

## PROPOSITION DE STAGE

Laboratoire : IGBMC

Adresse : 1 Rue Laurent Fries, 67400 Illkirch

Équipe de recherche : Stress response and aging signalling

Responsable de l'équipe : Gilles Charvin

Responsable de stage : ASPERT Théo/ JACQUEL Basile

Adresse électronique : charvin@igbmc.fr

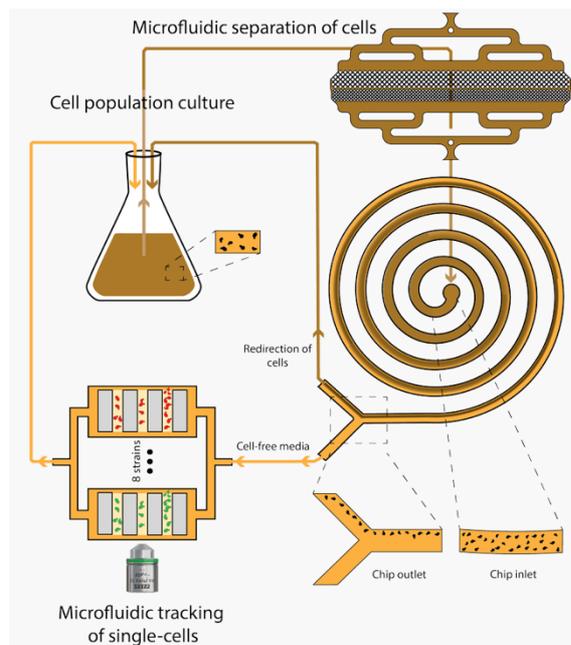
<http://charvin.igbmc.science>

Profil recherché : Quiescence, microfluidics, single cell analysis

## Titre du stage: Mechanism of entry into quiescence in budding yeast

### Background

Like any microorganisms, yeast cells can enter a reversible, dormant state when facing limitations in essential nutrients. This quiescent state allows the cells to survive for long periods of time with a very low metabolic activity, until better nutrient conditions arise. Importantly, it is also associated with a strongly increased tolerance and enhanced survival to a variety of environmental stressors. Yet, the differentiation program driving to the entry into quiescence remains poorly understood, in part due to the lack of environmental control in standard population measurements.



### Aims

Our team has developed a unique microfluidic device to track the proliferation of a population of cells -with single cell resolution- that experience a progressive exhaustion of resources (see figure). Using this system, we have shown that we can follow the dynamics of entry into quiescence with an unprecedented level of details. Based on this technique, we would like to decipher how the environment drives the establishment of the quiescence program.

In this context, during this internship, the student will address the following questions:

- 1) What is the role of the respiratory phase that succeeds fermentation during entry into quiescence?
- 2) Can we recapitulate the entry into quiescence

using temporally controlled environmental changes that mimic the nutrients limitation observed during a natural fermentation process in bulk?

During the internship, the student will acquire skills in fluorescence microscopy, yeast molecular genetics, flow cytometry, microfluidics and image analysis with Matlab.

### Environment

The group of Gilles Charvin has a long-standing interest in the development of single cell imaging techniques to address fundamental questions related to the control of cell growth and division in budding yeast, including stress response and replicative aging. The lab has a strong expertise in yeast genetics, live imaging and microfluidics.

Please contact Gilles Charvin ([charvin@igbmc.fr](mailto:charvin@igbmc.fr)) or visit our website for further information.