UQ Summer Research Scholarship Projects in Faculty of Medicine 2017

Read about the program on the https://employability.uq.edu.au/get-experiences/research-opportunities/uq-summer-research-program/apply-summer-research-program page, and apply online from 10 July – 31 August 2017 via https://employability.uq.edu.au/node/159/2#2

Please take note of where each project is located. Projects are listed under the unit names on the application page (CareerHub).

Scholars can select from one of the following to see the associated projects:

- Centre for Health Service Research
- Child Health Research Centre
- Ochsner Clinical School
- Office of Medical Education
- Princess Alexandra Hospital Southside Clinical Unit
- Prince Charles Hospital Northside Clinical Unit
- Primary Care Clinical Unit
- QIMR Berghofer Medical Research Institute
- Royal Brisbane Clinical Unit
- School of Biomedical Sciences
- School of Public Health
- UQ Centre for Clinical Research
- UQ Diamantina Institute

Important: These projects are located at multiple sites at St Lucia and Herston campuses and hospitals in Brisbane, Ipswich, and a number of rural and remote area facilities throughout the rest of the state.

Find out more about our research sites and research in our clinical schools and hospital sites.

Centre for Health Service Research

Project 01 The relationship between polypharmacy and cognitive status in residential aged care residents
Project 02 Quality indicators for the aged.
Project 03 Systematic review: Health assets to reduce the effect of frailty
Project 04 Healthy ageing and well-being in older indigenous adults
Project 05 Telehealth for Residential Aged Care Facilities: A Pragmatic Randomised Controlled Trial (RCT)

Child Health Research Centre

Project 06 Brain structure and function in infants at risk of cerebral palsy

Ochsner Clinical School

Project 07 Body shape compared to BMI as cardiometabolic risk predictors in obesity
Project 08 Outcomes in cancer patients receiving Immune Checkpoint Inhibitor Therapy.
Project 09 The role of T cell subsets in the pathogenesis of Rheumatoid Arthritis
Project 10 Skills sets necessary to explore clinical research
Project 11 A questionnaire assessing body image and medication compliance among women admitted to an inpatient psychiatric unit
Project 12 Low grade carotid stenosis follow up recommendations: the role of risk factors
Project 13 HIV prevention with emtracitabine/tenofovir DF (Truvada®) across the Ochsner Hospital System
Project 14 PneumoInspire
Project 15 Patient-derived xenograft models of colorectal cancer in combination therapies
Project 16 Epidemiology of diarrheal diseases among HIV infected adults seeking care at a tertiary institution in Jamaica
Project 17 Efficacy of anal pap smears in HIV negative men who sleep with men

Project 18 Impact of obesity in sepsis patients
Project 19 Molecular analysis of renal cell carcinoma metastasis
Project 20 Cardiovascular Study in Louisiana HIV population
Project 21 Cryptococcal Antigen positivity in immunocompromised patients
Project 22 Iron metabolism in Mitochondrial Disorders
Project 23 Value of urine microscopy in the evaluation of AKI in ESLD

Office of Medical Education

Project 24 The association between personal traits and well-being in Australian medical students.
Project 25 The association between personal traits and well-being in international medical students.

Princess Alexandra Hospital Southside Clinical Unit

Project 26 Systematic review and Meta Analysis of the mortality associated with antipsychotics among people with severe and persistent mental illness.
Project 27 Antipsychotic depot frequency: A systematic review and Meta-analysis
Project 28 An audit of GP referrals to a busy tertiary emergency department who are triaged to a waiting room: is there a gap in service?
Project 29 Naloxone use in a Clinical Toxicology Unit
Project 30 Power tool injury presentations to the Emergency Department

Prince Charles Hospital Northside Clinical Unit

Project 31 Perioperative fluid balance and colorectal surgery
Project 32 Smoking characteristics of hospitalized patients
Project 33 Volatile organic compounds (VOCs) to diagnose lung cancer
Project 34 Lung microbiome in COPD
Project 35 Predicting the likelihood of cancer from nodule risk calculators
Project 36 Biomarkers for lung cancer
Project 37 Characterisation of cancer subtypes in a lung bank
Project 38 Screening for early epigenetic changes in non-small cell lung cancer

Primary Care Clinical Unit

Project 39 Living with dementia and driving

QIMR Berghofer Medical Research Institute

Project 40 Developing human 'brain on a chip' cell models for investigation of brain ageing, disease, and drug development.
Project 41 The effect of genetic predisposition to traits on recruitment bias
Project 42 What makes the human brain unique?
Project 43 Using high-throughput gene editing techniques to examine CD4+ T cell responses in vivo during experimental malaria
Project 44 Developing host directed therapy to improve anti-parasitic immunity.
Project 45 Detection and interpretation of genetic influences on Parkinson disease and neuropsychiatric disease
Project 46 Effects of brain stimulation in whole brain dynamics: A EEG-TMS study
Project 47 Brain dynamics following (un-)successful ageing
Project 48 How brain dynamics emerge from energy constraints
Project 49 Modelling the effects of transcranial magnetic stimulation on large-scale brain dynamics

Royal Brisbane Clinical Unit

Project 50 Drug treatment of headaches in the emergency department
Project 51 Proximal tubule epithelial cell (PTEC)-immune cell cross-talk during renal hypoxic injury
Project 52 Development of respiratory simulation for the SimMan3G manikin
Project 53 PBM/ Patient Blood Management (PBM): reduce blood transfusion by optimal management of iron deficiency anaemia

School of Biomedical Sciences

Project 54 Role of NFIX in cerebellar development and medulloblastoma

Project 55 The use of archival material to inform shark and ray ecology in eastern Australia
Project 56 The role of C5aR2 in Motor Neurone Disease
Project 57 Repurposing of clinically approved drugs for neurodegeneration
Project 58 Enhancement of retromer function in Parkinson Disease
Project 59 Protective effects of triheptanoin in a model of muscular dystrophy
Project 60 Defining the protein machinery responsible for delivery of proteins from endosomes to the Golgi.
Project 61 Inflammation and white matter damage in a mouse TBI model

School of Public Health

Project 62 The experience of debt and how it influences women's health
Project 63 Prevalence and burden of substance use disorders
Project 64 Communicating the benefits of sitting less and moving more
Project 65 The case for banning cigarette filters – a policy with potential public health and environmental benefits
Project 66 Smoke free policies and laws in outdoor spaces
Project 67 A clinical trial of nicotine vaporisers for smoking cessation and relapse prevention
Project 68 The role of the media in health aspects of disasters
Project 69 Increasing access to testing, treatment and care for viral hepatitis in at risk migrant populations
Project 70 What are the Australian laws on electronic cigarettes?
Project 71 Refining the estimation of cigarette and alcohol use from wastewater analysis

UQ Centre for Clinical Research

Project 72 Assessment and treatment of depression and anxiety in dementia
Project 73 Cognitive decline in Parkinson's disease: early identification and treatment
Project 74 Simulation of brain network
Project 75 Patterns of EEG in network models of human brains
Project 76 Optimisation of bacterial proteome analysis of probiotics using Liquid Chromatography and Multiple Reaction Monitoring Mass Spectrometry

UQ Diamantina Institute

Project 77 Macrophage functions in bacterial infections
Project 78 Use of 3-D patient derived renal cell carcinoma spheroids to test new therapies
Project 79 Determining the mechanism of inhibitory antibodies
Project 80 Optimising the N-acetylcysteine dose regimen for managing paracetamol overdose using mechanistic biomarkers

Project Details

Centre for Health Service Research

Project title:	The relationship between polypharmacy and cognitive status in residential aged care residents
Project duration:	Length of project: 6 weeks Hours expected per week: 20 hrs/wk
Description:	This observational study will analyse data collected using the InterRAI online assessment tool. The data has been collected from a number of RACFs with subsequent assessments at 3 and 6 months. The data will allow the functional status and prescribing stability to be observed. Data from 700 patients has been collected thus far. Medication profiles will be analysed for polypharmacy and inappropriate prescribing in dementia patients. The findings of this study will assist in the development of specific prescribing strategies for persons with dementia.
Location:	Princess Alexandra Hospital, Woolloongabba
Expected outcomes and deliverables:	Applicants will gain experience in data management and manipulation, data cleaning, coding and analysis using SPSS.
Suitable for:	This project would suit Pharmaceutical and Medical students who wish to extend their knowledge of data analysis within a research environment.
Primary Supervisor:	Dr Nancye Peel
Supervisor's contact details:	Email: n.peel@uq.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Quality indicators for the aged
Project duration:	Length of project: 8 weeks Hours expected per week: Up to 36 hrs/wk
Description:	Quality of Care is an international priority in health service delivery. Our Centre provides a unique methodology for the development of quality indicators. We aimed to develop outcome, process and structure quality indicators in relation to common geriatric syndromes and function for the care of the frail aged hospitalised in acute general medical wards and the emergency department. A formal approach was taken for the development of quality indicators, including expert opinion, field study data and a formal voting process. We are at the concluding end of this project where involvement provides unique insight into the methodology for developing quality indicators and manipulating complex datasets.
Location:	Princess Alexandra Hospital, Woolloongabba.
Expected outcomes and deliverables:	Small literature searches will be completed to update the evidence on geriatric syndromes relating to the quality indicators to assist in finalising the documentation for publication. Some data checking will be carried out. There will be an opportunity to manipulate the dataset using SPSS to provide some frequency data and prepare some tables. A sophisticated voting system has been used with the expert panels to finalise these QIs. A round of voting will be undertaking during this period. The scholar will have the opportunity to facilitate the voting which will be a unique learning experience.
Suitable for:	An individual with a keen eye for detail, and a willingness to learn new skills. All information will be explained on the job so no prior experience is required.

