Contribution ID: **35** Type: **Invited speakers**

Structural evolution of temperature-responsive polysaccharide-block-polypeptide copolymers

Tuesday, 27 September 2022 11:40 (25 minutes)

Linking polysaccharides and polypeptides together leads to fully biocompatible copolymers with unique properties for healthcare applications: not only they are fully biodegradable, but also they offer specific recognition and docking properties to membrane receptors of biological cells. Moreover, the two blocks can respond to external stimuli, such as pH, temperature, or the presence of specific molecules. Although they are both hydrophilic, the solubility in water of the polypeptide block can differ from that of the carbohydrate part, leading to compartmentalized supramolecular aggregates such as core-corona spherical or cylindrical micelles, or vesicles.[1,2] Accordingly, they are ideal candidates as novel nano-carriers for drug delivery. This work reports a structural study performed by SANS in fall 2018 at the ILL on the D11 spectrometer, where we deciphered the phase behavior (in temperature and concentration) of diblock copolymers made of a thermosensitive elastin-like polypeptide (ELP) block,[3] tethered to various hydrophilic carbohydrate blocks: PEG, dextran, hyaluronan, and a short oligosaccharide (laminarihexose).[4]

[1] A. Carlsen, S. Lecommandoux, Curr. Opin. Colloid Interface Sci. 2009, 14 (5), 329–339.
[2] C. Bonduelle, S. Lecommandoux, Biomacromolecules 2013, 14 (9), 2973–2983.
[3] E. Garanger, S. R. MacEwan, O. Sandre, A. Brûlet, L. Bataille, A. Chilkoti, S. Lecommandoux, Macromolecules 2015, 48 (18), 6617–6627. [https://hal.archives-ouvertes.fr/hal-01370027]
[4] Y. Xiao, Z. S. Chinoy, G. Pécastaings, K. Bathany Katell, E. Garanger, S. Lecommandoux, Biomacromolecules, 2020, 21(1), 114–125. [https://hal.archives-ouvertes.fr/hal-02299856]

Primary authors: XIAO, Ye (Univ Bordeaux / CNRS / Bordeaux INP); CHIAPPISI, Leonardo; GARANGER, Elisabeth (Univ Bordeaux / CNRS / Bordeaux INP); SANDRE, Olivier (CNRS / Université de Bordeaux / Bordeaux INP); Prof. LECOMMANDOUX, Sébastien (Univ Bordeaux / CNRS / Bordeaux INP)

Presenter: SANDRE, Olivier (CNRS / Université de Bordeaux / Bordeaux INP)

Session Classification: Talks