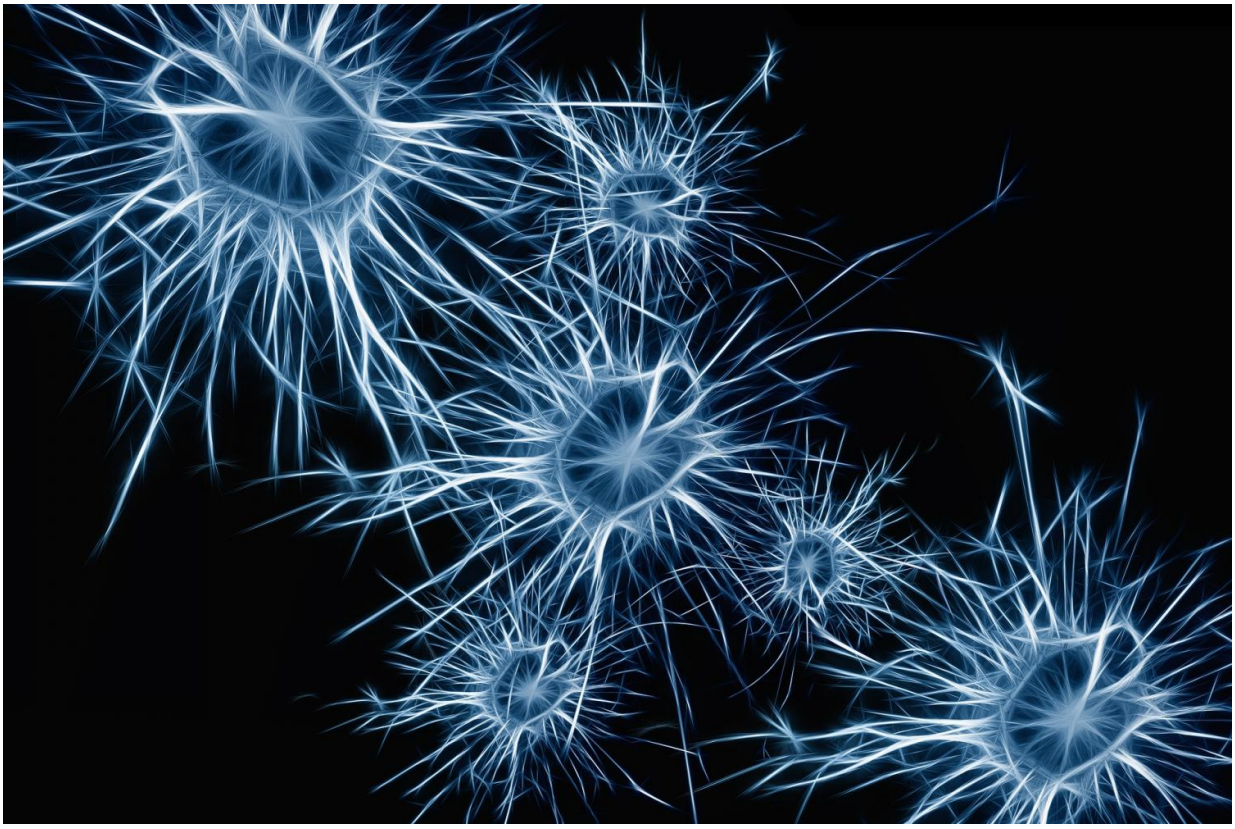

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Researchers at Boston University School of Medicine (BUSM) have uncovered new information on the pathways involved in neuronal regeneration, hopefully bringing the medical community one step closer

to managing brain and spinal cord injuries.

By observing neurons after injury, they found that by changing the levels of sugars that cover the surface of proteins (called O-GlcNAc modifications), they could alter neuronal metabolism and thus were able to significantly enhance neuronal regeneration after injury.

Using an experimental model, the researchers compared neurons in which O-GlcNAc levels were either absent or in abundance. The researchers then used a specially designed laser to injure individual neurons and measure subsequent regeneration in each of these conditions.

They surprisingly found that a change in the levels of O-GlcNAc, either as a reduction or an increase, resulted in an enhanced capacity of the neurons to regenerate. The researchers further demonstrated that this can occur by altering the neuron's metabolism during regeneration and shows the importance of the role of O-GlcNAc in coordinating the response to neuronal injury and regeneration.

The researchers believe there are potentially important clinical implications from this study that could significantly impact conditions like spinal cord injuries. "Using this as a model, we can now find other genes or drugs that act on metabolism to ultimately enhance regeneration and recovery after traumatic neuronal injury," explained corresponding author Christopher V. Gabel, Ph.D., associate professor of Physiology and Biophysics at BUSM.

These findings appear in the journal *Cell Reports*.

Provided by Boston University School of Medicine