Invitation

for an invited lecture and a doctoral thesis defense

Invited Lecture: Iron homeostasis of the mould *Aspergillus fumigatus*
Hubertus Haas (hubertus.haas@i-med.ac.at)
25.02.2025 at 10:00 AM
Meeting Room 6.014 (6th floor), Faculty of Science, Palacký University

The main research focus of the laboratory of Hubertus Haas is fungal iron homeostasis with an emphasis on siderophore metabolism and its transcriptional regulation in the *Aspergillus fumigatus*. *A. fumigatus* is a typical saprobic filamentous ascomycete, but also the most common airborne human mould pathogen, causing allergic and invasive diseases depending on the immune status of the patient. Unsatisfactory diagnostic and therapeutic options are reflected in the high mortality rate of *Aspergillus* infections. Studies over the last 25 years have revealed the crucial role of siderophore biosynthesis and iron regulation in the virulence of *A. fumigatus*. Consequently, the siderophore system represents a novel target for antifungal therapy. Siderophores have also been shown to have great potential for improving the diagnosis of fungal infections, either by detecting siderophores in body fluids or by imaging fungal infections using positron emission tomography with radiolabeled siderophores as tracers.

Doctoral Thesis Defense: Mass Spectrometry in Clinical Microbiology
Jiří Houšť (jiri.houst@biomed.cas.cz)
25.02.2025 at 11:00 AM
Meeting Room 6.014 (6th floor), Faculty of Science, Palacký University

Aspergillus fumigatus, *Scedosporium apiospermum*, and *Lomentospora prolificans* are globally distributed fungal pathogens decimating thousands of immunocompromised patients annually. The current diagnostic toolkit for the early detection of invasive mycoses remains inadequate. In response, innovative diagnostic platforms are being developed, including the mass spectrometry-based detection of fungal-specific iron-chelating secondary metabolites siderophores, either coupled to liquid chromatography or directly by matrix-assisted laser desorption/ionization. Initially, this thesis shows the mass spectrometry-based diagnostic potential of siderophores as early and specific biomarkers of invasive pulmonary aspergillosis in a rat model during an antimycotic intervention. Next, this work examines a detailed *p*H-dependent degradation kinetics of *A. fumigatus* siderophores, unveiling the primary degradation mechanism and pivotal by-products. Furthermore, this thesis identifies a complete siderophore portfolio of *S. apiospermum* and *L. prolificans*. The final aim of this research evaluates the feasibility of fungal siderotyping and its potential translation to the Biotyper instruments as a rapid and cost-effective diagnostic tool routinely performed at the bedside.