Primary Supervisor:	Dr Melinda Martin-Khan
Primary contact, if not supervisor:	Ms Dianna Ang
Supervisor's contact details:	Email: m.martinkhan@uq.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Systematic review: Health assets to reduce the effect of frailty
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	Frailty is a common clinical syndrome in older adults that carries an increased risk for poor health outcomes including falls, incident disability, hospitalization, and mortality. Identifying health assets that can delay the onset of frailty or improve the quality of life for those living with frailty is therefore a key public health priority. This project will complete a systematic review of published literature to identify health assets associated with lower frailty risk in community dwelling older persons. A systematic review of peer-reviewed published literature has already commenced. The work for this project will involve updating this literature search and the assistance with all other tasks associated with getting the paper ready for publication (see below). This will result in a co-author opportunity with one of the world's leading experts in frailty research.
Location:	Princess Alexandra Hospital, Woolloongabba.
Expected outcomes and deliverables:	Systematic literature searches will be performed to identify papers reporting on health assets that are associated with a lower frailty risk in community dwelling persons. Review of papers for relevant data and the extraction of this data into a spreadsheet. The mapping of evidence according to six key domains: Social, behavioural, economic, environmental, personal, and health and social services. Evaluation of data for quality and reliability of evidence. Assist in finalising the documentation for publication. Preparation of tables for inclusion in publication.
Suitable for:	An individual with high level critical thinking skills, keen eye for detail, methodological approach to work undertake and a willingness to learn new skills. All information will be explained on the job so no prior experience is required.
Primary Supervisor:	Associate Professor Ruth Hubbard
Supervisor's contact details:	Phone: 07 3176 5530 Email: r.hubbard1@uq.edu.au /cc. chsr@uq.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Healthy ageing and well-being in older Indigenous adults
Project duration:	Length of project: 8 weeks - to be negotiated Hours expected: between 20-36 hrs/wk
Description:	Projects are currently underway investigating the prevalence of dementia and healthy ageing in the Torres Strait and Northern Peninsular regions. A summer scholar is required to assist with desk-top based duties associated with these ground-breaking research projects. This work will largely involve assistance with the development and piloting of health and lifestyle assessment tools for use in these projects. Tasks associated with this project include, but are not limited to literature searches to identify tool content, and data extraction, mapping and evaluation of content for inclusion in the tool. Compiling the tool. Assisting with protocol development, ethics applications, and research guidelines. Some basic data analysis may also be undertaken.
Location:	Princess Alexandra Hospital, Woolloongabba

Expected outcomes and deliverables:	Systematic literature searches to identify potential question items for inclusion in the lifestyle assessment tool. Extraction of data into spreadsheets. Mapping of data items to different lifestyle components: diet, physical activity, social activities, access to health care services etc. Evaluation around the suitability of data for inclusion in the tool. Development of research protocols and guidelines.
Suitable for:	An individual who is a forward thinker with a keen eye for detail, and a willingness to learn new skills. All information will be explained on the job so no prior experience is required. UQ/Ochsner Medical School Students.
Primary Supervisor:	Dr Yvonne Hornby-Turner
Supervisor's contact details:	Phone: 07 3176 6636 Email: y.hornbyturner@uq.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Telehealth for Residential Aged Care Facilities: A Pragmatic Randomised Controlled Trial (RCT)
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	This is an opportunity to work with the leading international group in telehealth, based at the University of Queensland. This project is part of a large Randomised Control Trial (RCT) in residential aged care. The aim of the trial is to examine the effectiveness of a telehealth model of care for residents in long term care during a six month period. Utilisation of external health services (such as visits to an emergency department; hospital admissions or extended hospital episodes); and visits to a specialist in an ambulatory clinic setting will be investigated. This mini-project will be focused assisting in the preparation of data for a publication and finalising the archiving of data for the study.
Location:	Princess Alexandra Hospital, Woolloongabba.
Expected outcomes and deliverables:	A publication will need to be submitted for this project on one element in this timeframe which is quality of care. The scholar will assist in preparing the data tables and running the analysis for the data tables. Assistance will be given in all aspects of the operation, no prior knowledge is required. The project is drawing to a close and data needs to be archived. Assistance is required in checking that data has been filed according to specifications and stored electronically and put in archiving boxes.
Suitable for:	An individual with a keen eye for detail, and a willingness to learn new skills. All information will be explained on the job so no prior experience is required.
Primary Supervisor:	Dr Melinda Martin-Khan.
Primary contact, if not supervisor:	Ms Dianna Ang
Supervisor's contact details:	Email: m.martinkhan@uq.edu.au
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Child Health Research Centre

Project title:	Brain structure and function in infants at risk of cerebral palsy
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk

Description:	Cerebral palsy (CP) is the most common cause of physical disability in children, impacting 1 in 500 young Australians. This project aims to develop an evidence-based toolbox to allow very early and accurate identification of infants at a high risk of adverse developmental outcomes and cerebral palsy. This will enable earlier referral to specialist diagnostic teams, leading to earlier and more targeted interventions during infancy, a time of maximum neuroplasticity.
Location:	Centre for Children's Health Research, South Brisbane
Expected outcomes and deliverables:	Scholars will gain skills in data management and analysis, and in interpreting the findings. Scholars will have an opportunity to generate a publication from the research.
Suitable for:	Pre-medical provisional students interested in MD-HDR pathway. Those with an interest in paediatric medicine and rehabilitation - particularly cerebral palsy and related conditions.
Primary Supervisor:	Professor Roslyn Boyd
Primary contact, if not supervisor:	Dr Anna MacDonald
Supervisor's contact details:	a.macdonald@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application

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Ochsner Clinical School

Project title:	Body shape compared to BMI as cardiometabolic risk predictors in obesity
Project duration:	Length of project: 6-8 weeks Hours expected per week: ~30 hrs/wk
Description:	Body Shape compared to BMI as cardiometabolic risk predictors in obesity. **Background;** Body mass index (BMI) has long been used as the accepted standard for estimation of degree of adiposity in both smaller clinical and larger epidemiologic studies despite its widely known limitations and caveats. More recently it has become clear that thresholds for defining obesity have to be adjusted based on ethnicity. Furthermore there is accumulating data that subjects with similar BMI can have very different health related indices and cardiometabolic risk profiles based on differences in fat distribution. Anthropometric measures (of which waist and hip circumference are the most common and easily obtained) have often been mentioned as possible means of getting more clinically relevant information than just the BMI and two validated indices of body shape (The A Body Shape Index [ABSI] and the Body roundness index [BRI]) have been touted as potentially providing more clinically relevant information for risk stratification in obese subjects than the BMI. **Rationale;** Obtaining waist circumferences in clinics is a fairly easy procedure but is often not done as part of basic intake vital signs including in settings of weight and cardiometabolic risk management. This cross sectional cohort study seeks to determine if the addition of waist circumference and the computation of the two validated indices of body shape that can then be derived from that information provide any additional benefit in the clinical risk stratification of overweight and obese patients seen within the Ochsner Clinical network and to further determine what demographic covariates may influence this.

	If demonstrated to add significant clinical utility, this would provide evidence to inform change in clinical practice system wide with the intent of adding waist circumference measurement to the routine intake vital signs obtained and then monitored especially in patients who are overweight, obese and/or with cardiometabolic risk factors. **Aim and objectives;** 1. To obtain a cohort of subjects seen within the Ochsner Health network on whom waist circumference has been obtained at least once over the last 5 years of clinical follow up and compute the BMI, waist circumference, ABSI and BRI on these patients. 2. To compare and contrast the major clinical cardiometabolic surrogates between patients in the cohort based on BMI classes versus those based on waist circumference indices. 3. To evaluate the degree of correlation between BMI as compared to ABSI and BRI with the major clinical cardiometabolic surrogates. 4. To compare and contrast atherosclerotic cardiovascular disease (ASCVD) burden in the cohort based on BMI classes versus waist circumference and body shape indices classes. 5. To evaluate if any demographic parameters significant modulate the impact of the body shape indices and waist circumference on cardiometabolic risk association compared to BMI. **Hypothesis;** That main hypothesis being evaluated is that waist circumference measurement and body shape indices better predict cardiometabolic risk, correlate better with cardiometabolic risk surrogates and better predict ASCVD disease burden than BMI. **Methods/Approach;** Using assistance from the Data mining services of Ochsner clinical data mining group we will interrogate the EPIC clinical records of the bariatric, weight management, endocrinology and general medicine practices in the North shore and Greater New Orleans areas over the last 5 years seeking patients on whom waist circumference data is documented in the clinical records at least once. The intent would be to identify between 150-300 such subjects and then interrogate their EPIC EHR clinical records to obtain demographic, vital signs and relevant clinical information for inclusion in the study data base for subsequent data analysis. The demographic data to be obtained would be; age, sex, ethnicity, alcohol use, tobacco use, menopausal status (if relevant) and basic measure of socioeconomic status. The vital signs at or close to the time the waist circumference was obtained will include pulse rate, blood pressure, height, weight and BMI. To also obtain respiratory rate and pulse ox where available. The basic cardiometabolic surrogates to be obtained from the clinical records would include fasting glucose, lipid panel, urine microalbumin, uric acid, AST and ALT, HBA1c (if available), insulin (if available) and 25 OH Vitamin D. The disease burden outcomes to be obtained would be presence of diabetes, hypertension, dyslipidemia, heart disease, cerebrovascular disease, peripheral vascular disease, and erectile dysfunction.Other outcomes of interest and relevance to be noted if present would include obstructive sleep apnea (OSAS), NAFLD and/or NASH, PCOS, Chronic kidney disease (CKD) and history of cancer (with documentation of type)."
Location:	Ochsner Clinical School, New Orleans, LA USA
Expected outcomes and deliverables:	**Expected outcomes;** Gain experience in data extraction and abstraction from Electronic medical record Clinical records, gain experience with preparation of medium size data

