Invasive aspergillosis is among the most common fungal infections in immunocompromised hosts and carries a poor outcome. The spores of the causative organism, Aspergillus fumigatus, are ubiquitously distributed in the environment. Healthy hosts clear inhaled spores without developing disease, but individuals with impaired immunity are susceptible to a life-threatening respiratory infection that can then disseminate to other organs. The increasing use of immunosuppressive therapies in transplantation and cancer has dramatically increased suffering and death from this infection, and this trend is expected to continue. Current therapeutic approaches have been focused primarily on the pathogen, but a better understanding of host defenses in this infection may lead to the development of new treatments. This talk presents a multi-scale mathematical model that can serve as a simulation tool of the innate immune response to invasive aspergillosis, and the exploration of host-centric therapeutic approaches. (Received September 02, 2019)