UQ Summer Research Project 2026- SBMS

Project title:	**Interrogating the intersection between protein phosphorylation and purine metabolic networks.**
Hours of engagement & delivery mode	28 hours per week Onsite St Lucia: Otto Hirschfeld (81)
Description:	Protein phosphorylation by kinases is a key regulatory mechanism essential in all living systems. The modification involves addition of phosphate groups, typically on serine, threonine or tyrosine residues, to alter the activity, stability, localization and function of target proteins. In metabolic networks, phosphorylation of enzymes control metabolic flux and the cross-talk between phosphorylation and metabolic networks is critical for development and tissue homeostasis. Phosphorylation events often occur at key nodes in metabolic networks allowing for co-ordinated control across multiple pathways and adaptation to growth signals and nutrient fluctuations. Recently, our lab such a node that intersects protein kinases and enzymes involved in purine metabolism (see our preprint on bioRxiv: doi: https://doi.org/10.1101/2024.07.01.601630). Purines are required to make DNA/RNA, transfer energy and cell signalling. Dysregulated purines are associated with anxiety disorders, changes in appetite, energy levels, motor function and cognitive impairment. This summer project will contribute to our research program studying the role of purine enzyme phosphorylation in brain and muscle function.
Expected learning outcomes and deliverables:	Scholars can expect to gain technical skills in mammalian cell culture, cell treatment/manipulation, protein lysate preparation and biochemical assays to measure protein phosphorylation and metabolic enzyme function. Scholars will also develop research skills in data evaluation/interpretation, record keeping, safe laboratory practices and how to develop research hypotheses and novel research questions.
Suitable for:	Suitable for students with a background in cell biology, biochemistry, neuroscience or organic chemistry and interested in doing a research project in Honours, Masters or a PhD.
Primary Supervisor:	A/Prof Dominic Ng d.ng1@uq.edu.au https://about.uq.edu.au/experts/11728
Further info:	Supervisor CAN be contacted by students prior to submission of an application