

Pathogenic yeasts: *Candida albicans* & *C. glabrata*

Our research topics are:

- Molecular biology of human pathogenic fungi
- Functional genomics
- Host/pathogen interactions
- Metal acquisition
- Intracellular survival
- Invasion mechanisms
- Microevolution
- Morphology
- Mode of action of antifungal agents

Human pathogenic fungi frequently cause infections of the skin and mucosa, however, they are also capable of causing severe, life threatening mycoses.

The Department of **Microbial Pathogenicity Mechanisms (MPM)** investigates infections caused by human pathogenic fungi. Research is focused on the pathogenesis of mycoses due to yeasts such as *Candida albicans* or *C. glabrata*. *C. albicans* is regarded as the most important of all medically relevant yeasts and is an extremely successful pathogen in humans. *C. glabrata* is closely related to the non-pathogenic baker's yeast *Saccharomyces cerevisiae*. However, in many cases *C. glabrata* is the second most prevalent yeast pathogen in humans after *C. albicans*.

In contrast to most pathogenic fungi in humans such as *Aspergillus fumigatus*, *Cryptococcus neoformans*, or *Histoplasma capsulatum*, which are found in the environment, *C. albicans* and *C. glabrata* belong to the normal microflora of mucosal surfaces and are regarded as harmless commensals in most circumstances. In fact, most humans are probably colonized with these yeasts. An intact immune system and a balanced microbial flora are normally sufficient to protect the individual from *Candida* infections. However, certain critical events such as extensive antibacterial treatment or dysfunction of the immune system may enable these fungi to overgrow the microbial flora on mucosal surfaces.

Using cellular, microbial, molecular and biochemical methods and *C. albicans* or *C. glabrata* as model organisms, the goal of our research is to identify factors which fungal pathogens need to cause diseases. In addition to these efforts to increase our understanding of the basics of

pathogenesis of fungal infections, we also seek to identify new biomarkers for diagnostic approaches and potential targets for antimycotic drug development.

The department MPM closely cooperates with the research group [Microbial Immunology](#) (MI) and the Emmy Noether Junior Research group [Adaptive Pathogenicity Strategies \(APS\)](#), which develop and use *in vivo* infection models and investigate immunotherapies and interactions with the microbiota, in order to understand and prevent the pathogenesis of human pathogenic fungi.