	spreadsheet, gain experience with basic data analyses, gain experience with results presentation in academic setting and manuscript writing. **Deliverables;** 1. 1-3 Abstracts, posters and/or possibly oral session presentations at multiple regional and national meetings for the 2018-19 academic session. 2. Co-authorship on at least one peer reviewed manuscript on the research subject matter to be submitted to a medline cited peer reviewed medical journal
Suitable for:	UQ/Ochsner Medical School Students with a career interest in clinical research and clinical interest in cardiometabolic disease may be particularly interested in this project.
Primary Supervisor:	Dr Gabriel I. Uwaifo, Endocrinology, Diabetes and Metabolism Dept
Primary contact, if not supervisor:	Dr Brandy Panunti, Chief Dept of Endocrinology, Diabetes and Metabolism, Ochsner Medical Foundation
Supervisor's contact details:	Clinical Office Number: 985-639-3777, Research Office number: 504-842-1264, Mobile: 240-351-6479 Email: gabriel.uwaifo@ochsner.org
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Outcomes in cancer patients receiving immune checkpoint inhibitor therapy.
Project duration:	Length of project: 6 weeks Hours expected per week: 24 hrs/wk
Description:	**Background:** Immune checkpoint inhibitors represent a new class of antineoplastic agents that have provided great clinical efficacy with limited side effect profiles in the treatment of patients who have failed traditional therapies for advanced cancer. They are also being approved in specific patients in the first line treatment setting. These drugs work by stimulating the immune system to fight cancer. Neoplastic cells have conventionally been able to escape immunologic destruction through various mechanisms. Immune checkpoint inhibitor therapy causes the patient's own immune system to react against cancerous cells in the body. There has been a great deal of interest looking into strategies that modulate the immune system in order to provoke and boost the antitumor immune response. As a result, there has been the development of novel immunotherapy agents that function as programmed cell death-1 (PD-1) and programmed cell death ligand-1 (PD-L1) inhibitors and cytotoxic T-lymphocyte-associated protein-4 (CTLA-4) inhibitors. However, not all patients respond to therapy and the duration of response can vary significantly among patients. It is difficult to ascertain what characteristics would make a patient an ideal candidate for immune checkpoint inhibitors, especially across different histological cancer subtypes. **Rational:** Despite the success of immune checkpoint inhibitor therapy, not all patients respond equally. There needs to be an improved method to predict and identify which patients would benefit most from immune checkpoint inhibitor therapy in order to ensure the appropriate patients are able to obtain the most efficacious treatment available. Unfortunately, there remains a scarcity of predictors of response to immunotherapy. Further investigation into factors, including patient characteristics, tumor characteristics, and other possible biomarkers, that may aid in the identification of specific patients most likely to respond to treatment with immune checkpoint inhibitors should be pursued. **Objective:** To perform a retrospective analysis of cancer patients treated with immune checkpoint inhibitors, and to collect basic data regarding their

	characteristics, prognosis and treatment outcomes at Ochsner Medical Center/Ochsner Clinical School. **Methods:** Data collected will include demographic information (such as age at diagnosis, gender, height, weight, etc), baseline clinical characteristics (histology, stage, date of diagnosis, molecular testing, performance status, etc), prognostic markers (performance status, baseline labs, etc), treatment information (drug, dose) and outcome information (date of progression, time on treatment). Endpoints will include time to progression (TTP), overall survival (OS) and total time on treatment (TTOT). **Type of Subjects to be Studied:** We will retrospectively identify all patients seen at the Medical Oncology Clinic at Ochsner Medical Center who have been treated with immune checkpoint inhibitors (nivolumab, pembrolizumab, and atezulizumab, etc) during the last 5 years (between 1/1/2012 and 6/1/2017) **Inclusion Criteria:** 1.Patients with malignancy confirmed on pathology. 2. Patients treated with immune checkpoint inhibitors during the last 5 years. 3. Patient must have adequate follow-up documented. **Exclusion Criteria**: - 1.Age <18 2.Patients with hematologic malignancies receive treatment".
Location:	Ochsner Clinical School, New Orleans, LA USA.
Expected outcomes and deliverables:	Co-authorship on a conference abstract of journal paper.
Suitable for:	Medical students with some experience in retrospective research and basic statistics.
Primary Supervisor:	Dr Marc Matrana, Medical Director of the Precision Cancer Therapies Program, Ochsner Cancer Institute.
Supervisor's contact details:	Email: mamatrana@ochsner.org
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	The role of T cell subsets in the pathogenesis of Rheumatoid Arthritis
Project duration:	Length of project: 6 weeks Hours expected per week: 24 hrs/wk
Description:	Rheumatoid Arthritis is a chronic inflammatory autoimmune disease characterized by synovial inflammation with resultant cartilage and bone destruction. High affinity autoantibodies (auto-Abs), such as rheumatoid factor (RF) and anti-cyclic citrullinated peptide antibody(anti-CCP), are associated with enhanced risk of and contribute to the pain and cartilage and bone damage consequent to inflammation. The treatment of RA is largely based on management of the clinical consequences and manifestation of joint inflammation, which is likely to be remote from the early pathophysiologic defects. Although current biological drugs, such as inhibitors of TNF, T-cell co-stimulation, IL-6 receptor, B cells, JAK kinase, and IL-1, that specifically target the immune system have recently revolutionized outcomes in RA, 30-40% inadequate responses occur with each agent. One of the causes of inadequate clinical response may be incomplete elimination of self-reactive B cells residing in the synovium, or other lymphoid tissue as well as CD20lo/CD20– plasmablasts/plasma cells in peripheral sites (such as synovium and blood). As a consequence of interaction with pro-stimulatory T cells, these B cells/plasmablasts may survive, expand and differentiate in synovium or immune organs (particularly germinal centers), and ultimately produce auto-Abs that may perpetuate disease and result in tissue/joint damage. Therefore, there remains a

	great clinic need to identify cellular subsets that may help to differentiate distinct clinical features that correlate with pathophysiologic defects in RA, and ultimately use this information to design therapy with new biological agents or perhaps even combination of available biologics to improve outcomes in the 30-40% of patients resistant to current therapies. Classically, type 1 T helper (Th1) cells, which produce IFN-γ, were thought to drive RA pathophysiology. The discovery of the new T cell subsets has changed the spectrum of T cells in autoimmune diseases. The T follicular helper (Tfh) cell, identified as a special T cell subset expressing the transcription factor Bcl-6 and producing the cytokine IL-21, supports autoimmunity by inducing memory B cell proliferation with consequent production of high affinity self- reactive autoantibodies. Another T cell subset, Th17 cells produce the cytokine IL-17 and others known to activate cells resident in synovium. Our previous study has shown that both circulating Tfh cells and Th17 cells are significantly increased in active RA patients compared with healthy controls. The frequency of circulating Tfh cells correlates with the percentage of plasmablasts, anti-CCP antibody titer, and disease activity (as measured by DAS-28; conversely, the frequency of circulating Th17 cells correlates with serum level of RF (rheumatoid factor) and CRP (c-reactive protein, a marker of inflammation). These data indicate that Tfh cells may contribute to B cell differentiation and autoantibody production (RF), while Th17 cells may be involved in the inflammation (CRP) and pathogenesis of RA (CCP). Based on these preliminary data, our hypothesis is that Tfh/Th17 cell activity in RA is one of the key underlying immunopathological factors that may contribute to pathophysiology of disease, including autoantibody, inflammation and disease activity. Our primary objective is to elucidate the role of Tfh/Th17 cell in the pathogenesis of RA and the effect of DMARD (Disease-Modifying Anti-Rheumatic Drug) on their function. Our long-term goal is to develop novel and/or combination therapies with DMARD, with the aim of eradicating the auto-Ab production in the peripheral sites and blocking inflammation-caused systemic tissue damage, by blocking RA-Tfh cells and Th17 cells with small-molecule inhibitors and evaluating their efficiency in the treatment of RA. **Specific Aims:** Aim1 To examine the frequencies of Tfh cells and Th17 cells as well as B cells/plasmablasts cells in active RA patients before and after DMARD (Disease-Modifying AntiRheumatic Drug) treatment, and evaluate their correlation with auto-Ab production (RF, anti-CCP antibody), joint inflammation(ESR, CRP), and disease activity(DAS28) . Aim 2 To evaluate the therapeutic effect of small molecule inhibitors of Tfh cells (Bcl-6 inhibitor) and Th17 cells (GSK-3 inhibiotor) in the collagen-induced arthritis (CIA) mice model.
Location:	Ochsner Clinical School, New Orleans, LA USA
Expected outcomes and deliverables:	1. Co-authorship on local/regional/national conference abstract or journal paper. 2. Have the firsthand experience of bench research, such as isolating cells from blood, analyze cell subsets by flow cytometry, detecting the cytokines by ELISA, etc. 3. Attend the monthly research meeting and discuss results with physicians and researchers, and learn the latest progress related to our project by presenting literature.
Suitable for:	This project is open to applications from UQ/Ochsner Medical School Students who are interesting in immunology related diseases.
Primary Supervisor:	Dr William Davis, Head of Rheumatology Department and Dr Xin Zhang, Staff Scientist
Primary contact, if not supervisor:	Ms Linh Hellmers, BS
Supervisor's contact details:	Email: xzhang@ochsner.org or zhxin001@hotmail.com

Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Skills sets necessary to explore clinical research
Project duration:	Length of project: 8 weeks Hours expected per week: 20 hrs/wk
Description:	Thank you for your interest in clinical research to improve patient care. We have an active program in our Research DATa Laboratory to develop your skill-sets in conducting a clinical investigation. Regarding clinical research: your first steps are the following: To participate in human research or clinical studies, you must be CitiProgram certified with your completion certificate registered within our Research Division at Ochsner. www.citiprogram.org is the web-site ...CITI - Collaborative Institutional Training Initiative www.citiprogram.org following completion; register your certificate on the top right of the webpage located at http://ersa.ochner.org. To obtain EPIC electronic medical record access; call or e-mail Connie Catha ccatha@ochsner.org 504-842-7541 or Carol Marques cmarques@ochsner.org 504-842-6550 and request EPIC EMR access, which will require computer training. You will also need to fill out a volunteer application http://www.ochsner.org/giving/volunteer/volunteer-application/ and complete all requirements for the Office of Volunteer Services. Once these required steps are completed, here is our approach: In the development of a Research Question, there are SIX steps: 1. Do you have an area of interest that you want to explore, a topic that truly interests you? If not, then the next question: Is there a subspecialty that has your interest? If not, then together we will design a Research Question that leads to. 2. Literature review. You will meet with our librarians who will teach you how to electronically search for 10-15 recent papers related to your RQ. Review of these works begins to develop the language germane to the RQ, and knowledge of the previously reported independent and dependent predictors. The limitations paragraphs within the studies and the statistical approach in the Methods sections help develop a working hypothesis that meets the FINER principle: Feasible, Interesting, Novel, Ethical and Clinically Relevant. The working hypothesis evolves into the primary or a priori hypothesis (null and alternate) and one or more secondary hypotheses (null and alternative). Remember in undergraduate school, all theme papers had an Introduction, the Body consisting of three paragraphs of interest followed by Summation or Discussion. This approach carries into clinical research, with the Body consisting of three hypotheses. 3. Once the Introduction and Methods sections including the statistical approach are written, we submit the proposal to the Institutional Review Board (IRB) for human research. They require the aforementioned CitiProgram certification and financial disclosure statements. 4. Following IRB approval, data collection begins that can be onerous as we abstract the medical records (keystroke the data) for the previously reported independent predictors, the dependent predictors, and hopefully one or more novel in/dependent predictors developed during steps 1 and 2. However, one KEY benefit of data abstraction is a thorough understanding of the clinical flow of the patients under question. 5. Next, we perform statistical analyses of the univariate, bivariate, and multivariable relationships, as well as other advanced statistical analyses,

	such as partitioning. The nascent discovery of novel relationships leads to hypotheses of clinical intervention. Now we begin to improve clinical care and if time permits a prospective study using statistical process control charts to determine the benefit of the proposed intervention. 6. Finally, we write the manuscript (which is easy as the Introduction & Methods have been completed, then discuss the Results based upon the findings displayed in the tables and graphs, leading to the Discussion section that compares our results to the observations reported in the original 10-15 manuscripts. We will also prepare abstracts for presentations at meetings (i.e., Ochsner Research Day & Research Day at UQ) from the completed manuscript. Again thank you for your interest in clinical research. I look forward to developing your education.
Location:	Ochsner Clinical School, New Orleans, LA USA.
Expected outcomes and deliverables:	Research presentation(s) and hopefully a manuscript. UQ/Ochsner Medical School Students.
Suitable for:	Perseverance and dedication to the Research Question are the only requirements.
Primary Supervisor:	Dr Bobby Nossaman, Director of Research.
Supervisor's contact details:	Email: bnossaman@ochsner.org
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	A questionnaire assessing body image and medication compliance among women admitted to an inpatient psychiatric unit
Project duration:	Length of project: 6 weeks Hours expected per week 36 hrs/wk
Description:	Compare body image and its potential influence on medication compliance among women admitted to an inpatient psychiatric unit, with a specific focus on any racial differences.
Location:	Ochsner Clinical School, New Orleans, LA USA
Expected outcomes and deliverables:	Poster presentation and journal article.
Suitable for:	UQ/Ochsner Medical School Students interested in psychiatry.
Primary Supervisor:	Dr David Galarneau
Supervisor's contact details:	Email: dgalarneau@ochsner.org
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Low grade carotid stenosis follow-up recommendations: the role of risk factors
Project duration:	Length of project: 6 weeks Hours expected per week: 24 hrs/wk
Description:	We have identified that patients with identified low grade (less than 59%) carotid stenosis based on US criteria progress at different rates and therefore should have follow up US examinations recommended at different time intervals. However, we still need to understand what is the role of risk factors so we can therefore more accurately recommend the interval for follow up examinations not only based on degree of stenosis but also based on the individual patient's risk factors.(. Bennett G, Bluth E, Larson M, Qingyang Luo, PhD:

	"Recommendations for Low-Grade Carotid Stenosis Follow-up Based on a Single Institution Database". JUM . In press.).
Location:	Ochsner Clinical School, New Orleans, LA USA
Expected outcomes and deliverables:	Journal paper co-authorship and co-authorship on conference (RSNA)abstract and presentation.
Suitable for:	Students able to pick out clinical data from retrospective chart review . Will require retrospective chart review. UQ/Ochsner Medical School Students.
Primary Supervisor:	Professor Edward I Bluth
Supervisor's contact details:	Email: ebluth@ochsner.org or Dept of Radiology Ochsner Clinic Foundation
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	HIV prevention with emtracitabine/tenofovir DF (Truvada®) across the Ochsner Hospital System
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	In 2014, Louisiana had the highest incidence rate of the human immunodeficiency virus (HIV) among states in the US, primarily in men who sleep with men (MSM) (Grant 2010). Pre-Exposure Prophylaxis for HIV (PreP) with emtracitabine and tenofovir DF (pill brand name Truvada®), is highly effective in preventing HIV transmission in high-risk populations. Evaluating Ochsner providers' adherence to current recommended guidelines for prescribing PreP is important for identifying areas of improvement in clinical practice and monitoring to reduce new HIV infections. This is a cross-sectional study to compare characteristics of MSM who did and did not receive PreP during the study period. **Study Aim:** To determine what patient and provider factors are associated with MSM receiving a prescription for PreP. Specifically, among documented HIV negative MSM, what factors are associated with the prescription of PreP? Approach: We will compare characteristics of MSM who received PreP to MSM who did not receive PreP during the study period.
Location:	Ochsner Clinical School, New Orleans, LA USA
Expected outcomes and deliverables:	Applicants will learn skills in chart abstraction, qualitative data analysis and manuscript writing. I expect an abstract at research day and a manuscript to result from this project.
Suitable for:	No special qualifications required.
Primary Supervisor:	Dr Dodd Denton
Supervisor's contact details:	Email: gdenton@ochsner.org
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	PneumoInspire
Project duration:	Length of project: 8 weeks Hours expected per week: 20 hrs/wk
Description:	The study aims to provide up-to-date and generalisable information on current worldwide epidemiology and clinical practice associated with diagnosis and management of nosocomial pneumonia in Intensive Care Unit (ICU) patients. Specifically, the study aims to: a) evaluate the global epidemiology of nosocomial

	pneumonia in the ICU setting, analysing responsible pathogens, time course of resolution, ICU and hospital outcome, and b) describe on a global scale current clinical practice regarding diagnosis (and concordance with official guidelines) as well as management of ICU nosocomial pneumonia, including, type, dosing and appropriateness of administered antimicrobials, de-escalation strategies and treatment duration.
Location:	Ochsner Clinical School, New Orleans, LA USA.
Expected outcomes and deliverables:	Students will gain skills in data collection and possible publications.
Suitable for:	UQ/Ochsner Medical School Students.
Primary Supervisor:	Dr Julia Garcia-Diaz
Supervisor's contact details:	Email: jgarcia-diaz@ochsner.org
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Patient-derived xenograft models of colorectal cancer in combination therapies
Project duration:	Length of project: 6 weeks Hours expected per week: 24 hrs/wk
Description:	CRC is the third most common cancer and the second leading cause of cancer-related mortality, with an estimated incidence of 143,000 cases and 51,000 deaths per year in the United States. Despite optimal oncologic treatment, including surgery, chemotherapy, and/or radiotherapy, up to 50% of stage II and III CRC patients will develop extra- nodal metastases. This is the most significant negative determinant of CRC morbidity and mortality. Based on work from our group and others, we identified a unique class of cells, CRC tumor-initiating cells (Co-TIC), which are responsible for CRC growth, drug resistance, and subsequent extra-nodal metastasis. These cells were shown to express the cell surface markers CD133 and CXCR4. We have further found that Co-TIC involvement in these processes is largely dependent on lymph node stromal cell. We hypothesize that the LN microenvironment is responsible for supporting CD133+CXCR4+ Co-TIC in CRC growth and extra-nodal metastasis via providing CXCL12 that primes and stimulat Co-TIC. There is increasing evidence that the lymph node microenvironment play a significant role in cellular communication resulting in CRC tumor growth, drug resistance, and subsequent extra-nodal metastasis. This project is to use patient-derived xenograft models of colorectal cancer for combination therapy targeting Co-TIC in addition to conventional chemotherapy.
Location:	Ochsner Clinical School, New Orleans, LA USA.
Expected outcomes and deliverables:	Co-authorship on a conference abstract or journal paper.
Suitable for:	UQ/Ochsner medical school student year 3.
Primary Supervisor:	Dr Li Li , Director of Translational Cancer Research Laboratory.
Supervisor's contact details:	Email: lli@ochsner.org, Tel: 504-842-2428 (USA)
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Epidemiology of Diarrheal Diseases among HIV infected adults seeking care at a tertiary institution in Jamaica
Project duration:	Length of project: 8 weeks Hours expected per week: 20 hrs/wk

