# UQ Summer Research Scholarship Projects in the Faculty of Medicine 2024

Read about the UQ Summer Research Program on the UQ Summer & Winter Research Program page, and apply online between 18th September and 22nd October 2023. Applications must be lodged online via the UQ Careers and Employability page.

Use the links to jump to each project and back to the school or centre index. Please take note of where each project is located and any additional requirements. Projects are listed under the unit names on the application page (StudentHub).

***Think before you print:***
***– There are 78 projects here and the downloaded PDF is nearly 100 pages long.***

Additional projects may be uploaded over the coming weeks up until 17 September so please check which version you download.
*(This version posted 29 Sept 2023: one project changed from CHSR#3 to SPH#9- was incorrectly listed)*

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## School of Public Health

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## First Nations Cancer and Wellbeing Research Program

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## Medical School

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## Centre for Health Service Research

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| ~~CHSR#3~~ | Dr Darsy Darssan *Listing moved to SPH#9* | Text Analysis of Learner Experience |
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**UQ Centre for Clinical Research**

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| QIMRB#2 | Dr Daniel Lindsay | Quantifying the use of newly proposed melanoma excision services in Australia |
| QIMRB#3 | A/Prof Katia Nones | Evaluate blood cell free DNA for detection of actionable mutations for advanced lung cancer |
| QIMRB#4 | A/Prof Simon Phipps | How does osteopontin in milk affect neonatal microbiobe composition, the metabolome, and immune development to protect from disease? |
| QIMRB#5 | Dr. Behnam (Ben) Rashidieh | Targeting Breast Cancer and Metastasis by Oligonucleotide Therapeutics with Lipid Nanoparticle (LNP) Delivery System |
| QIMRB#6 | Dr Rehan Villani | Improving diagnostic processes for regulatory region variants |

**Mater Research Institute-UQ**

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| MRIUQ#1 | Dr Irina Buckle | Optimisation of multi-parameter flow cytometry panel for T cell characterisation in humanised mouse models. |
| MRIUQ#2 | Dr Jessica Sexton | Stillbirth trends in Australia over time |
| MRIUQ#3 | Dr Jessica Sexton | Risk of stillbirth among First Nations women |
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# Project Details

## School of Biomedical Sciences

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| **Project title: SBMS#1** | **Curating a Display** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20 hours |
| **Location:** | Herston:<br>UQ Health Sciences Building, Integrated Pathology Learning Centre |
| **Description:** | This summer research project will involve curating a display based on specimens in the Integrated Pathology Learning Centre. It will combine medical and historical research in order to produce a small display. There will be three main stages to this project. Stage one and three will be approximately one week with four weeks allocated to stage two.<br><br>The first stage will be selecting a specimen or multiple specimens to research for the display. The second stage will include researching the selected specimen/s and the theme or topic for the display. Curating the display will also be included in this step. The final stage will be exhibition install.<br><br>Depending on the topic and the available information, the final display could be a moveable display unit or a section of the Museum. This is a great opportunity to be involved in interdisciplinary work while building skills in science communication. |
| **Expected outcomes and deliverables:** | This project will primarily build research and communication skills, as well as offering an insight into exhibition development. The desired outcome is a small or medium-sized display on a particular theme. |
| **Suitable for:** | This project is suitable for any student who has an interest in historical research and who are willing to build their skills. It is also suitable for students wanting to expand their research and communication skills while learning about the role of museums in science communication. |
| **Primary Supervisor:** | Ms Rebecca Lush<br>Curator, Integrated Pathology Learning Centre<br>r.lush@uq.edu.au |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SBMS#2** | **Investigations into metabolism changes in epilepsy** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30-36 hours |
| **Location:** | St Lucia: Skerman Building |
| **Description:** | The project will investigate morphological and/or biochemical changes that may contribute to seizures in epilepsy using models. |
| **Expected outcomes and deliverables:** | Scholars may gain skills in data collection, contribute to a publication, produce a report or give an oral presentation at the end of their project. |
| **Suitable for:** | Second or third year UQ students who have completed BIOM2402 and are interested in energy metabolism and brain. |
| **Primary Supervisor:** | A/Prof Karin Borges<br>k.borges@uq.edu.au<br>Neurological Metabolism |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: SBMS#3** | **How does the histone modifying factor SETD2 regulate brain development?** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | St Lucia: Otto Hirschfeld Building |
| **Description:** | The controlled proliferation, then differentiation, of stem cells is crucial for the generation of organs of the correct size, and when things go awry, the consequences can be devastating. An example of this is seen in the developing brain, where the delayed differentiation of neural stem cells (NSCs) gives rise to brain enlargement (megalencephaly), a disorder characterised by intellectual disability. Megalencephaly is also commonly associated with autism spectrum disorder (ASD); indeed, ~15% of patients with ASD exhibit enlarged brains. Critically, megalencephalic ASD patients have significantly more severe behavioural, sensory and social deficits than other patients with ASD; bigger is definitely not better. This highlights the need to better understand the abnormal biological pathways leading to brain overgrowth. We know that the extended proliferation of NSCs can drive brain overgrowth. What we do not know are the mechanisms underlying this process, knowledge that is critical if we are to develop clinically tractable ways to treat megalencephalic patients. We have a creative and innovative take on the problem - we postulate that the epigenetic regulation of chromatin via trimethylation of lysine residue 36 on histone H3 (H3K36me3 - associated with open chromatin and transcriptional activity) regulates timely NSC differentiation, and that perturbations to this modification lead to disorders characterised by ASD with megalencephaly. Here, we will study the role of one of the factors that controls H3K36 methylation, SETD2, in brain development. |
| **Expected outcomes and deliverables:** | Students will gain an appreciation of the fundamental tenets of brain development and will learn how to critically analyse their own data, and that of others. They will learn wet lab skills including PCR, genotyping, histology and microscopy. |
| **Suitable for:** | Third year undergraduate students looking to do Honours projects |
| **Primary Supervisor:** | A/Prof Michael Piper<br>m.piper@uq.edu.au<br>Neural Stem Cells |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: SBMS#4** | **Changing muscle function with oxidation** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: negotiable |
| **Location:** | St Lucia: Sir William McGregor Building |
| **Description:** | The function of calcium channels in muscle fibres are altered by oxidation. In some experimental cases, disease model muscle fibres isolated from the mouse may progressively become oxidised during the course of the day, while individual fibres are sequentially isolated for experimental analysis. This project will use a mouse model of muscle disease to assess sarcoplasmic reticulum or mitochondrial functional changes through the course of the day of experiments. |
| **Expected outcomes and deliverables:** | Dissection of muscle fibres, preparation of muscle fibres for confocal imaging of compartmentalized calcium sensitive dyes; data analysis; working in a lab environment with experienced researchers. |
| **Suitable for:** | Students interested in muscle physiology and biophysics; confocal imaging; live cell experiments. |
| **Primary Supervisor:** | A/Prof Bradley Launikonis<br>b.launikonis@uq.edu.au<br>Muscle Research Lab |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: SBMS#5** | **Developing novel strategies to overcome immune suppression in cancer** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | St Lucia: Sir William McGregor Building |
| **Description:** | This project utilises a multi-disciplinary approaches to identify and validate novel immune suppressive pathways in cancer. Our lab is interested in developing novel nano-therapeutic methods to overcome immune suppression in cancer. The high recurrence rate is a major challenge in the clinical management of cancer. While stimulating our own immune system to recognize and attack tumour cells represents an attractive means to facilitate complete elimination of tumours, emerging data suggest that many of the immunotherapy tools, such as immune checkpoint inhibitors, only work in small percentage of cancer patients. We aim to develop effective strategies to overcome immune suppression and enhance the infiltration and function of cytotoxic T lymphocytes in tumours. We are also interested in developing more effective tumour-targeting delivery strategies for treatment of cancer. Ultimately, strategies developed in this project could harness the power of the immune system to eliminate tumours and significantly increase patient survival.<br>We are seeking a motivated undergraduate student who is interested in contributing to a large project involving nanotechnology and cancer biology, and who is eager to learn how to develop effective strategies to enhance anti-tumour immunity. The student will learn critical laboratory skills and knowledge needed to identify novel immune suppressive pathways in cancer. He/She will gain experience in working in a multidisciplinary environment, obtain hands-on training from the lab head and a postdoctoral fellow, and contribute to an exciting project in the area of cancer nanomedicine and immunology. This project is open to applications from students with a background in biomedical sciences, bioinformatics, chemical or biomedical engineering, who is interested in exploring research as a career path. |
| **Expected outcomes and deliverables:** | The student will learn critical skills needed to develop new strategies to enhance anti-tumour immunity in cancer. The student will be expected to attend weekly lab meetings and present his/her work at the end of the summer program in lab meeting. |
| **Suitable for:** | This project is suitable for students with a background in biomedical sciences, bioinformatics, chemical or biomedical engineering, who is interested in exploring research as a career path. |
| **Additional requirements:** | Students will be required to obtain the following for this project. Information will be provided with an offer of placement.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |
| **Primary Supervisor:** | Dr Sherry Wu<br>sherry.wu@uq.edu.au<br>Cancer Therapeutics |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: SBMS#6** | **Creating "digital twins" of the human neuro-musculoskeletal system to explore the influence of body shape and size on locomotor performance** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | St Lucia: Otto Hirschfeld Building |
| **Description:** | This project aims to examine the effects of body size and shape on locomotor performance. Using a combination of state-of-the-art computational simulations and empirical data from biomechanics experiments, we will explore questions such as: why do some body shapes or sizes outperform others? What is the upper limit on body size to move safely and efficiently? Is there an optimal 'design' to move fast or efficiently?<br><br>To explore these questions, we will create accurate computer simulations that act as "digital twins" of the human neuro-musculoskeletal simulation. Using these models, we can characterise the functions of individual muscles and even manipulate their characteristics (e.g., strength, stiffness, activation delays) to explore how altered form, perhaps as a result of age or disease, influences function. This enables us to understand how the anatomy and mechanics of the musculoskeletal system adapt to challenges as a result of size, age, and disease.<br><br>Traditional approaches to predict movements have relied on tracking simulations which use experimental data to reproduce movements. They work complementary to experimental analysis based on real-world recorded data from joint kinematic, and in some cases, neurological recordings. However, recent advances in physics-based simulations have changed the way that we can study and simulate movement. Predictive simulations allow us to generate novel movements that can be customised based on the characteristics of the model (or the real human).<br><br>The Neuromuscular Biomechanics Lab at UQ houses state-of-the-art facilities for performing biomechanical and motor control research. Our Gait Lab includes a comprehensive suite of tools: 3-dimensional motion capture, high-end ultrasound/elastography imaging devices, electrophysiological measurement tools, force plates and motor-driven dynamometers, and an instrumented treadmill capable of measuring ground reaction forces in all three dimensions for each and every step.<br><br>This research is part of a collaboration between the University of Queensland (School of Biomedical Sciences); University of the Sunshine Coast (School of Science and Engineering); and KU Leuven (Belgium). |
| **Expected outcomes and deliverables:** | The successful candidate student will be exposed to a variety of modelling and experimental techniques aimed at understanding mechanisms of musculoskeletal function including: OpenSIM and other musculoskeletal modelling tools; ultrasound imaging, electromyography, motion capture, force sensors. |

