

1080-92-166

Shernita Lee*, shernita@vt.edu, and **Kahmya McAlpin, Leslie Myint, John Nardini, Christopher Lawrence** and **Reinhard Laubenbacher**. *Discrete Modeling Techniques to Investigate the Innate Immune Response to Respiratory Fungal Pathogens*. Preliminary report.

The fungus, *Aspergillus fumigatus*, dwells in variable environmental conditions and after successful invasion of the host the innate immune response is signaled to eradicate the fungus quickly and efficiently by recruitment of inflammatory cytokines. The element iron is a target for the fungus to meet its nutritional needs, thus the innate immune response attempts to withhold iron and starve the fungus. Lung epithelial cells are a prime target for fungal infection due to constant exposure to airborne pathogens and are the first cells to directly interact with the fungus. We present a mathematical model of iron metabolism in lung epithelial cells and their response to *A. fumigatus* using discrete modeling techniques. The model is capable of making predictions and allows for the testing of conditions that are experimentally intractable, a process beneficial to many fields. (Received January 24, 2012)