Grace Lena

**Year in Course:** 3 (Senior)

**Topic:** Microbiology and Nitrogen Mustard Gas

**Title:** Micro-RNA-21 Is Associated With Nitrogen Mustard Treated Skin Inflammation on Mouse Keratinocyte Pam 212

**Mentor:** Dr. Hung-Duck Kim, New York Medical College

Micro-ribonucleic acids (microRNAs) have appeared as key gene regulators that control inflammation, autoimmune disease, and skin barrier regulator in keratinocyte [1-3]. Nitrogen Mustard [NM] is a blistering agent, or vesicants, that has been used in chemical warfare and induce inflammation and skin injury [4-10]. Intoxication of a mustard is associated with oxidative stress which is caused by an imbalance between production of oxidants and antioxidants in the lung and respiratory tract [10]. It has been thought that oxidative stress is a primary event triggering the inflammatory cascade and tissue injury [10]. We hypothesized that by targeting key molecules that protect the body from harm when exposed to Nitrogen Mustard skin inflammation would be regulated by microRNAs and unfold its target molecules in mouse keratinocyte cells. The study confirmed that microRNA-21 is a key regulator on skin inflammation by mitigating inflammatory cytokines [i.e., MCP1 and MIP1 alpha], not HO-1 mRNA expression. Taken together this data suggest that, microRNA -21 plays a key role on regulation of skin inflammation due to NM-driven oxidative stress evoked on mouse keratinocyte Pam212 cellular model.