Microbial Induced Electrochemistry at the Local Site and Single Cell Level

Supervisory Team

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Microbial Induced Corrosion (MIC) is a serious economic problem with an estimate worldwide cost of $113 Bn every year. MIC impacts a very wide range of industries, from power plants to construction, and even the health of humans with implants or protheses. While modern research has realised and demonstrated the relevance of microbial corrosion, the processes involved are still poorly understood, and mitigating strategies are still inadequate.

This is not surprising given the variety of electrochemical processes at work in biofilms.

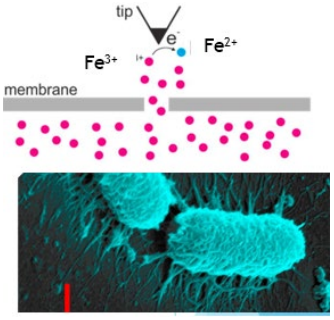

fig 1. Combining advanced fabrication and probing techniques to track electrochemistry at the local level.

This PhD project brings together expertise in nanoscale surface science and local scale electrochemistry, cell-surface interaction probes, microbiology and imaging across physical and biological sciences to study the electrochemical process that occurs both at the local site and single cell level and at the population level.

The appointed student will gain multidisciplinary skills and expertise in advanced characterisation techniques, including surface spectroscopy, scanning probe microscopy, local electrochemistry and bio-imaging approach, leveraging the unique capabilities at our Open Innovation Hub for Antimicrobial Surfaces, Surface Science Research Centre and the Centre of Cell Imaging, both equipped with state-of-the-art techniques.

With this project, we aim for a better understanding of the fundamental phenomena of MIC, delivering novel mitigating strategies that will lead to next-generation surface design principles.

The appointed student will enrol in the NBIC's Doctoral Training Centre, to be trained as an interdisciplinary scientist at the interface between Physical and Life Sciences. Three external placements will be offered during the PhD, to develop technical skills, knowledge exchange know-how, and awareness of business practice in the innovation sector.

Applications are encouraged from highly motivated candidates who have, or expect to have, at least a 2:1 degree or equivalent in Chemistry, Physics, Biophysics, Materials Science, Microbiology or Engineering. Applications should be made as soon as possible but no later than **30th April 2024** Candidates will be evaluated as applications are received, and the position may be filled before the deadline if a suitable candidate is identified. The project start date is 01/10/2024

Informal enquiries are also encouraged and should be addressed to Lucy Jones (Lucy.Jones2@liverpool.ac.uk)

Some teaching duties may be required, and these will be paid on top of the regular stipend

The award will pay full tuition fees and a maintenance grant for 3.5 years and it is anticipated that the successful candidate will start in October 2024. Applications from candidates meeting the eligibility requirements of the EPSRC are welcome – please refer to the EPSRC website