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| | They may be expected to work as part of a team to collect biomechanical experimental data in human subjects and will have the opportunity to generate publications from their research.<br><br>This research is part of a collaboration between the University of Queensland (School of Biomedical Sciences); University of the Sunshine Coast (School of Science and Engineering); and KU Leuven (Belgium). |
| **Suitable for:** | This project is suitable for students with a background in biomedical sciences, engineering, physics, computer sciences, mathematics, or biology. It is expected that that student is curious, motivated, and eager to learn new skills and work within an inter-disciplinary and positive research environment. Two placements are available for this project. |
| **Primary Supervisor:** | Dr Taylor Dick<br>t.dick@uq.edu.au<br>Neuromuscular Biomechanics |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SBMS#7** | **Insights into muscle asymmetry in scoliosis** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-30 hours |
| **Location:** | St Lucia: Otto Hirschfeld Building |
| **Description:** | Adolescent idiopathic scoliosis (AIS) occurs in 2-4% of adolescents with otherwise healthy musculoskeletal structures. The three-dimensional spinal deformation is associated with progressive wedging, translation, and rotation of multiple vertebrae. AIS develops rapidly and has no known cause or cure. Despite muscles applying forces to the vertebra, the impact of muscles on curve progression in AIS has largely been ignored. We have data collected that relates to paraspinal muscle activation, shape, size and quality (fatty infiltration) in AIS. The student aligned with this project will facilitate data collection and analysis related to this ongoing project. |
| **Expected outcomes and deliverables:** | Scholars will gain skills in data collection and analysis related to human movement and muscle force. The precise data to be analysed can be discussed with the supervisor. |
| **Suitable for:** | Students with an interest in: Physiotherapy / Human movement science / Anatomy / Functional Anatomy; who have a solid understanding about the factors that contribute to muscle force generation. |
| **Primary Supervisor:** | A/Prof Kylie Tucker<br>k.tucker1@uq.edu.au<br>Motor Control Pain Research |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: SBMS#8** | **Using advanced electromyography techniques to study spinal cord reflexes in humans** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | St Lucia: Otto Hirschfeld Building |
| **Description:** | Our brain and spinal cord work in harmony to control our muscles. In the spinal cord, motor units combine inputs from the brain and sensory feedback to generate muscle force. Our research team is trying to understand more about how motor units control movement in humans. We will be using a technique called high-density surface EMG (HDsEMG) to do so. For HDsEMG recordings, a multi-channel surface sensor is applied on the skin overlying the calf muscles. This sensor samples naturally produced electrical activity arising from muscle contraction. We will also use electrical stimulation to activate the nerves innervating the calf muscles to see how reflexes affect HDsEMG measures of muscle activity. Healthy adult participants will be recruited and invited to attend a lab-based testing session where these methods will be used. The information gained in this study will improve our understanding of how motor units function. It may also lead to the development of novel rehabilitation strategies for individuals with movement problems (e.g., spinal cord injury and stroke). |
| **Expected outcomes and deliverables:** | As a summer research project student, you will assist with the data collection for this project and can learn some cutting-edge neurophysiology techniques! Importantly, this project will give you a taste of lab-based research involving human subjects, which may be more appealing to those that might not be interested in wet lab and benchtop science. We expect that some of this work will eventually lead to a publication, and at the end of the project, you will be expected to deliver a brief presentation highlighting your experiences to peers and supervisors. |
| **Suitable for:** | This project is most suitable for students with a background in Biomedical Science, Science, Exercise Science/Physiology or Biomedical Engineering. |
| **Primary Supervisor:** | Dr Jacob Thorstensen<br>j.thorstensen@uq.edu.au |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SBMS#9** | **How do interactions between p75NTR, basal forebrain and the glymphatic system play a role in neurodegenerative disease?** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: up to 36 hours |
| **Location:** | St Lucia: Sir William McGregor Building |
| **Description:** | The project methodology may cover cell culture, animal handling, histology and microscopy. The student will be expected to participate in literature reviews, experimental design, data analysis and interpretation in the field of neurotrophins, glymphatic systems and dementia. |
| **Expected outcomes and deliverables:** | Students should expect to gain skills in experimental design, critical thinking and will be required to produce a report and deliver an oral presentation. Ideally the results would contribute to a publication. |
| **Suitable for:** | Suitable for independent students with a background in neuroanatomy and/or molecular biology |
| **Primary Supervisor:** | Prof Elizabeth Coulson<br>e.coulson@uq.edu.au or b.rumballe@uq.edu.au<br>Coulson Group |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SBMS#10** | **ErbB4 over expression to prolong the proliferative/regenerative window in neonatal mice** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: variable<br>Normally starts off slower and will be busier towards the end as the student becomes more independent. |
| **Location:** | St Lucia: Sir William McGregor Building |
| **Description:** | The neonatal heart is known for its unique capability for cardiac regeneration. We have developed adeno associated viruses (AAVs) to drive expression of ErbB4 in neonatal mouse hearts. We had an honours student test these viruses as part of an honours project and identified increased heart size and function. You would be helping to complete post-cull tissue processing including qPCR and immunohistochemistry to confirm that gene modification has occurred and evaluate markers of physiological and pathological cardiac enlargement. |
| **Expected outcomes and deliverables:** | You'll learn qPCR and immunohistochemistry, and help us to figure out if the cardiac enlargement we see is physiological or pathological. This would likely be included in a publication. |
| **Suitable for:** | Anyone interested in molecular biology for the first part of this project, but following the summer project, there would also be opportunities to continue your work in the same labs (Reichelt/Thomas) on this or a different project and these projects would include animal work, AAV design and administration, echocardiography. |
| **Primary Supervisor:** | Dr Melissa Reichelt and Prof Walter Thomas<br>m.reichelt@uq.edu.au<br>Reichelt group |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: SBMS#11** | **Functional Morphology of Claws in Predatory & Non-Predatory Birds: Behavioural & Morphometric Data Processing** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | St Lucia: Otto Hirschfeld Building |
| **Description:** | This data processing project supports a larger investigation into the adaptation of bird claw morphology to predatory and non-predatory foraging behaviours in numerous species. Data processing includes image-processing of a large collection of photos of bird claws (museum specimens) and data entry and processing of behavioural profiles of a large number of carnivorous bird species. This follows on from stages I & II of this project and may include other aspects if progress permits.<br>Image processing involves markup of morphological margins and landmarks, and application of geometries to obtain key morphometrics. Software involved will be Rhino & Grasshopper, include possibly also use Photoshop, illustrator (so some experience and proficiency in these, and general artistic skills is very desirable) and RStudio (Posit) for any analysis involved (so competency in data handling and using Excel/spreadsheets is desirable). There are thousands of photographs of hundreds of diverse species of carnivorous birds from several museums around the world (including owls, hawks, vultures) etc., so volume of work will be staged and depend on progress speed and quality (which will be checked along the way). This is an exciting project with several papers are planned for the resultant claw morphometric data relating to the evolution and adaptation of claw "sharpness", "robustness" and curvature with prey type, habitat use and arboreal vs terrestrial locomotion with comparisons to non-predatory birds and dinosaur ancestors. It is intended to provide the student with access to journal club shared with Carl Stephan (skeletal morphometrics for forensics & 2D-3D imaging techniques). If the student shows initiative and promise further research work directly related to this, or other human related musculoskeletal research will be considered. |
| **Expected outcomes and deliverables:** | Problem solving in data collection and processing, and insight into research and analysis.<br>Transferrable skills and experience in data collection and processing.<br>"Broaden their horizon" beyond human anatomy into comparative anatomy and concepts of evolution and functional adaptation. |
| **Suitable for:** | Students interested in a broader understanding of scientific research in anatomy.<br>Students with skills/interest/experience in: photoshop, illustration, RStudio and data handling.<br>Students with an interest in biomechanics, evolution and adaptation of form-function in vertebrates (especially birds & dinosaurs). |
| **Primary Supervisor:** | Chris Glen<br>c.glen@uq.edu.au<br>Anatomy |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SBMS#12** | **Investigating how an ALS risk factor regulates autophagy** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | St Lucia: Otto Hirschfeld Building |
| **Description:** | This project aims to gain a mechanistic understanding of how GGNBP2, a risk factor for ALS, regulates autophagy, which is a process that removes damaged organelles and protein aggregates from the cell. The work will be done in the fruit fly Drosophila melanogaster, where both overexpression and loss of function GGNBP2 causes locomotor phenotypes. The student will be involved in treating GGNBP2 mutant flies with drugs that increase or decrease autophagy to determine how this affects locomotor performance. |
| **Expected outcomes and deliverables:** | We expect that drugs that induce autophagy will ameliorate the locomotor defects in flies overexpressing or lacking GGNBP2. |
| **Suitable for:** | Students aiming to do a PhD. |
| **Primary Supervisor:** | A/Prof Sean Millard<br>s.millard@uq.edu.au<br>Molecular Mechanisms for Wiring the Brain |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: SBMS#13** | **The role of upper layer transcription factors in cortical development and evolution** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | St Lucia: Skerman Building |
| **Description:** | Student will perform histology, immunohistochemistry and microscopy on developmental brain sections of mice and marsupial dunnarts to compare and contrast upper layer transcription fact expression and manipulation between species and across development. |
| **Expected outcomes and deliverables:** | Applicants will learn techniques of brain sample preparation (sectioning, mounting), immunohistochemical labelling and microscopy, as well as image analysis and image preparation. |
| **Suitable for:** | Suitable in particular to students interested in developmental neuroscience and who have completed developmental neuroscience undergraduate courses (such as DEVB3001). Students considering Honours/PhD especially are encouraged. |
| **Primary Supervisor:** | Dr Laura Fenlon<br>l.fenlon@uq.edu.au<br>Cortical Development Plasticity and Evolution |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: SBMS#14** | **Comparative neuroanatomy of cortical circuits in mammals** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | St Lucia: Skerman Building |
| **Description:** | This project will examine similarities and differences in the way the cerebral cortex wires in the two main lineages of mammals (placentals and marsupials) |
| **Expected outcomes and deliverables:** | Skills in experimental design and execution, data collection and analysis, and expanded knowledge on developmental and evolutionary neuroscience |
| **Suitable for:** | Students with previous knowledge, experience and/or interest in neuroscience research and theory (developmental and/or systems) and considering Hons/PhD in related topics. |
| **Primary Supervisor:** | Rodrigo Suarez<br>r.suarez@uq.edu.au<br>Brain Evolution and Development |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: SBMS#15** | **Expanding the structural atlas of conotoxins** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30-36 hours |
| **Location:** | St Lucia: Skerman Building |
| **Description:** | Conotoxins are disulfide-rich peptides from the venom of cone snails. These peptides are potent modulators of many important ion-channels and receptors and have been extensively studied over several decades as lead molecules for drug development. The studies have however focussed on a small number of classes of conotoxins, with known functions. This project will use peptide chemistry to synthesise novel sequences identified from transcriptomics and NMR spectroscopy to structurally characterise peptides with new disulfide frameworks. |
| **Expected outcomes and deliverables:** | Depending on interest the project can be either chemistry or NMR focussed. It is expected that a novel peptide can be synthesised and its three-dimensional structure resolved. |
| **Suitable for:** | Students who are preferably going to undertake further research i.e. honours and maybe PhD.<br>Students with a strong interest in structural biology and drug design and with some skills in chemistry/and or biophysics.<br>Computational skills are beneficial. |
| **Primary Supervisor:** | A/Prof Johan Rosengren<br>j.rosengren@uq.edu.au |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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## School of Public Health

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| **Project title: SPH#1** | **Global Drug Survey: Analysis of data from the world's largest survey of drug use (2013-2023)** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30-36 hours |
| **Location:** | Herston: Oral Health Centre / Edith Cavell Buildings |
| **Description:** | The Global Drug Survey is the world's largest survey of drug use. We have annual data spanning 2013-2023 (with over 1,000,000 records), including from a special 2020 COVID-19 survey. Each year, respondents from over 30 countries have completed survey on their drug use (ever, last 12 months and last 30 days). We have data on over 100 different types of drugs: on the less typical drugs (e.g., ketamine, and many Novel Psychoactive Substances) and the more common drugs, for example cocaine, methamphetamines, cannabis and synthetic cannabis, and alcohol. If you are interested in drug and alcohol research, this project is for you.<br><br>We are looking for a highly motivated scholar to prepare one journal article using GDS data. The topic will be decided based on your interests and current relevant topics.<br><br>If you want to know more see http://www.globaldrugsurvey.com/ |
| **Expected outcomes and deliverables:** | • Conduct a literature review<br>• Create an Endnote library<br>• Draft a literature review<br>• May include data cleaning and preparation<br>• May include descriptive data analysis<br>• May include Big Data analytics |
| **Suitable for:** | Students who are preferably studying honours or Masters degrees; third-year students will be considered on a case-by-case basis. We are seeking a student who has:<br>• Excellent writing skills<br>• Strong quantitative analysis skills<br>• Interest in alcohol and illicit drug policy/interventions |
| **Primary Supervisor:** | Dr Cheneal Puljevic / Prof Jason Ferris<br>c.puljevic@uq.edu.au or j.ferris@uq.edu.au<br>Substance Use and Mental Health group |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SPH#2** | **Hysterectomy and oophorectomy in women aged 45 years and younger: a literature review** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-25 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | This project will allow a student to be involved in the Hysterectomy, Oophorectomy and Long-term chronic Disease (HOLD) study, improving our understanding of women who have these procedures aged 45 years and younger. The project will primarily require the student to perform a systematic review of the literature and write a literature review summarising the results.<br>Background: In Australia, more than 27,000 women have a hysterectomy each year. Around 30% of these also have both ovaries removed (bilateral salpingo-oophorectomy; BSO). Some studies have shown that hysterectomy may affect the long-term health of women who have the procedure when they are younger than 45 years. Our recent study of over 660,000 Australian women, showed hysterectomy with ovarian conservation before 35 years was associated with a 50% increased risk of mortality from causes other than cancer or cardiovascular disease, and this increased to 158% when the ovaries were also removed. The reasons for this increase are not yet clear but may relate to the socioeconomic and health characteristics of younger women who have hysterectomies. |
| **Expected outcomes and deliverables:** | The student will have the opportunity to improve their research skills from epidemiologists and receive mentoring on performing a literature search, critically appraising studies, understanding and summarising results, and academic writing. |
| **Suitable for:** | This project would suit a Public Health/Epidemiology student, or a student considering a PhD. |
| **Primary Supervisor:** | Dr Karen Tuesley<br>K.Tuesley@uq.edu.au<br>Hysterectomy, Oophorectomy and Long-term chronic Disease: the HOLD study |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SPH#3** | **Australian consumer perspectives of high-quality online information resources for gynaecological health** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | Our recent audit found that online gynaecological cancer symptom resources in Australia were of inadequate quality in terms of readability, understandability, actionability, and cultural inclusivity. An increase in the quantity of information will not solve this problem. Instead, we advocate for health information resources to be redesigned in collaboration with end users to ensure their accessibility.<br><br>We aim to explore the suitability of the top-ranked resources identified by this audit from the perspective of consumers, including women from the general population, those who have experienced gynaecological symptoms, First Nations women, women from culturally and linguistically diverse backgrounds, and the LGBTI+ community. The feedback will be used to adapt the content and help optimise evidence-based messages in a way that is accessible to all Australians. |
| **Expected outcomes and deliverables:** | The scholar will gain skills in developing a research proposal and study materials including participant information sheet, consent form, and data collection materials (survey, qualitative interview guide). The scholar will also gain experience completing an ethics application and submitting the relevant documents to UQ HREC for ethical approval. The student may also be asked to set up electronic databases to capture data collection. |
| **Suitable for:** | This project is suitable for postgraduate students, particularly MPH students interested in continuing with this topic as a Project in semester 1 2024. |
| **Primary Supervisor:** | Dr Tracey Di Sipio; Dr Abbey Diaz; Dr Belinda Goodwin<br>t.disipio@uq.edu.au |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SPH#4** | **Successes and challenges of digital health interventions in improving access to primary health care among priority populations in Australia** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | Digital technologies of all kinds have become essential resources in PHC, and their uptake is growing, with the past decade seeing rapid technology integration in a range of areas that support PHC and essential public health functions. common uses of digital technologies include searching medical knowledge resources, facilitating clinical support, monitoring quality of care, mapping and monitoring the spread of infectious diseases, and tracking medical supplies. Integrating clinical support tools and referral systems into PHC can help coordinate care and ensure its continuity across the care spectrum. Technologies can play an important role in patient safety by identifying risks and reducing harm in the primary care setting (e.g., measurement of vital signs and activity tracking, electronic records, and use of data in clinical decision-making). Digital tools can be used at the point-of-care diagnostic testing as a critical guide for treatment, medical and assistive devices. At the community level, digital technologies can be adapted to transfer knowledge and resources and assist health managers and providers in delivering health services to the communities.<br><br>In Australia, one in three people are born overseas, and one in five speak English as their second language at home, which often are referred to as Culturally and Linguistically Diverse (CALD) populations. These populations experience multiple barriers at the individual, organizational, and health system levels while accessing health services. Difficulties in understanding and communicating in English and understanding cultural differences between the country of origin and Western culture are some barriers that influence access to health services among CALD populations. Digital health interventions can have the potential to break those barriers and improve access to health services for individuals and communities from CALD backgrounds. Digital health interventions support and ensure health services among CALD populations by engaging communities in planning, designing, delivering, and evaluating PHC services. However, limited evidence is available on digital health interventions' role in ensuring health services among CALD populations in Australia. This review aims to explore the successes, challenges, and opportunities of digital health interventions to provide health services to the population from CALD backgrounds. |
| **Expected outcomes and deliverables:** | This review aims to understand the successes, challenges and opportunities of implementing digital health interventions in designing and implementing PHC services targeting CALD communities. Scholars will acquire skills on systematic literature review skills, data analysis, use of research software (such as Endnote, NVivo), interpretation of results, academic writing, and preparation of a manuscript for publication. A manuscript will be prepared to be submitted to the journal for publication. |
| **Suitable for:** | This project is primarily suitable for MPH first- or second-year students, who are interested in health systems and policy research, primary health care services, and health equity. Students of social sciences or health science backgrounds, who have an understanding and exposure to |

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| | scoping/narrative review in their undergraduate courses also can apply for this research project. |
| **Primary Supervisor:** | Dr Yibeltal Alemu<br>y.alemu@uq.edu.au , |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SPH#5** | **Successes, challenges and feasibility of community engagement in primary health care in Australia** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | The Alma-Ata Declaration of Primary Health Care (PHC) enunciated principles of comprehensiveness, intersectoral coordination, the use of appropriate technology, and affordable and appropriate health services for all. PHC as a whole-of-society approach to health ensures equity in the highest possible level of health and wellbeing. This vision emphasises integrated services (primary care and essential public health) to address people´s needs and preferences (as individuals, families, and communities). The 2018 Declaration of Astana reaffirmed and redefined the three core functions of PHC: service provision, multisectoral action and the empowerment of citizens. Community engagement is an approach for empowering the individual and communities and is essential to ensure the optimal design, implementation, and evaluation of resulting initiatives. Communities often have a more holistic view of health and wellbeing; engaging communities proactively in planning, designing, delivering, and evaluating PHC services can lead to improved community health. Collaboration between stakeholders (community members, researchers, and policymakers) drives efforts to solve complex health problems such as co-morbidities and chronic health conditions.<br><br>Priority population such as Culturally and Linguistically Diverse (CALD) populations experience multiple barriers at the individual, organisational and health system levels while accessing health services. Their engagement in the design and implementation of policy, programs, and services is essential to include their voices and address their health problems by ensuring tailored approaches and considering their linguistic and cultural contexts. However, limited evidence is available on the engagement in designing and implementing PHC programs and services in complex health system contexts in Australia. This review aims to explore the successes, challenges, and opportunities of community engagement of priority populations in the design and implementation of PHC services in Australia |
| **Expected outcomes and deliverables:** | This review aims to understand successes, challenges and opportunities in the engagement of priority populations such as CALD communities in PHC systems and services and contribute to the improved health system and realisation of universal health coverage. Scholar will acquire skills on systematic literature review skills, data analysis, use of research software (such as Endnote, NVivo), interpretation of results, academic writing, and preparation of a manuscript for publication. A manuscript will be prepared to be submitted to the journal for publication. |
| **Suitable for:** | This project is primarily suitable for MPH first- or second-year students, who are interested in health systems and policy research, primary health care services, and health equity. Students of social sciences or health science backgrounds, who have an understanding and exposure to scoping/narrative review in their undergraduate courses also can apply for this research project. |

