# Positive Allosteric Modulators Target TRPV1 with Analgesic Effects

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## ABSTRACT

Researchers at the University of California, Davis have developed de novo positive allosteric modulators (PAMs) that bind to TRPV1 proteins involved with pain-sensing in order to provide analgesic effects.

## FULL DESCRIPTION

TRPV1 is an ion channel receptor that is largely responsible for sensing and regulating body temperature in organisms; it also plays a role in sensing pain and may exacerbate chronic pain symptoms in some individuals. Hence, research has been conducted on analgesic drugs that can deactivate TRPV1 in order to provide pain relief. However, this protein is critical for temperature regulation and thus treatments that entirely block TRPV1 activity may lead to hyperthermia and other serious side effects. Furthermore, the methods currently used to accomplish this task often make such treatments irreversible. Further refinements to this approach may fill an unmet need for novel analgesics that can effectively treat chronic pain without the adverse effects associated with opioids and other drugs.

Researchers at the University of California Davis have developed de-novo positive allosteric modulator (PAM) peptides that bind to TRPV1 and provide long lasting pain relief. These PAMs bind to the ankyrin-repeat domain (ARD) of TRPV1 with nanomolar affinity in order to selectively modulate channel activity and achieve desired cellular effects. This technique overloads a localized area with calcium, causing nerve endings to temporarily become less sensitive to create an analgesic effect. In studies with rats, these de novo PAMs were shown to provide long lasting pain relief without affecting their body temperature, indicating a major breakthrough in therapeutic potential. This discovery has potential for future use as an analgesic for humans and animals such as pets and could prove useful in treating chronic pain.

## APPLICATIONS

- Use in analgesics specifically designed to treat chronic pain without addition side-effect
- Selective modulation of TRPV1 ion receptor

## FEATURES/BENEFITS

- In silico designed and fully validated at molecular, cellular and animal levels
- Pain relief lasts more than 3 times longer than previous control trial, with reduced side effects
- Robust protein binding and affinity
- Treatment is fully reversible
- Affect only TRPV1-expressing sensory neurons

## PATENT STATUS

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## OTHER INFORMATION

### KEYWORDS

de novo protein design, positive allosteric modulator, TRPV1, pain, analgesics

### CATEGORIZED AS

- **Biotechnology**
  - Health
  - Other
  - Proteomics
- **Materials & Chemicals**
  - Biological
- **Medical**
  - New Chemical Entities, Drug Leads
  - Other
  - Therapeutics

### RELATED CASES

| Country | Type | Number | Dated | Case |
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Additional Patent Pending

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