

Use of new fluorophores to study bacterial infection and heme acquisition in deep tissue.

The Section of Microbiology on the South Kensington Campus of Imperial College London is seeking applications for a PhD studentship for October 2012 entry under the supervision of Dr Andrew T. Ulijasz.

The Section of Microbiology is internationally recognized as a centre of excellence in research in the broad areas of microbial pathogenesis and microbial adaptation to the host. The Section is part of the Centre for Molecular Microbiology and Infection (CMMI) located within the Flowers Building on the South Kensington campus, which also houses groups from the Faculty of Natural Sciences working in related areas. In addition to the scientific training on offer, Imperial offers a variety of different courses for PhD students in a range of transferable skills. This, along with the wealth of scientific excellence elsewhere on campus, provides an almost unparalleled learning environment for PhD studies.

Project Overview

To date, real time observation of bacterial infection within an animal host has been difficult due to various technological impasses. To address this problem our lab is using new fluorescence technology we have helped develop which relies on a heme-based chromophore to enable their unique infrared fluorescent properties. These fluorophores will be introduced into various pathogenic bacteria, which may then be monitored within whole animal deep tissue without the use of surgical intervention or substrate injection. The project's first objective will focus on genetic engineering pathogenic microbes (*e.g. Staphylococcus aureus* and *Pseudomonas aeruginosa*) to harbour these fluorophores, and then monitoring their disease progression in a murine model with real time fluorescent whole mount imaging. As a second objective, we will take advantage of the fluorophore's heme-baring properties to initiate screens for novel components of heme acquisition, a crucial source of iron for most microbial pathogens. Overall, this project involves the development and practical usage of novel, cutting-edge technology to elucidate new pathways in bacterial pathogenesis.

Objective I: To develop strains of pathogenic bacteria harbouring novel infrared fluorophores, and use these strains to monitor real time, non-invasive disease progression in a murine model with whole mount imaging.

Objective II: To develop mutagenic libraries of these fluorescent strains and screen for novel pathways involved in heme acquisition.

This 3-year studentship is open to EU/EEA citizens. It is fully funded and includes a stipend of around £17,500 per annum and home/EU tuition fees. Only applicants selected for interview will be contacted.

Applicants must have, or expect to obtain, at least an upper second-class degree in an appropriate subject *e.g.* biology, biochemistry, genetics, microbiology or molecular biology.

To apply, please send a full CV (including the names and email addresses of at least two academic referees), and personal statement outlining how this programme of research and training will benefit from your past experience, and impact your career aspirations, to Dr Andrew Ulijasz (a.ulijasz@imperial.ac.uk) by 29 February 2012.