

ImplantSens is a Marie Skłodowska Curie European Training Network running from 2019 to 2023 focussed on the development of implantable biosensors with long term stability. ImplantSens will develop long-term stable implantable electrochemical biosensors by overcoming mass-transport limited sensing schemes. This is the major unsolved problem due to the formation of capsules by the foreign body response upon implantation of a sensor. ImplantSens will not only contribute to the painless long-term monitoring of glucose levels for diabetic patients but also to the development of future implantable sensors for the management of other chronic diseases. 11 Early Stage Researchers will be engaged in all tasks of this scientific chain, thus being trained in the fundamentals of bioelectrochemistry, enzyme engineering, electrode design as well as biocompatibility. Training of the fellows will be performed via an innovative program based on a blended learning concept and will take place at the host institutions, via secondments, workshops, schools and e-learning elements. The scientific training will be completed by training of complementary skill with respect to management, fund raising, IPR and scientific communication. The consortium consists of 7 leading scientists in Europe with the necessary expertise to target this ambitious goal supported by 4 SMEs.

An Early Stage Researcher position is available at the Bernal Institute at the University of Limerick, focused on the project "Preparation and characterization of mesoporous electrodes". The University of Limerick (UL) has over 14,000 students and 1,400 staff. The Bernal Institute at the University was established in 2016 with a capital investment of >€100 M and is comprised of 20,000 m² of contiguous, modern purpose-built offices and laboratories. The Institute houses a multidisciplinary team of over 350 scientists (chemistry, materials science, physics and biochemistry) and engineers (mechanical, aeronautical, biomedical, manufacturing and electronic) who undertake research in the design, synthesis, processing, characterization, modification, modeling and application of materials.

The position will be in the group of Prof. Edmond Magner and Dr. Uszula Salaj-Kosla (currently 4 PhD students and 2 visiting researchers). The group has all of the equipment necessary for the preparation, characterisation and utilisation of a wide range of support materials for the immobilisation of enzymes. In addition to the collaborative network in IMPLANTSENS, the group has extensive international collaborative linkages and typically host an average of 2-3 international researchers each year. The fellow will enrol in the structured PhD programme of the University and, as appropriate, take advanced technical modules together with a series of modules on transferable skills. In the project, the fellow will prepare a library of mesoporous gold electrodes with different properties (film thickness, pore size and pore shape) using magnetron sputtering and electrochemical deposition methods. The properties of the electrodes will be tailored to enable controlled immobilization of enzymes for direct electron transfer between enzymes and electrodes. He/she will characterize the performance of enzymatic sensors in sample matrices under varying conditions and integrate the sensors into an implantable system. As part of the project, a series of three research secondments are planned:

- Ruhr-University Bochum - Design of redox polymers and development of enzyme switching protocols
- CSIC - Institute of Catalysis Madrid - Covalent immobilization of redox enzymes to electrodes.
- Aptusens Malmoe - Biomedical evaluation of biosensors operating ex vivo under homeostatic conditions.

The position is fully funded for three years with a salary of €39,000 per annum.

Recent publications on this topic are listed below:

1. Xiao, X., Conghail, P.O, Lech, D., Magner, E. *ChemElectroChem*, 2019, 6., 1344-1349.
2. Lopez, F., Siepenkoetter, T., Xiao, X., Magner, E., Schuhmann, W., Salaj-Kosla, U. *J. Electroanal. Chem.* 2018, 812, 194-198.
3. Xiao, X., Siepenkoetter, T., Whelan, R., Salaj-Kosla, U., Magner E., *J. Electroanal. Chem.* 2018, 812, 180-185.
4. Xiao, X., Siepenkoetter, T., Conghaile, P.O., Leech, D., Magner, E. *ACS App. Mat. Int.* 2018, 10, 7107-7116.
5. Xiao, X., O'Conghail, P., Leech, D., Ludwig, R., Magner, E. *Biosens. Bioelect.*, 2017, 98, 421-427.
6. Siepenkoetter, T., Salaj-Kosla, U., Xiao, X., Magner, E. *ChemelectroChem*, 2017, 4, 905-912.
7. Siepenkoeter, T., Xiao, X., Salaj-Kosla, U., Pita, M., Ludwig, R., Magner, E. *ChemplusChem*, 2017, 82, 553-560.

Informal enquiries can be addressed to edmond.magner@ul.ie. Applications should be sent to ces@rub.de as a pdf document consisting of a curriculum vitae, the contact details of two referees who have knowledge of the academic work and capabilities of the candidate together with a letter of application outlining the candidate's interest in the position. Applicants should possess or be about to possess a good honours degree (upper second class degree or equivalent grade) in chemistry, biochemistry, chemical engineering or a related discipline.



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