

Photonics for biomolecular interaction sensing

Anastasia Skilitsi & Jérémie Léonard
Institut de Physique et Chimie des Matériaux de Strasbourg.

Biomolecular interactions are actively investigated (fundamental research) or screened (e.g. drug discovery) by using fluorescence detection of fluorescently-labeled biomolecular constructs. In this lab session, we will perform simple experiments with 1) droplet microfluidics, and 2) time-resolved fluorescence detection. Droplet microfluidics has emerged in the last decade as a very promising technology to manipulate rapidly water-in-oil microdroplets for a wide range of applications in biotechnologies (among other application fields). We use these droplets as micro-“reactors” in which biomolecular interactions may be investigated. Besides we will introduce time-resolved fluorescence detection as a tool to monitor biomolecular interactions. We will perform a simple experiment to illustrate how the fluorescence lifetime of a test fluorophore is influenced by the interaction with its environment. This is one example of fluorescence-based biosensing strategy exploited by the drug discovery industry to test biomolecular interactions (e.g. enzymatic activity).