



The MiEI consortium at the kick-off meeting in Pfinztal, Germany, 24th January 2023

Partnership in MiEI

Coordinated by the Fraunhofer Institute for Chemical Technology in Germany, MiEI involves partners and associated partners from 9 different countries, who will recruit 12 doctoral candidates for the project.

-  Fraunhofer ICT – Germany
-  University of Amsterdam – The Netherlands
-  Technical University of Denmark – Denmark
-  University for Continuing Education Krems – Austria
-  UCT Prague – Czech Republic
-  University Paris Cité – France
-  Innoverda – France
-  eChemicles – Hungary
-  Janssen Pharmaceutica – Belgium
-  ZHAW – Switzerland

Associated partners in MiEI

- Karlsruhe Institute of Technology
- Johannes Kepler Universität Linz
- University of Szeged
- Golin Wissenschaftsmanagement

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Social media

-  MiEI – Doctoral network for micro-process engineering for electrosynthesis
-  project_MiEI

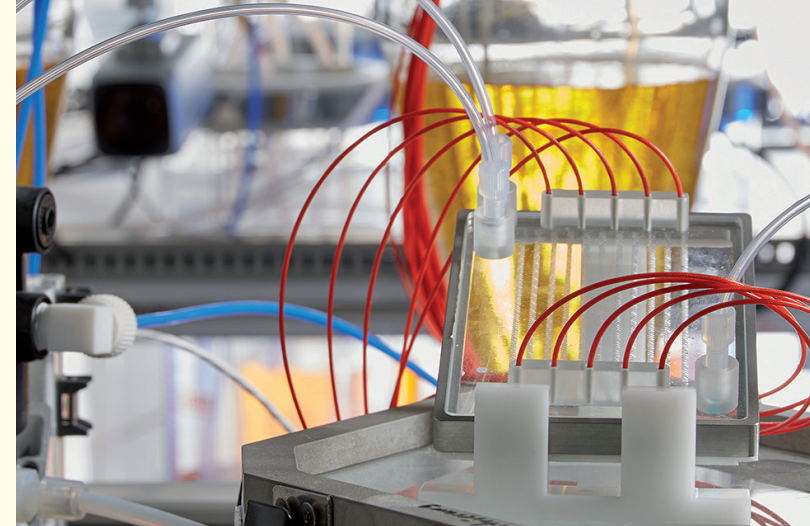
Funding

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Duration: 1.1.2023 – 31.12.2026

Interested?

Scan the QR code and find out more about new synthesis concepts for the pharmaceutical and fine chemical industry.



Doctoral network for microprocess engineering for electrosynthesis

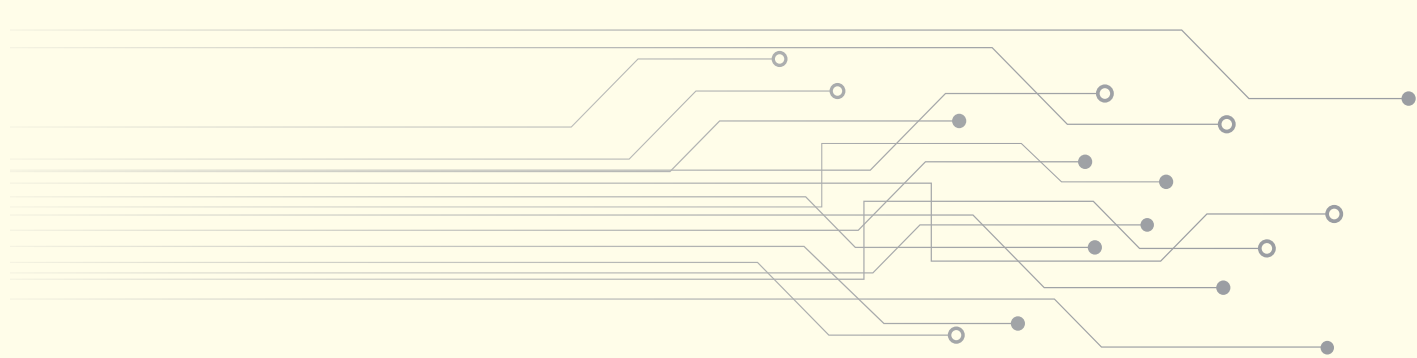
New synthesis concepts for pharmaceutical and fine chemical industry

MiEI is a research and training project funded by the European Union's Marie-Sklodowska-Curie programme.

The project aims to develop a synthesis technology for the chemical industry of the 21st century by combining the advantages of electrochemistry, micro process engineering and fluid chemistry.



Doctoral network for microprocess
engineering for electrosynthesis



Objectives

MiEI will develop scalable integrated cell concepts, allowing production on demand of fine chemicals and pharmaceuticals with increased efficiency, flexibility and lower product costs.

- Optimisation of electrochemical synthesis processes for microfluidic technology
- New models for electrodes and electrochemical flow cells
- Development of prototype cells and arrays of printed circuit boards (PCBs)
- Defining business opportunities through accompanying techno-economic evaluation

Research

In theory, electrochemical technologies offer the highest energy efficiency in production, and microfluidics offer the highest safety and best process control in chemical processes. A combination of these two technologies is the logical step towards a more reliable, flexible, safe and sustainable chemical industry.

For the development of different electrosynthetic processes, the experimental investigations will be supplemented by modelling and simulation, the design of cell concepts and prototypes, and evaluation through techno-economic analyses.

Training

MiEI aims to provide 12 PhD students with the scientific and complementary skills they will need for a career in electrochemical energy conversion. They will receive a firm grounding in the scientific skills needed for their individual project work, and a unique understanding of the interface between synthesis development, system engineering and market-relevant aspects. Training in entrepreneurship will help them to progress from theoretical to practical knowledge, and industrial secondments will allow them to experience different schools of thoughts and implement their knowledge in an industrial setting.

	Modelling and simulation		Synthetic process development		Integrated cell concepts and prototypes		Techno-economics
			Electrochemistry	Screening & optimisation	Cell concepts	Integrated sensors	
Non-aqueous electrosynthesis	Electrosynthesis of reactive intermediates						
Aqueous electrosynthesis	Electrooxidation of amines						
Two-phase electrosynthesis	Electrofluorination and -sulfonation						

Modular chemistry

Green chemistry

Safe chemistry

Complementary expertise of the project consortium.