

PROLIPEM

SPIN-OFF FELLOWSHIP, 2. AUSSCHREIBUNG, 2. EINREICHFRIST (SEPT. 2023)

Projektkurztitel:	ProLipEM
Projektlangtitel:	Lipid-like liquid crystals as proton conducting materials for fuel cells
Antragstellende Organisation:	Universität Graz
Fellows:	Dr. James Jennings DI Kurt Mayer, BSc.
Host:	Assoz. Prof. Dipl.-Ing. Dr.techn. Georg Pabst
Projektstandort:	Graz
Laufzeit:	01.03.2024 – 31.08.2025

PROJEKTZIEL:

Fuel cell technology is one of the most promising solutions to the energy crisis, offering a sustainable source of energy without the production of greenhouse gases. The proton-conducting membranes used within fuel cells are key to their operation: although only a thin piece of material, they are crucial to power generation and the operational lifetime of a fuel cell. However, current membrane technology is based on perfluorinated polymers (PFAS), which are highly damaging for the environment at every stage of their life cycle, from production to disposal. With the burgeoning regulations on PFAS materials within the EU and worldwide, the search has begun for materials that can replace them in the long term.

Our team at the University of Graz has developed new membrane technology based on bio-inspired molecular structures (ProLipEMs). In addition to having a lower environmental impact throughout their life cycle, some of the chemical building blocks of ProLipEMs can be sourced from renewable resources. Our new membrane solutions would therefore allow direct replacement of polluting PFAS-based membranes, and also potentially increase the operational range of fuel cells to a broader range of temperatures and humidities. These developments could accelerate fuel cell adoption within large-scale commercial transportation and stationary applications. Through this spin-off project we aim to optimize the new materials for use within fuel cells by elucidating their conductivity, stability and lifetime within fuel cell devices, whilst also scaling up the fabrication processes.

INFOBLATT

During this project, a market-ready prototype membrane will be developed for testing within fuel cells. The value proposition of the materials will be validated through laboratory and market research, by communicating with stakeholders who rely on current membrane technology. These new membrane materials will then form the basis of the spin-off company to be founded.

VISION SPIN-OFF:

- Found a successful startup that will manufacture fuel cell membranes to supply the global market (B2B).
- Develop partnerships with the growing renewable energy sector local to Graz, to strengthen Austria's position in sustainable technologies.
- Explore other renewable energy markets where ion-conducting membranes are used, including electrolysers and redox flow batteries.

Weitere [Information zum Spin-off Fellowship](#) finden Sie auf der FFG-Homepage.