Environmental Science Graduate Program Student Seminar Series

Quantifying fungal load in indoor environments to better characterize exposure among asthmatics

- **Sam Cochran**

Smith 3150 | 3 - 8 - 19 | 3:00 - 4:00 pm

Abstract:

Asthma represents a significant health and economic burden. There are an estimated 300 million diagnosed cases of asthma worldwide and this number is expected to increase to 400 million by 2025. In the U.S. alone, nearly $3,300 is spent per year, per person with asthma. Asthma is also a very complicated condition, with multifarious subtypes and differential understanding about what causes or exacerbates each. Though there are numerous factors implicated in asthma etiology, this presentation focuses on fungal diversity in homes, which we know to be inversely associated with asthma development. We can assess this diversity from indoor environmental samples using relative abundance data collected through next-generation DNA sequencing. However, relative abundances do not reveal total fungal load, a factor found to be crucial for symptom severity among non-allergic asthmatics. To fully characterize exposure, we have combined sequencing data with absolute quantification of spore equivalents, using quantitative polymerase chain reaction (qPCR) and digital polymerase chain reaction (dPCR). This project seeks to demonstrate the utility of this approach in uncovering associations between fungal load exposure and asthma symptoms and severity.