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| **Primary Supervisor:** | Dr Resham Khatri and Dr Yibeltal Alemu<br>r.khatri@uq.edu.au |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SPH#6** | **Understanding patterns of physical activity across the lifespan** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | Although the importance of physical activity for health is well established, much assumed knowledge in this field is based on methods that classify people as "active" or "inactive" at one time point and do not account for changes in physical activity and sedentary behaviour across the lifespan.<br><br>This project will be part of a program of research that aims to advance knowledge of patterns of physical activity and sedentary behaviour across the life course. The project utilises self-report and accelerometer data from rich longitudinal population studies to:<br><br>identify diverse patterns of physical activity and sedentary behaviour, as they exist in natural environments.<br><br>investigate if there are optimal ways to accumulate the same amount of physical activity to maximise health benefits. |
| **Expected outcomes and deliverables:** | Students will be given the opportunity to develop skills in statistical analysis, systematic reviews of literature, and contribute to written or visual reports associated with the project. The student may also have the opportunity to generate presentations for local or national conferences. These skills will give the student a substantial advantage with future research activities (e.g., PhD, and research assistant positions). |
| **Suitable for:** | Applicants with background knowledge of epidemiology, public health and physical activity are strongly encouraged to apply. |
| **Primary Supervisor:** | Dr Gregore Mielke<br>g.ivenmielke@uq.edu.au |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SPH#7** | **A review of propensity to engage in low-level crimes, including illicit tobacco purchasing** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30-36 hours |
| **Location:** | Herston: Oral Health / Edith Cavell Buildings |
| **Description:** | The proposed project will involve a review of scales measuring propensity to engage in low level crime.<br><br>Background: Multiple data sources show that Australians' use of illicit tobacco (e.g., illegally smuggled tobacco products from overseas) is increasing. The illicit tobacco trade causes substantial losses in tax revenue, funds organised crime syndicates, weakens public regard for the rule of law, and undermines Australia's world-leading tobacco control policies. Illicit tobacco purchasing is considered a 'low level' crime, akin to tax evasion (e.g., completing work for cash payments), buying pirated movies, or fare evasion. We are conducting a project that involves the development of a scale measuring susceptibility to illicit tobacco purchasing. To inform this project, we would like to conduct a review of existing scales, tools or screening measures assessing propensity to engage in low level crime. |
| **Expected outcomes and deliverables:** | The successful applicant can expect to gain experience in searching for peer-reviewed literature and grey literature, summarising research findings, and, if time permits, drafting an article summarising the review's findings. |
| **Suitable for:** | This project is ideal for a student with an interest in tobacco control, illicit drug markets, and/or criminal behaviour. This project would be best suited to a student with excellent academic writing skills and experience in searching for academic and/or grey literature. |
| **Primary Supervisor:** | Dr Cheneal Puljevic and Prof Coral Gartner<br>c.puljevic@uq.edu.au<br>NHMRC Centre of Research Excellence on Achieving the Tobacco Endgame |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SPH#8** | **Literature review of qualitative research exploring the feasibility and acceptability of tobacco endgame policies** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | Herston: Oral Health Centre |
| **Description:** | This project will involve a literature review of qualitative research that has explored the views of the general public or other stakeholders/experts on tobacco endgame policies. These are policies that aim to rapidly and drastically reduce smoking prevalence, such as reducing the number of retailers permitted to sell tobacco or only allowing the sale of tobacco products with non-addictive levels of nicotine. The project will involve searches of academic databases, collating research that meets eligibility criteria, and coding qualitative data using NVivo software. |
| **Expected outcomes and deliverables:** | Students will expected to identify relevant literature on the topic, and to extract information from the articles. Scholars will gain skills in literature reviews, qualitative research, and NVivo software package. |
| **Suitable for:** | Students with experience using Endnote and academic databases for literature searches. |
| **Primary Supervisor:** | Kylie Morphett<br>k.morphett@uq.edu.au<br>NHMRC Centre of Research Excellence on Achieving the Tobacco Endgame |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: SPH#9** | **Text Analysis of Learner Experience** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | In this project, you will be assisting us with qualitative data analysis. You will play a vital role in exploring and understanding qualitative data derived from written texts. In this exciting summer project, you will be able to explore the rich narratives and insights learners provide.<br><br>Through the analysis of written scripts, which could be essays, surveys, or open-ended responses, we aim to uncover hidden gems of wisdom and valuable feedback from these texts. Your role in this project will be integral as you assist in extracting, interpreting, and summarising these insights as simple graphs and tables. |

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| | By participating in the Text Analysis of Learner Experience project, you will gain valuable experience in qualitative data analysis and contribute to improving learners' educational experiences. Your work will be instrumental in uncovering the stories hidden within written texts, shaping the future of education, and making a meaningful impact in the field. |
| **Expected outcomes and deliverables:** | By participating in the Text Analysis of Learner Experience project, you will gain valuable experience in qualitative data analysis and contribute to improving learners' educational experiences. |
| **Suitable for:** | All students are encouraged to apply. |
| **Primary Supervisor:** | Dr Darsy Darssan<br>d.darssan@uq.edu.au |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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## First Nations Cancer and Wellbeing Research Program

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| **Project title: FNCWR#1** | **The landscape of cardiovascular risks communication and management in people diagnosed with cancer: a systematic review** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | In the ever-evolving landscape of oncology, the remarkable progress made in cancer treatments has undeniably extended the lives of many patients. However, this advancement is accompanied by an emerging concern: heightened cardiovascular risks among those diagnosed with cancer. Individuals battling cancer often encounter a myriad of challenges, among which cardiovascular complications are becoming increasingly prevalent. As the number of cancer survivors continues to grow, there is a pressing need to address the associated cardiovascular implications, ensuring both comprehensive treatment and patient awareness. The cardiovascular risks are frequently either under communicated or poorly managed, adding layers of complexity and threat to already-vulnerable populations.<br>The rationale for this review lies in its potential to identify gaps in the current approaches to communication and management of CVD risks in cancer patients, thereby offering actionable insights for clinicians, policymakers, and researchers. In addition, the review focus on exploration of racial and ethnic disparities addresses a critical and often overlooked dimension, revealing whether specific groups of cancer patients are disproportionately burdened by ineffective communication or suboptimal management of cardiovascular risks. By synthesising available evidence through an equity lens, the review aspires to contribute to a more just and inclusive healthcare framework, improving patient outcomes by tailoring interventions to the specific needs and contexts of diverse patient populations.<br><br>The aim of this systematic review includes 1) identifying existing cancer patients CVD risks communication and management strategies, 2) evaluating their acceptability and effectiveness and 3) examining disparities in risk understanding, communication, and management across different racial and ethnic groups. |
| **Expected outcomes and deliverables:** | Scholars will acquire the skill of developing search strategies, transferring articles to Endnote and screening tools, formulating the eligibility criteria and article screening, critique articles, and contribute to write-up of the article. |
| **Suitable for:** | Students considering Masters or PhD |
| **Primary Supervisor:** | Dr. Sewunet Belachew<br>s.admasubelachew@uq.edu.au<br>First Nations Cancer and Wellbeing Research Program |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: FNCWR#2** | **Cancer survivors' contraception choices and unplanned pregnancy among the Indigenous populations** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | One of the challenges of cancer survivors' is unmet needs in reproductive health needs such as contraception. There is limited awareness surrounding contraceptive choices among these unique community members. The consequences of a lack of awareness about contraception options are often related to unplanned pregnancies. Unplanned pregnancies can introduce an additional layer of complexity to the lives of cancer survivors, impacting not just their physical health but also their psychological and emotional well-being. This poses a multifaceted challenge that necessitates proactive intervention.<br><br>This review focused on understanding cancer survivors' contraceptive choices and the potential implications, specifically unplanned pregnancies. |
| **Expected outcomes and deliverables:** | The student will develop a search strategy to identify relevant articles using health databases and categorize the literature systematically using PRISMA guidelines, critically appraise and summarize research outcomes and also contribute to drafting a journal article to publish the research outputs. |
| **Suitable for:** | For students who want to expand their understanding regarding cancer and reproductive health, which are among the top health agendas nationally or internationally. The students will gain an opportunity of working collaboratively and expanding their network. |
| **Primary Supervisor:** | Dr Habtamu Bizuayehu<br>h.bizuayehu@uq.edu.au ;<br>First Nations Cancer and Wellbeing Research Program |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: FNCWR#3** | **Navigator-Led Interventions in Early Palliative Care Among Cancer Patients: A Rapid Review** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 23 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | Early palliative care interventions have demonstrated the potential to significantly enhance the quality of life for cancer patients. Navigator-led approaches are emerging as effective strategies to guide and support patients through the complexities of early palliative care. This rapid review aims to synthesize the existing literature on the effectiveness and impact of different navigator-led interventions in early palliative care settings, specifically among cancer patients.<br>The review will undertake a narrative synthesis of studies that have developed and implemented early palliative care interventions through various navigators.<br>The review will focus on studies that address the following aspects:<br>• The impact of Navigator-led early palliative care intervention programs across different cancer types, indigenous populations, and geographical locations.<br>• The role of different delivery personnel/professionals in early palliative care interventions.<br>• The cultural competency of these Navigator-led palliative care interventions.<br>Applicants will develop a comprehensive search strategy to identify articles written in English and published from January 2013 to June 2023. The student will identify and critically appraise the studies included in the final review.<br>The student will have the opportunity to draft a manuscript to summarize the research outputs together with other members of the team. |
| **Expected outcomes and deliverables:** | 1)Applicants will gain insights into current knowledge gaps in Navigator-led cancer care.<br>2)Applicants will develop a search strategy to identify relevant articles using health databases and appropriate search terms. They will learn to categorise the literature systematically using Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines.<br>3)Applicants will develop critical appraisal skills and summarize the research outcomes.<br>4)The applicant will develop scientific writing skills and contribute to drafting a journal article to publish the research outputs. |
| **Suitable for:** | We welcome applications from students with a range of backgrounds, including those in health sciences, clinical sciences, public health, and related fields. This project is particularly suited for individuals interested in cancer research (i.e., palliative care, cancer care, and healthcare interventions). |
| **Primary Supervisor:** | Dr Shafkat Jahan<br>shafkat.jahan@uq.edu.au ;<br>First Nations Cancer and Wellbeing Research Program |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: FNCWR#4** | **Review of pregnancy complications among Indigenous women with cancer** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | Cancer is related to poor pregnancy outcomes, while early management of pregnancy and improving positive pregnancy outcomes is a continued challenge. This could be partly attributed to the need for specialised teamwork between oncologists and obstetricians. There are also a lack of guidance and inconsistencies regarding the management plans for pregnancy among cancer survivors, a health system challenges to improve pregnancy outcomes.<br><br>This review aimed to understand the pregnancy complications of Indigenous women cancer survivors. |
| **Expected outcomes and deliverables:** | The student will develop a search strategy to identify relevant articles using health databases and categorise the literature systematically using PRISMA guidelines, critically appraise and summarise research outcomes and also contribute to drafting a journal article to publish the research outputs. |
| **Suitable for:** | For students who want to expand their understanding regarding cancer and maternal health, which are among the top health agendas nationally or internationally. The students will gain an opportunity of working collaboratively and expanding their network. |
| **Primary Supervisor:** | Dr Habtamu Bizuayehu<br>h.bizuayehu@uq.edu.au ;<br>First Nations Cancer and Wellbeing Research Program |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: FNCWR#5** | **Culturally responsive models of pancreatic cancer care for Aboriginal and Torres Strait Islander people** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30-36 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | The rapid review aims to describe the current evidence regarding the description, design, or evaluation of models of care for pancreatic cancer in Australia and/or models of cancer care for Aboriginal and Torres Strait Islander people. The review has commenced, but the successful student will assist with conducting an updated literature search, extraction of relevant data, and report writing. We encourage Aboriginal and/or Torres Strait Islander students to apply as well as any student who is planning on continuing to MPhil/PhD in a related area of research. |
| **Expected outcomes and deliverables:** | Develop and run a literature search<br>Assess eligibility of included papers using a pre-defined eligibility criteria<br>Extract relevant data from the included papers<br>May include drafting of sections of the manuscript |
| **Suitable for:** | We encourage Aboriginal and/or Torres Strait Islander students to apply as well as any student who is planning on continuing to MPhil/PhD in a related area of research.<br>This opportunity is most suitable to students who:<br>* Have a strong interest in Aboriginal and Torres Strait Islander health and/or interest in improving delivery of cancer care for complex cancers<br>* Have excellent attention to detail<br>* Are able to ask questions when needed<br>* Enjoy working in a high-paced team environment but also able to work independently when needed<br>Excellent writing skills preferred |
| **Primary Supervisor:** | Dr Abbey Diaz<br>abbey.diaz@uq.edu.au<br>First Nations Cancer and Wellbeing Research Program |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: FNCWR#6** | **Evaluation of wellbeing measure implementation into routine care for First Nations Cancer Patients in NSW** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30-36 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | Health services have an imperative to routinely collect Patient Reported Measures (PRMs) to inform patient and clinical decision making, service delivery, and improve patient outcomes. WM2Adults is a new holistic wellbeing measure developed with Aboriginal and Torres Strait Islander adults. We have partnered with the Cancer Institute NSW to assess the feasibility of implementing the WM2Adults measure within their existing PRM system. We are seeking a student researcher to assist us with the post-implementation evaluation phase of the project, which will involve the student assisting with aspects of qualitative analysis and write up of the evaluation. First Nations students are encouraged to apply. |
| **Expected outcomes and deliverables:** | The student will gain insight into qualitative evaluation and data analysis techniques, and contribute to the preparation of a journal article. |
| **Suitable for:** | We encourage First Nations students to apply, and are keen to hear from students who are considering a MPhil/PhD in this or a related field.<br>This opportunity is suited to students who are passionate about First Nations health and/or health services research, with an interest in developing qualitative research skills and experience. |
| **Primary Supervisor:** | Dr Kate Anderson<br>kate.anderson@uq.edu.au<br>First Nations Cancer and Wellbeing Research Program |
| **Contact info:** | Students are encouraged to contact the supervisor prior to submission of an application |

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| **Project title: FNCWR#7** | **What Matters 2Kids: Understanding wellbeing for First Nations children** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30-36 hours |
| **Location:** | Herston: School of Public Health Building |
| **Description:** | While all children face challenges associated with unprecedented environmental, social and technological change, First Nations children face additional challenges associated with inter-generational trauma resulting from the impacts of colonisation. A key obstacle to overcoming the disparities facing First Nations children is the lack of culturally appropriate measures to assess key outcomes, including wellbeing. The WM2Kids Project is developing a nationally relevant, strengths-based, and culturally grounded wellbeing measure for First Nations Australian children aged 5-11 years that is grounded in their experiences, values, and culture. We are seeking a student researcher to assist us with qualitative data analysis, and involvement in write up of the results. First Nations students are encouraged to apply. |
| **Expected outcomes and deliverables:** | The student will gain insight into wellbeing measures and qualitative data analysis techniques, and contribute to the preparation of a journal article. |
| **Suitable for:** | We encourage First Nations students to apply, and are keen to hear from students who are considering a MPhil/PhD in this or a related field.<br>This opportunity is suited to students who are passionate about First Nations health, children's health and/or health equity, with an interest in developing qualitative research skills and experience. |
| **Primary Supervisor:** | Dr Kate Anderson<br>kate.anderson@uq.edu.au<br>First Nations Cancer and Wellbeing Research Program |
| **Contact info:** | Students are encouraged to contact the supervisor prior to submission of an application |

