OXFORD INTERDISCIPLINARY BIOSCIENCE
Doctoral Training Partnership

Industrial CASE Studentship Advertisement – 2023-24

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Project Title:	Assessing risks of resistance to novel antibiotics

Brief description of project:

Antibiotic resistance will be one of the greatest challenges that humanity will face in the 21st century. Resistant infections currently cause >1 million deaths per year, and may become the leading cause of mortality by the mid 21st century. In light of this challenge, there is an urgent need to develop new antibiotics.

The spread of antibiotic resistance in pathogen populations is driven by evolutionary processes. However, evolution is not considered during the development of new antibiotics. The goal of this project will be to assess the potential for a bacterial pathogen (Pseudomonas aeruginosa) to evolve resistance to new antibiotics that have been discovered by Bactobio, the commercial partner.

Specific topics of interest include: (i) How easily can Pseudomonas evolve resistance to new antibiotics? (ii) What are the fitness costs associated with resistance, and how stable is resistance in the absence of antibiotic exposure? And, (iii) What are the genomic mechanisms underpinning resistance to novel antibiotics? Addressing these questions will make it possible to assess the risks of resistance to new antibiotics, accelerating the process of antibiotic development and providing tools to prevent the emergence of resistance.

Oxford is a world-leader for evolutionary microbiology, and the newly completed Life and Mind Building will provide cutting-edge facilities and expertise for this project. The project will include a placement at Bactobio that will expose the student to gold-standard industrial practices in drug discovery and mentorship from leading experts in antibiotic discovery.

Attributes of suitable applicants:

This project is most suitable for applicants with a degree in Biology or Microbiology. Previous lab experience in microbiology is an asset, but not essential. Successful applicants will be highly motivated, eager to learn both evolutionary biology and microbiology, and enjoy working in diverse and friendly research environments.

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Funding notes:

This project is funded for four years by the Biotechnology and Biological Sciences Research Council UKRI-BBSRC. UKRI-BBSRC eligibility criteria apply (https://www.ukri.org/files/funding/ukri-training-grant-terms-and-conditions-guidance-pdf/). Successful students will receive a stipend of no less than the standard UKRI stipend rate, currently set at £18,622 per year, which will usually be supplemented by the industrial partner

This project is supported through the Oxford Interdisciplinary Bioscience Doctoral Training Partnership (DTP) studentship programme. The student recruited to this project will join a cohort of students enrolled in the DTP's interdisciplinary training programme, and will participate in the training and networking opportunities available through the DTP. For further details, please visit www.biodtp.ox.ac.uk. The DTP and its associated partner organisations aim to create a community that is innovative, inclusive and collaborative, in which everyone feels valued, respected, and supported, and we encourage applications from a diverse range of qualified Applicants. Interested students should contact the primary supervisor if they are interested in applying to this project.