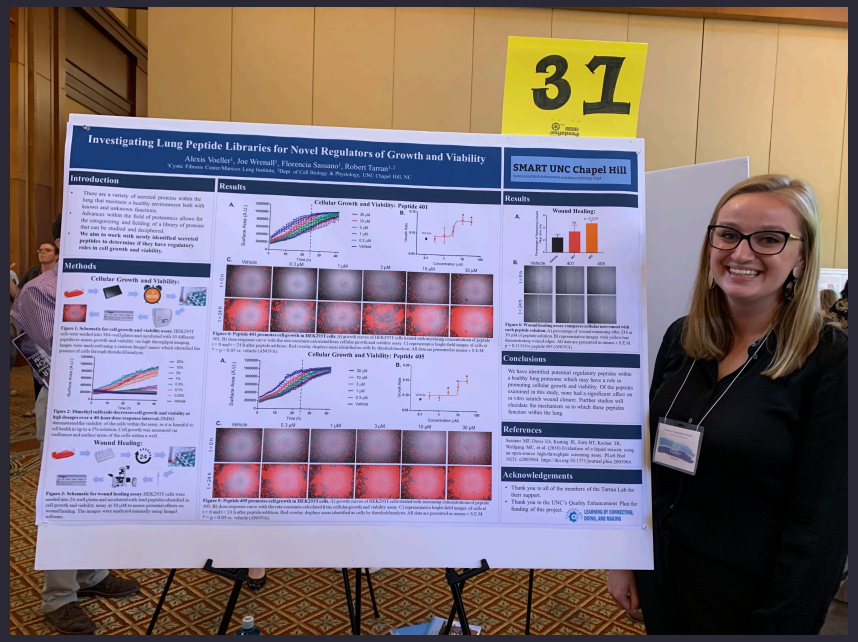
Investigating Lung Peptide Libraries for Novel Regulators of Growth and Viability

By: Alexis Voeller

Major: Biology B.S. & Chemistry B.A.

Faculty Advisor: Robert Tarran

Department: Cell Biology & Physiology, Marsico Lung Institute



Background and Research Question

- There are a variety of secreted peptides (shortened protein amino acid chains) within the lung that maintain a healthy environment both with known and unknown functions
- Advances within the field of proteomics (study of proteins) allows for the categorizing and fielding of a library of proteins and peptides that can be studied with a physiological perspective
- **We aim to work with newly identified secreted peptides to determine if they have a role in cellular growth or viability**
- **Why is this important?**
- This research is hoped to be backbone in finding the mechanism as to how a few of these peptides function within the healthy lung and what their purpose could be in a diseased lung
- We are hoping to discover if any of these peptides have therapeutic potential within diseased lungs

Results and Significance

- We have tested 10 peptides out of the 1800 peptides within the library to explore their potential role in promoting cellular growth and viability
  - Human embryonic kidney cells were seeded into 384-well plates and incubated with 10 different peptides to assess growth and viability via high throughput imaging
  - Images were analyzed using a custom imaging program macro which identified the presence of cells by highlighting their presence and surface area
  - **Out of the 10 peptides tested, we identified two possible candidates within our library that have produced the potential to promote cellular growth and viability**
- We took these two candidates and performed an in vitro scratch wound closure assay by scratching away cells to see whether or not these peptides promote wound closure or change cellular movement
  - Further studies need to be performed to make conclusions about these peptides in regards to wound closure mechanisms
- Further studies will elucidate the mechanism as to which these peptides function within the lung and whether or not these naturally occurring peptides can have therapeutic potential within lung disease