**Abstract:** Malignant mesothelioma (MM) is a deadly disease caused by asbestos exposure. The most common site for mesothelioma is the pleura, the outer lining of the lungs, but can also arise in the peritoneum and the pericardium. When asbestos fibers are inhaled the lung macrophages attempt to phagocytize the fibers, which leads to oxidative stress. The mechanism by which asbestos causes MM is not yet fully understood, as it is a very complex pathway. In order to develop better therapeutic strategies for MM it is important to understand the mechanism of MM development in response to asbestos. Recent work in the lab of Dr. Shukla has demonstrated that asbestos can activate NLRP3 (Nod-like receptor protein3) inflammasomes in human mesothelial cells (Particle Fiber Toxicology, 2013, 10, 39), however, the exact mechanism how asbestos prime or activate NLRP3 is not known. During the research project the effect of asbestos exposure on toll like receptors (TLRs) in human mesothelial cells (LP9) was explored. It was hypothesized that activation of the toll like receptors is involved in asbestos-induced inflammasome activation. Using qRT-PCR it was demonstrated that TLR9 is over expressed when mesothelial cells are exposed to asbestos. Small interfering RNA (siRNA) were then used to inhibit TLR9 to see the effect on asbestos-induced inflammasome (NLRP3) activation. After inhibition with siRNA it is hypothesized that the activation of NLRP3 will be decreased.