Cell permeable Peptide for Allergic Airway Diseases and Viral Infections

Overview

McGill University is seeking a company interested in developing a long acting STAT6 directed peptide that is demonstrated to inhibit allergen-induced airway inflammation and airway hyper-responsiveness, two hallmark clinical characteristics of asthma in humans. The peptide comprises a protein transduction domain conjugated to a moiety that inhibits STAT-6 transcription factor. Preclinical data provides evidence demonstrating that the chimeric peptide inhibits the production of cytokines responsible for the pathogenesis of allergic airway disease and inhibits allergen-induced airway inflammation and airway hyper-responsiveness. Intranasal administration of the peptide in clinically relevant murine models provides sustained efficacy for at least two weeks. In addition, the research confirms the absence of overt toxicity to cultured cells. The STAT6 peptide is protected under an issued US patent. The inventors have shown recently a new application of the use of STAT6-IP as a potential therapeutic and immune enhancement agent in viral infections. The treatment and prevention of viral infections using STAT6-IP has been protected under a US patent application.

Applications

Novel therapy for allergic airway disease including asthma and allergic rhinitis as well as prevention and treatment of viral infections. There is currently no specific antiviral therapy for patients with asthma. This therapy can be considered as advancement to inhibit TH2 cytokines as well as innate pro-inflammatory cytokine production for patients with asthma.

Advantages

- STAT-6 peptide targets the root cause of asthma rather than only addressing the symptoms thereby having disease modifying characteristics.
- STAT-6 peptide targets specifically the immune response in the airways, thereby providing effective symptom control.
- STAT-6 peptide interrupts or completely abrogates the allergic cascade resulting in inhibition of inflammation and airway remodeling and reduction of side effects.
- STAT6-IP has been used in a heterologous model of influenza infection in asthmatic mice and the treatment has modified airway pathology and lowered the TH2 cytokine expression.
- STAT6-IP can be delivered topically.
- STAT6-IP is poorly immunogenic.
- STAT6-IP exhibits low toxicity in human cells.
- STAT6-IP has prolonged effectiveness for at least 2-4 weeks and potentially longer.
Inventors: Elizabeth Fixman and Christine McCusker

Dr Elizabeth Fixman: Associate Professor; Department of Medicine and Meakins-Christie Laboratories of McGill University.

PhD in Pharmacology from Johns Hopkins University. Research focuses on recombinant retroviruses to generate gene-modified T cells with the capacity to deliver specific cytokines or molecules with therapeutic potential to the airways. Research on airway inflammation and smooth muscle remodeling in addition to using cell permeable peptides to inhibit signaling molecules whose aberrant activation contributes to allergic airway disease.

Dr Christine McCusker: Associate Professor; Department of Pediatrics, Montreal Children’s Hospital. MD from McMaster University.

Research focuses on investigating the mechanisms by which the mucosal immune system regulates the responses to antigens. Using murine models of allergic asthma and rhinitis she showed upper airways antigen challenge results in inflammatory changes in both the upper and lower airways and that the airway hyper responsiveness and inflammation achieved with this model are TH2-IL13-dependent.

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