

Newly discovered pathway for pain processing could lead to new treatments

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The discovery of a new biological pathway involved in pain processing offers hope of using existing cancer drugs to replace the use of opioids in chronic pain treatment, according to scientists at McGill University.

Because many therapeutic options, such as opioids, for patients with chronic pain carry the risk of addiction and undesirable side effects, this breakthrough offers promising lines of research into [chronic pain treatment](#), says Luda Diatchenko, professor at McGill's Faculty of Dentistry and co-lead author of the new study

The scientists discovered that EGFR blockers, routinely given to [lung cancer patients](#) to inhibit tumour growth, were as potent analgesics as morphine in mouse models of inflammatory and chronic pain.

"We now need to answer two questions: Is this really effective for human chronic pain? And what are the side effects associated with the dosage needed to efficiently treat it?" says Diatchenko, who holds the Canada Excellence Research Chair in Human Pain Genetics.

Repurposing existing drugs to treat diseases other than those they were designed for can be advantageous, because the toxicity of these compounds is well understood, making them a fast and relatively inexpensive way to develop new treatments.

If these [cancer](#) therapeutics don't turn out to be useful for pain management, they could nevertheless be used as the foundation to develop new drugs. "By re-engineering or tweaking these drugs, the road to getting to a useful pain treatment will be much, much shorter," explains Jeffrey Mogil, professor at McGill's Department of Psychology and the study's co-lead author.

The research, published in *The Journal of Clinical Investigation*, describes the crucial role in pain of a protein known as epidermal growth factor receptor (EGFR).

"This is quite exciting as EGFR is one of the most studied proteins in all of biomedicine because of its important role in cancer. But aside from a

few clinical case studies, a role for EGFR in pain has never been shown", adds Mogil, who is also the director of the Alan Edwards Centre for Research on Pain.

The researchers believe the EGFR pain pathway they found in mice and fruit flies is relevant to humans because of genetic results also reported in the paper on human cohorts with chronic facial [pain](#), which linked two genes in the EGFR pathway.

"We know this pathway is relevant in humans," Diatchenko says. "This discovery is very exciting and important; it's really going to help us extend our knowledge about the molecular pathophysiology of [chronic pain](#)."

The scientists hope their findings will lead to clinical trials in order to assess the potential of EGFR inhibitors used in cancer therapy as [pain management](#) therapeutics.

More information: Epiregulin and EGFR interactions are involved in pain processing, by Loren J. Martin et al., *Journal of Clinical Investigation* (2017)

Provided by McGill University

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