



An Immunomodulatory Innate Defence Regulator (IDR) Peptide Alleviates Airway Inflammation and Hyperresponsiveness

Hadeesha Piyadasa (University of Manitoba)

Supervisor: Neeloffer Mookherjee

Asthma Canada – AllerGen Goarn-Enhoring Graduate Student Research Award

Piyadasa's project aims to develop a new therapeutic approach for asthma, with potential to control the steroid unresponsive form of the disease, without compromising patients' immune response to control infections. He hopes that his efforts will further the development of these molecules in treating people with asthma in the future.

An Immunomodulatory Innate Defence Regulator (IDR) Peptide Alleviates Airway Inflammation and Hyperresponsiveness

Asthma is one of the most common chronic respiratory diseases worldwide. It is characterized by inflammation in the lungs and narrowing of the airways, which makes it difficult to breathe. Around 3.8 million Canadians suffer from asthma and the direct and indirect cost related to asthma in Canada is around \$2.2 billion annually. Nearly 10% of patients do not respond to available steroid therapies and have severe uncontrolled asthma. These patients represent the major burden of asthma and associated healthcare costs. Moreover, commonly used steroid therapies for people with severe asthma can increase the risk of lung infections, which results in worsening of asthma. Therefore, there is an urgent need to develop new therapies that can control asthma, without compromising a patient's ability to resolve infections.

Piyadasa's project focuses on new molecules known as innate defence regulator (IDR) peptides, which are designed from natural molecules that play a critical role in the immune response. IDR peptides can control both inflammation and infection in the lung, with the potential to overcome side effects associated with current therapies. A lead IDR peptide had been identified and shown to improve breathing capacity, and control airway inflammation and cellular processes linked to steroid unresponsiveness, in an animal model of allergic asthma. Following this, Piyadasa's project aims to develop a

new therapeutic approach for asthma, with potential to control the steroid unresponsive form of the disease, without compromising patients' immune response to control infections.

About Hadeesha Piyadasa

As an undergraduate at the University of Manitoba, Hadeesha Piyadasa was interested in the biological sciences due to the tangible applications of its concepts to health science. He gained experience in scientific research by working as a research assistant in Dr. Joe O'Neil's lab in the biochemistry department isolating and working on the glycerol facilitator membrane protein. After his undergraduate degree, he began a graduate degree in Dr. Mookherjee's Lab at the Manitoba Centre for Proteomics and System's biology at the University of Manitoba. His primary research was focused on understanding the effects of synthetic cationic host defense peptides on allergic asthma. He hopes that his efforts will further the development of these molecules in treating people with asthma in the future.