

## 2024 Summer Research Project

<b>Project title:</b>	<b>Improving pharmacokinetic profiles of <math>^{89}\text{Zr}</math> PET ligands for personalised medicine</b>
<b>Project duration, hours of engagement &amp; delivery mode</b>	Duration of the project, 6-10 weeks during Summer Vacation.  Hours of engagement must be between 20-36hrs per week  COVID-19 considerations: Applicant will be required on site for project.
<b>Description:</b>	$^{89}\text{Zr}$ , a positron emitting radioisotope, has seen extensive use in the field of Positron Emission Tomography (PET), an imaging technique useful at diagnosing cancers and tracking disease progression over a treatment regime. As $^{89}\text{Zr}$ is an inorganic radiometal, it requires an organic ligand to coordinate it for use as an imaging agent.  This project will aim to investigate improving the pharmacokinetics of the widely used $^{89}\text{Zr}$ ligand, desferrioxamine B (DFO). DFO is currently used clinically for the treatment of iron overload disease and has been used in numerous clinical trials for $^{89}\text{Zr}$ PET imaging applications. While DFO provides acceptable chelation of $^{89}\text{Zr}$ for PET imaging, the ligand structure could be improved to increase the stability of the metal-ligand complex. This typically comes at the cost of an ideal pharmacokinetic profile or important physiochemical properties such as aqueous solubility. This project will investigate some potential modifications to the DFO scaffold to improve these properties.
<b>Expected outcomes and deliverables:</b>	Students can expect to gain experience in ligand synthesis, including analytical techniques such as NMR Spectroscopy and Liquid Chromatography Mass Spectrometry. Depending on the success of synthesis, students may experience test radiolabelling of the synthesised compound/s with $^{89}\text{Zr}$ .
<b>Suitable for:</b>	This project is open to Honours/Masters students with a background in chemistry.
<b>Primary Supervisor:</b>	James Wood
<b>Further info:</b>	Please contact James Wood ( <a href="mailto:j.wood1@uq.edu.au">j.wood1@uq.edu.au</a> ) prior to application if you wish to discuss the project further.