

UQ Summer Research Project 2026- SBMS

Project title:	Thresholds of mitophagy in mitochondrial disease
Hours of engagement & delivery mode	30 hours per week Onsite St Lucia: Otto Hirschfeld (Bld 81)
Description:	This project will explore how cells regulate mitochondrial turnover through mitophagy. The student will systematically manipulate the expression of key mitophagy regulators—BNIP3 and NIX (activators) and FBXL4 and PPTC7 (suppressors)—to generate cell lines representing distinct mitophagy states. Using these models, they will perform high-content imaging to quantify mitophagy and assess its relationship to cellular energy balance through ATP assays. The project will also integrate mitochondrial respiration analysis, metabolomic profiling, and measurements of cell growth and viability to define how changes in mitophagy influence overall cell function.
Expected learning outcomes and deliverables:	Techniques: Mammalian cell culture, CRISPR/dTAG-based gene manipulation, fluorescence microscopy, image analysis, ATP and viability assays, and mitochondrial profiling. Practical skills in mammalian cell culture and basic molecular manipulation (transfection, drug treatment, or inducible expression systems). Quantitative image analysis and data interpretation using microscopy-based assays. Experience with bioenergetic and viability measurements to assess mitochondrial function. An understanding of how mitochondrial turnover contributes to cellular health and stress responses. Insight into experimental design and hypothesis testing in cell biology research. Expected outcomes: By the end of the 6-week placement, the student will compile a short written report summarising their findings and present their results to the research group. Depending on progress, the data may also contribute to an ongoing manuscript or grant application.
Suitable for:	These projects are suitable for those students with an interest in mitochondrial biology.
Primary Supervisor:	Associate Professor Julia Pagan j.pagan@uq.edu.au Pagan Lab - Targeted protein degradation - School of Biomedical Sciences - University of Queensland
Further info:	The supervisor MUST be contacted by students prior to submission of an application