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## Medical School

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| **Project title: MED#1** | **Digital Innovation within Rural Primary Health Care** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 25 hours |
| **Location:** | Toowoomba: Rural Clinical School |
| **Description:** | Improving healthcare delivery across Australia is a nation-wide priority across the health sector. Digital technology has the potential to revolutionise the way health services are provided, through efficient prevention and intervention within primary health care. Tracking and monitoring patient health, timely intervention to prevent disease progression, and real-time disease treatment and management can provide opportunities for improved health outcomes. The integration of digital technology has also been shown to improve health system efficiency, provide increased access to quality health care, enhance data collection and synthesis, and increased personalised approaches to prevention and intervention efforts. The use of innovative technologies to provide better health care and improved health outcomes is transforming the world. Despite the considerable progress made across the world, the scope for integrating digital health technology within primary health care that services rural or remote populations across the world remains unknown. This review aims to conduct a rapid review of the literature to collate existing evidence regarding the use and integration of digital health technology within primary health care services in rural or remote populations across the world. |
| **Expected outcomes and deliverables:** | Expected outcome - To describe the scope for digital health technology within primary health care that service rural or remote populations across the world. A journal manuscript will be produced, on which the student will be a co-author. |
| **Suitable for:** | Students interested in research and conducting a scoping review. Good data synthesis, extraction, and academic writing skills will be required. |
| **Primary Supervisor:** | Dr Bushra Nasir<br>b.nasir@uq.edu.au<br>Rural Clinical School research |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: MED#2** | **A systematic review of consumer engagement in rural health practice, research and education** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 25-30 hours |
| **Location:** | Toowoomba: Boyce Gardens |
| **Description:** | This systematic review will synthesise the evidence on consumer involvement in rural health practice, education, and research in order to identify key enablers and barriers to their participation. Findings will inform policy, practice, and research recommendations to maximise consumer involvement in all aspects of rural health, thereby ultimately improving outcomes for both consumers and health services.<br>Registered PROSPERO protocol<br>The review has commenced and screening is in progress. |
| **Expected outcomes and deliverables:** | Students will gain skills in the systematic review methodology and gain insights into rural health. They will work with the supervisor and other students, thereby gaining collaborative working skills. They will be a co-author on at least one paper. |
| **Suitable for:** | Students with previous experience of undertaking a literature review.<br>Students that are interested in research.<br>Students that are self-driven and can work collaboratively with a team. |
| **Primary Supervisor:** | Dr Priya Martin<br>priya.martin@uq.edu.au<br>Rural Clinical School research |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: MED#3** | **Silicosis: Harnessing new ideas to conquer the re-emergence of an ancient lung disease. The SHIELD Study** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | Chermside: Clinical Sciences Building,<br>Thoracic Department, The Prince Charles Hospital |
| **Description:** | The SHIELD study is a cohort study which is identifying risk factors for a diagnosis of silicosis and for progression. This Summer Project will allow the Scholar to join a well established research team in a supportive environment and participate in SHIELD data entry and analysis. All required approvals are in place. The SHIELD study is UQ Sponsored and is supported by the UQ instance of RedCap. Depending on interest, there are opportunities to obtain exposure to laboratory research, and basic laboratory techniques. This project would suit one or two Summer Scholars. |
| **Expected outcomes and deliverables:** | The Scholar will be expected to enter clinical data into a RedCap database. Training in RedCap is available. Aside from gaining skills in data collection, database use and analysis, the Scholar will contribute to publication. Opportunities to deliver an oral presentation at a local or national conference may be available. |
| **Suitable for:** | This project would suit an applicant with some experience of data collection and basic analysis. Prior experience with MS Excel and databases would be highly desirable. Prior experience with RedCap would be an advantage but is not essential. |
| **Additional requirements:** | Students will be required to obtain the following for this project. Information will be provided with an offer of placement.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases. As a minimum, evidence of Measles, Mumps, Rubella, Varicella, Pertussis and COVID-19 vaccination and TB assessment questionnaire will be necessary |
| **Primary Supervisor:** | Prof Dan Chambers<br>daniel.chambers@health.qld.gov.au<br>Qld Lung Transplant program Research Unit |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: MED#4** | **Modified release paracetamol overdose: are we doing better?** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Woolloongabba:<br>Clinical Toxicology Unit, Princess Alexandra Hospital |
| **Description:** | This is a retrospective observational series of modified release paracetamol poisoning following the release of Australian & New Zealand Guidelines for paracetamol poisoning in 2019 which changed management recommendations for this group.<br><br>This project is a collaboration among the Princess Alexandra Hospital Toxicology Unit, the Queensland Poisons Information Centre, the NSW Poisons Information Centre and the Prince of Wales Hospital Toxicology Unit.<br><br>Previous research has shown that modified release paracetamol overdose is more severe than immediate release preparation overdose and can cause liver injury even if the antidote acetylcysteine is provided early. Recent guidelines recommended increased doses of acetylcysteine and increased use of activated charcoal in an effort to address this.<br><br>The aim of the project is to determine whether management of these poisonings has improved following release of the guideline and would utilise the databases of the PA toxicology unit and the Queensland Poisons Information Centre. |
| **Expected outcomes and deliverables:** | Gain experience in undertaking a literature review, completing data collection for an observational series and assisting with data analysis.<br>It is an expectation that this research will be published in a peer review journal, the student will be included in the manuscript's authorship. |
| **Suitable for:** | Suitable for candidates with an interest in toxicology and with good attention to detail. Pre-med students preferred. |
| **Additional requirements:** | Students will be required to obtain the following for this project. Information will be provided with an offer of placement.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |
| **Primary Supervisor:** | A/Prof Katherine Isoardi<br>katherine.isoardi@health.qld.gov.au |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: MED#5** | **Adherence to non-invasive ventilation in children** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20 hours |
| **Location:** | South Brisbane:<br>Respiratory and Sleep Department, Queensland Children's Hospital |
| **Description:** | Some children require ventilator devices at home for use during sleep. We are exploring factors relating to their adherence with using these. Specifically, we are looking at whether spending one vs two nights in the hospital to start them on the device is associated with better adherence. |
| **Expected outcomes and deliverables:** | The student will be involved in collating de-identified data. They have the option of being involved in drafting a journal article and would be included as a middle author in any publication. They have the option of supervised tour/observership of the paediatric sleep laboratory in action to understand the data/scenario the research aims to address. |
| **Suitable for:** | Suitable for pre-med students |
| **Additional requirements:** | This project is located within a hospital site. Students may be required to obtain the following for this project. Information will be provided if this is necessary, but please discuss with the project supervisor.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases<br>• A Blue Card, for working with children |
| **Primary Supervisor:** | Dr Ajay Kevat<br>ajay.kevat@health.qld.gov.au<br>kids sleep research |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: MED#6** | **A systematic review of hospital ambulatory (outpatient) procedural outcomes** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | Chermside:<br>Cardiology Department, The Prince Charles Hospital |
| **Description:** | While hospitals are often associated with urgent or emergent care for acute illness, it is perhaps unappreciated that more than two-thirds of all hospital encounters in Australia and globally occur for elective (scheduled or planned) care. A large proportion of these is elective procedures for the diagnosis and treatment of a diverse array of conditions. These procedures largely fall into four distinct groups: (1) endoscopic procedures with or without intervention (such as gastrointestinal endoscopy, cystoscopy); (2) diagnostic and therapeutic procedures of the circulatory system (such as coronary angiography and percutaneous coronary intervention, endoluminal peripheral vascular intervention); (3) low- to moderate-risk day-only surgical procedures for a range of conditions; and (4) higher-risk procedures that are mostly performed electively but require admission to hospital for recovery (such as elective hip replacements and coronary artery bypass surgery). The number of elective and day-only procedures are ever increasing, driven by procedural advances such as minimally invasive techniques, and improvements in anesthesia, facilitating rapid recovery times and allowing more complex procedures to be performed on sicker patients as day procedures. Yet the outcomes of these procedures are poorly understood.<br><br>Accordingly, this project will undertake a systematic review and meta-analysis of outcomes of elective outpatient procedures to determine the overall incidence of adverse outcomes such as death, readmissions, and complications and how they vary among various types of procedures. Students are expected to learn systematic review and meta-analysis methodology, contribute to the conduct of the review including developing a search strategy, literature searching, screening for eligible studies and data extraction. Students will also contribute to the analyses of findings to formulate a manuscript for publication. |
| **Expected outcomes and deliverables:** | Students are expected to learn systematic review and meta-analysis methodology, contribute to the conduct of the review including developing a search strategy, literature searching, screening for eligible studies and data extraction. Students will also contribute to the analyses of findings to formulate a manuscript for publication. |
| **Suitable for:** | Suitable for students with an interest in medicine, epidemiology, allied or public health or with a specific interest in the topic. |
| **Additional requirements:** | Students will be required to obtain the following for this project. Information will be provided with an offer of placement.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases. As a minimum, evidence of Measles, Mumps, Rubella, Varicella, Pertussis and COVID-19 vaccination and TB assessment questionnaire will be necessary |

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| **Primary Supervisor:** | A/Prof Isuru Ranasinghe<br>i.ranasinghe@uq.edu.au<br>Cardiovascular Research Centre – Health services outcomes research |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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## Child Health Research Centre

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| **Project title: CHRC#1** | **Evaluation of Technology Use around Bedtime in Children with Neurodisability** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | South Brisbane:<br>Child Health Research Centre-UQ,<br>Centre for Children's Health Research Building,<br>Queensland Children's Hospital |
| **Description:** | This project is an evaluation of interview data from parents of children with neurodisability and aims to understand how technology is used around bedtime. The student will have the opportunity to work with an experienced qualitative researcher in our group to analyse the interview data. There will also be the opportunity to assist in analysing quantitative survey data which will compare the use of technology in neurotypical children with those with a neurodisability. The overall goal is to be able to inform the advice that we provide to families within the sleep clinic. It will also contribute to the advice within a larger clinical guideline for sleep in children with neurodisability |
| **Expected outcomes and deliverables:** | Scholars will gain skills in quantitative data analysis and survey data analysis. They will have the opportunity to contribute to publication and can also undertake oral presentation at the monthly research group meeting as well as other suitable forums. |
| **Suitable for:** | This project would be ideal for a student with a background in social science, psychology or a related field. It would also be suitable for someone who is pre-medical and wishes to gain insight into clinical research. Students considering a PhD would also be appropriate as this study has potential for expansion to further related work. |
| **Additional requirements:** | This project is located in a CHQ building. CHQ currently requires evidence of vaccination for COVID before providing access to the building. Information will be provided with offers of placements, if this requirement is still in place then.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |
| **Primary Supervisor:** | Jasneek Chawla<br>jasneek.chawla@health.qld.gov.au<br>Kids Sleep Research Group |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: CHRC#2** | **Measuring diet quality in children with cerebral palsy** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | South Brisbane:<br>Child Health Research Centre-UQ,<br>Centre for Children's Health Research Building,<br>Queensland Children's Hospital |
| **Description:** | This study aims to evaluate a measure of diet quality in children with cerebral palsy (CP) against a validated 3-day weighed food diary. The data for this study comes from a prospective cohort of children with CP born in Queensland, Australia.<br><br>The summer research students will use a modified Australian Recommended Food Score (ARFS) to score three-day weighed food diaries collected from children between the ages of 2 and 12 years. This will produce a modified ARFS total score and sub-scores (vegetable, fruit, meat/chicken/fish, vegetarian choices, grains, dairy, condiments, and water). The students will also classify the dietary intake reported in the weighted food diaries by food groups (cereals, fruits, vegetables, meat & alternatives, dairy and discretionary foods).<br><br>The relationship between total modified ARFS score and sub-scores, food groups, and macro- and micro-nutrient intake estimates from the 3-day weighed food diaries will then be assessed using linear regression, adjusting for total energy intake, age, sex, feeding difficulties and gross motor function classification system (GMFCS) level. The validation of a measure of diet quality in children with CP will allow us to explore the impact of diet quality on health outcomes in this population. |
| **Expected outcomes and deliverables:** | The student will gain experience in:<br>• Diet quality assessment<br>• Data scoring and classification (food diaries)<br>• Data management (cleaning, preparation, entry)<br>• Descriptive data analysis and linear regression |
| **Suitable for:** | This project is suitable for a Bachelor of Exercise and Nutrition Sciences student. There is sufficient work to facilitate 2 students. |
| **Additional requirements:** | This project is located in a CHQ building. CHQ currently requires evidence of vaccination for COVID before providing access to the building. Information will be provided with offers of placements, if this requirement is still in place then.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |
| **Primary Supervisor:** | Dr Stina Oftedal<br>s.oftedal@uq.edu<br>Queensland Cerebral Palsy and Rehabilitation Research Centre |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: CHRC#3** | **Advancing assessment and diagnostic practices for fetal alcohol spectrum disorder (FASD)** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | South Brisbane:<br>Child Health Research Centre-UQ,<br>Centre for Children's Health Research Building,<br>Queensland Children's Hospital |
| **Description:** | Contributing to a current research project in our Neurodevelopmental Clinic that is evaluating the assessment and diagnostic process for FASD. |
| **Expected outcomes and deliverables:** | Scholars will gain skills in assessment and diagnostic processes for FASD, data collection and analysis. |
| **Suitable for:** | Open to all students, but particularly suggested for students who may be considering a PhD. |
| **Primary Supervisor:** | Dr Natasha Reid<br>n.reid1@uq.edu.au<br>Fetal Alcohol Spectrum Disorder Research Collaboration |
| **Primary contact, if not supervisor** | Khari Garavelis, Project Coordinator<br>k.garavelis@uq.edu.au |
| **Additional requirements:** | This project is located in a CHQ building. CHQ currently requires evidence of vaccination for COVID before providing access to the building. Information will be provided with offers of placements, if this requirement is still in place then.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: CHRC#4** | **Building together: Better consenting practices for the most vulnerable in healthcare research** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 24 hours |
| **Location:** | South Brisbane:<br>Child Health Research Centre-UQ,<br>Centre for Children's Health Research Building,<br>Queensland Children's Hospital |
| **Description:** | In a life-threatening situation when urgent life-saving care in an intensive care unit (ICU) is required, any delay to receiving treatment may increase the likelihood of a poor clinical outcome. In such instances, obtaining prospective informed consent for research from substitute decision makers for adult patients, and the families/carers of a paediatric patient, is challenging. This can lead to a lack of evidence-based guidelines and new treatments for acutely ill patients, due to suboptimal research participation.<br><br>The importance of conducting high-quality research in ICUs has been recognised internationally. Across many jurisdictions, legislation has been amended to include consent approaches that, where the treatment is time-critical, permits researchers to administer experimental treatments prior to gaining consent. This approach seeks to gain consent from the participant or caregiver after the treatment has been administered, and the emergency nature of the clinical situation has passed. Although not labelled in the National Statement, this process is variably known as deferred consent, delayed consent, research without prior consent, or consent-to-continue. However, adoption of this approach is relatively recent, with 1) uncertainty about the acceptability to patients, families, clinicians, researchers and the general public, 2) inconsistency in nomenclature causing confusion and misinterpretation, and 3) discrepancies amongst human research ethics committee (HREC) interpretation of the guidance. A scoping review of published literature, current policies and guidelines has therefore been undertaken to inform consent practices in ICUs and understand the perceptions of a broad range of stakeholders involved in consenting practices.<br><br>The results of this scoping review will inform the development of future processes and materials to enhance understanding and implementation of delayed consent. |
| **Expected outcomes and deliverables:** | Scholars will gain experience in scoping review methodology, become well versed in the challenges associated with obtaining consent in an intensive care environment, and collaborate with a broad network of highly esteemed researchers and clinicians. This review will culminate in a publication, of which the scholar will be an author. |
| **Suitable for:** | Essential:<br>* Attention-to-detail<br>* Task-oriented<br>Highly regarded:<br>* Experience with consenting patients for research |

