

Seminar in Microbiology

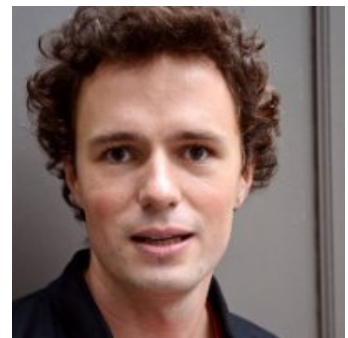
Monday, May 23, 2016

Salle de séminaire Salle E07.3347.a, CMU

11:30 – 12:30

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Monitoring *Escherichia coli* with single cell resolution in changing environments

In this seminar, I will explain how we monitor large *Escherichia coli* populations growing in dynamically changing environments with single cell resolution. This is made possible by combining state-of-the-art microfluidics designs, and by harnessing recent computer vision technics so that cells segmentation and their tracking from one frame to the next are performed jointly.

As a study case I will revisit the diauxic shift that occurs when available nutrients change from glucose to lactose at the single cell level. Cell growth and the activity of the endogenous lac promoter are monitored over the entire cell cycle of more than 10'000 cells in order to compare the following environments: glucose and lactose alternating every 4 hours, constant glucose, and constant lactose. After switching to lactose, each cell shows a lag before the lac operon is expressed and growth resumes; the shape of the lag times distribution as well as what we can learn from it about selection in fluctuating environments will be discussed.