



IL-10 for Suppression of Neuropathic Pain and Enhancement of Morphine Analgesia

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Background

Neuropathic pain, a condition caused by damage and/or inflammation to nerves following traumatic injury, infection, diabetes, or chemotherapy, affects millions of people worldwide. Opioid, anti-convulsant, and anti-depressant drugs have traditionally been used to treat this disorder. Unfortunately, standard drug therapy has had limited efficacy and side-effects of tolerance and addiction have caused many care providers to under-prescribe and patients to under-utilize. Due to the inadequacy of treatment options, many patients worsen over time.

[Dr. Linda Watkins'](#) lab at the University of Colorado Boulder studies how to treat chronic pain. While all currently available therapies target neurons, Dr. Watkins' work has shown that a major player in the development and maintenance of neuropathic pain is a non-neuronal cell called glia. Glia outnumber neurons 10 to 1 and when activated can compromise the ability of analgesics to suppress pain by producing proinflammatory cytokines causing an enhanced and prolonged pain experience. The anti-inflammatory cytokine interleukin-10 (IL-10) has the ability to suppress the production and function of many proinflammatory cytokines released by activated glia. Therefore, IL-10 has emerged as a novel drug candidate to treat neuropathic pain.

Technology

Dr. Watkins' research has shown that intrathecal administration of IL-10 protein provides relief from chronic pain in animal models. This analgesic effect is achieved through the introduction of plasmid DNA (pDNA) encoding IL-10. Moreover, prolonged analgesia is achieved through encapsulating this plasmid DNA in a poly-lactic-co-glycolic acid (PLGA) degradable micro-particle which slowly releases the plasmid in the CSF and induces macrophages to take-up (phagocytose) the plasmid, leading to higher IL-10 gene-expression levels. Ongoing studies additionally demonstrate utility in a number of other neurological disorders.

Partnering

Patent rights related to this technology have been optioned to [Xalud Therapeutics](#), a start-up company actively seeking funding and partnering opportunities.

IP Status:

Issued patents; available for partnering.

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Key Publication:



[Release of plasmid DNA-encoding IL-10 from PLGA microparticles facilitates long-term reversal of neuropathic pain following a single intrathecal administration.](#)
Pharm Res. 2010 May;27(5):841-54.

Patent Filings:

[Methods for treating neuropathic pain by administering IL-10 polypeptides.](#) U.S. 7,261,882, issued Aug. 28, 2007.

[Methods for delivering genes.](#) U.S. 8,524,678, issued September 3, 2013; multiple countries.

[Mutant IL-10.](#) U.S. 7, 749,490, issued July 6, 2010; multiple countries.

[Methods for treating pain.](#) U.S. 8,598,133, issued December 3, 2013; multiple countries.