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Novel Adenyly Cyclase Inhibitors for Chronic Pain and Opioid Dependence

Non-addictive compounds selectively inhibit an enzyme for effective chronic and inflammatory pain relief, offering a viable, non-opioid treatment and a therapy option for opioid dependence.

The annual cost of chronic pain in the United States is estimated to be $635 million, impacting more than 100 million people, as reported by the American Pain Society. The Centers for Disease Control and Prevention estimate that 91 people die in the U.S. every day from an opioid overdose. Chronic and inflammatory pain are commonly treated with opioids. However, use of opioids often leads to opioid dependence. Dependence puts patients at risk for overdose, both fatal and nonfatal. As the World Health Organization states, 45% of drug users experience nonfatal overdose.

Researchers at Purdue University are developing compounds to provide effective pain relief without the risks associated with opioids. The researchers' compounds selectively inhibit adenylyl cyclase 1, an enzyme that has previously been validated as a target for inflammatory pain. Inhibiting adenylyl cyclase 1 produces an analgesic effect in animal models. These compounds also show promise as a therapy to treat opioid dependence, itself.

Advantages:

-Chronic and inflammatory pain relief

-Non-opioid

-Non-addictive

Potential Applications:

-Pain treatment

-Opioid dependence treatment option

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Pharmaceuticals/Small Molecule Therapeutics

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Related Publication:

Tarsis F. Brust et al., Identification of a selective small-molecule inhibitor of type 1 adenylyl cyclase activity with analgesic properties

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