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Office of Technology Management

NOVEL NEUROSTEROIDS FOR TREATING PAIN DISORDERS

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Value proposition: *Novel analgesic compounds that block CaV3.2 currents in nociceptive dorsal root ganglion neurons in order preemptively treat pain in subjects, unlike other products that are continuously administered post onset of pain.*

Technology Description

Researchers at Washington University in St. Louis have developed compositions and methods for treating pain through the administration of neuroactive steroids (NAS). Current treatment for postoperative pain has been limited to somewhat non-specific systemic drugs (opioids) having significant side effects or potential for abuse due to insufficient knowledge about sensitization mechanisms. The researchers identified a major contribution of CaV3.2 (T-type) calcium-channels to sensitization of pain responses as these channels enhance excitability of peripheral nociceptors. The researchers created compositions of NAS that specifically block the current of CaV3.2 (T-type) calcium-channels to alleviate pain. The method involves preemptive administration of the compositions to alleviate mechanical hyperalgesia post-surgery.

Compared to current methods used for pain relief, the novel NAS compounds have more favorable pharmacokinetic (PK) and pharmacodynamic (PD) properties as they are site-specific and can be administered preemptively to provide pain relief and are less likely to be abused and produce undesired side effects.

Stage of Research

Compositions demonstrate effective analgesia in a rodent model of post-surgical pain.

Publications

- Novel neuroactive steroid with hypnotic and T-type calcium channel blocking properties exerts effective analgesia in a rodent model of post-surgical pain. Br J Pharmacol. (2020)
- Multifaceted Actions of Neurosteroids. BioRxiv (2025)

Applications

- Can be used to for pain therapy/treating chronic pain in operating rooms, post-operative care, clinics, etc.

Key Advantages

- Preemptive pain relief
- Decreased potential for abuse
- Decreased side effects
- Neuro-specificity
- Anticipated favorable PK and PD

Patents

Patent pending

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