

Laboratoire Colloïdes et Matériaux Divisés

Postdoc :

Making magnetic microbeads with microfluidics

Context : The Laboratory Colloïdes et Matériaux Divisés (LCMD) belongs to the institute Chimie Biologie et Innovation (CBI) from ESPCI Paris. It invents and innovates at the intersections of disciplines between chemistry, physics and biology. It creates novel approaches and new materials for biology, revisits and upgrades old processes of material manufacturing and is fascinated as much by the research and development that emanate from its spin off.

Project : Magnetic microbeads having a functionalised surface find applications in biotechnology, such as DNA sequencing, biomarker detection in biological medium or separation of cells, pathogenic microorganisms, proteins, ... The possibility to create calibrated object with the desired magnetic content and surface properties would increase the efficiency and reproducibility of such microbeads.

At LCMD, we are working on the use of microfluidics for creating novel particles for bioassays from emulsion template. Indeed, microfluidic technology shows unprecedented performances for fabricating highly homogeneous emulsion droplet size along with controlled physicochemical features. In addition, using emulsion template allows to encapsulate various components during the emulsification step and thus to easily make composite materials. At a first stage, we were focusing on the development of magnetic and functionalised emulsion droplets that can be used for biomarkers detection based on magnetic agglutination.

Today, we wish to extend the process for making solid particles. This objective relies on the capability to make magnetic particles synthesis on the micrometer range compatible with emulsification in microsystems. This implies to ensure the stability of the magnetic nanoparticles dispersed in a polymer solution as well as a control over time of the solid-liquid surface properties of microfluidic chips. The project is a collaboration between LCMD and a major international Life Science company.

Candidate : We are therefore seeking a highly motivated post-doc to validate the use of microfluidics for creating calibrated magnetic microbeads in a large amount. The candidate should possess a PhD, or should have a strong background, in material science, especially involving polymers and emulsions, and be interested to learn to use microfluidics systems and adapt formulation to the project needs.

Flexibility, autonomy, the ability to work in a highly multidisciplinary team and good interpersonal skills are essential. The candidate should be fluent in English.

The duration of the project is 12 months.

Contact : A motivation letter and a CV should be sent to Nicolas Bremond (nicolas.bremond@espci.fr).