

# Tell-tale gene affects success of drug used to treat chronic pain, study finds

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Women who carry a particular form of a pain gene are more likely to respond well to a common medication used to treat long-term discomfort, research shows.

In a study, women with [chronic pelvic pain](#) who had a naturally occurring variation of a gene, known as Neuregulin 3, in their DNA were more likely to experience relief after taking the painkilling drug gabapentin.

Targeting gabapentin use to those with this [genetic marker](#) would avoid ineffective treatment and unwanted side-effects in those who are unlikely to respond, experts say.

The findings could improve use of gabapentin in treating chronic pelvic pain—a persistent, disabling pain which affects one in four women worldwide.

Gabapentin, often prescribed for chronic pain, targets the central nervous system—which carries messages between the brain and nerves throughout the body—to reduce heightened pain sensitivity that affects people with long-standing conditions.

The findings, from the University of Edinburgh, follow a previous study from the same team which suggested that gabapentin treatment was beneficial for certain women, with moderate improvements in the worst or average pelvic pain for 40 percent of participants.

The latest study, in collaboration with the University of Oxford, studied the genetic make-up of 71 women with chronic pelvic pain who received gabapentin—29 responded to the medication and 42 saw no improvement.

They found a naturally occurring variation of the gene Neuregulin 3, which determined who would respond to gabapentin. The gene gives rise to a protein of the same name, found in the brain and spinal cord, which is involved in pain sensation and transmission.

The findings offer fresh insight into the underlying mechanisms behind chronic pain, and may have implications for other conditions besides pelvic pain, experts say.

The team say more research is needed to confirm the findings in a larger population of women. Their work is being supported by Edinburgh Innovations (EI), the University's commercialization service, which has patented the discovery and is seeking a commercial partner to further the research.

The study is [published](#) in the journal *iScience*.

The study's lead author, Dr. Scott Mackenzie from the University of Edinburgh's Centre for Reproductive Health said, "A genetic factor that can predict how well [gabapentin](#) will work in patients offers the prospect of tailored treatment, and provides invaluable insights into understanding chronic pain. We hope eventually to use this genetic marker to optimize personalized [treatment](#) decisions and minimize adverse effects for women with chronic pelvic pain."

Dr. Susan Bodie, EI's Head of Business Development for the College of Medicine and Veterinary Medicine, said, "Isolating this single genetic marker is an important discovery that could ultimately help refine treatments for millions of women worldwide who suffer from chronic pelvic pain, as well as increasing our understanding of its role in other pain conditions. We believe this is an exciting opportunity for collaboration with a commercial partner who can help translate the research into a clinical setting."

**More information:** Genome-wide association reveals a locus in Neuregulin 3 (NRG3) associated with gabapentin efficacy in women with chronic pelvic pain, *iScience* (2024). [DOI: 10.1016/j.isci.2024.110370](#). [www.cell.com/iscience/fulltext ...](#)

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