Leibniz-Institut für Naturstoff-Forschung
und Infektionsbiologie
Hans-Knöll-Institut

Job Advertisement No. HKI-26/2018

The **Leibniz Institute for Natural Product Research and Infection Biology – Hans Knöll Institute** – (Leibniz-HKI, www.leibniz-hki.de) investigates the pathobiology of human-pathogenic fungi and identifies targets for the development of novel natural product-based antibiotics. The Department of Microbial Pathogenicity Mechanisms (www.leibniz-hki.de/en/microbial-pathogenicity-mechanisms.html) invites applications for one

Doctoral Researcher (f/m) (FunHoMic)

in the field of Microbiology / Infection Biology / Cellular Microbiology.

The project will be associated to the European Innovative Training Network (ITN) "Deciphering the fungus-host-microbiota interplay to improve the management of fungal infections – FunHoMic" within the Horizon2020 Marie Skłodowska-Curie Actions (Early Stage Researcher 12 - ESR 12).

Project background – Fungi infect billions of people annually, kill as many people as tuberculosis or malaria and are a major problem for healthcare. *Candida albicans* is a major opportunistic fungal pathogen and frequently causes superficial or even fatal infections. However, most humans are asymptotically colonised by this fungus as a part of their commensal microbiota. We are a leading research group in the investigation of *Candida* spp. pathogenicity mechanisms including their interaction with immune cells, their nutrient acquisition strategies, their evolution and adaptation in pathogenicity, the mechanisms involved in the commensal-to-pathogen shift and their capacity to cause host damage (see: www.leibniz-hki.de/en/mpm).

In this project, the successful applicant will use our sophisticated *in vitro* and *ex vivo* model systems to investigate important aspects of *C. albicans*' interaction networks during commensalism and pathogenesis, focussing on the influence of human microbiota and probiotics on host-*Candida* interplay. The overarching goal is to elucidate the molecular mechanisms by which bacteria act as protective partners or antagonists of *C. albicans*. See more detailed description below.

Eligibility criteria – All applicants must be early-stage researchers of any nationality in the first four years of their research career. They are required to undertake transnational mobility and, *in the 3 years immediately prior to recruitment, must not have resided or carried out their main activity (work, studies, etc.) in Germany for more than 12 months*. The appointed researcher must not have spent more than 12 months in the 3 years immediately prior to their recruitment in the same appointing organisation.

Candidate's profile – We expect a Master´s degree (or equivalent) in Life Sciences (e.g. Biology, Biochemistry, or Microbiology). Furthermore, the applicant should be able to perform team-oriented as well as independent work. Practical experiences in one or more of the following subjects are beneficial: Microbiology, Molecular Biology, Infection Biology, Cell Biology. Practical experience in cell culture, microarrays or fungal genetics is an advantage.

We offer – The successful candidate will be hosted at the Department MPM at the Leibniz-HKI. The institute is embedded in the outstanding scientific environment of the Beutenberg Campus providing state-of-art research facilities and a highly integrative network of life science groups. We offer a multifaceted scientific project with excellent technical facilities, a place in a young, committed team, as well as strong scientific collaborations. Furthermore, the successful candidates will take part in the extensive ITN training programmes. The length of individual appointments for an ESR will be at least 36 months within a network. Salary is paid according to the regulations of the Marie Skłodowska-Curie Actions. HKI is an equal opportunity employer.

For further information: Please contact Prof. Bernhard Hube | +49 3641 532 1401 | career@leibniz-hki.de

Applications - Complete applications in English should include a CV, a complete list of publications, a brief statement of research experiences, the addresses of two possible referees, and should be submitted by **31.03.2019** via the online application system of the HKI.

Project description

Candida albicans is a major opportunistic fungal pathogen that can cause both life threatening disseminated infections in immunocompromised patients as well as vulvovaginal infections in woman with a fully functional immune system. Nevertheless, most humans are asymptotically colonized by this fungus as a part of their commensal microbiota. In fact it is this bacterial microbiota that plays a key role in maintaining the commensal state of *Candida albicans*, which is highlighted by the fact that the use of antibiotics is a major risk factor for *Candida*-infections.

The Early Stage Researcher (ESR 12) (PhD student) within the FunHoMic Marie Curie International Training Network will investigate how members of the microbiome, specifically lactobacilli, play a role in antagonizing the commensal-pathogenic transition of *C. albicans*.

These interactions will be studied using a highly innovative dynamic gut-on-chip model that represents the gut epithelial barrier, the vascular system, and the immune system. Additionally as part of the project a novel dynamic in vitro model for studying *Candida*-host-microbiome interactions in vulvovaginal candidiasis will be established by the candidate.

Using this model the candidate will investigate the molecular interactions of how lactobacilli antagonize *C. albicans* pathogenicity, thereby focusing on inhibition of specific fungal pathogenicity mechanisms as well as changes in the host's immune response.

As part of the PhD project the candidate will be involved in two direct collaborations with industry, that involve secondments in the company Mimetas, experienced in establishment of dynamic Organ-on-Chip models and the company Biose with expertise in the development of live biotherapeutic micro-organisms

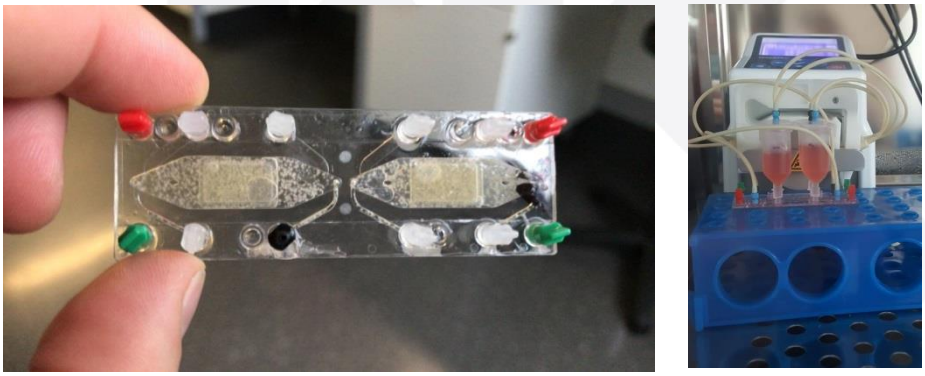

Fig. 1 The gut-on-chip model representing the gut epithelial barrier

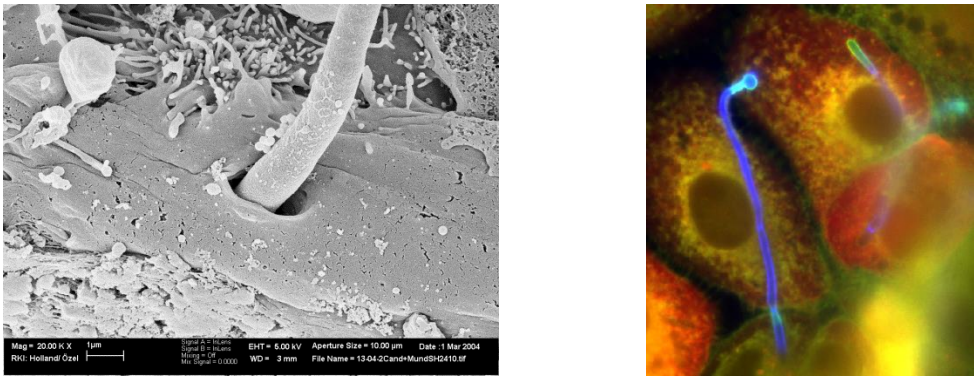

Fig. 2 *C. albicans* hyphae invading human epithelial cells