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| | * Experience in an intensive care environment |
| **Additional requirements:** | This project is located in a CHQ building. CHQ currently requires evidence of vaccination for COVID before providing access to the building. Information will be provided with offers of placements, if this requirement is still in place then.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |
| **Primary Supervisor:** | A/Prof Kristen Gibbons<br>k.gibbons@uq.edu.au<br>Children's Intensive Care Research |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: CHRC#5** | **Identifying barriers and facilitators to implementing adaptive trial designs in paediatric critical care: A mixed-methods study of PICU clinical trial researchers** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20 hours |
| **Location:** | South Brisbane:<br>Child Health Research Centre-UQ,<br>Centre for Children's Health Research Building,<br>Queensland Children's Hospital |
| **Description:** | Challenges in conducting randomised controlled trials (RCTs) in the paediatric intensive care unit (PICU) include heterogeneous patient cohorts, complex consent requirements and low mortality. Adaptive trial designs have been shown to improve the efficiency of RCTs and are often more cost-effective and can result in recruitment of fewer patients. Despite these advantages, only 3% of RCTs in paediatric critical care have incorporated an adaptive trial design. The reasons for the lack of adoption remains unclear. This is a mixed-methods project with two main aims: 1) Identify the barriers and facilitators to conducting adaptive RCTs in paediatric critical care, through surveying PICU clinical trial researchers, and 2) through interviews, learn from the experiences of PICU trialists who have incorporated adaptive trial designs to develop strategies for successful implementation. |
| **Expected outcomes and deliverables:** | Applicants will gain skills in survey design and data collection, quantitative data analysis of survey responses and qualitative analysis of interview transcripts. The applicant will contribute to the publication of this project. |
| **Suitable for:** | This project is open to students with an interest in the design and conduct of clinical trials. Would be a suitable project for students considering a PhD, who would like some research experience. It would be desirable for students to have some statistical programming experience preferably in R, or STATA/SPSS. Students who are interested in learning statistical programming are encouraged to apply. |
| **Additional requirements:** | This project is located in a CHQ building. CHQ currently requires evidence of vaccination for COVID before providing access to the building. Information will be provided with offers of placements, if this requirement is still in place then.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |
| **Primary Supervisor:** | Dr Trish Gilholm<br>p.gilholm@uq.edu.au<br>Children's Intensive Care Research Group |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: CHRC#6** | **Review and analysis of EEG data and correlation with clinical outcomes in children and adults** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | South Brisbane:<br>Child Health Research Centre-UQ,<br>Centre for Children's Health Research Building,<br>Queensland Children's Hospital |
| **Description:** | Brain connectivity is a metric of brain activity that assesses the strength of communication arising from brain regions in specific functional brain regions. The analysis of brain connectivity allows us to predict brain function following injury more accurately and monitor change during recovery. High-definition electroencephalogram (HD-EEG) is a neuroimaging technique that allows us to visualize brain function. Using EEGs collected in children with an acquired brain injury as well as neurodiverse children and adults who have received neurostimulation, the student will analyse the data using specific techniques and software to correlate with clinical outcomes.<br><br>The successful applicant(s) will gain unique experience in EEG analysis and use of analytical techniques and software. |
| **Expected outcomes and deliverables:** | Gain skills in data collation, review and analysis. The student will be exposed to different analytical techniques and develop tables and listing. |
| **Suitable for:** | This project is suitable for a student with a background in biomedical science with an interest in neuroscience. Experience in data handling a statistics would be welcome |
| **Additional requirements:** | This project is located in a CHQ building. CHQ currently requires evidence of vaccination for COVID before providing access to the building. Information will be provided with offers of placements, if this requirement is still in place then.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases<br>• A Blue Card, for working with children |
| **Primary Supervisor:** | Professor Karen Barlow<br>Acquired Brain Injury in Children |
| **Primary contact, if not supervisor** | Hema Moench<br>h.moench@uq.edu.au |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: CHRC#7** | **Profiling the expression of active genes and adaptive immune receptors on cancer cells to develop a deeper understanding of paediatric hematopoietic cancer** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | South Brisbane:<br>Child Health Research Centre-UQ,<br>Centre for Children's Health Research Building,<br>Queensland Children's Hospital |
| **Description:** | A cancer diagnosis at any age is upsetting, but felt more harshly when the patient is a young child who has only started out in life. Compared to adult cancer patients, the window of opportunity to help child cancer patients is especially short. We need to create an early warning system for paediatric cancers. Specialized immune cells known as T-cells and B-cells use specific receptors to recognize tumour antigens and fight cancerous cells. My lab's vision is to harness these cells and their receptors to enable early cancer detection and disease monitoring. These specific adaptive immune receptors are essential for all aspects of the T- and B-cell's life cycle, serving as natural 'time-keepers' of the immune response against cancer progression. We will create bespoke computational algorithms to explore the properties that define how effective these immune cells are in childhood cancer, perform high resolution gene expression profiling at the single-cell level and develop highly advanced computer models that can be used to detect adaptive immune receptors that are targeted towards cancer. The projects will be largely dry-lab based and the students will be expected to work on either of the following project topics: 1) evaluating machine learning models to classify paediatric cancer using T cell receptor repertoires; 2) Profiling the expression of active genes and adaptive immune receptors on cancer cells to develop a deeper understanding of paediatric hematopoietic cancer; or 3) Developing single-cell trajectory analysis methods for adaptive immune cells |
| **Expected outcomes and deliverables:** | The applicants can expect to learn skills in quantitative discipline for immunology research. They will gain skills in computational approaches for data collection and curation and the results may contribute to a publication from the group. The students will also be encouraged to present their work at the various student conferences that happen throughout the year across Brisbane. |
| **Suitable for:** | The projects will suit either an immunologist wanting to learn bioinformatics and/or a computer scientist who wants to apply their skills onto biological problems. Clinical or pre-med students who are keen to learn programming are also welcomed. Students considering a PhD will be highly considered. |
| **Additional requirements:** | This project is located in a CHQ building. CHQ currently requires evidence of vaccination for COVID before providing access to the building. Information will be provided with offers of placements, if this requirement is still in place then.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |

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| **Primary Supervisor:** | Dr. Zewen Kelvin Tuong<br>z.tuong@uq.edu.au<br>Computational Immunology |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: CHRC#8** | **Preschool HABIT-ILE** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | South Brisbane:<br>Child Health Research Centre-UQ,<br>Centre for Children's Health Research Building,<br>Queensland Children's Hospital |
| **Description:** | Young children with bilateral cerebral palsy (CP) often experience difficulties with gross motor function, manual ability and posture, impacting developing independence in daily life activities. Preschool HABIT-ILE (Hand Arm Bimanual Intensive Training Including Lower Extremity) is a novel intensive motor intervention that has been developed and tested in older children with unilateral and bilateral CP. This study aims to compare an adapted preschool version of HABIT-ILE to usual care in a randomised controlled trial. The Peabody Developmental Motor Scales-2 is the primary outcome and measures fine and gross motor skills. To determine responsiveness of the PDMS-2 it will be compared to the Canadian Occupational Performance Measure (COPM). The COPM is a measure of goal performance (rated by parents).<br>Students will categorise goals according to International Classification of Function (ICF) domains and link them to other relevant outcome measures (fine and gross motor outcomes). Students will summarise data descriptively. Responsiveness will be determined by correlation of change between the two measures. |
| **Expected outcomes and deliverables:** | Objectives/Outcomes<br>Students will gain skills in<br>1. coding the COPM goals according to International Classification of Function (ICF) domains<br>2. coding the COPM goals as they pertain to other gross and fine motor outcome measures<br>3. develop appropriate REDCap fields<br>4. data entry to excel and REDCap<br>5. data cleaning of demographic details<br>6. quantitative data analysis. |
| **Suitable for:** | allied health, occupational therapy, speech therapy, physiotherapy |
| **Additional requirements:** | This project is located in a CHQ building. CHQ currently requires evidence of vaccination for COVID before providing access to the building. Information will be provided with offers of placements, if this requirement is still in place then.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |
| **Primary Supervisor:** | Dr Andrea Burgess<br>a.burgess@uq.edu.au<br>Queensland Cerebral Palsy & Rehabilitation Research Centre |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: CHRC#9** | **Parent perspectives of participating in the ENACT study** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 25-30 hours |
| **Location:** | South Brisbane:<br>Child Health Research Centre-UQ,<br>Centre for Children's Health Research Building,<br>Queensland Children's Hospital |
| **Description:** | Researchers at The University of Queensland have developed an early intervention approach for families of babies with an increased chance of autism, that is, for babies with a first-degree relative (parent or sibling) on the autism spectrum.<br><br>The early intervention program, ENACT, is delivered online through an e-course, ENACT 101, combined with online clinical consultations to assist parents to tailor the intervention to best meet their own individual needs and the needs of their baby.<br><br>ENACT harnesses the power of parents' everyday interactions with their babies to support infant development - and parents' own wellbeing - from the earliest months.<br><br>We have conducted 10 qualitative interviews with parents who have completed ENACT. In this project, the student will be involved in transcribing the interviews and commencing the thematic analysis. |
| **Expected outcomes and deliverables:** | The student who completes this project will gain experience in qualitative data analysis. This will include transcribing participant interviews and commencing a thematic analysis of the data. |
| **Suitable for:** | Undergraduate students from HABS School would be well suited to this project. It would also suit students with an interest in parenting studies, ASD, and early childhood intervention. Students who are interested in completing a PhD and would like experience in an RCT study would also benefit from this project. |
| **Additional requirements:** | This project is located in a CHQ building. CHQ currently requires evidence of vaccination for COVID before providing access to the building. Information will be provided with offers of placements, if this requirement is still in place then.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |
| **Primary Supervisor:** | Dr Jacqui Barfoot<br>j.barfoot@uq.edu.au<br>Enact |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: CHRC#10** | **LEAP-CP (Learning through Everyday Activities with Parents) for First Nations Communities** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20 hours |
| **Location:** | South Brisbane:<br>Child Health Research Centre-UQ,<br>Centre for Children's Health Research Building,<br>Queensland Children's Hospital |
| **Description:** | Background: Cerebral palsy is the most common cause of childhood physical disability with significantly higher rates in Indigenous Australians (5x postnatally). Children with cerebral palsy are regularly diagnosed after 2 years, missing critical opportunities when brain development is greatest. Early interventions for babies at high risk of cerebral palsy with promising effects are available. We need to get them to the right children at the right time.<br><br>The LEAP-CP Project: We are recruiting 86 babies at risk of cerebral palsy aged 3-12 months living in Indigenous communities in Queensland to a randomised controlled trial; to receive a peer delivered multidisciplinary best practice treatment in the home (vs health advice). The intervention targets interaction, movement, nutrition, cognition, and parent coping and wellbeing. Babies are detected using smart-phone technology (General Movements app), which is able to predict CP with 98% accuracy from as young as 12 weeks. Parents know their babies best, live in the local community, & can provide effective peer support to other mothers. This makes them powerful change agents to deliver the therapy, particularly in remote communities.<br><br>The intern program will be assisting the research team in two key areas related to the LEAP-CP trial. (1) Baseline data management for the RCT (follow-up with clinicians, data entry in RedCAP, data cleaning and simple descriptive statistics); (2) Embedding Indigenous perspectives into the LEAP program: updating documents based on feedback from Indigenous Yarning Circles. |
| **Expected outcomes and deliverables:** | 1. Scholars will gain an understanding of commonly used gold standard child development assessments used in the RCT (including the Bayley, Peabody, Ricci scales for vision).<br>2. Scholars will gain skills in data management in RCTs; including coordination/ tracking data completeness in a multisite trial, data entry with RedCAP (research database), summarising data for interim reporting (simple descriptive statistics).<br>3. Scholars will gain an understanding of First Nations perspectives on an early family support program for infants with cerebral palsy; an understanding of the process of 'cultural adaptation of intervention programs'; working with a team to synthesise adaptations (including with the Indigenous Group Facilitator). |
| **Suitable for:** | Preferable for students training in a clinical area, such as Allied Health, nursing/ midwifery, public health. An interest in cross cultural/ Indigenous Health is also desirable. |

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| **Additional requirements:** | This project is located in a CHQ building. CHQ currently requires evidence of vaccination for COVID before providing access to the building. Information will be provided with offers of placements, if this requirement is still in place then.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |
| **Primary Supervisor:** | Dr Kath Benfer<br>k.benfer@uq.edu.au<br>Queensland Cerebral Palsy & Rehabilitation Research Centre |
| **Primary contact, if not supervisor** | Shaneen Leishman<br>s.leishman@uq.edu.au |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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## Centre for Health Service Research

