



Understanding the Role of Protein Prenylation in Asthma

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Asthma Canada / AllerGen Goran-Enhörning Graduate Student Research Award

\$20,000 to support investigations into early-onset asthma by a PhD student

Thomas Mahood, a PhD student at the University of Manitoba, is investigating the role of protein modifications in asthmatic lungs. His research will provide a better blueprint for understanding the mechanisms of asthma – giving us a look into how we can treat the disease and help people living with asthma to breathe easier.

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The immune system has been a critical target for drug treatment in asthmatics. However, many generic drugs can cause harmful side effects and may not relieve asthma symptoms for some people.

Thomas Mahood, a PhD student at the University of Manitoba, is looking for ways to provide a more targeted treatment for people living with asthma. His research focuses on the cellular level of proteins, examining how physiological changes can cause protein modifications to occur in asthmatic lungs. Some of these protein modifications contribute to thickening and reactivity of airways in asthmatic lungs, thus limiting the intake of air.

As there are hundreds of proteins in the lung, Mahood and his colleagues are conducting research using both an animal model and cultured lung cells from human donors to determine which proteins to target. By using specialized inhibitors designed to change how some proteins are modified and specialized next

generation technologies like proteomics, Mahood is looking for the “broken gears” in asthma that will ultimately improve lung function.

Protein modifications are difficult to study because researchers still don’t know the full extent of these modifications in the human body – or the identity of the modified proteins that specifically contribute to the onset and symptoms of asthma. Mahood’s project is cutting-edge, as he is developing new strategies to assess modifications that tag fatty lipid chains to proteins to change their function. His work will also test whether specific chemical inhibitors of these modifications alter asthma-like responses.

Proteins are the functional “gears” of the cell; understanding where they are in the lung and what role they play is critical in treating asthma and helping people with this disease to breathe easier.

About Thomas Mahood

Thomas Mahood grew up with asthma in a small town in Manitoba. There were many days when he had difficulty breathing and had to visit the hospital due to an asthma exacerbation. Because asthma had such a profound impact on his life, Mahood realized that he wanted to make a difference in the world by helping others who were also living with the disease.

This interest in asthma drove Mahood towards understanding the molecular mechanisms behind the disease. Working in the Children’s Hospital Research Institute of Manitoba at the University of Manitoba, he is pursuing his dream by working with Dr. Andrew Halayko.

Since starting his PhD on asthma research, Mahood has had his research published and awarded at both the national and international level. He hopes to take his passion and move forward into an eventual career as an independent researcher focused on biomarker discovery for asthma.

A Message to the Asthma Community – From: Thomas Mahood

“There are people down the street, across the city, all over Canada, who know what you’re going through. No matter how difficult it is to breathe at times, there are people who feel the same way you do. You are not alone. Reaching out to the community is the best way to find strategies to deal with your asthma and learn how research scientists are trying to help.”