

JOB POSTING

Recruiting organisation:

INNOVERDA, France

Subproject title:

Sustainable oxidation processes for
pharmaceuticals via flow electrosynthesis

Starting date:

1st September 2023 (or earlier if preferred)

Salary:

The Doctoral Network "MiEI" is financed by the European Union under the framework of the program HORIZON Europe, Marie Skłodowska-Curie Actions. The doctoral candidate will be hired for 36 months under contract by INNOVERDA with a monthly gross salary of approx. 3600 € (including mobility allowance, but excluding other allowances that depend on eligibility, e.g. family allowance, special needs allowance).

Background information:

Marie Skłodowska-Curie Doctoral Networks are joint research and training projects funded by the European Union. Funding is provided for doctoral candidates from both inside and outside Europe to carry out individual project work in a European country other than their own. The training network "MiEI" is made up of 10 partners, coordinated by Fraunhofer ICT in Germany. The network will recruit a total of 12 doctoral candidates for project work lasting for 36 months.

New industrial production strategies like "production on demand" and "Industry 4.0" are increasing the demand for new digital concepts for the chemical industry that are easily scalable and can work like a construction kit. In addition, the reduction of fossil fuel consumption requires novel synthesis concepts with on-demand capabilities paired with the use of electrical

energy as a primary source for chemical processes.

MiEI will address this demand from the chemical industry, combining the advantages of electrochemistry, micro process engineering and flow chemistry. The recruited researchers will explore new models for electrodes and electrochemical flow cells, and develop innovative integrated prototype cells using printed circuit board (PCB) technology as a mass-scalable and flexible tool. These cutting-edge technologies will be applied to promising fine chemical and pharmaceutical synthetic routes, which will be further accompanied by techno-economic evaluation defining new business opportunities. The new MiEI technologies and processes will allow safe, flexible and sustainable synthetic routes for the chemical industry of the future.

Job description:

The advertised subproject is fully funded by the Marie Skłodowska-Curie European Training Network „MiEI“. It will be carried out by one doctoral candidate at INNOVEDA (PhD supervision at Université Paris-Cité) over a period of 36 months.

INNOVERDA is a French start-up focusing on the discovery and development of electrochemical flow processes for the Chemical and Pharmaceutical Industry, with the goal to substitute corrosive and toxic agents, and improve global sustainability. INNOVERDA works since its creation on research projects on electrooxidation in close collaboration with electrochemistry experts of Université Paris-Cité.

The recruited researcher will explore electrooxidation as a synthetic route for the case study of aqueous electrosynthesis. In detail, the oxidation of amine compounds will be targeted, which are important intermediates for the atom- and step-efficient production of pharmaceutical intermediates.

The researcher will be responsible for the research, development and mechanistic investigation of these novel electro-organic methods for the synthesis of new synthons. Starting with the basic electrochemical characterization of the redox system and identification of key parameters for performance she/he will transfer the methodology to continuous processing using MiEl's prototype cells and model support for process intensification. By this means, the scalability of the system toward L/h production will be evaluated, and the product scope using different precursors will be screened. The researcher will further evaluate different down-stream processing to illustrate the whole value-added chain.

Benefits:

The recruited researcher will have the opportunity to work as part of an international, interdisciplinary team of 12 doctoral candidates, based at universities and industrial firms throughout Europe. She/he will be supported by two mentors within the MiEl project, and will have multiple opportunities to participate in professional and personal development training. Through her/his work she/he will gain a unique skill-set comprising electrosynthesis, flow chemistry and process analytical technologies, as well as modern control engineering techniques. She/he is expected to finish the project with a PhD thesis and to disseminate the results through patents (if applicable), publications in peer-reviewed journals and presentations at international conferences.

The facilities are located in the south of Paris, accessible via the urban metro. Flexible working hours are possible in respect of security requirements of work in a laboratory. INNOVERDA proposes a complementary health insurance for its employees.

Requirements:

Qualifications / experience:

- In accordance with the European Union's funding rules for doctoral networks, applicants must NOT yet have a PhD
- Excellent Masters degree in organic chemistry or chemical engineering with a focus on electrochemistry
- Strong interest in electrochemistry and experimental cross-disciplinary work at the interface of organic chemistry and process development
- Laboratory experience in the design, organic synthesis and characterization of novel molecules (NMR, UV/vis, FT-IR, HPLC, GC etc.)
- Strong interest in reaction mechanisms and mechanistic understanding
- Working knowledge in the field of electrochemistry is advantageous
- Familiarity with lab equipment, including chemical handling procedures and attention to detail as well as environmental, health and safety (EHS) requirements
- Excellent communication skills and willingness to work in collaborative projects with multiple partners in the network and in strong collaboration with the academic partner at Université Paris-Cité.
- Ability to speak effectively in front of large groups (conferences, project meetings, customers)
- Very good English language skills (French is beneficial)
- Self-motivation and the ability to achieve goals independently as well as to contribute effectively to the team

Mobility:

The applicant must not have resided or carried out her/his main activity (work, studies etc.) in France for more than 12 months in the past 3 years.



Doctoral network for microprocess
engineering for electrosynthesis

How to apply:

Please send your CV by e-mail (preferred) or by post, quoting the reference 8DC-INO.

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Application deadline: 15th March 2023