LCPO
Laboratoire de Chimie des Polymères Organiques

université de BORDEAUX

Postdoctoral Researcher Position – LCPO
FRANCE

Synthesis of Polymers for Liquid Crystal Nanoparticles

Duration: 1 year, starting March 2025

Position

Liquid crystalline nanoparticles (LCNs) are nano-objects with non-lamellar internal organisation such as inverse bicontinuous cubic and hexagonal structures (cubosomes and hexosomes). Their curved bilayers arrange in highly organized thermodynamically stable structures in which hydrophobic regions and aqueous channels coexist and can encapsulate and protect both hydrophobic and hydrophilic species. They exhibit an extensive hydrophobic volume and large bilayer-water interfacial area. While lipid cubosomes have been known since the 1990s, the accessible range of structural parameters such as internal water channel diameter is quite limited. This project aims to address this through the preparation of hybrid LCNs incorporating both lipid and polymeric components.
Amphiphilic copolymers containing monomers that are designed to be incorporated into the lipid bilayer will be synthesized using RAFT polymerization in a flow reactor. The use of flow chemistry will permit rapid optimization of reaction conditions and the generation of libraries of polymer samples, while reducing batch-to-batch variation. The resulting copolymers will be evaluated for their capacity to stabilize and modulate the structure of LCNs without disrupting their long-range order and periodicity.

The principal activity will be to develop protocols for the synthesis and characterization of copolymers by radical polymerization in a flow reactor. A secondary aspect of the project involves the self-assembly of the polymers into liquid crystal nanoparticles and characterization of the resulting particles. The recruited candidate will present their results at scientific meetings and will write reports and articles.

The candidate will be located within the *Laboratoire de Chimie des Polymères Organiques* (LCPO), one of the top-tier centers of polymer science in France, located on the campus of the University of Bordeaux. The research activities of the laboratory span the whole range of modern polymer science. It offers a stimulating workplace for anyone who wants to gain a top-level training in polymer chemistry.

Candidate's profile

The ideal candidate will hold a PhD degree, preferably with expertise in Polymer Synthesis. The recruited candidate will have skills in polymer synthesis (controlled radical polymerization) and characterization (NMR, SEC, HPLC, absorption/emission spectroscopies, etc.). Experience in flow chemistry and/or programming languages such as Python, R or Labview would be an advantage.

Application

Candidates are invited to apply by clicking here
Contact: simon.harrisson@enscbp.fr

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