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**Alex N. Nguyen Ba, Ph.D.**

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Cambridge, Massachusetts

**High-resolution observations of evolutionary dynamics and large scale quantitative trait mapping in budding yeast populations**

**LE MARDI 9 OCTOBRE 2018 À 12 H 30**

**Conjointement avec le Département de biochimie, de microbiologie et de bio-informatique**

Pavillon Charles-Eugène-Marchand, salle Hydro-Québec (1210)

The dynamics of adaptation play a central role in determining the pace and outcome of evolution. These dynamics imprint a pattern of mutations in evolving genomes that can reveal evolutionary processes and history. In my talk, I will describe a novel renewable barcoding technology that allows high-resolution observation of evolutionary dynamics in evolving yeast populations over the course of 1000 generations. Our design ensures that each individual in the population retains barcodes specifying their full ancestry and this genealogical information can be leveraged to infer and track all established adaptive mutations. This provides the first direct evidence of a ‘traveling wave’ of fitness that has been predicted but has never been previously observed. We find that the fate of an adaptive mutation is mostly determined by the dynamics of clonal competition and hitchhiking within and between lineages. Surprisingly, less-fit lineages often acquire adaptive mutations that allow them to ‘leapfrog’ much fitter genotypes. This leads to dramatic fluctuations in the traveling wave, an effect that has been neglected in previous theoretical work.

Expanding from these ideas, I will briefly describe how we have exploited similar technologies to genotype and phenotype thousands of genetically distinct individuals. This produces a genotype-phenotype map from wild populations, which we can use to compare patterns of mutations in nature with the products of different dynamics observed in the laboratory.

**Lunch et breuvages seront offerts.**

**SVP confirmer votre présence sur <https://doodle.com/poll/pehzuakxfs6yvk66> avant le vendredi 5 octobre, 10 h**

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