Project title: **Studies on the Total Synthesis of Anthracimycin and Related Natural Products**

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**Project Description:**

Anthracimycin 1 and chlorotonil A 2 exhibit extremely potent activity as antibiotic agents, while streptosetin A 3 has anti-tumour activity. All of these natural products contain a decalin ring system, which is non-trivial to construct. This project aims to develop a general strategy for the expedient synthesis of highly functionalised decalin systems present in these (and other) natural products.

Dogma suggests that the way to construct these molecules is via an intramolecular Diels-Alder reaction; however, this necessitates the synthesis of entirely different linear precursor molecules. Our strategy will involve the development of a general diastereoselective annulation approach, which will allow the synthesis of each possible stereochemical arrangement from a single cyclohexane precursor. This will enable us to target these natural products as well as analogues for synthesis and subsequent biological evaluation.
Training:

All research students follow our innovative Doctoral Training in Chemistry (iDTC): cohort-based training to support the development of scientific, transferable and employability skills. All research students take the core training package which provides both a grounding in the skills required for their research, and transferable skills to enhance employability opportunities following graduation. Core training is progressive and takes place at appropriate points throughout a student’s higher degree programme, with the majority of training taking place in Year 1. In conjunction with the Core training, students, in consultation with their supervisor(s), select training related to the area of their research.

The Clarke group trains all members in contemporary synthetic organic chemistry techniques, including the spectroscopic identification of compounds. The student will attend weekly group meetings focusing on the development of literature awareness, presentation of results, problem solving and mechanistic skills. Guidance will also be given on project management and project specific scientific issues. As part of the Organic Chemistry section the student will be exposed to a wide range of visiting speakers through a vibrant external seminar program. The student will also be encouraged to present their work as a poster and as oral presentations at least two different national or international meetings.

Equality and Diversity:

The Department of Chemistry holds an Athena SWAN Gold Award and is committed to supporting equality and diversity for all staff and students. The Department strives to provide a working environment which allows all staff and students to contribute fully, to flourish, and to excel. Chemistry at York was the first academic department in the UK to receive the Athena SWAN Gold award, first attained in 2007 and then renewed in October 2010 and in April 2015.

Funding:

This project is available to those who are able to fund their own studies

For more information contact chemgrad@york.ac.uk or see our web page: http://www.york.ac.uk/chemistry/postgraduate/