



Novel Target Site-Specific Pain Therapy Using BMN

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Patent Status:

Utility Patent Pending

Description of Technology

Pain is often viewed as a symptom of an underlying condition. However, in certain chronic pain instances, pain becomes the disease itself. Analgesics and anesthetics are the primary pharmacologic treatments for all types of pain. The most clinically-used drugs are in the opioid family, such as codeine, hydrocodone, morphine, and methadone. These drugs have several significant side effects, including physical dependence and addiction, and are usually only prescribed as a last resort for pain management. Other current pain therapies, such as nonsteroidal anti-inflammatory drugs and acetaminophen, are either inadequate or cause uncomfortable or deleterious side effects with prolonged use. Most pain treatments are not localized to a specific region or cell type and thus require relatively large and sustained doses to achieve long-term effects. A pain therapy formulation that can be target specific tissue regions and deliver a sustained release is needed in the healthcare space of pain management.

The naturally occurring Botulinum Neurotoxin A (BTX-A) has proven highly beneficial for the treatment for neuralgia, joint pain, and several neurological disorders. The mechanism by which BTX-A inhibits pain remains elusive. Discovering this mechanism will advance therapeutic uses of BTX-A against pain. Researchers at the University of Wyoming have begun to uncover BTX-A's mechanism for managing pain by demonstrating that BTX-A decreases the activity of TRPV1/TRPA1 channels. Researchers have also invented a method for site-specific delivery of BTX-A. BTX-A magnetic nanoparticles (BMN) are injected at the site of the injury and kept in place by the application of an external magnetic field. This delivery system offers the advantage of providing sustained and prolonged biological activity of drugs at the desired target site. The site-specific delivery advances the analgesic effects of BTX-A and decreases undesired side-effects.

Applications

Using BTX-A as a pain inhibitor can greatly improve the treatment of patients with chronic pain with fewer side effects than previous methods. The novel delivery system can also readily be extended to other disease conditions, like cancer, where site-specific delivery of drug molecules is highly beneficial.

Features & Benefits

- BTX-A used for the treatment of several neurological disorders and pain
- Novel delivery system allows for site-specific application
- Decreased undesired side-effects
- Magnetic nanoparticle delivery system applicable to cancer treatments

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