Developing the next generation of antibacterials – combating the risk of resistance

Research Project Code: BIOL2281016

Project detail:
Traditional antibiotics, which either kill or prevent the growth of bacteria, impose a selective pressure that encourages bacteria to develop resistance after their first use. Coupled with their widespread use, bacterial resistance to antibiotics is rapidly rising rendering current treatments ineffective. Consequently, research into understanding the workings of bacterial organisms is crucially important to underpin the development of new approaches to combating the infections they cause.

An attractive alternative to the conventional antibiotic approach is to target functions that are essential for the bacteria’s ability to infect the host. This novel therapeutic strategy would disarm the bacteria rather than killing them, and thus reduce the potential for the bacteria to develop resistance. A research project is available to pursue this alternative approach, thereby addressing a highly topical and strategically relevant issue. Specifically, the project will aim to understand the key molecular interactions responsible for controlling bacterial virulence and explore ways to target such fundamental processes for therapeutic benefit.

This project forms part of a larger body of research and will be undertaken in collaboration with colleagues at Imperial College London UK, The RNA Therapeutics Institute at the University of Massachusetts Medical School USA, and the Universidade Federal de Vicosa Brazil. Opportunities for placements in partner laboratories will be explored as appropriate as the work programme progresses.

Training will be provided in a range of molecular biology, biochemical, biophysical and structural techniques. Opportunities will also be available to utilise, for the first time, a recently developed and patented novel technology devised to study molecular interactions in a high throughput manner. The Callaghan group has a strong track record of high impact publications and a strong network of academic and industrial collaborations. This project is ideally suited to those wishing to pursue careers in academia, the healthcare sector or the pharmaceutical industry.

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Key Words: antibacterial, drug development, novel technology, patent, virulence, molecular interactions