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DETECTION OF SPHINGOSINE-1-PHOSPHATE RECEPTOR AGONISTS FOR TREATMENT OF NEUROPATHIC PAIN

Technology Offer

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Introduction

Despite the existence of a variety of marketed analgesics, several forms of pain remain inadequately treatable with drugs. This is particularly true for chronic and neuropathic pain. Neuropathic pain, triggered by multiple insults to the nervous system, often proceeds chronically and produces severe distress in the everyday life of affected patients. Improved understanding of the mechanisms of nociception (the neuronal process in pain sensation) has led to the identification of novel targets for potential analgesics. The development or repurposing of drugs acting at these novel targets offers the opportunity for new approaches to neuropathic pain therapy.

Invention

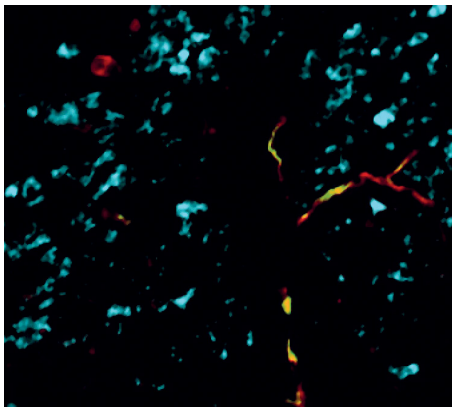
Sphingosine-1-phosphate (S1P) is an intracellular mediator with a wide spectrum of signaling functions. In neurons, its effects depend on the neuronal subtype. Peripherally, S1P promotes neuronal growth and excitability and S1P receptor inhibition reduces inflammatory or chemotherapeutic pain. The present invention is a screening method for activators of the S1P receptor, including FTY720, which downregulate sensitisation of nociceptive neurons in the spinal cord and therefore, offer a novel approach to the relief of traumatic or pain.

Market Potential

S1P agonists may be developed or existing agents repurposed for the treatment of spinally elicited neuropathic pain, such as that due to nerve injury.

Development Status

The invention has been validated with the S1P modulator, FTY720 (fingolimod), at the level of cellular responses and in animal models of neuropathic pain. Specificity has been shown by the fact that spinal S1P receptor agonism has no effect on peripheral nociception.



Spinal cord image of mice with neuropathic pain after 5 days of treatment with FTY720. Neurons (NeuN, blue) and infiltrating anti-inflammatory M2-type macrophages (F4-80, red; CD206, green) are shown.