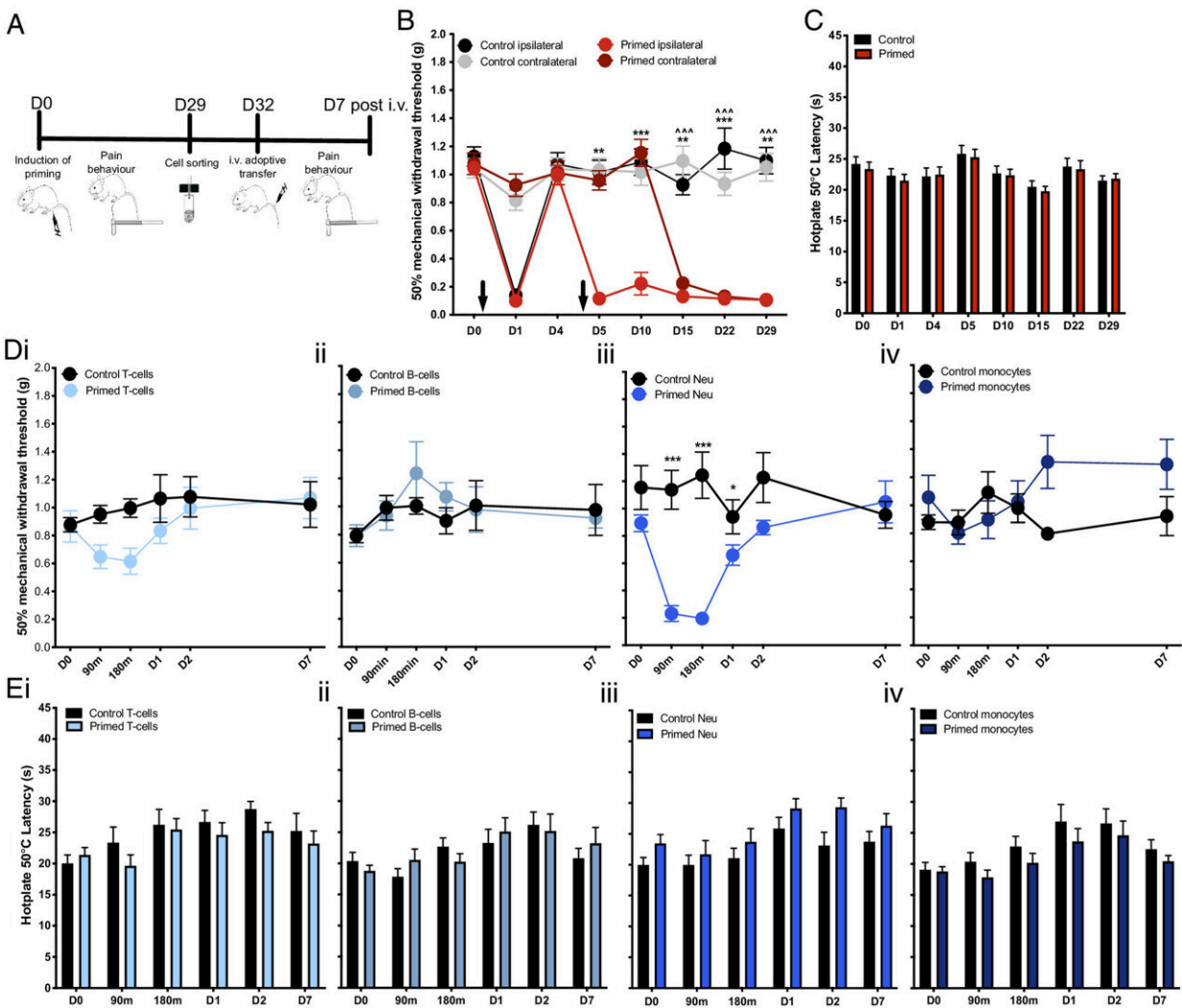


Possible association found between neutrophil migration into sensory ganglia and fibromyalgia pain

May 1 2023, by Bob Yirka



Adoptive transfer of neutrophils from primed mice confers widespread pain in naïve mice. (A) Schematic for study design: a hyperalgesic priming model of

widespread pain was induced in mice (primed mice $n = 24$; control mice $n = 24$). On D29, blood cells were obtained through cardiac bleed from primed and control mice, flow sorted into B cells, T cells, neutrophils, and monocytes, and injected into naïve mice whose pain behavior was monitored up to 7 d. (B) Mechanical hypersensitivity to von Frey stimulation of ipsilateral and contralateral limbs of primed and control mice (**P P P C) Latency to nociceptive behavior in the hot plate assay (two-way RM ANOVA primed vs. control). (D) Mechanical hypersensitivity to von Frey stimulation and (E) thermal hypersensitivity in the hot plate following adoptive transfer of (i) T cells, (ii) B cells, (iii) neutrophils, and (iv) monocytes from primed mice ($n = 8$) and control mice ($n = 8$) (*P P Proceedings of the National Academy of Sciences (2023). DOI: 10.1073/pnas.2211631120

A team of biomedical researchers from Queen Mary University of London, Hebrew University and University College London has found evidence of an association between fibromyalgia-type symptoms and migration of neutrophils into sensory ganglia. In their study, reported in *Proceedings of the National Academy of Sciences*, the group explored possible causes of fibromyalgia in mouse experiments.

Fibromyalgia leads to fatigue, depression, sleep problems and widespread pain throughout the body. In the past, patients with [fibromyalgia](#) usually did not have other measurable symptoms, so doctors for many years doubted its existence. In recent years, some physical signs have been found, including elevated levels of neutrophils in the bloodstream and associated cytokines that are produced by the neutrophils.

Some research has also shown that the means by which the neutrophils cause pain by is invading bundles of ganglia in the central nervous system.

Neutrophils are the most abundant type of white blood cell produced by the human body. They play an essential role in fighting off infections as part of the innate immune system. Medical researchers still do not know why elevated levels occur in people with fibromyalgia, but suggest it hints at a possible problem with the [immune system](#) overreacting to some as yet unknown element.

Recent research has also found evidence that fibromyalgia may be the result of the central nervous system amplifying nerve signals as they pass through the brain and [spinal cord](#)—also for some unknown reason. In this new effort, the researchers tested the idea that the overabundance of neutrophils leads directly to pain in patients.

Testing involved collecting neutrophils from fibromyalgia patients with abnormally high levels of the cells and injecting them into test mice. After a brief period, they tested the mice to see if they became more sensitive to pain than usual and found that they did. Dissection showed that the neutrophils had made their way to the [central nervous system](#) and had invaded sensory ganglia—likely the source of the increase in pain sensitivity observed in the mice.

The researchers say their findings establish a link between [neutrophils](#) and the pain associated with fibromyalgia, which suggests therapies to reduce such levels may provide relief for such people.

More information: Sara Caxaria et al, Neutrophils infiltrate sensory ganglia and mediate chronic widespread pain in fibromyalgia, *Proceedings of the National Academy of Sciences* (2023). [DOI: 10.1073/pnas.2211631120](https://doi.org/10.1073/pnas.2211631120)

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