Prostaglandin E2 Mediates Sensory Nerve for Bone Formation and Pain of Skeletal Diseases

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Technology description

Unmet Need

More than 50 million US adults are affected by arthritis, a joint disorder that can result in persistent pain. There is no cure for arthritis, and in the end stages of the disease, joint replacement is often needed. Current approaches to treat arthritis aim to control pain via the use of analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs). However, current approaches to treat arthritis pain are inadequate, resulting in unsustained pain relief and substantial adverse effects. Consequently, there is a need to identify therapeutic targets that can both limit disease progression and improve arthritic pain management.

Technology Overview

The inventors have identified prostaglandin E2 (PGE2), cyclooxygenase-2 (COX-2) and Prostaglandin E2 receptor 4 (EP 4) as promising therapeutic targets in the treatment of arthritis pain. The inventors found that mice with elevated COX-2 expression in the osteocytes of subchondral bone can spontaneously develop osteoarthritis and rheumatoid arthritis (RA). COX-2 is also the major producer of PGE2 within the bone, which is a regulator of bone formation. The inventors found that PGE2 activates EP4, enabling sensory innervation, which is a contributor to arthritic pathogenesis. Thus, PGE2, COX-2 and EP4 are all promising targets in the treatment of diseases that causes arthritic pain.

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