Postdoctoral position starting from June-July 2020

MINES ParisTech, Centre de Mise en Forme des Matériaux (CEMEF)
Sophia Antipolis, France

Oligosaccharidic (multi)block copolymers with tunable composition and properties (OLIBLOCK)

financed by the French National Agency for Research (ANR)

The main objective of the OLIBLOCK project is to widen the possibilities of creating new chemical structures from oligosaccharide blocks. Polysaccharides are abundant, natural, inexpensive, renewable, stable and modifiable hydrophilic biopolymers. They have attractive biological and chemical properties such as non-toxicity, biocompatibility, biodegradability, polyfunctionality, high chemical reactivity, chirality, chelation and adsorption capacities. However, natural polysaccharides often exhibit solubility, processability, and feasibility issues to variable extends depending on the type of polysaccharide, causing difficulties in employing them in a wide variety of applications. In this project, we will prepare and study the properties of a new class of multiblock copolymers based exclusively on the assembly of newly synthesized oligosaccharides carrying different functionalities and thus varying properties.

The OLIBLOCK project is conducted via collaboration between 3 partners: (1) Laboratoire de Glycochimie, des Antimicrobiens et des Agroressources (LG2A) in Amiens, (2) Laboratoire Ingénierie des Matériaux Polymères (IMP) in Lyon and (3) Centre de Mise en Forme des Matériaux (CEMEF) in Sophia Antipolis. CEMEF has extensive expertise in studying the physico-chemical, mechanical and processing properties of polysaccharide-based polymers and solutions.

At CEMEF, the successful candidate will be in charge of correlating the structure of multiblock copolymers (prepared by the partners LG2A and IMP) with their physical and physico-chemical properties in solution and in bulk as well as their mechanical and processing properties. In addition, for the most promising polymers relevant applications will be investigated based on the polymers' peculiar properties. Examples of such applications include nanoparticles for encapsulation and release of drugs, bio-inks for 3D printing, stabilizers for cosmetics or stabilizers/dispersants of renewable colloids such as nanocellulose, chitin or starch nanoparticles.

Keywords: Polymers, physico-chemical properties, mechanical and processing properties, nanoparticles, encapsulation and release, 3D printing, stabilization of colloids
Skills: Materials science, physical chemistry of polymers, colloid science, fluent in English
Duration: 1 year, starting from June-July 2020
Location: CEMEF (Sophia Antipolis, South of France)
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Please send your detailed CV and at least two e-mail addresses of reference persons.