Description:	To understand the epidemiology of diarrheal diseases among HIV infected adults at a tertiary care clinic in Kingston, Jamaica. SPECIFIC AIMS Primary Aims 1.Prevalence of diarrheal diseases among HIV infected adults seeking care at the CHARES clinic at UHWI 2.Factors associated with diarrheal illness among HIV infected adults seeking care at the CHARES clinic at UHWI Secondary Aims 1.Etiology of infectious diarrheal diseases among HIV infected adults.This study will be of a case-control study design.
Location:	Ochsner Clinical School, New Orleans, LA USA.
Expected outcomes and deliverables:	Data entry into study specific software, analysis and publications.
Suitable for:	UQ/Ochsner Medical School Students.
Primary Supervisor:	Dr Obinna Nnedu
Supervisor's contact details:	Email: onnedu@ochsner.org
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Efficacy of anal pap smears in HIV negative men who sleep with men
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	**Background** Men who sleep with men (MSM) WITH HIV have a very high rate of anal dysplasia, and guidelines clearly recommend annual screening anal pap smears for MSM with HIV. MSM who do not have HIV have a lower rate of anal dysplasia than MSM with HIV, but a higher rate than the rest of the male populations. Guidelines on performing anal pap smears in HIV negative MSM are mixed, with most guidelines recommending anal pap smears every three years. The basis for this recommendation is mainly expert opinion, as there is little data on which to base decisions. Thus, there is controversy among providers as to whether anal pap smears should be performed in HIV negative MSM. Ochsner primary care providers have been performing anal pap smears in HIV negative MSM for the past two years. The incidence rate of anal dysplasia (high or low grade squamous epithelial lesions) is not known. We do not know associations with age or race. **Study Aim:** To describe the characteristics of HIV negative MSM with anal pap smears showing dysplasia. To calculate the incidence rate of anal dysplasia in HIV negative MSM.
Location:	Ochsner Foundation Hospital, New Orleans.
Expected outcomes and deliverables:	Applicants for this project will do complete background research, specify a protocol, determine appropriate research methods and complete an ethics and compliance (IRB) protocol for submission.
Suitable for:	UQ/Ochsner Medical School Students.
Primary Supervisor:	Dr G. Dodd Denton
Supervisor's contact details:	Email: gdenton@ochsner.org

Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Impact of obesity in sepsis patients
Project duration:	Length of project: 8 weeks Hours expected per week: 20 hrs/wk
Description:	Data regarding outcomes in septic patients varies depending BMI's. This study seeks to evaluate outcomes in patients with serve sepsis and septic shock in our system.
Location:	Ochsner Foundation Hospital, New Orleans.
Expected outcomes and deliverables:	Students will have the opportunity to gain skills in data collection, analysis and publications.
Suitable for:	Students interested in infectious disease with any background and open to UQ/Ochsner Medical School Students.
Primary Supervisor:	Dr Julia Garcia-Diaz
Supervisor's contact details:	Email: jgarcia-diaz@ochsner.org
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Molecular analysis of renal cell carcinoma metastasis
Project duration:	Length of project: 6 weeks Hours expected per week: 24 hrs/wk
Description:	Renal cell carcinoma (RCC) is a deadly and difficult-to-treat cancer. In one year in USA and Australia, approximately 66,000 new cases and 15,000 deaths from RCC occurred. RCC is a complex disease with widely varying prognosis. Metastatic RCC is incurable and fatal. Our hypothesis is that RCC and lymph node (LN) stromal cell interactions enhance tumorigenicity, metastasis, and drug resistance. Our goal for this project is to identify the molecular signals involved in tumor/LN stromal interaction and further examine their roles in tumor progression, metastasis, and chemotherapy resistance.
Location:	Ochsner Foundation Hospital, New Orleans
Expected outcomes and deliverables:	Co-authorship on a conference abstract or journal paper.
Suitable for:	UQ/Ochsner medical school student year 3.
Primary Supervisor:	Dr Li Li
Supervisor's contact details:	Email: lli@ochsner.org or Phone: 504-842-2428 (for Australia dial 0011-1 before the number).
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Cardiovascular Study in Louisiana HIV population
Project duration:	Length of project: 8 weeks Hours expected per week: 20 hrs/wk
Description:	Cardiomyopathy has been described in 185 of HIV patients; and higher in those with aids. This study will determine the prevalence of cardiac abnormalities in pts with HIV infection.
Location:	Ochsner Foundation Hospital, New Orleans.

Expected outcomes and deliverables:	Data collection and publication.
Suitable for:	UQ/Ochsner Medical School Students interested in cardiology and ID.
Primary Supervisor:	Dr Julia Garcia-Diaz
Supervisor's contact details:	Email: jgarcia-diaz@ochsner.org
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Cryptococcal Antigen positivity in immunocompromised patients
Project duration:	Length of project: 8 weeks Hours expected per week: 20 hrs/wk
Description:	Cryptococcal antigenemia positivity in cirrhotic patients collecting serum and running lateral flow assay.
Location:	Ochsner Foundation Hospital, New Orleans.
Expected outcomes and deliverables:	Scholars will gain skills in data collection and analysis. Opportunities for publications can come from research.
Suitable for:	Project is open to all applications from student interested in infectious disease and all UQ/Ochsner Medical School Students.
Primary Supervisor:	Dr Julia Garcia-Diaz
Supervisor's contact details:	Email: jgarcia-diaz@ochsner.org
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Iron metabolism in Mitochondrial Disorders
Project duration:	Length of project: 8 weeks Hours expected per week: 24 hrs/wk
Description:	Iron metabolism in Mitochondrial Disorders.
Location:	Ochsner Foundation Hospital, New Orleans.
Expected outcomes and deliverables:	Co-Authorship on conference abstract a journal article.
Suitable for:	Ochsner Clinical School students completing Year 3 or Year 4 in November 2017.
Primary Supervisor:	Dr. Raj Warrier
Supervisor's contact details:	Email: rwarrier@ochsner.org
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Value of urine microscopy in the evaluation of AKI in ESLD
Project duration:	Length of project: 8 weeks Hours expected per week: 20 hrs/wk
Description:	The hypothesis is that a urine score based on presence and number of granular casts provides diagnostic (to categorize tubular injury vs. hepatorenal) and prognostic utility (to predict response to therapy) in the evaluation of AKI in ESLD (cirrhosis). In addition, we will explore value of waxy casts in AKI. a. Role of

	researcher: data collection, urine collection, processing and microscopic examination.
Location:	Ochsner Foundation Hospital, New Orleans
Expected outcomes and deliverables:	Submission of abstract as 1st author to a regional/national meeting. Co-authorship in a future manuscript(s), possibly 1st or 2nd authorship.
Suitable for:	UQ/Ochsner Medical School Students. Inquisitive, visual skills, attention to detail.
Primary Supervisor:	Dr Juan Carlos Q. Velez
Supervisor's contact details:	Email: juancarlos.velez@ochsner.org
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Office of Medical Education

Project title:	The association between personal traits and well-being in Australian medical students
Project duration:	Length of project: 6 weeks Hours expected per week: 24 hrs/wk
Description:	This project focuses on data from domestic students in Australian medical schools. This project is suited to students with a background or interest in education and/or psychology to pursue research in the area of well-being and resilience during medical training. The successful applicant will join a multidisciplinary team investigating current aspects of student well-being as well as assessing areas to further develop, such as career guidance and counselling. The health and well-being of medical students is an important concern to medical schools and medical educators. Medical students experience high levels of anxiety, depression, and burn-out. The successful and healthy progression through medical training poses the question of whether certain personality profiles allow some students to better endure the stress and pressure of a medical school education. The research will contribute to a comprehensive longitudinal program of medical education research.
Location:	No specific location.
Expected outcomes and deliverables:	Co-author on a conference abstract or a journal paper.
Suitable for:	Applicants with a background in science, psychology or education are preferred. Applicants must have a good background and experience in working with large data sets using Excel and SPSS. A good understanding of statistics and experience in statistical analyses, plus, excellent writing skills is required.
Primary Supervisor:	Associate Professor Diann Eley
Supervisor's contact details:	Email: d.eley@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	The association between personal traits and well-being in international medical students
Project duration:	Length of project: 6 weeks Hours expected per week: 24 hrs/wk

Description:	This project focuses on data from international students in US medical schools. This project is suited to students with a background or interest in education and/or psychology to pursue research in the area of well-being and resilience during medical training. The successful applicant will join a multidisciplinary team investigating current aspects of student well-being as well as assessing areas to further develop, such as career guidance and counselling. The health and well-being of medical students is an important concern to medical schools and medical educators. Medical students experience high levels of anxiety, depression, and burn-out. The successful and healthy progression through medical training poses the question of whether certain personality profiles allow some students to better endure the stress and pressure of a medical school education. The research will contribute to a comprehensive longitudinal program of medical education research.
Location:	No specific location.
Expected outcomes and deliverables:	Co-authorship on a conference abstract or a journal paper.
Suitable for:	Applicants with a background in science, psychology or education are preferred. Applicants must have a good background and experience in working with large data sets using Excel and SPSS. A good understanding of statistics and experience in statistical analyses, plus, excellent writing skills is required.
Primary Supervisor:	Associate Professor Diann Eley
Supervisor's contact details:	Email: d.eley@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Princess Alexandra Hospital Southside Clinical Unit

