



PhD thesis offer in Rennes

Boronic acids /glycolipids association for the formation of organogels

PhD funding from the French Ministère de l'Enseignement Supérieur et de la Recherche (*MESR*) (net salary ~1400€).

Beginning: October 2018.

Duration: 36 months.

Location: Team: Organic Chemistry and Interfaces, Institut des Sciences Chimiques de Rennes UMR6226, Université Rennes 1, France.

Description:

The thesis project is located at the interface between organic synthesis and physicochemistry of soft matter and aims at the formation of gels resulting from a combination of boronic acids / glycolipids. The scientific community distinguishes two types of gels, chemical gels formed from polymers and physical gels whose cross-linking nodes are non-covalently formed. If the former have the advantage of stability, the latter are generally sensitive to a stimulus (temperature, pH, light, ...). Boronic acids are known in particular to form cyclic esters in the presence of cis diols functions of sugars or nucleosides under physiological conditions. The combination of these two partners then leads to a new structure that has original properties that can be modulated according to the substituents present on the two monomers. The objectives of the project will be to design, synthesize and analyze these new molecules able to self-assemble in a solvent to create a gel (organogel or hydrogel), the formation of fibrils by self-assembly leading to a decrease in the mobility of the solvent until the formation of the gel. The variations on both the boronic acid and on the sugar part must make it possible to elucidate / adapt the structural parameters necessary for the formation of gels according to the envisaged solvent. Once this step is completed, we will introduce structural elements of interest such as polyaromatic cycles or helicenes which should give the gel interesting chiroptic properties. The goal of this project is to set up a simple and efficient technology to access such gels and to characterize their rheological and optical properties. These new objects can be used as biostimulable materials (recognition of molecules of interest) or for the vectorization of bioactive species. The doctoral student will be in charge of the aspects of organic synthesis, formulation and physicochemical characterization (SEM, TEM, SAXS), leading to a formation by the relevant research at the interfaces of these disciplines.

Skills required:

The subject addresses a strongly motivated student for a multidisciplinary project allying synthesis and physico-chemical characterizations. The candidate should be a skilled organic synthetic chemist. He (she) must be self-motivated, hard-working and have good communication abilities.

How to apply: please send e-mail with your CV, motivation letter and academic transcripts, and provide two contacts (e-mail, phone) for information to: Fabienne Berrée (MCF) (fabienne.berree@univ-rennes1.fr), Loïc Lemiègre (MCF) (loic.lemiegre@enscr-rennes.fr).