Columbia Technology Ventures

Novel method for treating chronic neuropathic pain with propofol derivatives

Technology #2605

It is estimated that one-sixth of the population suffers from chronic pain with neuropathic pain as a prominent component. Available therapies offer little or no relief in greater than 50% of neuropathic pain patients. In animal models, gene deletion and pharmacological studies have implicated the HCN1 subunit of the IH pacemaker ion channel family as a driver of at least one modality of neuropathic pain. This channel has an intriguing sensitivity to propofol, a clinically used intravenous general anesthetic, suggesting the channel may be a pharmacologically tractable target.

This invention comprises compositions and methods for managing or treating chronic pain using non-anesthetic propofol derivatives. A class of compounds have been identified that are devoid of anesthetic activity, analgesic with respect to mechanical allodynia and mechanical and thermal hyperalgesia in the peripheral nerve ligation (PNL) model of neuropathic pain, efficacious antagonists of pacemaker channels incorporating the HCN1 subunit, targeted against HCN1 channels via a sterically defined site, and modifiable in a manner consistent with generation of peripherally restricted variants without loss of HCN1 antagonism.

Propofol derivatives provide analgesia without anesthetic effect.

Acute pain responds well to medication, such as opioid analgesics or anesthesia for surgery. These treatments, however, have significant side effects and require close physician supervision. Therefore, these treatments are not generally useful for chronic neuropathic pain. The current technology isolates the analgesic effect of propofol from its hypnotic effects, which may allow for the successful treatment of chronic pain without unwanted side effects.

These compounds have demonstrated analgesic activity in animal models of both mechanical and thermal pain.
Lead Inventors:
Gareth R. Tibbs, Ph.D.; Peter Goldstein, M.D.; Pamela Flood, M.D.

Applications:
- Neuropathic back pain
- Diabetic neuropathy
- Post-herpetic neuralgia
- HIV neuropathy
- Trigeminal neuralgia

Advantages:
- Drug class demonstrated clinically to be safe
- Novel target for neuropathic pain
- In vivo demonstration of efficacy

Patent information:
Patent Pending (WO/2011/019747)

Licensing Status:
Available for licensing and sponsored research support
Tech Ventures Reference: IR 2605

Related Publications:

Inventors
Gareth Tibbs