Project title:	Systematic review and meta-analysis of the mortality associated with antipsychotics among people with severe and persistent mental illness.
Project duration:	Length of project: 6-8 weeks Hours expected per week: approx 28 hrs/wk
Description:	People with severe and persistent mental illness die earlier than the general population. Part of this excess mortality is related to specific antipsychotic adverse drug reactions. We aim to systematically review the literature relating to mortality associated with antipsychotic medications, and conduct a meta-analysis examining if certain anti-psychotics or classes of anti-psychotics are associated with higher mortality.
Location:	Princess Alexandra Hospital, Woolloongabba.
Expected outcomes and deliverables:	We are only advertising one project, however we have capacity to supervise 2 students for this particular project.
Suitable for:	**Methods:** This will be a Cochrane-like review comparing: Mortality rates associated with specific antipsychotics and classes of antipsychotics among people with severe and persistent mental illness. Through a systematic search of Medline, EMBASE and PsycInfo. **Expected outcomes and deliverables:** Meta-analyses will be done in Cochrane's software program, RevMan, for which training would be provided, and be supervised by Steve Kisely who is an experienced Cochrane reviewer, being 1st author on two & co-author on another four and Dan Siskind and experience clinical academic psychiatrist. The nature of the project means that the work is flexible and so could fit round other

	commitments. It will give practical experience of doing a Cochrane-type review and meta-analysis, as well as the possibility of publication in a peer-reviewed journal with a reasonable impact factor.
Primary Supervisor:	This project is open to applications from MD/MBBS and health sciences students from The University of Queensland. Applications from students with experience of undertaking Medline, EMBASE or PsycInfo searches are especially welcome.
Primary contact, if not supervisor:	Associate Professor Dan Siskind
Note before application:	Email: d.siskind@uq.edu.au
Project title:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Antipsychotic depot frequency: A Systematic Review and Meta-analysis
Project duration:	Length of project 6-8 weeks Hours expected per week: approx 28 hrs/wk
Description:	We will conduct a Cochrane-like systematic review and meta-analysis to examine whether the frequency of administration of depot antipsychotic medications (2/52, 4/52, 2/12 vs 3/12) has different efficacy.
Location:	Princess Alexandra Hospital, Woolloongabba.
Expected outcomes and deliverables:	A manuscript for submission to a peer-reviewed psychiatric journal.
Suitable for:	Medical student or health science students. Experience with systematic reviews or meta-analyses would be helpful but not essential.
Primary Supervisor:	Professor Steve Kisely
Supervisor's contact details:	Email: s.kisely@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	An audit of GP referrals to a busy tertiary emergency department who are triaged to a waiting room: is there a gap in service?
Project duration:	Length of project: 8 weeks Hours expected per week: 24 hrs/wk
Description:	The GP – Emergency Department inter-phase plays a significant role in the emergency presentations. The study will be an audit of all patients who are referred by a GP to a major hospital Emergency Department. The study will review all presentations to determine differences in numbers, referral conditions, and management across days of the week and months of the year.
Location:	Princess Alexandra Hospital, Woolloongabba
Expected outcomes and deliverables:	The EMRG summer scholarships have a strong emphasis on learning about the entire research process. These will include: a) literature review, b) development of the research proposal, c) completion of an ethics application, d) collection and analysis of data, and e) reporting and dissemination of findings. Previous recipients of summer scholarships wrote a report, presented to the ED research group and then at the Autumn Symposium of the Australasian College of Emergency Medicine. Co-authorship on peer reviewed publications is anticipated. Similar outcomes are expected in 2017.
Suitable for:	Any MD student with interest in developing research skills. No prior research experience is necessary as a primary objective of this exercise is to learn about the research process.
Primary Supervisor:	Dr Tina Bazianas

Primary contact, if not supervisor:	Dr Robert Eley
Supervisor's contact details:	Email: r.eley@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application. This project is heavily subscribed.

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Project title:	Naloxone use in a Clinical Toxicology Unit
Project duration:	Length of project: 8 weeks Hours expected per week: 24 hrs/wk
Description:	Retrospective review of patients presenting over a 2 year period (2016-2017) requiring naloxone for opioid intoxication to identify patterns of use, efficacy and safety with a particular focus on naloxone infusions. Electronic chart audit of approximately 160 patients with synthesis of results.
Location:	Princess Alexandra Hospital, Woolloongabba.
Expected outcomes and deliverables:	The EMRG summer scholarships have a strong emphasis on learning about the entire research process. These will include: a) literature review, b) development of the research proposal, c) completion of an ethics application, d) collection and analysis of data, and e) reporting and dissemination of findings. Previous recipients of summer scholarships wrote a report, presented to the ED research group and then at the Autumn Symposium of the Australasian College of Emergency Medicine. Co-authorship on peer reviewed publications is anticipated. Similar outcomes are expected in 2017.
Suitable for:	Any MD student with interest in developing research skills. No prior research experience is necessary as a primary objective of this exercise is to learn about the research process.
Primary Supervisor:	Dr Katherine Isoardi and Dr Colin Page
Primary contact, if not supervisor:	Dr Robert Eley
Supervisor's contact details:	Email: r.eley@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application. This project is heavily subscribed.

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Project title:	Power tool injury presentations to the Emergency Department
Project duration:	Length of project: 8 weeks Hours expected per week: 24 hrs/wk
Description:	Detailed case information from people who have suffered a non-fatal injury whilst using a power tool is needed to better understand the circumstances surrounding the incident. Emergency department data from Metro South Hospitals from 2005-2017 will be analysed to examine the trends, patterns, and outcomes of occupational and domestic power tool related emergency department presentations and hospitalisations over time. For this study power operated lawn mowers will be included with powered drills, saws, grinders and nail guns. This information will be used to complement ongoing prospective data collections from patients presenting with power tool injuries.
Location:	Princess Alexandra Hospital, Woolloongabba
Expected outcomes and deliverables:	The EMRG summer scholarships have a strong emphasis on learning about the entire research process. These will include: a) literature review, b) development

	of the research proposal, c) completion of an ethics application, d) collection and analysis of data, and e) reporting and dissemination of findings. Previous recipients of summer scholarships wrote a report, presented to the ED research group and then at the Autumn Symposium of the Australasian College of Emergency Medicine. Co-authorship on a peer reviewed publication is anticipated. Similar outcomes are expected in 2017.
Suitable for:	Any MD student with interest in developing research skills. No prior research experience is necessary as a primary objective of this exercise is to learn about the research process.
Primary Supervisor:	Dr Robert Eley
Supervisor's contact details:	Email: r.eley@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application. This project is heavily subscribed.

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Prince Charles Hospital Northside Clinical Unit

Project title:	Perioperative fluid balance and colorectal surgery
Project duration:	Length of project: 8 weeks Hours expected per week: 20 hrs/wk
Description:	Optimal perioperative fluid therapy for patients undergoing abdominal surgery and colorectal surgery, in particular, remains controversial. Current recommendations on perioperative fluid therapy are based on single trials and refer to major general abdominal surgery rather than to individual procedures, such as colorectal resection. Recent studies suggest that avoidance of fluid overload, rather than fluid restriction, seems to be the key to better postoperative outcome. This project will involve retrospective assessment of volume of fluid administered and its association with morbidity following colorectal surgery.
Location:	The Prince Charles Hospital, Chermside
Expected outcomes and deliverables:	This project will introduce the medical student to the perioperative management in the real world through retrospective data collection. Student will be encouraged to work towards presentation or publication of the study results.
Suitable for:	Students with knowledge about excel and basic statistical knowledge would be preferred. This may be of interest to students considering general surgery or anaesthesia as their future career
Primary Supervisor:	Dr. Usha Gurunathan, Senior staff specialist anaesthetist, Department of Anaesthesia, The Prince Charles Hospital
Supervisor's contact details:	Email: usha.gurunathan@health.qld.gov.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application. **This project is hosted in a hospital department. Depending on the project, there may be additional conditions that apply, e.g. assignment of the student's intellectual property to allow UQ to enter into a student placement agreement with the hospital, evidence of your vaccine-preventable disease status and/or blue cards.**

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Project title:	Smoking characteristics of hospitalized patients
Project duration:	Length of project: 8 weeks

	Hours expected per week: 36 hrs/wk
Description:	As background smoking prevalence decreases, the remaining smokers tend to be more "hardcore". We wish to test this hypothesis against a historical cohort at TPCH. The student will help prepare an ethics application and administer a questionnaire to hospitalised patients in conjunction with a nurse. The student can expect to learn: 1) Hands-on experience with ethics applications and questionnaire development; 2) Working in the ward environment with patients and 3) Some simple data analysis.
Location:	The Prince Charles Hospital, Chermside
Expected outcomes and deliverables:	Students will be asked to produce a short oral presentation at the end of their project. They will be expected to gain competency in project-specific skills and knowledge by the end of the 8 weeks, such as ethical application processes, patient recruitment and administering questionnaires. Some preparation prior to commencement will be required.
Suitable for:	Students with good interpersonal skills and an interest in respiratory diseases would be suitable for this project. However, any students with an interest in clinical research and learning are welcome to apply.
Primary Supervisor:	Dr Henry Marshall
Primary contact, if not supervisor:	Ms Maria Martins
Supervisor's contact details:	Tel: 07 3139 4110
Note before application:	The supervisor MUST be contacted by students prior to submission of an application. **This project is hosted in a hospital department. Depending on the project, there may be additional conditions that apply, e.g. assignment of the student's intellectual property to allow UQ to enter into a student placement agreement with the hospital, evidence of your vaccine-preventable disease status and/or blue cards.**

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Project title:	Volatile Organic Compounds (VOCs) to diagnose lung cancer
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	Lung cancer is the biggest cause of cancer deaths and the outcome is poor because of its frequent later presentation. Early detection of lung cancer (eg. via non-invasive breath biomarkers (VOCs)) means more patients can be referred for curative surgery or combined modality treatment before the cancer is too advanced. Field-asymmetric ion mobility spectrometry (FAIMS) is an analyser that separates molecules from samples according to the speed at which they move through a gas under the influence of an electric field. The aim of the study is to use the FAIMS platform to validate VOCs identified by gas chromatography and mass spectrometry as signature VOCs for lung cancer, in an independent group of subjects with lung cancer. Students may gain skills in patient recruitment, data collection, research methodology and analyses or have an opportunity to help generate data for presentation and publications from their research.
Location:	The Prince Charles Hospital, Chermside
Expected outcomes and deliverables:	Students will be asked to produce a short oral presentation at the end of their project. They will be expected to gain competency in project-specific skills and knowledge by the end of the 8 weeks.
Suitable for:	Students with an interest in respiratory diseases (especially lung cancer) would be suitable for this project. However, any students with an interest in laboratory research and learning are welcome to apply.
Primary Supervisor:	Dr Annette Dent and Ms Maria Martins

