

Devising Flow Chemistry [^{18}F]-Fluorine Radiolabelling Methods for Evaluation of Bio-Distribution and Therapeutic 'Mechanism of Action' Studies - PhD Scholarship

About the Project

Positron emission tomography (PET) is a powerful molecular imaging technique that can provide detailed 3-dimensional images over time of the bio-distribution of a drug inside a whole live cell or animal. The overarching aim of the PhD project will be to devise flow chemistry protocols to access two series' of compounds possessing potent antitumor and antibiotic activity, respectively. These protocols will be subsequently adapted to provide a rapid means of producing radiolabelled analogues which will be investigated in PET studies, providing critical information pertaining to compound mechanism of action.

Once a lead compound is labelled with an appropriate PET radionuclide (i.e. Fluorine-18), competition and blocking studies with known ligands for the biological target can provide a means of identifying a mechanism of action. These studies can also provide a measure of drug affinity for the target. PET studies can also provide significant information relating to absorption, distribution, metabolism and excretion (ADME). Consequently, robust and efficient protocols to synthesise radiolabelled analogues are of high value in the sphere of drug design and discovery.

The specific project aims are to:

- Develop flow chemistry methodologies to synthesise 'cold standards' and iodonium-, diazonium-, and chloro-based radiolabelling precursors for classes of tumour suppressing and antibiotic analogues.
- Explore and develop new radiolabelling methods for polypyridine ligands including the use of unique functional groups such the sulfonyl fluoride and fluoromercurial group.
- Evaluate the chemical stability, and bio-stability of all [^{18}F] radiolabelled analogues.
- Undertake *in vivo* bio-distribution and 'mechanism of action' studies for selected classes of biologically active compounds.

Candidates will:

- Have completed a Bachelor Degree with First Class Honours or other equivalent qualifications in the field of medicinal chemistry.
- Possess a working knowledge of synthetic chemistry, chromatography, and compound characterisation including HPLC, MS, IR, and NMR (1D and 2D) c) and possess experience in the synthesis of [^{18}F] radiolabelled analogues.

The scholarship is open to domestic applicants only.

What does the Scholarship Provide?

Successful candidates will receive \$25,392 tax-free per annum for three years and a funded place in the doctoral degree.

Need more information?

Contact *Dr Christopher Gordon* to discuss the project: c.gordon2@uws.edu.au or +61 2 4620 3201. Contact the Research Scholarships Development Officer *Ms Tracy Mills* to discuss enrolment and scholarships: HDRscholarships@uws.edu.au or +61 2 4736 0966

How to apply

Submit an application form, including a 1 page research proposal and CV by the closing date, 12 November 2014. The application form can be downloaded from the web at www.uws.edu.au/research/scholarships

APPLICATIONS CLOSE 12 NOVEMBER 2014