



Project Title: Identifying modulators for human glycine receptors as potential treatments for pain		Code: SPS15
Host School / Institute: Sydney Pharmacy School/ Brain and Mind Centre		Address: Brain and Mind Centre, 94 Mallet St, Camperdown 2050
Certificates & Clearances required: No		
Primary Supervisor: Prof Mary Collins		
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Co-Supervisor/team: Dr Nathan Absalom , Mr Grant Richter (PhD candidate) and A/Prof Thomas Balle		
Project Type: Laboratory based		
Project Category: Pharmacy; Pharmacology		
Skills / Attributes of a successful student: Enthusiasm; thirst for knowledge; some basic good practice laboratory skills. All other knowledge and skills will be taught.		
Project Keywords: Glycine receptors; Pain; novel therapies; molecular biology; electrophysiology		
<p>Project Description: The glycine receptor is an important inhibitory ion channel that conducts chloride ions. It is expressed in key areas of the spinal cord and brain that mediate the pain pathways and thus plays a significant role in alleviating chronic pain. However, only a handful of compounds exist for this receptor most likely due to a lack of technology that can be used to quickly identify new lead molecules. To progress this project, we have established a collaboration between Molecular modellers, Chemists, and Pharmacologist to identify novel lead molecules and establish a high throughput assay to evaluate these compounds.</p> <p>Therefore in this project, you will assess novel glycine receptor modulators by first using two-electrode voltage clamp methods. This involves synthesising mRNA for the human glycine receptor, injecting the mRNA into the Xenopus oocyte expression system which will in turn will translate the mRNA to functional protein and embedded this protein on the cell surface. You will then measure changes to the current that passes through the channel as a measure of activity when applying glycine and the drug. The compounds will be evaluated in this system for agonist, antagonist and modulation effects. Alongside, you will develop a high throughput assay by developing a stable cell line using a mutated glycine receptor that conducts calcium and measure changes in fluorescence as a sign of receptor activity.</p> <p>You will compare the activities of the two systems in your project. The work conducted will be fed back to our chemists in order to make better molecules and to our pharmacologists for assessing in animal models. This project is a mini-drug discovery project and replicates what is actually done in biotech and pharmaceutical companies.</p>		