Primary contact, if not supervisor:	Ms Maria Martins
Supervisor's contact details:	Tel: 07 3139 4110
Note before application:	The supervisor MUST be contacted by students prior to submission of an application. **This project is hosted in a hospital department. Depending on the project, there may be additional conditions that apply, e.g. assignment of the student's intellectual property to allow UQ to enter into a student placement agreement with the hospital, evidence of your vaccine-preventable disease status and/or blue cards.**

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Project title:	Lung microbiome in COPD
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	Respiratory infections, both acute and chronic, are frequent in patients with chronic obstructive pulmonary disease (COPD). The aim of the project is to recruit inpatients and outpatients with COPD and assess the differences in the lung microbiome during exacerbation and stability. Students may gain skills in clinical trials research, data collection, research methodology and analyses or have an opportunity to help generate data for presentation and publications from their research.
Location:	The Prince Charles Hospital, Chermside
Expected outcomes and deliverables:	Students will be asked to produce a short oral presentation at the end of their project. They will be expected to gain competency in routine laboratory procedures such as specimen collection and processing, as well as project-specific skills and knowledge, by the end of the 8 weeks.
Suitable for:	Students with an interest in respiratory diseases and the microbiome would be suitable for this project. However, any students with an interest in laboratory research and learning are welcome to apply.
Primary Supervisor:	Prof Ian Yang and Janet Shaw
Primary contact, if not supervisor:	Ms Maria Martins
Supervisor's contact details:	Tel: 07 3139 4110
Note before application:	The supervisor MUST be contacted by students prior to submission of an application. **This project is hosted in a hospital department. Depending on the project, there may be additional conditions that apply, e.g. assignment of the student's intellectual property to allow UQ to enter into a student placement agreement with the hospital, evidence of your vaccine-preventable disease status and/or blue cards.**

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Project title:	Predicting the likelihood of cancer from nodule risk calculators
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	The aim of this project is to test how well different risk calculators perform in relationship to pathologically proven lung cancers. This will inform us on how best to use these new emerging tools in the clinic. Students should gain skills in data collection, research methodology, clinical research and analyses with the opportunity to learn how to generate data for presentation and publication.
Location:	The Prince Charles Hospital, Chermside

Expected outcomes and deliverables:	Students will be asked to produce a short oral presentation at the end of their project. They will be expected to gain competency in project-specific skills and knowledge by the end of the 8 weeks.
Suitable for:	Students with an interest in respiratory diseases (especially lung cancer) would be suitable for this project. However, any students with an interest in clinical research and learning are welcome to apply.
Primary Supervisor:	Professor Kwun Fong and Barbara Page
Primary contact, if not supervisor:	Ms Maria Martins
Supervisor's contact details:	Tel: 07 3139 4110
Note before application:	The supervisor MUST be contacted by students prior to submission of an application. **This project is hosted in a hospital department. Depending on the project, there may be additional conditions that apply, e.g. assignment of the student's intellectual property to allow UQ to enter into a student placement agreement with the hospital, evidence of your vaccine-preventable disease status and/or blue cards.**

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Project title:	Biomarkers for lung cancer
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	This project will investigate the use of minimally invasive bio-fluids (blood, microvesicles, broncoscopy washings) to enable the detection of lung cancer biomarkers using modern technologies. Students may gain skills in sample collection and bio banking, data collection, research methodology and analyses or have an opportunity to help generate data for presentation and publications from their research.
Location:	The Prince Charles Hospital, Chermside
Expected outcomes and deliverables:	Students will be asked to produce a short oral presentation at the end of their project. They will be expected to gain competency in routine laboratory procedures such as specimen collection and processing, as well as project-specific skills and knowledge, by the end of the 8 weeks.
Suitable for:	Students with an interest in respiratory diseases (especially lung cancer) and genetics would be suitable for this project. However, any students with an interest in laboratory research and learning are welcome to apply.
Primary Supervisor:	Professor Kwun Fong and Brielle Parris
Primary contact, if not supervisor:	Ms Maria Martins
Supervisor's contact details:	Tel: 07 3139 4110
Note before application:	The supervisor MUST be contacted by students prior to submission of an application. **This project is hosted in a hospital department. Depending on the project, there may be additional conditions that apply, e.g. assignment of the student's intellectual property to allow UQ to enter into a student placement agreement with the hospital, evidence of your vaccine-preventable disease status and/or blue cards.**

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Project title:	Characterisation of cancer subtypes in a lung bank
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk

Description:	The Prince Charles Hospital Lung Bank is collection of specimens collected from consenting hospital patients over 20-30yrs, including lung tissue, blood and lung fluids. Curation of this rich resource, including clinical and pathological characteristics of both specimens and patients, will ensure the availability of high quality material for multiple research studies. The student will gain skills in data collation (both in the laboratory and through secure patient databases), clinical chart reviewing and pathology report reviewing, or have an opportunity to help generate data for presentation and publications from their research.
Location:	The Prince Charles Hospital, Chermside.
Expected outcomes and deliverables:	Students will be asked to produce a short oral presentation at the end of their project. They will be expected to gain competency in routine laboratory procedures such as specimen collection and processing, as well as project-specific skills and knowledge, by the end of the 8 weeks.
Suitable for:	Students with an interest in respiratory diseases (especially lung cancer) would be suitable for this project. However, any students with an interest in laboratory or clinical research and moderate computer skills are welcome to apply.
Primary Supervisor:	Dr Felicia Goh and Eloise Shaw
Primary contact, if not supervisor:	Ms Maria Martins
Supervisor's contact details:	Tel: 07 3139 4110
Note before application:	The supervisor MUST be contacted by students prior to submission of an application. **This project is hosted in a hospital department. Depending on the project, there may be additional conditions that apply, e.g. assignment of the student's intellectual property to allow UQ to enter into a student placement agreement with the hospital, evidence of your vaccine-preventable disease status and/or blue cards.**

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Project title:	Screening for early epigenetic changes in non-small cell lung cancer
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	This project will investigate a previously described methylation biomarker panel to distinguish normal and lung cancer samples from the UQTRC Bio-bank (tissue, blood and broncoscopy washings). Students will gain skills and experience in sample collection and processing, DNA extraction, quantification and modification, data collection and statistical analyses.
Location:	The Prince Charles Hospital, Chermside
Expected outcomes and deliverables:	Students will be asked to produce a short oral presentation at the end of their project. They will be expected to gain competency in routine laboratory procedures such as specimen collection and processing, as well as project-specific skills and knowledge, by the end of the 8 weeks.
Suitable for:	Students with an interest in respiratory diseases (especially lung cancer) and genetics would be suitable for this project. However, any students with an interest in laboratory research and learning are welcome to apply.
Primary Supervisor:	Prof Kwun Fong and Eloise Shaw
Primary contact, if not supervisor:	Ms Maria Martins
Supervisor's contact details:	Tel: 07 3139 4110
Note before application:	The supervisor MUST be contacted by students prior to submission of an application. **This project is hosted in a hospital department. Depending on the project, there may be additional conditions that apply, e.g. assignment of the student's**

	intellectual property to allow UQ to enter into a student placement agreement with the hospital, evidence of your vaccine-preventable disease status and/or blue cards.

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Primary Care Clinical Unit

Project title:	Living with dementia and driving
Project duration:	Length of project: 8 weeks Hours expected per week: 24 hrs/wk
Description:	Our research project investigates the management of driving cessation with patients with dementia in primary care settings. We have developed a comprehensive support- and education-based intervention targeted at people with dementia and their family members to support them in managing driving cessation. This summer project may involve completing a literature review of potential tools that measure fitness to drive in primary care settings. It may also include participant recruitment, and assistance with data gathering, data entry and analyses. The exact nature of the work will depend upon the outcomes of our work in Semester 2.
Location:	Herston
Expected outcomes and deliverables:	The scholar's duties may include reviewing relevant literature, assisting with participant recruitment, and data gathering.
Suitable for:	The project would suit a student who has an interest in working with older persons, and in dementia research.
Primary Supervisor:	Dr Theresa Scott
Supervisor's contact details:	Email: theresa.scott@uq.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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QIMR Berghofer Medical Research Institute

Project title:	Developing human 'brain on a chip' cell models for investigation of brain ageing, disease, and drug development
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	Dementia (a form of neurodegeneration) is a rapidly growing health issue for Australia and worldwide with an expected 136 million cases by 2050 and there are currently no effective treatments. One of the major problems with trying to understand and treat dementia and related disorders, such as motor neuron disease, is that there are no ideal cell models to allow detailed molecular and cellular studies. Current models are generally composed of 2 dimensional cultures of neonatal rodent brain cells that do not accurately represent the complex 3D microenvironment and physiology of the human brain. To overcome this, we are developing a 3D human 'brain on a chip' platform. We grow human neural stem cells and human brain macrophages in 3D cultures on an OrganoPlateTM culture microfluidic platform. The aim is to generate an accurate model of an Alzheimer's brain involving neurons, astrocytes and Alzheimer's brain pathology including amyloid peptide deposition. Due to the importance of inflammation in the brain during Alzheimer's disease, we aim to add a neuro-immune response to the cultures by adding human brain

