TECHNOLOGY

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Blocking pannexin-1 channels: A novel therapy for opiate withdrawal

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Background

Opiates are essential for treating pain, but a major problem in terminating opiate therapy is the debilitating withdrawal syndrome that plagues chronic users. The mechanisms underlying opiate withdrawal are poorly understood, and effective therapies are lacking.

Current treatments for opiate addiction include opioid agonists and antagonists. The pannexin-1 (Panx1) channel has been identified as a therapeutic target for opiate withdrawal. *In vivo* experiments revealed that withdrawal from morphine induces long-term synaptic facilitation in lamina-I/II neurons within the spinal dorsal horn, a key site of action for opiate analgesia.
Genetic ablation of Panx1 from microglia abolished the potentiated spinal output and ameliorated the morphine withdrawal behavior.

Treatment with a Panx1 blocking peptide or clinically utilized broad-spectrum Panx1 inhibitors, mefloquine and probenecid, reduced the severity of withdrawal. Probenecid and mefloquine are clinically approved broad-spectrum Panx1 inhibitors: probenecid, an anti-gout medication, and mefloquine, an anti-malarial drug.

Areas of Application

- Treatment of withdrawal symptoms/syndrome

Competitive Advantages

- In therapeutic doses for its current indications (anti-gout), probenecid is generally well tolerated and has a low incidence of side effects.

Stage of Development

In vivo preclinical data, awaiting regulatory approval from Health Canada for a pilot clinical trial.

Intellectual Property Status

Provisional US patent application filed.

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Publications

Burma, NE, *et al*., 2017. Blocking microglial pannexin-1 channels alleviates morphine withdrawal in rodents. Nature Medicine; AOP; doi:10.1038/nm.4281