Period: Fixed-term contract for 4 years.

Planned Starting date: January 2019

Place: Brussels, Belgium

Working Language: English

Job description

The Engineering of Molecular NanoSystems laboratory of the Université libre de Bruxelles offers a doctoral fellowship (4 years) for a highly motivated chemist to work on the synthesis and development of supramolecular receptors for nucleotides. This research should lead to a PhD-degree.

This fellowship is offered in the context of a project for excellent research funded by the European Research Council (ERC) aimed at the development of molecular transmembrane transporters for phosphorylated biomolecules.

In biology, lipid bilayer membranes function as impermeable barriers for ionic and hydrophilic species, which can only cross the membrane with the aid of dedicated membrane proteins. Synthetic organic compounds can also be used to transport ions of interest across membranes. They need to bind the ion in order to extract it from the aqueous phase into the bilayer, to then move across the membrane and to release the ion on the other side. The development of such mobile ion carriers is of interest for biochemical research and pharmaceutical or biotechnological applications.

The aim of the project is to develop synthetic anion receptors that are able to bind biologically relevant phosphorylated compounds, such as nucleotides. In the next stage of the project, the ability of these receptors to transport phosphates and nucleotides across membranes will be investigated.

The successful applicant will form a team with a post-doctoral researcher to work together on the synthesis of receptors for phosphoryl groups and nucleotides. This involves the preparation of building blocks and their subsequent assembly into receptors using a Dynamic Combinatorial Chemistry approach. The methodology for this approach will be developed. The interactions between the synthesised receptors and phosphorylated guests will be investigated using various physicochemical methods including NMR, microcalorimetry, and optical spectroscopy. The ability of these receptors to function as transporters will be investigated, using large unilamellar vesicles and model systems.
The PhD student will join the Technology and Engineering Sciences doctoral training school of the ULB. Participation in events from the national thematic doctoral school on Molecular, Supramolecular and Functional Chemistry (EDT-CHIM) and in national and international conferences will constitute part of the training program. The ULB also offers a wide variety of courses on transferable skills, specifically targeting PhD students. English and French are the languages spoken in the laboratory but all results will be disseminated in English (seminars, written reports, and articles).

Profile

- Master degree in Chemistry or Chemical Engineering
- An excellent Master thesis
- Experience in synthetic organic chemistry research
- Experience in the structural characterisation of organic compounds by NMR spectroscopy
- Familiar with the concepts of Supramolecular Chemistry
- Highly motivated
- Keen to learn
- Team worker
- Able to analyse problems and think critically
- Creativity and problem-solving skills
- Excellent communication skills in English

Experience in the following is an asset:

- Development of robust synthetic protocols for the preparation of new compounds.
- High Pressure Liquid Chromatography (HPLC)

Interested?

Applications should be sent by email to hennie.valkenier@ulb.ac.be no later than the 3rd of November 2018 and should include:

- a cover letter motivating the application
- a CV, including a list of publications and communications
- contact details of two persons can provide a reference

The selection procedure will start shortly after the 3rd of November.
The net amount of the fellowship will be ~€2000/month. Further benefits are:

- EU Citizens and citizens from countries that have a bilateral social security agreement with Belgium: social security coverage including medical insurance, unemployment benefit, retirement pension, maternity leave and child benefit.
- Non-EU Citizens from countries that have no bilateral social security agreement with Belgium: social security coverage including medical insurance, maternity leave and child benefit.
- Insurance against accidents in the workplace.
- Tax exemption.
- Low-cost private hospitalization insurance.
- On-site services at the ULB: medical centre, university hospital, sports centre, subsidized restaurants, cultural centre, crèche, activities for children...
- No full fees for the PhD training program, only €32/year registration fees.