Interaction with immune cells

Phagocytes such as macrophages and neutrophils are key players of the innate immune system and represent a crucial line of defense against pathogenic *Candida* species such as *C. albicans* and *C. glabrata*. This is particularly illustrated by the fact that invasive *Candida* infections rarely occur in healthy hosts, and a compromised immune system is one of the major predisposing factors for disease.

Recognition of *Candida* cells by phagocytes leads to cytokine production, phagocytosis, and the activation of antimicrobial effector functions to induce killing of the fungus. On the other hand, pathogenic *Candida* spp. are well adapted to their host and have developed mechanisms to evade or counteract the anti-microbial activities of phagocytes. One of these mechanisms is the adaptation of fungal metabolism to cope with nutrient limitation inside the phagosome. This and other strategies allow *C. albicans* and *C. glabrata* to not only survive phagocytosis by macrophages, but even proliferate intracellularly and escape. *C. albicans* escapes by rapid hyphal growth and host cell damage. In contrast, *C. glabrata* replicates as yeast cells inside macrophages and persists for days, before macrophages burst and fungal cells are released.

We want to characterize the interaction of *C. albicans*, *C. glabrata,* and *C. auris* with phagocytes. We are especially interested in the fungal factors and activities that help *Candida* to cope with these immune cells, survive and escape. Moreover, in close collaboration with the Junior Research Group Adaptive Pathogenicity Strategie**s** we investigate how immunotherapy impacts on the interactions between *C. albicans* and macrophages and mitigates escape of *C. albicans* from macrophages. Therapies that aim at improving the innate immune system are increasingly recognized as essential in improving the outcome of fungal infections. Particularly interferon-γ is a promising candidate due to its potential of improving macrophage microbicidal activity.

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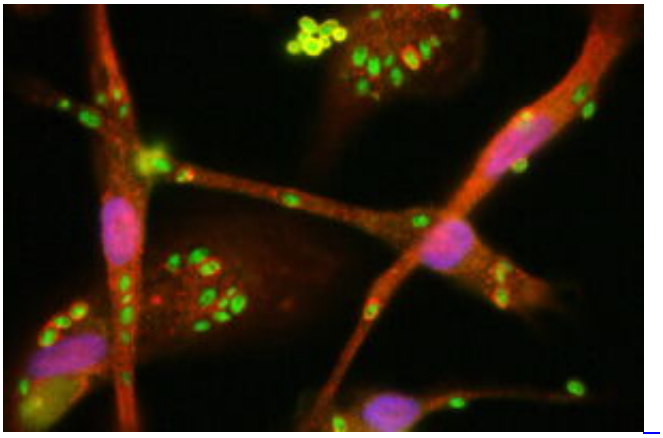
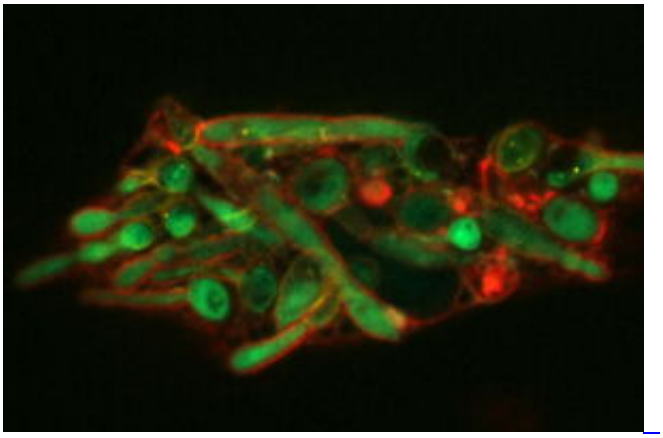
 Visualising the maturation of *C. glabrata*-containing vacuoles. *C. glabrata* resides and replicates within macrophages by modifying the maturation of their phagosomal compartment.

-  Reporter gene analysis: *Candida albicans* forms hyphae inside macrophages and expresses the Candidalysin toxin-encoding gene *ECE1* (green)

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