

Project proposal template
Graduate School studentships
March 2015

Project title

Synthesis of chiral sulfur containing imidazoles and imidazol-2-ylidenes: applications as ligands and pharmaceuticals.

First Supervisor

Dr

Neil Williams

Second Supervisor

Dr Donatella Banti

School

Pharmacy and Chemistry

Other member of supervisory team
(no more than three KU supervisors in total)

Specific requirements
beyond 2:1 degree

Project summary
(max 4,000 characters)

One of the most challenging requirements of the chemical and pharmaceutical industry is the conversion of simple, readily available chemical feed-stocks into complex chiral molecules in an efficient and sustainable manner. Enantioselective catalysis offers the best opportunities for achieving this aim. We have recently synthesized the first example of an imidazol-2-ylidene ligand containing a chiral sulfur atom. This ligand class offers exciting prospects in the field of enantioselective catalysis. The project will focus on the synthesis and characterisation of a small library of related ligands. A modular design will allow easy variation of substituent groups at different points of the ligand. The electronic and steric variation will be focused on optimising catalytic processes such as the silver catalyzed A-3 reaction, in which an alkyne, an aldehyde, and an amine are coupled together. In addition, the library of chiral sulfur-containing imidazoles developed will be screened for bioactivity (anti-cancer or anti-inflammatory properties) in collaboration with colleagues elsewhere, as they would be expected to interact with cytochrome P450 systems.