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| **Project title: CHSR#1** | **Impact of disability on health-related quality of life amongst older Australians: Estimates from 20 waves of HILDA Survey** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 25-25 hours |
| **Location:** | Herston: UQ Health Sciences Building, Royal Brisbane and Women's Hospital |
| **Description:** | Background: This study aims to investigate the impact of different types of disabilities on health-related quality of life (HRQoL) among Australian older adults.<br><br>Methods: Longitudinal data were derived from twenty waves (2 through 21) of the Household, Income and Labour Dynamics in Australia (HILDA) Survey. HRQoL was captured using the 36-item Short-Form Health Survey (SF-36). The HILDA survey collects information on 17 types of disability. We categorised disability into sensory, physical, psychological, and other disabilities. Fixed-effects panel regression models were used to assess the associations between disability and HRQoL.<br><br>Results: We found that respondents with physical, psychological, and other disabilities have statistically significantly lower HRQoL than their counterparts on the SF-36 sub-scales, summary measures, and health-utility index.<br><br>Conclusion: These findings suggest that comprehensive health strategies addressing the complex needs of disabled individuals should be implemented to improve the HRQoL of older Australians. |
| **Expected outcomes and deliverables:** | The scholar will learn data management skills as well as econometric analysis experience. The scholar will produce a manuscript for publication in a top-quartile journal (Q1) under the supervision of the supervisor. |
| **Suitable for:** | This project is open to applications from students with a background in health economics, public health, or health sciences. |
| **Primary Supervisor:** | Dr Syed Afroz Keramat<br>s.keramat@uq.edu.au |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: CHSR#2** | **Efficacy of Lifestyle Interventions to Reduce the Risk of Parkinson's Disease Dementia** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Herston: UQ Health Sciences Building, Royal Brisbane and Women's Hospital |
| **Description:** | Twelve lifestyle risk factors (such as physical inactivity, low levels of cognitive and social engagement) are known to account for approximately 40% of all cases of dementia worldwide. For Alzheimer's disease these risk factors have been well characterised and many interventions focussed on these lifestyle factors are underway internationally.<br><br>Despite a large overlap in the neuropathology of Alzheimer's disease and Parkinson's disease, far less is known about the field of lifestyle risk factors and interventions to combat these for people living with Parkinson's disease. A scoping review will be conducted to map the literature and identify knowledge gaps in the emerging area of lifestyle interventions to improve cognition in people experiencing mild cognitive impairment or dementia related to Parkinson's disease. |
| **Expected outcomes and deliverables:** | The outcome will be co-authorship of a scoping review of lifestyle interventions for cognitive decline and dementia associated with Parkinson' disease. Students will learn valuable skills in conducting scoping reviews and systematic reviews |
| **Suitable for:** | This project would be suitable for bio-medical, pre-medical, psychology (and similar) students and any student interested in honours, research Masters or PhD studies. Basic understanding of research methodology is required but previous experience with scoping reviews or systematic reviews is not, as training will be provided.<br>Must be enthusiastic, motivated and keen to learn. |
| **Primary Supervisor:** | Dr Daniel Bailey<br>daniel.bailey@uq.edu.au<br>Dementia and Neuro Mental Health Research Unit |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: CHSR#4** | **Paediatric brain tumour patients in Queensland: How far do patients have to travel to get treatment** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | Herston: UQ Health Sciences Building, Royal Brisbane and Women's Hospital |
| **Description:** | The burden of paediatric brain cancer and treatment on children, families, health services and society is intense and prolonged. Although there is an explosion of research examining the advances in diagnostics, radiotherapy, and genomics informing targeted therapeutics and precision medicine, there remains a paucity of evidence to guide service development. In particular, there is scant evidence that describes the individual and societal resources required to treat and support children with brain cancer and their families.<br><br>This research is a secondary analysis of hospital administrative datasets capturing all patients aged 0-18 diagnosed with brain cancer, who received treatment in Queensland between 2008 and 2018. This research aims to understand the distance these patients need to travel to their treatment centre and how this impacts their outcomes.<br><br>Queensland has a unique challenge, covering a large geographical space with a small population. Hence an understanding of patients travel for treatment is crucial for health service planning. |
| **Expected outcomes and deliverables:** | 1. Applicants will learn about hospital administrative data<br>Applicants will utilise data from the Queensland Hospital Admitted Patient Data Collection, Emergency Department Data Collection, Perinatal Data Collection and Death Registrations/Cause of Death Unit Record File.<br><br>2. Applicants will further develop quantitative data analytical and data visualisation skills<br>Applicants will use software such as R or Stata to produce graphs and tables summarising the data to calculate distances travelled and the impact of this on health outcomes. Regression methods or other statistical analysis may be utilised to estimate impacts.<br><br>3. Applicants will develop scientific writing skills<br>Applicants will contribute to drafting a journal article to publish the results of the analysis. |
| **Suitable for:** | Students should have some experience in quantitative data analysis using either R, Stata, SAS, etc. (e.g. completed STAT1201 or PUBH2007 or PUBH7630) |
| **Primary Supervisor:** | Professor Jason Pole<br>j.pole@uq.edu.au<br>Administrative Data Analytics group |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: CHSR#5** | **Improving healthcare professionals' knowledge and understanding of frailty via online education courses** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 21 hours |
| **Location:** | Woolloongabba: Centre for Health Services Research, Building 33, Princess Alexandra Hospital |
| **Description:** | This research project aims to co-design online education courses for healthcare professionals to improve their knowledge and understanding of frailty. We are running focus groups, interviews and co-design workshops with consumers, healthcare professionals and healthcare students to design the content, look and feel, and functionality of the courses. Depending on the stage of the project at the start of the summer placement, the student will either be involved in: a) checking workshop transcripts against recorded videos of the workshops/focus groups/interviews to ensure that they are accurate + assist with the qualitative analysis of data, or b) helping to produce the online courses (e.g., writing scripts, storyboarding the course design, designing case studies etc.). Applicants do not need any prior experience as training will be provided. Knowledge of, or experience with, qualitative analysis is desirable. This project would suit students studying medicine or other health disciplines, including psychology. |
| **Expected outcomes and deliverables:** | The student will gain experience in qualitative analysis with the potential to contribute to a publication, depending on the stage of the project. They may also gain experience on online course development, web design, and translating research findings into practice. Depending on the stage of the project, the deliverables will be: a) qualitative analysis and completed codebook, or b) scripts and storyboard design for the online modules. |
| **Suitable for:** | Applicants do not need any prior experience as training will be provided. Knowledge of, or experience with, qualitative analysis is desirable. This project would suit students studying medicine or other health disciplines, including psychology. This project is especially well suited to those interested in pursuing a PhD in the future as it will expose them to a research environment. |
| **Primary Supervisor:** | Dr Kristiana Ludlow<br>k.ludlow@uq.edu.au<br>Geriatric Medicine group |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: CHSR#6** | **Advancing nutrition care in hospitals** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | Herston: UQ Health Sciences Building, Royal Brisbane and Women's<br>and<br>Woolloongabba: TRI Building, Princess Alexandra Hospital Woolloongabba |
| **Description:** | Malnutrition in hospitals is common, costly and contributes to adverse events in hospital. Evidence from clinical trials demonstrates that proactive nutritional intervention is effective, but practice audits consistently show that patients eat and drink poorly in hospital and that 1 in 4 have worsened nutritional status during their admission.<br><br>This placement will give the student the opportunity to work across 3 different research programs underway that focus on 1) improving measurement of the quality of nutrition care, 2) understanding patient perspectives on the term 'malnutrition' and 3) developing education materials to prevent malnutrition amongst older people in the community. The placement will offer the students diverse research opportunities, including experience using REDCap, developing a qualitative research protocol, working with consumers in research, and developing materials to support a clinical trial. |
| **Expected outcomes and deliverables:** | Gain experience in diverse research methods, opportunity to interact with consumers and clinician researchers within a health service, and contribute to a national clinical trial. There is an opportunity to present an overview of their placement at the Ageing and Geriatric Medicine student meeting. It is unlikely that this placement will result in a publication. |
| **Suitable for:** | All students |
| **Primary Supervisor:** | Dr Adrienne Young<br>a.m.young@uq.edu.au<br>Ageing and Geriatric Medicine |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: CHSR#7** | **Behaviour change and goal setting in the Transition Care Program** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | Woolloongabba: Centre for Health Services Research, Building 33, Princess Alexandra Hospital |
| **Description:** | The Transition Care Program is a slow stream rehabilitation program available for older adults leaving hospital. Our study aims to examine how the goals clients set impact their activity levels, quality of life and health outcomes. A behaviour change framework will be evaluated to understand if we can improve outcomes.<br><br>This placement would offer the student the opportunity to support the project in a number of ways, including through contributing to literature reviews, writing manuscripts, learning about REDCap data management software, evaluating manuals and improving training materials. |
| **Expected outcomes and deliverables:** | Applicants can expect to learn a wide range of skills in research and clinical trials, including understanding how clinical trials are set up, manuscript write-up and publication processes, data management software, and stakeholder engagement. |
| **Suitable for:** | Suitable for behavioural science, psychology and medical students. Some research experience preferred |
| **Primary Supervisor:** | Dr Natasha Reid<br>n.reid@uq.edu.au<br>Geriatric Medicine group |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: CHSR#8** | **Applied digital health research - healthcare AI** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Herston: UQ Health Sciences Building, Royal Brisbane and Women's Hospital |
| **Description:** | The Queensland Digital Health Centre (QDHeC) at the University of Queensland is a leading multidisciplinary research centre which has leveraged over AUD$46m from government, industry and universities to pioneer digitally-enabled health innovation and build smart healthcare systems. QDHeC's key healthcare partner, the state government health department, Queensland Health, has implemented a single instance of an electronic medical record (EMR) across the state; currently the richest repository of health data in Australia and one of the largest in the southern hemisphere. It represents approximately 70% of all hospital presentations and contains millions of outpatient and inpatient episodes of care including emergency presentations, allied health, surgical, maternity, pathology, radiology, bio-medical and medication records. QDHeC's researchers from across all university faculties and various disciplines (medicine, IT, business, maths, physics and data science), use cutting edge techniques in AI and machine learning applied to EMR and other sources of rich health data to accelerate delivery of new insights across the quadruple aims of healthcare. QDHeC serves as a truly multidisciplinary catalyst for collaboration among researchers, governments and industry.<br><br>QDHeC has an exciting opportunity for enthusiastic students to contribute to its healthcare AI program of work. You will work closely with research fellow Dr Lee Woods (primary care nurse with research expertise in digital healthcare transformation and workforce capability development in digital health) and QDHeC Deputy Director of Research, Professor Jason Pole (an internationally renowned epidemiologist and cancer survivorship expert with >30 years of methodological expertise in real-world data linkage and research platform development) to build new knowledge on applied digital health research and responsible healthcare AI. This work will have a focus on the consumer voice asking critical research questions about consumer acceptance of clinical healthcare data use for AI. We are particularly interested in the voice of marginalised populations and how to mitigate bias in large clinical datasets in which healthcare AI is trained. |
| **Expected outcomes and deliverables:** | Be a part of an interdisciplinary, world-class research organisation with leading clinician researchers.<br>Preparation of research manuscript(s) together with internal and external stakeholders.<br>Consumer co-design and research protocol development with an inclusive, innovative, future-focused research team with strong clinical partnerships. |
| **Suitable for:** | Enthusiastic students with a keen interest in technology and data to improve health and care.<br><br>Students with an open mind, and ability to collaborate with others on wicked healthcare problems to develop innovative solutions. |

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| | You do NOT need to have technical/coding/programming skills. This is human factors research in digital health and healthcare AI. |
| **Primary Supervisor:** | Dr Lee Woods and Prof Jason Pole<br>lee.woods@uq.edu.au<br>Queensland Digital Health Centre |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: CHSR#9** | **Improving Quality of Care for People with Dementia in the Acute Care Setting (eQC)** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Herston: UQ Health Sciences Building, Royal Brisbane and Women's Hospital |
| **Description:** | In this student research program, participants will have the opportunity to gain hands-on experience in conducting mixed methods research related to health care.<br><br>Project 1: For this aspect of the program, students will conduct qualitative analysis of patient interviews. As part of the process, students will serve as secondary data analysts, actively involved in conducting theme analysis on the interview data.<br><br>Project 2: Students will collaborate on a systematic literature review. Taking on the role of a secondary reviewer, participating in literature screening, data extraction, and quality assessment.<br><br>Project 3: This segment of the program centers on a mixed-method study, comprising both surveys and interviews. The student will serve as a secondary data analysts on quantitative and qualitative research. |
| **Expected outcomes and deliverables:** | The student will have the opportunity to contribute to research publications and deliver an oral presentation summarising their project findings. Expected deliverables include reports on each study and active involvement in research papers. This experience will enrich their research capabilities and provide tangible achievements for their academic and professional portfolios. |
| **Suitable for:** | Would suit 3rd year, honours students in health sciences related fields. Good working knowledge of statistical and qualitative analysis and strong writing skills will be highly regarded. |
| **Primary Supervisor:** | Dr Daniel Bailey<br>daniel.bailey@uq.edu.au<br>Dementia in the Acute Care Setting |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: CHSR#10** | **FITTEST study: slowing the progression of frailty in community-dwelling older adults** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | Herston: UQ Health Sciences Building, Royal Brisbane and Women's<br>and<br>Woolloongabba: TRI Building, Princess Alexandra Hospital Woolloongabba |
| **Description:** | The FITTEST trial aims to test the effectiveness of multicomponent interventions in slowing the progression of frailty amongst community-dwelling older adults. This is a national multi-centre randomised controlled trial, with recruitment planned to commence in Q1 2024.<br><br>This placement would offer the student the opportunity to support the set-up and operations of a large clinical trial. Activities may include setting up and testing databases, preparing training and operations manuals, piloting data collection procedures with consumers, and supporting research approvals. |
| **Expected outcomes and deliverables:** | Diverse experience gained in the operations of a national clinical trial and working within a multidisciplinary research group. The student will have the opportunity to present an overview of their placement to the Ageing and Geriatric Medicine team at the conclusion of their project. It is not anticipated that there will be a publication from this placement. |
| **Suitable for:** | All students |
| **Primary Supervisor:** | Dr Adrienne Young<br>a.m.young@uq.edu.au<br>Ageing and Geriatric Medicine |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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## UQ Centre for Clinical Research

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| **Project title: UQCCR#1** | **Understanding underlaying brain mechanisms of memory impairment in Parkinson's disease** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | Herston: UQCCR Building, Royal Brisbane and Women's Hospital |
| **Description:** | Memory deficits are prevalent among individuals living with Parkinson's disease and research indicates a strong correlation between these deficits and the eventual development of dementia. The aim of this project is to investigate the specific traits associated with memory impairment in Parkinson's disease as well as to investigate the relationship between the memory impairment and the hippocampal subfields in Parkinson's disease. |
| **Expected outcomes and deliverables:** | The student will have the opportunity to acquire practical, hands-on experience in various areas of research, including neurocognitive assessment, data analysis, and neuroimaging analysis. The student will also be granted the opportunity to observe face-to-face assessments conducted with individuals living with Parkinson's disease. This experience will foster a profound understanding of both the disease and its impact on cognitive function.<br>The outcome could potentially result in the submission of conference abstracts and contribute to the publication. |
| **Suitable for:** | This project is open to application from students with a background in neuroscience, psychology, student considering honours or PhD |
| **Primary Supervisor:** | Dr Ji Hyun Yang<br>j.yang1@uq.edu.au<br>Dementia and Neuro Mental Health Research Unit |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: UQCCR#2** | **Extracellular vesicle mediated targeting in gestational diabetes mellitus** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | Herston: UQCCR Building, Royal Brisbane and Women's Hospital |
| **Description:** | Gestational Diabetes Mellitus (GDM) is a form of diabetes first diagnosed during pregnancy and with a lesser degree of hyperglycaemia than overt diabetes. GDM is the fastest growing type of diabetes in the world and is the most common medical complication of pregnancy. Extracellular vesicles (EVs) are small nano sized vesicles involved in cell communication and involved in the pathophysiology of GDM. In this project we have identified that there are specific miRNA signatures in EVs that correlate to the changes in insulin sensitivity in GDM. This project will perform functional studies with regard to insulin sensitivity by over expressing the candidate miRNAs in insulin target cells and analysing the insulin stimulated glucose uptake and glucose metabolism in these cells. This study will provide insights into the function of EVs and the mechanism by which they alter insulin response in target cells. |
| **Expected outcomes and deliverables:** | Skills in cell culture and techniques related to extracellular vesicles |
| **Suitable for:** | Suitable for students with molecular biology background and considering to do PhD/Career in science. |
| **Primary Supervisor:** | Dr Soumyalekshmi Nair<br>s.nair@uq.edu.au<br>Translational Extracellular Vesicles in Obstetrics and Gynae-Oncology Group |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: UQCCR#3** | **Comparison of Different Mass Spectrometry Sample Preparation Techniques for Extracellular Vesicles** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20 hours |
| **Location:** | Herston: UQCCR Building, Royal Brisbane and Women's Hospital |
| **Description:** | For bottom-up or shotgun mass spectrometry proteomics, the sample needs to be digested into peptides. The sample preparation procedure varies depending on many factors. The project will involve the isolation of extracellular vesicles from human plasma, followed by various sample preparations. The goal is to gain knowledge about which sample preparation is most suitable for EVs. |
| **Expected outcomes and deliverables:** | Applicants will gain skills in data collection, isolation of extracellular vesicles, and mass spectrometry |
| **Suitable for:** | This project is open to students with previous experience in the laboratory, pre-medical provisional students, and students considering a PhD. |
| **Primary Supervisor:** | Dr Andrew Lai<br>a.lai@uq.edu.au<br>Salomon group |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: UQCCR#4** | **Investigating nucleic acids associated with extracellular vesicles** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Herston: UQCCR Building, Royal Brisbane and Women's Hospital |
| **Description:** | Our project proposes an exploration of the intriguing domain of nucleic acids associated with extracellular vesicles (EVs) to uncover their potential significance in disease diagnostics. Through the application of advanced molecular biology methodologies and comprehensive bioinformatics analysis, our research will delve into the nucleic acid profile of EVs, unravelling valuable insights into their potential diagnostic applications in various diseases. |
| **Expected outcomes and deliverables:** | You will gain skills in molecular biology, such as extracellular vesicle isolation, protein and nucleic acid quantification, and sequencing (if time permits) |
| **Suitable for:** | Students considering a PhD |
| **Primary Supervisor:** | Dr Dominic Guanzon<br>d.guanzon@uq.edu.au<br>Salomon group |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: UQCCR#5** | **Validation of biomarkers of breast cancer progression** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 25-30 hours |
| **Location:** | Herston: UQCCR Building, Royal Brisbane and Women's Hospital |
| **Description:** | While we talk about breast cancer as though it is a single disease, there are many different types and the WHO recognises more than 20 histological subtypes. We are using molecular pathology to better understand the natural history of the different subtypes and how we can appropriately target with therapy.<br><br>The lab has performed a series of spatial transcriptomic profiling studies using the 10X Genomics Visium platform. A number of candidate genes have been identified that appear to have a role in the progression from ductal to lobular growth pattern, characteristic of the Mixed ductal lobular breast cancer subtype. We will now use Immunohistochemistry to validate these candidates in a cohort of clinical samples. |
| **Expected outcomes and deliverables:** | Gain an understanding of translational research and working with clinical samples<br>-gain an understanding of breast cancer<br>-learn immunohistochemistry and related analyses<br>-contribute to a larger project and be named as an author on any future publications |
| **Suitable for:** | This project would be ideal for pre-med students or those considering a research career. |
| **Primary Supervisor:** | Dr Amy McCart Reed<br>amy.reed@uq.edu.au |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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## Frazer Institute

