Séminaire

INSTITUT Charles SADRON
CNRS - UNISTRA - STRASBOURG

Jeudi 4 avril 2024 à 9h30-11h30

Amphithéâtre Henri Benoît

Miniworkshop

« Self-assemblies of (poly)peptides »

Elisabeth Garanger

Laboratoire de Chimie des Polymères Organiques – Univ. Bordeaux, CNRS

Post-modifications of recombinant elastin-like polypeptides towards bioactive (nano)materials and self-assemblies

Elastin-like polypeptides (ELPs) are thermo-responsive biopolymers whose primary sequence is derived from a natural extracellular matrix protein (elastin). Genetically-engineered and produced recombinantly in heterologous hosts (typically *Escherichia coli* bacteria to ensure reasonable production yields), they are perfectly monodisperse macromolecules. Although powerful to yield ELPs with exact primary structures and lengths, protein engineering techniques present however some limitations, in particular lengthy bacterial cloning steps and limited chemical diversity due to few possible post-translational modifications in *E. coli* bacteria. My research activities are therefore dedicated to exploring a *dual biotechnological and chemical approach*, combining **recombinant biosynthesis of ELPs** with **orthogonal chemical bioconjugation methods** to enlarge the diversity of relevant ELP-based macromolecules and self-assemblies thereof for **biomimetic**, **biological** and/or **biomedical applications**.

Franck Artzner

IPR, Université Rennes

Self-assembly of peptides and proteins seen by x-ray scattering

The fine resolution of self-assemblies is a complex experimental exercise, because these objects rarely form single crystals. Two complementary strategies are employed at present: electron microscopy, the resolution of which has progressed rapidly in recent years, and X-ray scattering. This technique provides access to spatial frequencies, symmetry elements and object dimensionality. The next step, which consists in positioning molecules, peptides and proteins on the basis of these indices, in order to propose a realistic model of peptide nanotubes [Valery, Nature Com. 2015, 6, 7771], is sometimes a tricky one [Valery, PNAS 2003 100, 10258;vs. Pierri, PNAS 2022 119, e2120346119]. Laboratory and synchrotron-based X-ray scattering is a very powerful tool, but data analysis varies widely from one system to another, as in the case of synthetic protein nanotubes [Moreaud, PNAS 2023], or magnetic polymer nanotubes [Houard, Materials Horizons 2023,10, 547-555].

Les personnes souhaitant rencontrer les orateurs sont priées de prendre contact avec Fouzia Boulmédais.