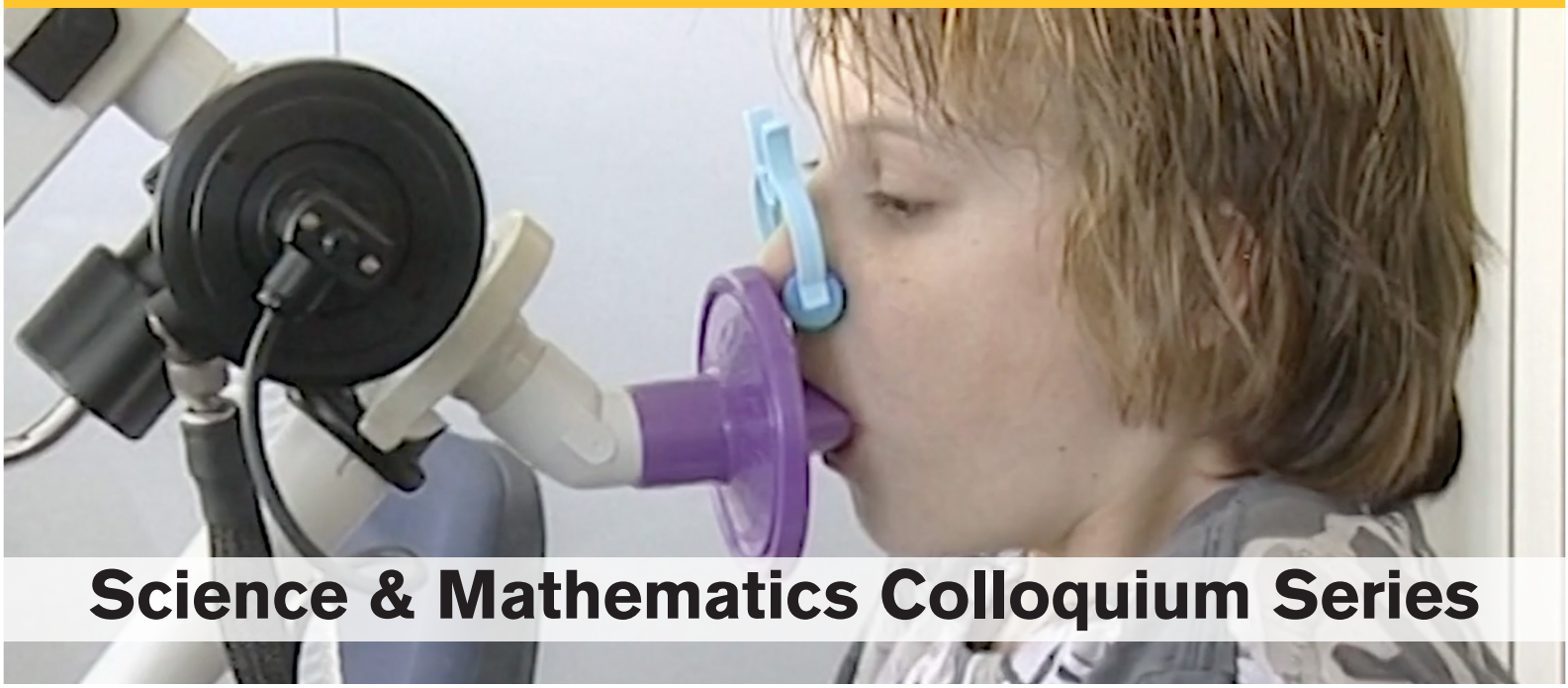
Discovering volatile biomarkers for phenotyping lung infections



Science & Mathematics Colloquium Series

Presentation by Heather Bean

Assistant Professor of Biomedicine and Biotechnology
ASU School of Life Sciences, Colllege of Liberal Arts & Sciences

Wed., Sept. 28, 3 p.m.
Free and open to the public
ASU's Polytechnic campus
Cooley Ballroom, Student Union
refreshments at 2:45 p.m.

The primary cause of morbidity and mortality for persons with cystic fibrosis (CF) is pulmonary damage from chronic bacterial lung infections, with *Staphylococcus aureus* and *Pseudomonas aeruginosa* responsible for 90% of all infections. During chronic infection, these pathogens acquire phenotypes, such as antibiotic resistance and mucoidy, that are significantly correlated to lung function decline. However, accurately diagnosing these phenotypes in the clinical microbiology laboratory is incredibly challenging due to rapid phenotypic switching by the bacteria once they are cultured outside of the lung environment.

The aim of our work is to identify volatile biomarkers that can be used to determine infection etiology and detect antibiotic resistance and mucoidy phenotypes directly from patient specimens, without the need for laboratory culturing.

Faculty and practitioners discuss their current research and field projects in the college's Science and Mathematics Colloquium Series, held throughout the academic year at the ASU Polytechnic campus.

Heather Bean and her research team are applying advanced chromatography and mass spectrometry methods to identify metabolic biomarkers produced by microbial pathogens through analysis of clinical samples, such as sputum and breath.

The research group is also identifying biomarkers the host produces in response to the microbial pathogens, and biomarkers that the host-pathogen system produces in the unique metabolic feedback environment created during infection. In addition to more sensitive diagnostics, these data may contribute to the development of more effective drugs to treat chronic lung infections, such as those associated with cystic fibrosis and COPD.

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