PhD Scholarship: The costs and consequences of antimicrobial resistance in microbial communities

Applicants are invited for a fully funded PhD position in the group of Dr Andrew Letten at the University of Queensland to study resource competition and antimicrobial resistance evolution in microbial communities.

Background: Ecological theory provides a powerful framework for understanding the competitive balance between sensitive and resistant bacteria, and therefore the evolution of resistance (Letten et al, 2021 Nature Eco Evo). The primary goal of this ARC funded project is to go beyond the theory and test how well we can predict the evolution and persistence of resistant bacteria in microbial communities under the highly variable environmental conditions typical of most microbial systems (from soils and water to the gut). This is critical not only for our fundamental understanding of microbial competition and evolution, but also ultimately for the identification and development of new ecologically-aware strategies for managing resistance.

A wide variety of investigatory approaches fall within the scope of the project including high throughput screening and competition assays, molecular work, mathematical modelling, and computer simulations. The PhD student will have ample room to take the project in a more experimental or computational/theoretical direction depending on their interests and background. This is to say that highly motivated students that are primarily interested, or have a strong background, in either empirical or computational/theoretical research are both encouraged to apply. Similarly, the project is suitable to students coming from a microbiology or molecular background interested in ecological and evolutionary research, or those coming from an ecological or evolutionary background who are interested in bringing their knowledge to microbial systems.

A working knowledge of laboratory research, experimental evolution and/or mathematical modelling would be of benefit to someone working on this project. The applicant will demonstrate academic achievement in the field(s) of ecology, evolutionary biology, microbiology or molecular biology and the potential for scholastic success.
A background or knowledge of R or Python programming and ecological and/or evolutionary theory is highly desirable.

The student will be based in the School of Biological Sciences at The University of Queensland, Brisbane, Australia. We are a research-intensive University and our School comprises more than 100 academic and postdoctoral research staff, and ~200 higher-degree research students. The student and project will benefit from the SchoolÂ's formidable research expertise in ecology, evolutionary biology and genetics, physiology, and mathematical, statistical and computational biology.

As a scholarship recipient, you'll receive:

- Living stipend of $28,854 per annum tax free (2022 rate), indexed annually
- Tuition fees covered
- Single Overseas Student Health Cover (international applicants)

Please contact Dr Andrew Letten (a.letten@uq.edu.au) as soon as possible if you are interested (including a CV and a brief statement on your research background and interests). More information on the recruitment process here https://graduate-school.uq.edu.au/project/costs-and-consequences-antimicrobial-resistance-microbial-communities.

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