PhD- experimental investigation of self-assembly and phase transitions in lipids/nucleic acids mixtures (F/H)

POSTE À POURVOIR le 01/09/2021  LOCALISATION DU POSTE 6 RUE JEAN CALVIN 75005 PARIS
ÉTABLISSEMENT ESPCI Paris - PSL

ENVIRONNEMENT ET CONTEXTE DE TRAVAIL

L'École Supérieure de Physique et de Chimie Industrielles de la Ville de Paris - PSL (ESPCI Paris - PSL) est à la fois une Grande École d’ingénieurs et un institut de recherche (17 laboratoires) de réputation internationale jouissant d’une forte culture d’excellence scientifique (6 Prix Nobel). L’enseignement et la recherche se situent à la croisée du savoir et du savoir-faire en physique, chimie et biologie.

Notre établissement fait partie de l'Université PSL. Située au cœur de Paris, celle-ci fait dialoguer tous les domaines du savoir, de l’innovation et de la création. Classée parmi les 50 premières universités mondiales, elle forme au plus près de la recherche des chercheurs, artistes, ingénieurs, entrepreneurs ou dirigeants conscients de leur responsabilité sociale, individuelle et collective.

STRUCTURE D’ACCUEIL

About ESPCI Paris - PSL :
ESPCI ([https://www.espci.fr/en/](https://www.espci.fr/en/)) is a leading French “Grande Ecole” founded in 1882, educating undergraduate and graduate students through a programme merging basic science and engineering, as well as a world-renowned research institution. ESPCI Paris hosts 11 research units, all associated to CNRS and/or INSERM and/or other Parisian Universities in the form of joined research units, covering the fields of physics, chemistry and biology. ESPCI Paris has setup a tradition of excellence in research, with distinguished scientists who have contributed to its history. Five Nobel Prize awardees are a testimony of the culture of excellence in the Institute. Favoring interdisciplinary and operating at the frontiers between fundamental research and innovation, are two major objectives of the School.
ESPCI is also a member of “Paris Science et Lettres” Research University ([https://www.univ-psl.fr/en](https://www.univ-psl.fr/en)), an ambitious collaboration project between 26 research institutions in a broad range of disciplines from engineering, chemistry and oncology to economics, management, humanities and performing arts.

About the laboratory/Research Unit :
The position will be based in the Laboratoire de Biochimie (LBC) which is part of the UMR8231 Chimie, Biologie, Innovation at ESPCI Paris/CNRS. Research at LBC is focused on droplet-based microfluidics for applications in biology and in fundamental investigations in origin of life.
MISSION DE RECHERCHE

LABORATOIRE DE BIOCHIMIE (LBC) WHICH IS PART OF THE UMR8231 CHIMIE, BIOLOGIE, INNOVATION AT ESPCI PARIS/CNRS

The PhD position is funded by the Ecole doctorale 388 - Chimie Physique et Chimie Analytique de Paris-Centre. The aim of this research consists in studying the formation of ordered phases typical of liquid crystals in mixtures of lipids and nucleic acids monomers and oligomers (DNA and RNA) to investigate the emergence of effective proto-cellular structures and nucleic acids non-enzymatic polymerization. This project foresees the realization of a microfluidic open reactor where mixtures of monomeric building blocks are submitted to hydration-dehydration cycles, where polymerization takes place in the dry phase by condensation and compartmentalization takes place in the wet phase by vesicles formation. The final goal is to probe the evolution of the starting RNA population trough cycles.

Experimental techniques :
Phases characterization by microscopy (polarized, fluorescence, confocal, FRAP, FRET), X-ray scattering, UV-Vis spectroscopy ; Products analysis : PAGE, enzymatic essay, HPLC, MALDI, LC-MS, NMR ; Lithography and soft-lithography techniques for PDMS chip realization.

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COMPÉTENCES ATTENDUES

Skills required :
Experimentalist with a strong background in organic chemistry, supramolecular chemistry, biochemistry, or soft-metter physics.

Experience in microscopy, experimental investigation of lipid/nucleic acids solutions (samples preparation and characterization) and interest in prebiotic chemistry will be a plus.

He/she will have good proficiency in oral and written English, collaborative skills and ability to communicate.

NON DISCRIMINATION, OUVERTURE ET TRANSPARENCE

Notre établissement, comme l'ensemble de l'Université PSL, s'engage à soutenir et promouvoir l’égalité, la diversité et l’inclusion au sein de ses communautés. Nous encourageons les candidatures issues de profils variés, que nous veillerons à sélectionner via un processus de recrutement ouvert et transparent.
MODALITÉS DE RECRUTEMENT

**Education level:**
Applicants must have a diploma (or obtain a diploma before their employment starts) granting access to doctoral studies (typically a MSc degree). Candidates may apply prior to obtaining their master’s degree but cannot begin before they receive it.

**Experience required:**
A practical experience in good laboratory practices and experimentation will be highly considered.

MODALITÉS DE CANDIDATURE

**Application procedure:**
Send a CV and a motivation letter to tommaso.fraccia@espci.fr to introduce yourself, describe your background and previous experiences of relevance for the position, and present your future career focus.

**Deadline for applications:** 16 May 2021

**Contacts:**
Philippe NGHE : Maître de Conférences at ESPCI ; https://blog.espci.fr/nghe/philippe.nghe@espci.psl.eu

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CONTACT

Fraccia TOMMASO
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ACCÈS


**Access:**
Métro line 7 (Place Monge/CensierDaubenton) - RER B (Luxembourg) - Bus 21, 27 & 47 - 3 Vélib’ stations

AUTRES INFORMATIONS

Recherche principal : Chimie analytique Recherche secondaire : Chimie moléculaire

Référence
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