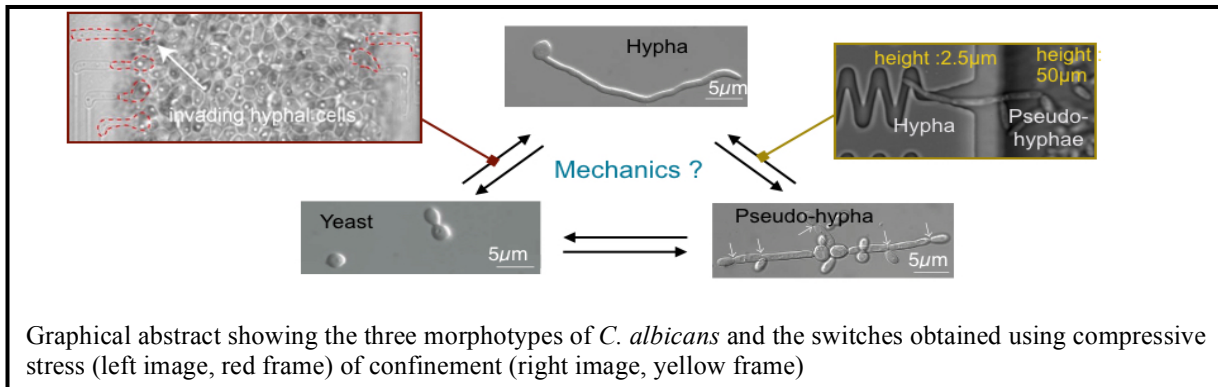


***Candida albicans* “on-chip”:
Biomechanical approach of morphogenetic plasticity of the yeast *C. albicans***

CONTEXT

Candida albicans is an opportunistic pathogen yeast that exists in three morphotypes: rugby-shaped yeasts, elongated filamentous hyphae, and intermediate pseudo-hyphae types (see Graphical abstract). The switch from one morphotype to another one has been associated with benign (*candidiasis*) to deep-seated infections in which *C. albicans* cells invade biological tissues.



Different regions of the body have different physico-chemical characteristics, resulting notably in various sources of confinement and mechanical stresses that *C. albicans* cells may experience. Recently, ***we have shown that the switch from one morphotype to another one was highly dependent on mechanics***, raising the question of the role of such stresses in promoting or restraining virulence.

PROJECT

The goal of this PhD project is to investigate morphotype regulation under mechanical stress. To this end, various microfluidic devices will be developed in order to control the physico-chemical environment cells are subjected to. In particular, the yeast-to-hyphal and the pseudo-hyphal-to-hyphal transitions will be investigated. The results from these biophysical studies will serve as a basis to study *C. albicans* invasiveness into mammalian cells within “organ-on-a-chip”-like devices. This PhD will take place into a larger collaborative network involving Pasteur Institute in Paris (C. d’Enfert team) and the theoretical group in Physico-Chimie Curie (P. Sens)

FRAMEWORK

We are looking for a highly motivated student who is ***eager to work at the interface between physics and biology***. Among others, the candidate will learn microbiology techniques and microfabrication. The thesis will be in between two laboratories: the LAAS-CNRS (Toulouse), under the supervision of M. Delarue, and the Institut Curie – IPGG (Paris) under the supervision of C. Villard. The first half of the PhD program will be at LAAS-CNRS, where the student would be studying the yeast-to-hyphal transition under well-defined physico-chemical conditions, learning microfabrication in the state-of-the-art 1500m² clean room. The second half of the PhD will be at Institut Curie/Institut Pierre-Gilles de Gennes for microfluidics, investigating the role of confinement in hyphal growth and the pseudo-hyphal-to-hyphal transition. The PhD student would sign in the PSL-“Physique Ile de France” doctoral school in Paris, and regular bimonthly meetings will be organized, either in Paris or in Toulouse.

If you are interested, please send your CV, a short statement of interest, and the contact information of at least one reference to: catherine.villard@curie.fr and morgan.delarue@laas.fr .