#### The University of Texas io Grande Valley

School of Mathematical & Statistical Sciences

# Colloquium Series

## **Modeling Human Airway Swelling** by the Deep Power of **Fundamental Mathematics**

#### Dr. Kun Gou

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**Abstract:** 

Calculus and Differential Equations can be applied to study interesting biological problems. In this talk, such fundamental mathematics is creatively used to model a disease called tracheal angioedema (airway swelling), and to discover unexpected results. Tracheal angioedema is caused by airway soft tissue swelling due to fluid leakage from the blood vessels. This pathology can suddenly change the normal tracheal luminal size, and cause breathing difficulty for a medical emergency. The extra fluid accumulation inside the tissue can also alter the stiffness of the tissue, and make the airway opening size change more complicated. We set up a model using continuum mechanics to understand how the angioedema swelling extent can quantitatively change the trachea luminal size, particularly under the tissue stiffness modification. Interestingly, the swelling may not always shrink the tracheal lumen, but may expand it sometimes. This model can assist conducting more appropriate medical treatment for tracheal angioedema.

#### Date: Friday August 10, 2018

#### **Time: 2:00 pm– 3:00 pm**

### Place: EMAGC 3.502 (Edinburg) / BLHSB 1.312 (Brownsville)

The talk will be delivered live in Edinburg campus and will be streamed to the Brownsville

campus . Refreshments will be severed at 1:50 pm.

For further information or for special accommodations, please contact Dr. Oraby at 665-3536 or via email at Tamer.Oraby@utrgv.edu

