# New selective small molecule inhibitors for the treatment of pain and itch

## Unmet Need

In the United States, an estimated 50 million adults suffer from chronic pain and around 20 million adults suffer from high-impact chronic pain. Ongoing difficulty in safely treating pain has led to the current opioid crisis in the United States. Additionally, pain medications that lack target selectivity often have strong side-effects such as gastrointestinal distress, cardiac arrhythmias, and seizures. Although non-selective have been developed, these are generally accompanied by serious side-effects. The need for safe, specific, non-addictive opioid alternatives for the treatment of chronic pain is high.

## Technology

Researchers at Duke University have identified novel small molecules for the treatment of chronic pain. These small molecule antagonists bind to and inhibit the sodium ion channel Nav1.7, which has been shown to be essential for sensing pain. Duke researchers have developed multiple Nav1.7-specific inhibitors using virtual compound screening and computer-aided drug design. These inhibitors show promising activity in cell-based assays and one lead compound has demonstrated *in vivo* analgesic and anti-itch efficacy in mouse models.

## Other Applications

Nav1.7-specific inhibitor also demonstrates anti-itch activity that could be applied to patients experiencing chronic itch.

## Advantages

- Novel Nav1.7-specific inhibitors that reduce inflammatory and neuropathic pain in mouse models of chronic pain

- *In silico* screening of small molecules identified antagonists that selectively bound to key regions of Nav1.7 ion channel which limits risk of side effects
- A non-addictive opioid alternative

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## Publication(s)

## External Link(s)

• From the Duke Center for Translational Pain Medicine