

A method for treating pain and inflammation using GPR37 agonists

Unmet Need

Uncontrolled inflammation is a prominent component of many common diseases and is the root cause of chronic pain. When inflammation persists, the inflammatory factors are never completely cleared from the system, leading to chronic pain. Treatments with anti-inflammatory drugs often prove ineffective, whereas opiates carry a risk of tolerance and addiction, especially with long-term use. The mechanisms that regulate resolution of inflammation and pain are not well understood. Research has revealed that the resolution of inflammation is an active process involving the production of specialized pro-resolution factors. These endogenous lipid mediators act on their respective G-protein-coupled receptors in immune cells to suppress pain. Thus, insights into mechanisms that can harness pro-resolution factors could lead to the development of more effective analgesics.

Technology

Researchers at Duke have discovered a method for treating pain and inflammation using a composition including a GPR37 agonist. They have discovered that GPR37, a G-protein coupled receptor expressed by macrophages, plays a central role in the resolution of inflammatory pain. GPR37 is a receptor for a pro-resolution factor, neuroprotectin D1. It triggers macrophage phagocytosis, shifts cytokine release toward an anti-inflammatory profile, and thereby helps to reverse inflammatory pain. This invention has been demonstrated in mouse models.

Other applications

This invention has the potential to treat other inflammation-related disorders, including infection, malaria, and sepsis.

Advantages

- A novel therapeutic method that promotes the resolution of inflammation
- Should have less side effects than anti-inflammatory drugs
- Could have wide ranging applications including treating inflammation, inflammatory pain, viral and bacterial infection, malaria, and sepsis

Duke File (IDF)

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Inventor(s)

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Links

- [From the lab of Dr. Ru-Rong Ji](#)
- [Inflammatory pain: be it resolved! \(Pain Research Forum Commentary, 2018\)](#)
- [Accelerating the reversal of inflammatory pain with NPD1 and its receptor GPR37 \(JCI Commentary, 2018\)](#)
- [A review by the inventor - Neuroimmune modulation of pain and regenerative pain medicine \(JCI, 2020\)](#)

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Publications

- [GPR37 regulates macrophage phagocytosis and resolution of inflammatory pain \(Journal of Clinical Investigation, 2018\)](#)
- [Activation of GPR37 in macrophages confers protection against infection-induced sepsis and pain-like behaviour in mice \(Nature Communication, 2021\)](#)