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Titre de la thèse :

Engineering artificial organelles to reveal the composition of pathological granules in cells involved in neurodegenerative diseases

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Membrane-less organelles are ubiquitous functional sub-units of cells that are involved in many vital functions such shaping the general gene expression output. Importantly, their dysfunctions into toxic aggregates are linked to neurodegenerative and cancer diseases. The concept of phase separation has recently been proposed to explain how RNAs and Proteins can condense into viscoelastic membrane-less organelles in cells. Nevertheless, the biochemical characterization of such organelles and their possible manipulation require the development of novel tools. By combining chemical biology and biophysics, our team has recently developed a novel methodology (ArtiGranule) to form artificial membrane-less organelles, within living cells. Combining ArtiGranule with 'Omic' approaches will provide a new tool to identify the biochemical compositions of pathological granules and provide novel targets for treating disease.

Mots clés : Intracellular phase transition, protein engineering, artificial organelles, microscopy

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