

Title:

Horizontal gene transfer in porous media

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Abstract (300 words maximum):

Horizontal gene transfer is an important mechanism in prokaryotic evolution that allows bacteria to quickly adapt to changes in the environment, leading to adaptations such as antibiotic resistance or detoxification genes within a population. Experiments involving horizontal gene transfer are often performed in homogeneous liquid cultures. However, most bacteria are found in structurally complex environments such as soil, and thus experiments performed in a homogenized medium may neglect the impact of the physical structure of the soil matrix, which will influence factors such as nutrient and oxygen distribution. To address this, we plan to use microfluidics chips mimicking the soil structure, into which we will introduce red fluorescent *Acinetobacter baylyi* ADP1, a naturally competent soil species. Once the bacteria have established in the channel, we will inject a nutrient solution mixed with DNA fragments encoding sfGFP and monitor the uptake and expression of the DNA fragments under the microscope. This experimental set-up allows us to control initial parameters, such as flow rate, DNA injection, nutrient concentration, and medium structure, but it is not possible to control the internal localized conditions that will shape, as well as be influenced by, the population within the medium.