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| **Project title: FI#1** | **Understanding inflammatory responses of epithelial cell** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30-36 hours |
| **Location:** | Woolloongabba: Translational Research Institute, Princess Alexandra Hospital |
| **Description:** | The skin is a vital organ protecting us from external challenges such as injury and stress. Epithelial and immune cells in the skin play crucial and diverse roles during infection, inflammation and cancer. We have previously shown that NF-kB and cell death signalling are the key regulators of inflammation and immunity in the skin. Here we want to investigate in-depth mechanisms of epithelial inflammatory signalling pathways in regulating immune responses and tissue homeostasis. Understanding the signalling mechanisms will provide important clues to target underlying inflammatory conditions such as inflammatory skin diseases and cancer.<br><br>Specific aims of the project are to<br>1. Decipher stimulation-induced immune responses in epithelial and immune cells.<br>2. Study inflammatory signalling pathways regulating skin inflammation. |
| **Expected outcomes and deliverables:** | Students will gain experience in research laboratory skill and techniques, such as tissue culture, in vitro assays, immunohistochemistry, microscopy and Western Blot in a culturally diverse lab. Students will also develop the essentials skills required in science, such as protocol writing, data analysis, figure preparation and presentation, critical thinking etc. |
| **Suitable for:** | This project is suitable for students with a background in Biomedical Sciences and to the student who would like to follow a path to Honours or HDR. |
| **Primary Supervisor:** | Dr Snehlata Kumari<br>s.kumari@uq.edu.au |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: FI#2** | **Enhancing Natural Killer Cell-Based Immunity for Immunotherapy Against Solid Cancers** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 20-36 hours |
| **Location:** | Woolloongabba: Translational Research Institute, Princess Alexandra Hospital |
| **Description:** | In recent years, the pursuit of enhancing natural killer (NK) cell-based innate immunity has emerged as a promising avenue for immunotherapy targeting challenging solid cancers. Strategies such as chimeric antigen receptors (CAR) and monoclonal antibody (mAb) therapy have shown remarkable potential in activating NK-cell-mediated antibody-dependent cellular cytotoxicity (ADCC) against solid malignancies.<br><br>However, the battle against these formidable cancers is complex. Cancer cells possess an array of immunosuppressive mechanisms that they exploit to evade immune surveillance, potentially compromising the effectiveness of NK cell-mediated ADCC. Recognizing the urgency of the situation, the exploration of strategies to bolster the cancer-killing capabilities of NK cells has emerged as a rapidly evolving area of research.<br><br>The core objective of this project is to delve into the intricate mechanisms employed by cancer cells to subvert NK cell-based immunity. By dissecting these mechanisms, we aim to unravel the sophisticated tactics that cancer cells employ to counteract NK cell activity, thereby laying the groundwork for innovative interventions.<br><br>Our vision goes beyond mere understanding. We are dedicated to propelling the field forward by contributing critical insights that can ultimately shape the development of advanced immunotherapies. These future interventions hold the potential to unleash the full therapeutic power of NK cells against the most challenging and resistant "hard-to-cure" cancers.<br><br>By forging a comprehensive understanding of the intricate interplay between NK cells and cancer cells, we aspire to pave the way for groundbreaking strategies that circumvent immunosuppression and amplify NK cell-mediated cancer cell eradication. This project aspires not only to advance scientific understanding but also to impact the lives of countless individuals battling solid cancers that have thus far defied conventional treatments.<br><br>In the pursuit of our objectives, we are driven by the passion to transform the landscape of cancer immunotherapy. The collaborative efforts of our team, combined with cutting-edge techniques and a commitment to innovation, will be pivotal in realizing the full potential of NK cell-based immunotherapies.<br><br>Together, we embark on this journey to unveil the secrets of NK cell-cancer cell interactions and, in doing so, pave the way for a future where even the |

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| | most challenging solid cancers can be conquered through the power of enhanced innate immunity. |
| **Expected outcomes and deliverables:** | Participating in this project promises an enriching and transformative experience for scholars dedicated to advancing the frontier of cancer immunotherapy. Through active engagement, participants can anticipate gaining a diverse range of skills, knowledge, and professional growth opportunities. Here's a glimpse of what applicants can expect to gain from their involvement:<br><br>1. In-Depth Understanding: Scholars will acquire a comprehensive understanding of the intricate interplay between NK cells and solid cancer cells, diving into the realm of immunosuppressive mechanisms and the strategies that hold potential to overcome them.<br><br>2. Laboratory Proficiency: Participants will be immersed in cutting-edge laboratory techniques, honing their skills in cell culture, immune cell assays, and state-of-the-art analytical methodologies. This hands-on experience will contribute to their proficiency in experimental design and execution.<br><br>3. Data Collection and Analysis: Scholars will gain practical expertise in data collection, interpretation, and analysis. They will become adept at extracting meaningful insights from complex datasets, a crucial skill in modern biomedical research.<br><br>4. Collaboration and Networking: Engaging with a dynamic team of researchers will foster collaborative skills and provide exposure to a multidisciplinary research environment. Scholars will have the opportunity to forge lasting connections with experts, both within the team and beyond.<br><br>5. Scientific Communication: The project encourages effective scientific communication, with participants expected to contribute to a publication highlighting their findings. Scholars will gain insights into the publication process, enhancing their ability to present their work to a wider scientific audience.<br><br>6. Presentation Proficiency: As a culmination of their efforts, participants will be expected to deliver an oral presentation showcasing their project outcomes. This experience will not only strengthen their presentation skills but also empower them to succinctly convey complex scientific concepts.<br><br>7. Critical Thinking and Problem-Solving: Scholars will cultivate critical thinking abilities as they tackle intricate challenges in cancer immunotherapy. By devising innovative solutions, participants will sharpen their problem-solving skills, equipping them for future research endeavours.<br><br>8. Contribution to Future Therapies: The ultimate deliverable of this project is the potential to contribute to the development of novel |

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| | immunotherapies targeting "hard-to-cure" cancers. Scholars will play a pivotal role in advancing our understanding of NK cell-based immunity, potentially shaping the landscape of future cancer treatments. |
| **Suitable for:** | Students with a background in chemistry, biochemistry, cellular biology, immunology and biotechnology. |
| **Additional requirements:** | Students will be required to obtain the following for this project. Information will be provided with an offer of placement.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |
| **Primary Supervisor:** | A/Prof. Fernando Guimaraes<br>f.guimaraes@uq.edu.au<br>Guimaraes group |
| **Contact info:** | The supervisor CAN be contacted by students prior to submission of an application. |

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| **Project title: FI#3** | **Evaluating the effects of arginine depletion on pancreatic cancer survival** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Woolloongabba: Translational Research Institute, Princess Alexandra Hospital |
| **Description:** | This project looks at whether pancreatic cancer cell lines are susceptible to killing by arginine depletion. Arginine plays important roles in the metabolism of an organism. It is the precursor for the synthesis of proteins and other molecules of great biological importance, including nitric oxide, ornithine, polyamines, agmatine, proline, glutamate, creatine, dimethylarginine, and urea. The project will look at the impact of arginine depletion on the survival of 3 human pancreatic cancer cell lines in the laboratory. |
| **Expected outcomes and deliverables:** | The student can expect to learn tissue culture and the set up and analysis of assays that determine cancer cell viability and proliferation over time. The student will give an oral presentation to the lab group at the end of their project. |
| **Suitable for:** | This project is suitable for UQ students considering an Honours degree project in the field of cancer treatment. |
| **Additional requirements:** | Students will be required to obtain the following for this project. Information will be provided with an offer of placement.<br>• Evidence of vaccination or non-susceptibility for vaccine preventable diseases |
| **Primary Supervisor:** | A/Prof James Wells<br>j.wells3@uq.edu.au |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| Project title: FI#4 | Transcriptional Regulation of Long-Term CD8+ T Cell Memory |
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| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 30 hours |
| **Location:** | Woolloongabba: Translational Research Institute, Princess Alexandra Hospital |
| **Description:** | CD8+ T cells play a key role in destroying virus-infected cells and generating immunological memory, which provides long-term protective immunity. CD8+ T cell immunotherapy is emerging as a potent treatment to control chronic virus infections, but adoptively transferred CD8+ T cells are currently only short-lived, limiting their efficacy. Growth factor independent-1 (GFI1), a transcriptional repressor, plays a crucial role in T cell development, particularly in the maturation of T cells in the thymus. We observed that conditional deletion of GFI1 in CD8+ T cells leads to defective memory responses following chronic virus infection. Our data suggest that GFI1 expression is pivotal in maintaining long-term persistence of memory T cell responses following chronic virus infection. The aim of this project is to observe if GFI1 expression is selectively maintained in memory CD8+ T cells. To test this, we will quantify the expression level of GFI1 gene in different CD8+ T cell populations, for instance naÃ¯ve, effector and memory T cells, following virus infection in mouse model. The research will use novel reporter mice, such as ID3GFPxEomesmCherry and Tcf7GFPxEomesmCherry created in the Belz lab. The GFI1 gene expression in different T cell populations will be assessed using fluorescence-activated cell sorting followed by gene expression analysis with quantitative PCR (qPCR). The TaqMan probes for qPCR will quantify GFI1 expression in different T cell populations and compare this to expression levels of T cell factor 1, an established marker of memory T cells. The results will show if GFI1 expression acts to identify long-term memory T cell population, similar to T cell factor 1 expression. |
| **Expected outcomes and deliverables:** | This short project will identify the GFI1 expression levels in different T cell populations and help us better understand the transcriptional regulation of long-term memory CD8+ T cells. Furthermore, if GFI1 is selectively expressed in memory T cells in the mouse model, we will proceed and analyse the GFI1 expression levels in the human peripheral blood T cells. This would allow us to draw parallels between T cell responses in mouse model and humans and ultimately improve the adoptive immunotherapy by selective transfer of GFI1 expressing T cells to recipients. Thus, the project has clear translational potential.<br><br>The project employs cutting edge tools and applicant will learn a number of wet lab techniques, ranging from cell sorting, RNA isolation and qPCR gene expression analysis. These are advanced techniques, and having background knowledge of immunology would be helpful. However, support from the supervisor will ensure completion of the project in a timely manner. The applicant is expected to analyse the qPCR data and present this in the context of the project. The applicant will be assisted at each stage of the project starting from wet lab experiment to data analysis and presentation. Furthermore, the applicant will potentially contribute to a publication with the generated data. |

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| **Suitable for:** | Suitable for Hons. student with background in Immunology/Infection Biology. |
| **Primary Supervisor:** | Dr M. Zeeshan Chaudhry<br>mz.chaudhry@uq.edu.au<br>Australian Infectious Diseases Research Centre |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| Project title: FI#5 | Optimise the production of therapeutic T cells |
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| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 28-36 hours |
| **Location:** | Woolloongabba: Translational Research Institute, Princess Alexandra Hospital |
| **Description:** | Chimeric Antigen Receptor (CAR)-T cells have demonstrated remarkable efficacy in the treatment of various human cancers, particularly hematologic malignancies. These innovative cells are derived from the T cells present in the patient's own blood. Following extraction, they are genetically modified to express CARs and subsequently reintroduced into the patient for cancer therapy. However, it is evident that the current production process may not be optimised to its fullest potential. This is reflected in the restricted expansion of generated CAR-T cells and their limited persistence within the patient's body, ultimately compromising the overall therapeutic effectiveness.<br><br>In light of these challenges, there is a pressing need to enhance the manufacturing protocol of CAR-T cells. By leveraging our new discoveries into the regulation of T cell differentiation and survival, this project will pioneer novel strategies for refining the in vitro T cell cultivation process. The overarching goal is to bolster the functionality of these cells within the in vivo environment, thereby augmenting their therapeutic impact against cancer. |
| **Expected outcomes and deliverables:** | Knowledge of T cell immunobiology<br>T cell in vitro culture assays<br>Flow cytometry to measure T cell functionality |
| **Suitable for:** | Students with a background in biomedical sciences, who are considering an Honours and/or PhD. |
| **Primary Supervisor:** | Prof Di Yu<br>di.yu@uq.edu.au<br>Yu group |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: FI#6** | **To assess activation and function of T cells in 3D tumour cultures** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 24 hours |
| **Location:** | Woolloongabba: Translational Research Institute, Princess Alexandra Hospital |
| **Description:** | This project aims to develop an assay to monitor activation of T cells and killing of tumor cells using 3D tumour spheroids. Traditionally, activation of antigen specific T cells were assessed using chemically synthesized tetramers that contain fluorescent avidins displaying biotinylated peptide-MHC (pMHC) complexes of predicted neoantigens to matched MHC to screen for antigen-specific T cells in blood or in the tumour by flow cytometry. While this approach is effective for CD8+ T cells that can bind MHC bound peptides of high and low affinity, it is ineffective for CD4+ T cells that can bind MHC II peptides of low affinity. Furthermore, tetramer-based assays do not account for efficient processing of antigens by the cell machinery, loading onto MHC and presentation on the cell surface for T cell binding. By using an alternative assay in which antigen presenting cells derived from the patient's and mouse blood used to present antigens from the tumour can enhance of ranking peptides. And by assessing antigen-specific killing of patient or mouse-derived tumor cells in 3D culture, narrows the search for T cell-based antigen screening to advance credible identified hits for selection in preclinical studies. |
| **Expected outcomes and deliverables:** | The successful applicant can expect to gain further expertise in the use three-dimensional (3D) tumour culture systems to understand T cell function in vitro. This is important in developing novel assays to assess the function of T cells and antigen presentation capabilities of tumour cells. This can lead to publication quality data, the opportunity to presenting research findings in oral presentations and be competitive in applying for further research opportunities. |
| **Suitable for:** | Students with background in microscopy and image analysis, culture of tumour cell lines and primary immune cells, immunofluorescence staining and cryosectioning of OCT embedded tissues. While experience is desirable, training will be provided. |
| **Primary Supervisor:** | Dr Joseph Yunis<br>j.yunis@uq.edu.au<br>Yu group |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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## QIMR Berghofer Medical Research Institute

