Breathing or Wheezing:

The Fight for Air When You Have Severe Asthma

by **Bethany Baker**, MS on behalf of the UTMB Institute for Translational Sciences | **24 April 2017**

Statistically speaking, a typical elementary classroom of 24 students will likely have two or three students who have asthma. What causes asthma? Is it curable? These types of questions were answered at the Science and Communities Interact (SCI) Café conversation on the evening of Thursday, April 20th at the MOD Coffeehouse in Galveston. The informal discussion was led by the Professor and Vice Chair of the Department of Internal Medicine at UTMB, William, J. Calhoun, MD; and a Biochemistry and Molecular Biology Graduate Student at UTMB and asthma patient, KarryAnne Belanger.

Asthma is a lung disease involving constriction of the airways. While asthma is one of the most common chronic diseases in industrialized nations, the good news is its symptoms can be treated with affordable medications. One member from the community asked if asthma is curable. Dr. Calhoun explained that medication can reduce breathing dysfunction and exacerbations but that there are currently no disease-modifying drugs that have been developed; simply stated, no drug has been developed that remediates the disease long-term.

Another community member inquired about genetics influencing the probability of asthma. Dr. Calhoun described that while some diseases are independent of genetics, asthma is definitely a disease that has hereditary characteristics. He further explained how a mother's genetics tend to have a bigger effect on the baby's asthma outcome than the father's genetics. For instance, if only the mother has asthma then there is a one in two (50%) chance the baby will have asthma. However, if only the father has asthma, then there is a one in four (25%) chance the baby will have asthma. Unfortunately, if both parents have asthma, there is a three out of four (75%) chance the baby will have asthma.

The advancement of characterizing an individual based on their genes, known scientifically as biological genotyping, not only allows for asthma prediction, it facilitates determining asthmatic severity through non-invasive procedures. A relatively new sampling approach, known as exhaled breath condensate, is a technique where a patient exhales into a mouthpiece that is attached to a collection device. The water vapor from the exhaled breath condenses and proteins within this liquid can be analyzed. From the proteins in the condensate, it can be determined whether the patient does or does not have asthma and if they do, the severity factor of usual, mild, or severe.

KarryAnne Belanger, a graduate student at UTMB who performs research in the Department of Biochemistry and Molecular Biology and Dr. William Calhoun, Vice Chair of Internal Medicine and Professor at UTMB.

So what should you do if you think you have asthma? If you believe you have asthma, it is recommended you see a physician to obtain a proper diagnosis. Research shows that long duration of untreated asthma can scar the epithelial cells in our lungs, which are cells that cover the surface of the lungs and assist with airflow.
Scarring causes the lung to stiffen, not only making breathing more difficult but also making asthma harder to treat.

The Institute for Translational Sciences and the Sealy Center for Environmental Health and Medicine at UTMB invite you to come be a part of the conversation! SCI Café is open to the public and is free to attend. The next one will be held on **May 18th** with the topic of **"The State of our Bay."** The discussion will occur at **MOD Coffeehouse located at 2126 Post Office Street in Galveston.** We hope to see you there!