

A new drug to manage resistant chronic pain

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Neuropathic pain, caused by nerve or tissue damage, is the culprit behind many cases of chronic pain. It can be the result of an accident or caused by a variety of medical conditions and diseases such as tumors, lupus, and diabetes. Typically resistant to common types of pain management including ibuprofen and even morphine, neuropathic pain can lead to lifelong disability for many sufferers.

Now a drug developed by Tel Aviv University researchers, known as BL-7050, is offering new hope to patients with neuropathic pain. Developed by Prof. Bernard Attali and Dr. Asher Peretz of TAU's Department of Physiology and Pharmacology at the Sackler Faculty of Medicine, the medication inhibits the transmission of pain signals throughout the body. In both in-vitro and in-vivo experiments measuring electrical activity of neurons, the compound has been shown to prevent the hyper-excitability of neurons — protecting not only against neuropathic pain, but epileptic seizures as well.

The medication has been licensed by Ramot, TAU's technology transfer company, for development and commercialization by BioLineRx, an Israeli biopharmaceutical development company.

Targeting potassium for pain control

According to Prof. Attali, the medication works by targeting a group of proteins which act as a channel for potassium. Potassium has a crucial role in the excitability of cells, specifically those in the nervous system and the heart. When potassium channels don't function properly, cells

are prone to hyper-excitability, leading to neurological and cardiovascular disorders such as epilepsy and arrhythmias. These are also the channels that convey [pain signals](#) caused by nerve or [tissue damage](#), known as neuropathic pain.

With few treatment options available for neuropathic pain, Prof. Attali set out to develop a medication that could bind to and stabilize the body's potassium channels, controlling their hyper-excitability and preventing the occurrence of pain by keeping the channels open for the outflow of potassium. This novel targeting approach has been recently reported in the journal *PNAS*.

Inducing calm in the neurons

Understanding the mechanism that controls these channels has been crucial to the development of the drug. By successfully controlling the excitability of the neurons, Prof. Attali believes that BL-7050 could bring relief to hundreds of millions of patients around the world who suffer from neuropathic pain. The medication will reach the first phase of clinical trials in the near future.

In pre-clinical trials, BL-7050 was tested in rats experiencing both epilepsy and neuropathic pain and was found to be efficient in protecting against both when taken as a pill. While on the medication, rats were no longer affected by stimuli that had previously caused pain. Measures in the electrical activities of neurons also revealed that the medication was able to induce "calm" in the neurons, inhibiting pain pathways.

Provided by Tel Aviv University

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