



Understanding the Role of the Human Gut Virome in the Development of Early-onset Asthma

Moïra Dion (Université Laval)

Goran-Enhörning Graduate Student Research Award

Supervisor: Professor Sylvain Moineau

Moïra Dion, a PhD student at Université Laval, will develop computer tools to precisely identify bacteriophages and what bacteria they infect, using stool samples from a large cohort of 700 children. She will then determine if children that develop asthma have different bacteriophages, which will contribute to understanding what triggers asthma in early life.

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Just like us, bacteria can get infected by viruses, which are called bacteriophages. Bacteriophages are very abundant and are found wherever there are bacteria. It is estimated that 10^{31} bacteriophages roam on the planet, a number that is quite hard to picture. You might wonder how bacteriophages can be linked to asthma. I study specifically bacteriophages present in the human gut and how they interact with bacteria.

Recent studies by our collaborators in Denmark showed that certain microbial compositions in the human gut in the first year of life are associated with the development of early-onset asthma. This means that when specific bacteria are more or less present in the gut, children are more likely to develop asthma. We want to further explore this by looking at the bacteriophages in the gut and their impact on early-onset asthma. Given their abundance, can bacteriophages influence the development of asthma?

During my PhD, I will develop computer tools to precisely identify bacteriophages and what bacteria they infect, using stool samples from a large cohort of 700 children. I will then determine if children that develop asthma have different bacteriophages, which will contribute to understanding what triggers asthma in early life.

About Moïra Dion

I obtained my bachelor's degree in microbiology from Université Laval in 2016 and pursued graduate studies in the same research field, under the supervision of Professor Sylvain Moineau. My main focus in research is understanding how the microbes and

viruses that live on and inside our bodies can influence our health. I received a scholarship from the National Sciences and Engineering Research Council for my master's degree and a scholarship from the Fonds de recherche du Québec – Nature et technologies and from Sentinel North for my PhD project. During my graduate studies, I had the opportunity to go to Copenhagen (Denmark) for a three-month internship with our collaborators on the project.

As a scientist, I value teamwork, curiosity and women's equal participation in science. I'm also actively involved in promoting science among high school students to share my passion and increase awareness on the importance of critical thinking. In the future, I wish to continue research in Canada and teach at the university level. I'm interested in developing computer tools to study, predict and tackle health-related issues.