KCC2 chloride transporter upregulation via GSK3ß inhibition or delta-2 catenin gene therapy for the treatment of chronic pain

Duke LICENSING & VENTURES

Value Proposition

Chronic pain management is a pressing clinical challenge due to the extent of U.S. adults suffering from chronic pain, the ineffectiveness or side effects of current treatments, and the ongoing opioid epidemic. It is estimated that as many as 1 in 3 – or 100 million – Americans currently suffer from chronic pain. This technology is relevant for a wide variety of chronic conditions wherein pain management is a key factor. It is also applicable as an alternative to opioid-based therapies and the treatment of patients recovering from opioid addiction.

Technology

Duke inventors have reported a pharmaceutical composition for treating pain. This technology utilizes mechanistic research into the biological relevance of KCC2, a chloride ion channel, in the management of chronic pain. KCC2 has been found to be highly attenuated in the pathology of chronic pain. Therefore, therapies which target its upregulation are desired for pain management. This technology highlights two approaches – a novel screened compound which targets GSK3B inhibition, and targeted spinal overexpression of delta-2 catenin, both of which achieve KCC2 upregulation and alleviation of chronic pain in mouse models.

Other Applications

Other applications may include treatment of chronic itch.

Advantages

Chronic pain is currently managed using numerous steroidal-based and opioid compounds with efficacy concerns and numerous side effects, including addiction. The advantages to this technology are that it offers more effective pain management via the KCC2 transporter using a non-opioid, non-steroidal approach.

Publications

- Repurposing cell growth-regulating compounds identifies kenpaullone which ameliorates pathologic pain via normalization of inhibitory neurotransmission

Duke File (IDF)

T-006462

Inventor(s)

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Links

- From the lab of Dr. Wolfgang Liedtke

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