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| **Project title: QIMRB#1** | **Improving bone marrow/stem cell transplant outcomes through pre-transplant modulation of donor T cell function** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Herston: QIMR Berghofer |
| **Description:** | Background & Hypothesis: Donor stem cell/bone marrow transplantation (allo-SCT/BMT) is an important curative therapy in the treatment of blood cancers, however its application is limited by serious complications such as graft-versus-host disease (GVHD) that have a significant impact on patient mortality and quality of life. Early inflammatory responses during preparative transplant conditioning initiate a cascade of adaptive immune responses that manifest as acute and/or chronic tissue damage in >50% of transplant recipients. GVHD treatment options are relatively limited and focused on immunosuppression and steroidal therapy, which are problematic due to opportunistic infection and refractory disease, therefore new therapies are urgently needed. Donor-derived T cells are known to be the key drivers of GVHD pathology but are also critical to maintain ongoing anti-tumour immunity, also known as Graft-versus-leukemia (GVL) effects, which prevent cancer relapse in these patients. Identifying novel ways to target GVHD whilst maintaining GVL is key to improving patient outcomes. We propose that in vivo screening of potential therapeutic targets via manipulation of donor T cells pre-transplant will accelerate therapeutic development in this area.<br><br>Aims & Approach: In this study, we will utilise recent advances in CRISPR-mediated gene therapy to modulate T cell function in naïve primary T cells for allo-SCT. This will involve optimisation, testing and validation of CRISPR gene editing of novel targets in naïve mouse T cells in vitro prior to transplant into allogeneic mice. |
| **Expected outcomes and deliverables:** | Students will develop new skills in techniques relevant to immunology research such as immune cell isolation, gene modification and exposure to in vivo models of inflammatory disease. This is an ideal opportunity to gain experience in the laboratory and will aid in future career choices (e.g. Honours, PhD & beyond). Students will be expected to produce either a report or poster and a short oral presentation at the end of their project. |
| **Suitable for:** | We are looking for students with a strong interest in immunology who are keen to learn new techniques relevant to the field, e.g. flow cytometry, immune cell isolation, in vitro cell culture etc. |
| **Primary Supervisor:** | A/Prof Kate Gartlan<br>Kate.Gartlan@qimrberghofer.edu.au ;<br>QIMR Berghofer Immunopathology |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: QIMRB#2** | **Quantifying the use of newly proposed melanoma excision services in Australia** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Herston: QIMR Berghofer |
| **Description:** | Australia has the highest incidence rates of melanoma in the world, contributing to significant financial burdens on the Australian healthcare system. Complete excisions of suspicious melanoma remain the recommended diagnostic procedure for aiding melanoma diagnosis. From November 1 2022, new Medicare Benefit Schedule (MBS) items were introduced to resolve confusion around the claiming of excisions for melanoma. Using readily accessible data, this study aims to quantify the use of these new MBS items across Australia and the financial implications of their use. |
| **Expected outcomes and deliverables:** | Participants will learn about the diagnostic procedures for managing melanoma, gaining skills in data extraction, descriptive data analysis, health economics, publication writing and/or presentation development. |
| **Suitable for:** | Anyone interested in skin cancer/melanoma, with experience in Excel and basic analytical skills (or hoping to learn such skills). |
| **Primary Supervisor:** | Dr Daniel Lindsay<br>Daniel.lindsay@qimrberghofer.edu.au ;<br>QIMR Berghofer Health Economics |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: QIMRB#3** | **Evaluate blood cell free DNA for detection of actionable mutations for advanced lung cancer** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Herston: QIMR Berghofer |
| **Description:** | We work across multiple different cancer types using a wide range genomics data, including whole-genome, whole-exome, panel sequencing and transcriptome to understand cancer development and treatment of cancer patients. Background: Lung cancers remain the leading cause of mortality from cancer representing 18% of all cancer's death, with a 5-year survival of only 10 to 20%. Most lung cancer patients are diagnosed at advanced stages of disease. For the majority of these patients the main method to acquire tumour material for diagnosis, staging and genomic testing are small biopsies. One of the main limitations for patients to receive genomic testing to inform their treatment in the clinic, is the lack of suitable tumour tissue for testing. The above project will use whole genome sequencing of advanced lung cancers and panel sequencing of blood samples from the same patients. Aim: The aim of this project is to compare the potential of tissue and blood samples to detect mutations that can inform treatment options for advanced lung cancer patients. Outcome: The results of the project will aid evidence of suitability of blood as an alternative source of material genomic testing to improve testing rates in advanced lung cancers in the clinic. Genomic testing guarantees equality of patients access to the best cancer treatment as possible. |
| **Expected outcomes and deliverables:** | The candidate with work closely with bioinformaticians and cancer biologists. Student will have access to a unique data set and will learn about lung cancer biology, actionable mutations detection and sequencing technologies used to detect mutations. The student will learn how to summarize, compare and interpret sequencing data sets. |
| **Suitable for:** | Applicants require some computational skills so suited for bioinformatics students with interest in cancer genomics. The project requires bioinformatic analysis for interpretation of sequencing results. Thus, knowledge of python or R are required to be able to compare sequencing data sets. |
| **Primary Supervisor:** | A/Prof Katia Nones<br>Katia.Nones@qimrberghofer.edu.au ;<br>QIMR Berghofer Medical Genomics |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: QIMRB#4** | **How does osteopontin in milk affect neonatal microbiome composition, the metabolome, and immune development to protect from disease?** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Herston: QIMR Berghofer |
| **Description:** | Factors in the milk, such as sugars, microbes and growth factors promote growth and immune development. This is partly achieved via the assembly of the gut microbiome. Infants who are breast-fed are at lower risk than those who are fed formula, although the underlying mechanisms are unclear. We have shown that osteopontin in milk confers protection against infection and that this is mediated by an increase in the number of dendritic cells and regulatory T cells, an effect that appears to be downstream of changes to the microbiome and metabolome (metabolites in serum). We are now seeking to elucidate the specific microbes, metabolites and cellular pathways that link OPN to immune development. |
| **Expected outcomes and deliverables:** | You will learn several skills in relation to the conduct of rigorous biomedical research. You will be taught how to excise and process tissue from mice, and trained to perform a number of cellular and molecular techniques (flow cytometry, immunohistochemistry, ELISA, etc). You will be supervised in the lab by a postdoc and PhD students. If appropriate you will be co-authored on publications, and outstanding students will be encouraged to stay on for Hons and PhD. |
| **Suitable for:** | Those with an interest in immunology or microbiology, and a willingness to learn. |
| **Primary Supervisor:** | A/Prof Simon Phipps<br>simon.phipps@qimrberghofer.edu.au ;<br>QIMR Berghofer Respiratory Immunology |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: QIMRB#5** | **Targeting Breast Cancer and Metastasis by Oligonucleotide Therapeutics with Lipid Nanoparticle (LNP) Delivery System** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Herston: QIMR Berghofer |
| **Description:** | Background: Cancer is the second leading cause of death worldwide. The major cause of cancer-related mortality (~90%) is due to metastasis. Breast cancer (BC) is the most commonly diagnosed cancer among women. Of the 10,000 Australians that live with metastatic breast cancer only 32% are alive after 5-years (relative survival-rate). While current cancer treatments mostly focus on targeting the primary tumours, the treatment or prevention of metastasis continues to have limited success. We have shown genetic inhibition of Cep55 reduces cancer progression and metastatic potential in mouse models. However, Cep55 is considered undruggable due to its coiled-coil structure; therefore, we have proposed an innovative approach using the antisense-oligonucleotides (ASOs), to inhibit Cep55 expression at the mRNA level. This strategy will generate a proof-of-concept, highlighting the ability and effectiveness of targeting undruggable and hard-to-treat cancers (invasive, aggressive, and advanced cancers) and metastasis preclinically through pilot studies in-vitro and in-vivo. Aims: 1) Screen ASOs in a range of human and mouse metastatic and triple-negative breast cancer cell lines. 2) Evaluate preclinically whether ASO-Lipid nanoparticles (LNP) impedes breast cancer growth, progression, and spread and examining the efficacy, stability, specificity, and toxicity in-vivo. 3) Investigate the mechanism of action and functional role of Cep55 in tumour-microenvironment and metastasis by spatial transcriptomics. |
| **Expected outcomes and deliverables:** | We expect this project will generate proof-of-concept data on the effectiveness of the ASO-LNP system and provide an on-target mechanistic validation in preclinical models of breast cancer. We anticipate this strategy pave the way for a resolution to treat patients with aggressive cancers and overcome the metastatic burden. Project tasks: This project will apply a wide range of techniques in medical research, cell biology and tumour immunology to target the cancer cells, mouse works and the student will become familiar with these techniques and possibly be involved in the publication depending on the achieved results. |
| **Suitable for:** | Suitable for Honours and pre-med students |
| **Primary Supervisor:** | Dr. Behnam (Ben) Rashidieh<br>Behnam.Rashidieh@qimr.edu.au ;<br>QIMR Berghofer Signal Transduction |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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| **Project title: QIMRB#6** | **Improving diagnostic processes for regulatory region variants** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Hours expected per week: 36 hours |
| **Location:** | Herston: QIMR Berghofer |
| **Description:** | Hereditary disease diagnosis has improved dramatically in recent times due to improvements in genomic sequencing technology. The majority of work however has centered on the diagnosis of gene variants in the protein coding region of the genome. The non-coding region of the genome remains an unexplored and underdiagnosed area. In particular, variants in regulatory regions have a high likelihood of impacting gene function and causing disease, but few have sufficient available information to determine if they cause disease in a patient. This project centers on translating research methods into evidence informed clinical process for non-coding variant interpretation. There are many bioinformatics tools that are being used in a research context to identify and understand non-coding variants and predict variant impact on function, however their accuracy and best use in clinical application is not well understood. This project aims to identify improved methods for diagnostic evaluation of non-coding variants through computational prediction of variant impact. To achieve this we will investigate some of the many bioinformatics tools available, identifying which are applicable to non-coding variant diagnostics. We will prioritise the most practical tool/s (we have already developed an extensive database of potential tools) and use a set of established non-coding disease variants to assess the clinical reliability of these tools for genetic variant interpretation. This project will evidence applicability of new methods for non-coding variants in inherited disease diagnosis, and develop processes or the appropriate use of these tools in a clinical setting. |
| **Expected outcomes and deliverables:** | Students will learn processes relevant to applied genomic diagnostics, specifically in variant curation. Scholars may gain skills in data collection, analysis and bioinformatics, but do not necessarily need to be an expert bioinformatician as this project is focussed on the aspect of clinical translation. Tools used will be selected based on the student's prior-experience/ability. In this project students will have an opportunity to inform clinical genomics process and may also be asked to produce a report or oral presentation at the end of their project. This work is intended to contribute to a publication. |
| **Suitable for:** | Students would require a basic understanding of human genetics and would benefit from some understanding in genomics, basic statistics or bioinformatics. An interest in learning |
| **Primary Supervisor:** | Dr Rehan Villani<br>rehan.villani@qimrberghofer.edu.au ;<br>QIMR Berghofer Molecular Cancer Epidemiology |
| **Contact info:** | The supervisor MUST be contacted by students prior to submission of an application. |

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## Mater Research Institute – UQ

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| **Project title: MRIUQ#1** | **Optimisation of multi-parameter flow cytometry panel for T cell characterisation in humanised mouse models** |
| **Project duration, hours of engagement** | 6 weeks from 8th January to 16th February 2024<br>Approximately 23 hours/week.<br>Attendance at training sessions and seminars relating to flow cytometry training. |
| **Description:** | Type 1 diabetes (T1D) is an autoimmune disorder resulting from T cell mediated destruction of pancreatic insulin producing beta-cells. Much of our understanding of the disease pathophysiology comes from studies in preclinical models. Non-obese diabetic (NOD) mouse has been indispensable for T1D research. However, many successful therapies in mice failed to translate into humans.<br>Humanised mouse models (animals with engrafted human immune system) have been successfully used in the immuno-oncology field and are gaining significant interest in other research areas. These state-of the-art models allow us to study immune responses to therapeutics allowing a more rapid translation into clinic. This pilot study will aim to optimise a multiparameter spectral flow cytometry panel to be used for in-depth characterisation of T cells in humanised mouse models.<br>Specific tasks will include:<br>Wet lab:<br>- Titration of antibodies<br>- Acquisition of samples on flow cytometer<br>Dry lab:<br>- Basic analysis using flow cytometry software<br>- High dimensional clustering analysis (time permitting)<br><br>No previous flow cytometry / spectral flow cytometry experience necessary, the training will be provided.<br>Some training involves online workshop and seminar attendance and the applicant must be self-driven to acquire the knowledge necessary for this project. |
| **Expected outcomes and deliverables:** | The Glycation and Diabetes Laboratory is located at the TRI and applicant will be expected to attend in-person. This will give an opportunity to gain wet laboratory skills and acquire data for this project.<br>The spectral flow cytometry is highly advanced technique and will require either prior knowledge or willingness to learn and participate in the extensive training (both in-person and online tutorials). The applicant will be provided with guidance on how to analyse and interpret the flow cytometry data they acquire. The applicant may be asked to present in the laboratory meeting. Students may also be asked to produce a report or oral presentation at the end of their project. |
| **Suitable for:** | Individual needs to be self-driven, motivated, and willing to learn. In-person attendance is necessary due to the nature of the project. |
| **Primary Supervisor:** | Dr Irina Buckle |
| **Further info:** | Please contact Dr Irina Buckle on Irina.buckle@mater.uq.edu.au |

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| **Project title: MRIUQ#2** | **Stillbirth trends in Australia over time** |
| **Project duration, hours of engagement & delivery mode** | 6 weeks from 8th January to 16th February 2024<br>20hrs per week<br>Project can be completed under a remote working arrangement, ideally completed on-site. |
| **Description:** | The primary goal of this research study is to analyse and understand the trends in stillbirth rates across Australia over a specified period. By examining the patterns, changes, and potential influencing factors, the project aims to contribute to a deeper comprehension of stillbirth occurrences and support evidence-based strategies for prevention and intervention.<br><br>The research will employ a retrospective observational design, utilizing national stillbirth data collected over the past two decades. Both quantitative and qualitative analysis techniques will be employed to ensure a comprehensive understanding of the trends and potential factors surrounding stillbirths. |
| **Expected outcomes and deliverables:** | Students will gain skills in the following areas and will have an opportunity to generate a publication:<br>• Data Collection: Acquiring stillbirth data from national reports.<br>• Data Analysis: Utilizing statistical tools to analyse the data, the study will examine trends, variations, and potential correlations between stillbirth rates and various factors.<br>• Comparative Analysis: The research will involve a comparative analysis of stillbirth rates across different time periods.<br>• Qualitative Insights: Qualitative data, such as healthcare policies, changes in healthcare practices, and public awareness campaigns, will be collected and analysed to provide context to the quantitative findings.<br>• Interpretation of Findings: Drawing conclusions from the data analysis, the study will offer insights into the changes in stillbirth rates over time, potential contributing factors, and implications for healthcare policy and practice. |
| **Suitable for:** | This project is open to applications from students with experience or interest in clinical and epidemiology research in 3rd or 4th year. |
| **Primary Supervisor:** | Dr Jessica Sexton |
| **Further info:** | Contact Dr Jessica Sexton: jessica.sexton@mater.uq.edu.au |

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| **Project title: MRIUQ#3** | **Risk of stillbirth among First Nations women** |
| **Project duration, hours of engagement & delivery mode** | 6 weeks from 8th January to 16th February 2024<br>20hrs per week<br>Project can be completed under a remote working arrangement, ideally completed on-site. |
| **Description:** | This project is a systematic review that aims to comprehensively examine the existing body of literature regarding risk of stillbirth among First Nations women in Australia. By aggregating and critically analyzing available research, the study seeks to identify key risk factors, contributing causes, and potential interventions to mitigate the incidence of stillbirth within this specific population.<br><br>The research will adhere to established guidelines for conducting systematic reviews and will use the software COVIDENCE. A structured approach will be followed, including defining search criteria, screening articles for relevance, assessing their quality, and synthesizing findings to draw evidence-based conclusions. |
| **Expected outcomes and deliverables:** | The systematic review is expected to provide a comprehensive overview of the risk factors associated with stillbirth among First Nations women in Australia. By synthesizing existing research, the study will offer insights into patterns, gaps, and the overall quality of evidence in this area. This student will have an opportunity to publish the study results.<br><br>Key outcomes include:<br>• Search Strategy: Develop a well-defined search strategy targeting academic databases, medical journals, and gray literature. Search terms will include variations related to "stillbirth," "First Nations," "Indigenous," "Aboriginal," “First Nations”, “Torres Strait Islander”, "risk factors," and "Australia."<br>• Study Selection: Apply predefined inclusion and exclusion criteria to screen identified articles. Articles meeting quality and relevance criteria will be selected for further analysis.<br>• Quality Assessment: Employ standardized tools to assess the quality of selected studies. This step ensures that the review includes robust and credible research.<br>• Data Extraction: Systematically extract relevant data from the selected studies, including study characteristics, sample sizes, methodologies, risk factors identified, and outcomes related to stillbirth among First Nations women.<br>• Data Synthesis: Analyse the extracted data using appropriate synthesis methods, such as thematic analysis, to identify recurring risk factors, trends, and disparities specific to the First Nations population.<br>• Quality of Evidence: Assign levels of evidence to the synthesized findings based on the quality and strength of the included studies.<br>• Identify Gaps and Recommendations: Identify gaps in the current knowledge base and propose recommendations for future |

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| | research, interventions, and policy changes to address the identified risk factors. |
| **Suitable for:** | This project is open to applications from students with experience or interest in clinical and epidemiology research in 3rd or 4th year. |
| **Primary Supervisor:** | Dr Jessica Sexton |
| **Further info:** | Contact Dr Jessica Sexton: jessica.sexton@mater.uq.edu.au |

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| **Project title: MRIUQ#4** | **Perinatal mortality in rural and remote communities** |
| **Project duration, hours of engagement & delivery mode** | Six weeks<br>20hrs per week<br>Project can be completed under a remote working arrangement, ideally completed on-site. |
| **Description:** | The primary objective of this epidemiological research study is to investigate the rates and underlying factors contributing to perinatal mortality in rural and remote communities. By examining the unique challenges faced by these communities, the study aims to identify disparities, potential risk factors, and avenues for improving perinatal health outcomes in these underserved areas. |
| **Expected outcomes and deliverables:** | This research is expected to yield a comprehensive understanding of the perinatal mortality landscape in rural and remote communities. By identifying risk factors and disparities, the study will contribute to evidence-based strategies that aim to reduce perinatal mortality rates and enhance maternal and infant health in underserved areas. This project will contribute to a peer-reviewed publication.<br><br>Key outcomes include:<br>• Literature Review: Conduct a thorough review of existing literature on perinatal mortality, healthcare access, socio-economic factors, and cultural considerations in rural and remote communities. This review will inform the research focus and provide context.<br>• Data Collection: Collect quantitative data from health databases, registries, and healthcare institutions to determine perinatal mortality rates in rural and remote areas. Qualitative data will be gathered through culturally sensitive interviews or focus group discussions with community members and healthcare professionals to explore local perspectives.<br>• Data Analysis: Utilize statistical analysis to examine perinatal mortality rates, demographic trends, and potential correlations with factors such as distance from healthcare facilities, socio-economic status, and availability of prenatal care.<br>• Risk Factor Identification: Identify specific risk factors contributing to perinatal mortality within rural and remote areas.<br>• Intervention Strategies: Based on the findings, develop recommendations for interventions and strategies that address the identified risk factors and improve perinatal health outcomes in these communities. |
| **Suitable for:** | This project is open to applications from students with experience or interest in clinical and epidemiology research in 3rd or 4th year. |
| **Primary Supervisor:** | Dr Jessica Sexton |
| **Further info:** | Contact Dr Jessica Sexton: jessica.sexton@mater.uq.edu.au |

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