

Changing 'channels' to eliminate chronic pain

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In most cases of chronic pain -- lingering pain that never seems to go away after accidents or prolonged illnesses — no pill exists to dull the hurt. Billions of dollars are lost every year in sick days taken to alleviate chronic pain, and as much money is spent by the healthcare system to diagnose what's wrong.

Dr. Joel Hirsch of Tel Aviv University conducts basic research investigating calcium channels in the human body, established targets for the alleviation of chronic pain. His research, recently presented at the Biophysical Society in San Francisco, provides new information into how these channels work. His laboratory is developing computer-derived models of drugs that might affect chronic pain — such as pain from backaches, sore limbs and arthritis — which are targeted for calcium channels.

"We have determined structures of calcium channel components which provide a framework for drug design and targeting," Dr. Hirsch says. "There is still much to learn about calcium channels, which enable pain signals to travel from the body to the brain."

Once he and his colleagues understand the deeper mechanisms of these channels, they hope to use new drugs to modulate them "on" and "off" as needed — and provide relief to the millions of people who suffer from the condition.

Finding where it hurts

According to the American Chronic Pain Association, chronic pain is pain that persists a month or more beyond the usual recovery period for an injury or illness. It can continue for months or years, is not always constant, but usually interferes with one's quality of life at all levels.

Three drugs on the market target calcium channels for pain indications such as Lyrica, Neurotonin and ziconitide. But they are not effective in many cases, while ziconitide requires an injection into the spine. Hence, there is a considerable need for alternative drugs.

"[Calcium channels](#) are still poorly understood, but we do know that they are also important players in pathways that cause epilepsy. Our research into neuropathy, or finding treatments for chronic pain, may yield a new class of compounds that serve multiple purposes," says Dr. Hirsch. "Our challenge is to target calcium channel modulators to specific tissues or channel types a single drug for all forms of [chronic pain](#) isn't likely.

"There are literally millions of people that already take calcium channel blockers for angina and hypertension. More research on how this family of channels works could yield a new kind of drug for a specific subfamily of these channels," Dr. Hirsch concludes.

Provided by Tel Aviv University

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