



Expressions of Interest for a PhD Opportunity in Antibacterial Nanostructured Polymers (in the context of an application to the 2016 IRC Enterprise Partnership Scheme)

Academic Supervisor – Dr Susan Kelleher, Dublin City University

Enterprise Partner – Irish plastics manufacturer (already identified)

Deadline for expressions of interest – Wednesday 4th May 2016

IRC application deadline – Friday 10th June 2016

Outcome of competition – September 2016

Project start date – 1st January 2017

Aim

This project aims to address the issue of bacterial growth on plastics used in the food and medical industries. In particular, the focus will be on nanopatterns which can kill bacteria using purely physical means. To date, nanopatterned materials, such as black silicon, titanium nanopillars, and cicada wings, have shown to be bactericidal based on physical stretching of the bacterial cell membrane. The degree of bactericidal activity varies depending on the shape and spacing of the nanostructures, as well as the type of bacteria. This project aims to investigate the ability of nanopatterns to be incorporated into the materials used in the packaging industry, and demonstrate their ability to cause an antibacterial response against the most relevant bacteria.

Skills involved

This project is highly multidisciplinary and will give the candidate the opportunity to learn skills in the areas of nanofabrication, polymer chemistry and antibacterial cell testing, including polymer directed self-assembly, photopolymerisation techniques, and materials engineering. The analysis and characterisation work will involve the use of atomic force microscopy, scanning electron microscopy, and fluorescent imaging. The work will be highly collaborative with potential to engage with Tyndall National Institute, AMBER, UCD, and the Technical University Dresden. In addition, the candidate will be expected to liaise and engage in discussions with the Enterprise Partner on a regular basis, as well as participate in conferences and writing of publications.

Requirements

The successful candidate will be a highly motivated quick learner, who has the ability to work alone, as well as part of a team. They should have a 2.1 or 1.1 undergraduate honours degree in chemistry, biomedical engineering, or a related subject, and must be prepared to register as a full-time PhD student at DCU for 4 years. Candidates with similar grades from a related Master's degree are also very welcome to apply. A broad knowledge of engineering and microbiology, as well as an interest in industrial applications, would be an advantage.

To register your interest

This PhD opportunity is dependent on a successful funding application to the competitive Irish Research Council Enterprise Partnership Scheme. Therefore, the selected candidate will prepare an application for this scheme alongside Dr Kelleher and the Enterprise Partner. This is a unique opportunity to play a role in defining the PhD project and work alongside an industry mentor. For more information on the scheme please visit: <http://www.research.ie/scheme/enterprise-partnership-scheme>. Expressions of interest should take the form of a CV (including a breakdown of undergraduate courses taken and the results obtained), a cover letter, and the names and contact details of two academic references. **Documentation (or informal queries) should be emailed to susan.kelleher@dcu.ie by the 4th May 2016.** The successful candidate will work to prepare the formal application by the 10th of June 2016.