

Proposition de financement doctorale pour la rentrée 2018-2019

Titre de la thèse :

Light responsive polymersomes for the burst release of neuromodulators

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This project aims at developing new light sensitive polymersome able to trap neuropeptide (Serotonine and dopamine for instance) and to release them (burst release meaning here $< 1s$) upon remote application of a stimulus. The shell will be based on copolymers exhibiting UCST properties. With homemade microfluidic platforms, aqueous droplets will be formed, that will serve as template for the formation of the polymersomes. Being soluble in the water phase at the beginning of the process, the copolymer will precipitate upon temperature variation. The control of this precipitation is one key aspect of the study. Another important step is the transfer of the formed vesicles into a water phase, while avoiding destabilization. Gold nanoparticles embedded into the carrier will allow to trigger in situ the temperature increase upon light illumination, thereby causing the dissolution/destabilization of the shell. These polymersomes will be used to unravel neuronal pathways in zebrafish larvae in collaboration with the group of C. Wyart.

Mots clés : burst release, light, polymersome, neuromodulation