Human pathogenic fungi

During the last decades, life-threatening fungal infections have increased, especially in the expanding immunocompromised population. Despite antimycotic treatment, these infections are associated with substantial mortality. The two main causative agents of fatal fungal infections in Europe are *Candida* spp. and *Aspergillus fumigatus*.

*C. albicans* and *C. glabrata* are part of the normal microbial flora that colonizes mucocutaneous surfaces of the oral cavity, gastrointestinal tract, and vagina of many mammals, and cause occasionally mucosal infections even in immunocompetent, colonized hosts. However, in ICU patients *Candida* can disseminate into the blood stream, leading to sepsis. *Candida* infections are the result of a co-ordinated battle between the fungus and its host, in which professional phagocytic cells provide the central innate defense barrier. The initial recognition by epithelial cells, the handling of the pathogen by macrophages/dendritic cells and neutrophils plays a central role in the resolution of the immune response.

*A. fumigatus* is a ubiquitous mold which produces spores that are inhaled daily in large amounts by everyone. While these spores are eliminated quickly by the healthy immune system, they can germinate and grow within the lungs of immunocompromised patients, thus causing disease. Similar to *Candida*, epithelial cells, innate immunity, and especially phagocytes play a key role in preventing and combating *A. fumigatus* infections.