

Evaluation of trained innate immunity to rhinovirus infections in highly differentiated asthmatic airway epithelial cells

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Aubrey Michi, a Ph.D. student at the University of Calgary

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Respiratory viral pandemics have taken center stage as global health emergencies. Asthmatics are a high-risk group for acute exacerbations instigated by cold viruses, particularly, human rhinoviruses (HRV). We know that repeated cold virus infections during early childhood are strongly linked to wheezing illnesses and subsequent asthma development. In particular, the HRV-C genetic group of HRVs are strongly linked to severe lower airway exacerbations and increased hospitalizations in asthmatic children. Since all children experience numerous seasonal colds, but not all children develop asthma, we propose that the cells lining the asthmatic airways may mount an abnormal immune response to repeated HRV infections. This may result in permanent changes in the airway cells that contribute to creating an asthmatic airway in childhood.

Aubrey Michi, a Ph.D. student at the University of Calgary is investigating the phenomenon of “trained” innate immunity, in which exposure to multiple HRV infections may reprogram infected airway cells to fight subsequent infections more efficiently. We hypothesize that asthmatic airway epithelial cells may not undergo this “training” to fight repeated infections, which could implicate a mechanism by which repeated rhinovirus infections further childhood asthma development.

About Aubrey Michi

Originally from sunny Southern California, Aubrey completed her B.Sc. in Environmental Science and Economics at University of California, Los Angeles (UCLA). Her passion for exploration and adventure brought her to the University of Calgary, Alberta to pursue a molecular biology Ph.D. in Dr. David Proud’s respiratory research laboratory. She leads multiple asthma projects investigating the role of rhinovirus infections in changing cell metabolism, epithelial barrier function, and repeated rhinovirus infections in cells taken from human lung donors. She is highly involved in the University of Calgary Inflammation Research Network (IRN) which supports multidisciplinary collaborations of chronic inflammation-focused health research. Aside from laboratory work, Aubrey has a passion for cooking elaborate meals from recipes she has collected throughout her world travels.

She’s working towards becoming an independent Principal Investigator herself specializing in metabolic features of respiratory viral infections, with a focus on asthma. Her research philosophy centers on

intellectual flexibility: we should never change the data to match our thinking but change our thinking to match the data.