Job Title: PhD Position 2024-2027 - Electroenzymatic Biosensor for H2 Detection
Location: Marseille, France
Institution: Bioenergetics and Protein Engineering (BIP), CNRS, Aix-Marseille Univ.
Laboratory Website: Bioenergetics and Protein Engineering - BIP08

Position Overview:

Join our dedicated team at the CNRS and Aix-Marseille University to undertake groundbreaking research on hydrogen detection technologies, crucial for sustainable energy solutions. This PhD position offers the opportunity to design and develop a state-of-the-art electroenzymatic biosensor for hydrogen (H2) detection, addressing the urgent need for safe hydrogen storage and utilization.

Research Context:

With the pressing challenge of climate change, the development of CO2-neutral energy sources is vital. Hydrogen is a promising sustainable energy carrier, but its properties require advanced detection systems for safe storage and handling. Our research focuses on the use of Ni-Fe hydrogenase from *Aquifex aeolicus* for the development of sensitive, miniaturized biosensors capable of detecting hydrogen in various environmental conditions.

Research Goals:

- Optimize enzyme immobilization for enhanced H2 oxidation catalysis.
- Develop methodologies to overcome hydrogen mass transport limitations.
- Employ in situ and operando techniques to map enzyme activity.
- Improve bioelectrode stability under various conditions.
- Explore the effects of biosensor geometry and miniaturization on sensor performance.
- Enhance fundamental understanding of enzymatic behavior in confined spaces and integrate findings with enzymatic fuel cell technologies.

Candidate Profile:

- Master's degree in Chemistry, with a strong focus on Analytical Chemistry.
- Keen interest in Electrochemistry and 3D Printing.
- Enthusiasm for multidisciplinary research.

Funding:

This position is co-funded by Aix Marseille University and the Agence-Innovation-Défense (AID).

Application Process:

Please submit your CV, a motivation letter, copies of academic transcripts and degrees, and two recommendation letters to Dr. Elisabeth Lojou at lojou@imm.cnrs.fr.

Application Deadline: 31st December 2024