Researchers unlock new mechanism in pain management

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Gerald Zamponi, Ph.D., is shown in his University of Calgary lab. Credit: Trudie Lee Photography, supplied by Alberta Innovates – Health Solutions

It's in the brain where we perceive the unpleasant sensations of pain, and researchers have long been examining how calcium channels in the brain and peripheral nervous system contribute to the development of chronic

pain conditions.

Neuroscientist Gerald Zamponi, PhD, and his team at the University of Calgary's Hotchkiss Brain Institute have discovered a new mechanism that can reverse chronic pain. Using an animal model, their research has found that pain signals in nerve cells can be shut off by interfering with the communication of a specific enzyme with calcium channels, a group of important proteins that control nerve impulses.

Their Canadian Institutes of Health Research (CIHR) funded study was published in the September issue of *Neuron* – one of the most influential journals in the field of neuroscience.

Zamponi is now applying his research and partnering with the Centre for Drug Research and Development (CDRD) in Vancouver to develop a drug that could one day improve the lives of those with inflammatory pain such as arthritis, irritable bowel disease or neuropathic pain. Their approach may be able to reduce the pain associated with these conditions.

"Chronic pain can be a debilitating condition that affects many people and is often poorly controlled by currently available treatments. Therefore, new treatment avenues are needed. Our discovery opens the door towards new treatments, and based on the data that we have so far, it is a viable strategy," says Zamponi, the lead author of the study and senior associate dean of research at the Cumming School of Medicine.

With CDRD, Zamponi and his team are screening over 100,000 molecules in hopes of finding one that would stop the enzyme from communicating with the calcium channel. If they can isolate the right molecule, they can potentially turn it into a drug. So far, they have already found two viable molecules that have been validated by his group as painkillers in animals.

Commercialization of the project is possible as Zamponi and his team are one of six successful projects funded through the competition of the Alberta/Pfizer Translational Research Fund Opportunity. "AIHS is delighted that the strong partnership created with Pfizer, Western Economic Diversification, and Alberta Innovation and Advanced Education is helping to develop promising innovations from basic research into technologies, drugs, and tools to improve health," says Dr. Cy Frank, President & CEO of Alberta Innovates – Health Solutions."

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