	macrophages. These cultures can be used to understand how amyloid accumulates, what role neuroinflammation has in the disease process, incorporation of patient cells, and enhance development of potential therapeutics that would normally only be examined in large scale animal studies. The model also forms a basis for similar models for other brain disorders including motor neuron disease and Parkinson's disease. Techniques will include neural stem cell and inflammatory cell culture, molecular studies (i.e. qPCR), microscopy (confocal imaging) and protein analysis (western blot).
Location:	QIMR Berghofer Medical Research Institute.
Expected outcomes and deliverables:	The student can expect to participate in cutting edge neuroscience research and potentially contribute to journal publications. The student will also learn state-of-the-art stem cell culture procedures and common laboratory techniques as well as an insight into dementia and the development of new approaches to understand brain disorders. Students may give a short report or oral presentation at the end of their project.
Suitable for:	This project is suitable for students with a biomedical background and an interest in neuroscience, brain diseases, neural stem cell technologies or neurotherapeutics.
Primary Supervisor:	Associate Professor Anthony White
Supervisor's contact details:	Email: tony.white@qimrberghofer.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	The effect of genetic predisposition to traits on recruitment bias
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	Population based research projects only recruit those willing to take part in a study, therefore potentially introducing a recruitment bias. As part of the PISA study (Prospective Imaging Study of Aging: Genes, Brain, and Behaviour) we are leveraging our extensive in-house cohorts drawn from genetic studies of approximately 16,000 individuals. All participants are being invited to complete an online survey on cognition and behaviour, lifestyle and family history. The fact that we already have genetic data for all participants before recruitment, presents a unique opportunity to investigate how a person's genetic predisposition to certain traits or psychiatric disease risk affects their propensity to take part. During this project we aim to investigate the association of genetic variants which affect education attainment (a proxy for IQ) and risk of psychiatric disease with the recruitment status. Results will highlight important biases which could affect findings from population based studies.
Location:	QIMR Berghofer Medical Research Institute, Herston.
Expected outcomes and deliverables:	Scholars will gain skills in participant recruitment and data analysis. They will be expected to complete a literature review for the study and may also be asked to produce a report or oral presentation at the end of their project. There may be opportunity to generate a publication from their research.
Suitable for:	This project would suit an applicant with an interest in genetic epidemiology and biostatistics, and with experience in statistical analysis.
Primary Supervisor:	Professor Nick Martin
Primary contact, if not supervisor:	Dr Michelle Lupton
Supervisor's contact details:	Email: Michelle.Lupton@QIMRBerghofer.edu.au

Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	What makes the human brain unique?
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	To understand human-specific brain function we need to interrogate a system that is capable of investigating (1) A manipulable human brain model together with (2) The whole human transcriptome to include recently evolved non-coding genomic changes. Therefore, we combine (1) induced pluripotent stem cell (iPSC) technology, from which functional human neurons can be derived and manipulated, with (2) whole genome transcriptomics. This allows us to investigate relevant gene expression involved in human neuronal function. A major strength of the iPS system is that we can easily investigate temporal changes, unlike any other system previously while sequencing allows us to decipher the response of the whole genome, including human-specific regions previously unseen.
Location:	QIMR Berghofer Medical Research Institute, Herston.
Expected outcomes and deliverables:	Students will be able to gain experience in either wet lab or bioinformatic aspects of the projects. They will learn how to come up with a relevant question, design an experimental plan and follow through to publishable results. Written and oral skills will also be practiced.
Suitable for:	Prior knowledge or experience in a laboratory setting (either wet lab or bioinformatics) will be useful but is not necessary. Students will, however, need to be enthusiastic, willing to learn and reliable.
Primary Supervisor:	Dr Guy Barry
Supervisor's contact details:	guy.barry@qimrberghofer.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Using high-throughout gene editing techniques to examine CD4+ T cell responses in vivo during experimental malaria
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	We know that immune cells called CD4+ T-cells can provide excellent protection against infectious agents. However, in order to do so, they must differentiate into a range of effector phenotypes, termed “T-helper” (Th) cells. We understand relatively little about how CD4+ T cells decide which type of Th cell they should become to provide protection against a malaria infection. Recently, using single-cell transcriptomics, we discovered a large number of genes which may play a role in controlling Th fate. This project aims to employ state of the art gene editing techniques, to knock out these genes in a high throughput manner, and then to screen for changes in Th fate. This project will involve using in vivo models of malaria in conjunction with cellular immunology and CRISPR-cas9 mediated gene editing techniques.
Location:	QIMR Berghofer Medical Research Institute, Herston
Expected outcomes and deliverables:	This project will provide the applicant an opportunity to gain a deep understanding of T-cell immunology, as well as experience in a wide array of cutting edge in vivo cellular immunology techniques including, flow cytometry, gene-editing, cell culture, in vivo models, bioinformatics and single-cell transcriptomics. Our laboratory is

	heavily focussed on research training; so the applicant will receive thorough training in transferable skills such as team work, effective communication skills and leadership.
Suitable for:	Enthusiasm Attention to detail A capacity to work hard during unsocial hours Good numeracy skills Laboratory skills are desirable Bioinformatics and computing skills, including programming in R, is highly desirable.
Primary Supervisor:	Dr. Ashraful Haque
Supervisor's contact details:	Email: Ashraful.haque@qimrberghofer.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Developing host directed therapy to improve anti-parasitic immunity
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	**Background:** Eliminating parasites, such as those that cause malaria and leishmaniasis, often requires the generation of robust host immune responses. However, these responses need to be tightly controlled so they do not damage host tissues. Therefore, humans have developed potent immunoregulatory networks to control inflammation and prevent disease. Many pathogens persist in hosts because these immunoregulatory mechanisms emerge prior to them being eliminated. These immunoregulatory networks can also render vaccines and treatments shown to be effective in healthy volunteers, sub-optimal or even ineffective in disease endemic areas. Specialized sub-populations of CD4+ T cells are major regulators of inflammation during parasitic diseases. In this application we will identify key molecules required for regulatory T cell function during malaria and leishmaniasis, and test whether transient blockade of these molecules can improve vaccine efficacy and/or responses to anti-parasitic drug treatment. **Hypothesis:** Immunoregulatory networks established after first exposure to parasites protect hosts from disease, but impede subsequent development of anti-parasitic immunity. **Aim:** To identify immune checkpoint molecules that can be targeted to improve vaccine efficacy and responses to drug treatment. **Methods:** We will employ a range of molecular and cell-based approaches to improve parasite-specific CD4+ T cell responses in in vitro assays, as well as in infected animals.
Location:	QIMR Berghofer Medical Research Institute, Herston.
Expected outcomes and deliverables:	Following the completion of this project, scholars will have expertise in immunology, cell and molecular biology, cellular assays, animal models of parasite infection, data recording, analysis and presentation, experimental design, report writing and oral presentation.
Suitable for:	This project is suitable for students studying biology subjects, with a specific interest in immunology and/or infectious diseases. Some laboratory experience is desired, but not essential. Ideally, we are looking for students interested in doing an Honours year project and/or post-graduate studies in the future.
Primary Supervisor:	Professor Christian Engwerda

Supervisor's contact details:	Email: chrisE@qimr.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Detection and interpretation of genetic influences on Parkinson disease and neuropsychiatric disease
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	**Background:** Genome-wide association studies (GWAS) have made significant progress in identifying single nucleotide polymorphisms (SNPs), or genetic variants in the DNA, associated with complex human phenotypes or diseases. Recent findings suggest many of these variants are associated with multiple diseases. This phenomenon has two important implications: first, it provides an opportunity to prioritise likely causal genetic variants, and second, it may provide important information on the causal relationship between diseases. The subsequent integration of other molecular data, such as genome-wide gene expression, may further prioritise risk variants for follow-up functional studies. The identification of causal variants and genes is the important next step in identifying the biological pathways underlying complex diseases and may ultimately facilitate the development of more effective patient management and treatment strategies. **Aims:** (1) Examine shared genetic influences between Parkinson disease and multiple neuropsychiatric diseases, including major depressive disorder, schizophrenia, anxiety, and attention deficit disorder. (2) Integrate genome-wide association and gene expression data to prioritise the discovery of pathogenetic mechanisms underlying Parkinson disease and neuropsychiatric diseases. **Method:** Summary association statistics from 4 GWASs of neuropsychiatric traits (schizophrenia, major depressive disorder, anxiety, and attention deficit hyperactivity disorder) and Parkinson disease are available for download from the Psychiatric Genomics Consortium (PGC) (http://www.med.unc.edu/pgc/) and the Parkinson Study Group (PSG) (http://www.pdgene.org/gwas) websites. Gene expression data have been obtained from the Common Mind Consortium (brain, n=613), the Young Finns Study (blood, n=1,264), and the Genotype-Tissue Expression Project (GTEx, 44 post-mortem tissues). A transcriptome-wide association study (TWAS) will be performed for each GWAS. Implicated alleles and genes will be further characterised using publicly available data including the Genotype-Tissue Expression (https://www.gtexportal.org/) project and Encyclopedia of DNA Elements (ENCODE) (https://www.encodeproject.org/). **Significance:** The proposed study and resulting network of genetic (SNP) variation and gene expression will complement GWASs performed by the PGC and the PSG. This project, utilising publicly available data and genetic analysis techniques, will contribute to understanding the underlying genetic architecture and biological mechanisms of Parkinson disease and neuropsychiatric disease. **Description of work:** The student will get access to a cluster computer that stores the described data sets. The command-line and statistical software tools will be used to analyse and interpret genome-wide association data.

Location:	QIMR Berghofer Medical Research Institute, Herston
Expected outcomes and deliverables:	The summer student will gain experience in genetic analysis techniques and the use of large scale genomic compendia for the functional interpretation of disease susceptibility loci.
Suitable for:	This project will suit a science student preferably majoring in genetics, mathematics or physics who wishes to gain experience in genetic analysis techniques.
Primary Supervisor:	Professor Eske Derks
Supervisor's contact details:	Email: Eske.Derks@qimrberghofer.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Effects of brain stimulation in whole brain dynamics: A EEG-TMS study
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	Neuropsychiatric disorders are associated with disruptions to brain dynamics, which can be modified by brain stimulation. The goal of this project is to characterize the changes in brain dynamics induced by transcranial magnetic stimulation (TMS). This is a fundamental step to optimise the protocols for non-invasive brain stimulation.
Location:	QIMR Berghofer Medical Research Institute, Herston.
Expected outcomes and deliverables:	Students will gain skills in mathematical modelling and computational neuroscience. Students will be expected to write a short report by the end of the project, detailing their findings. If successful, the work will form part of a future publication.
Suitable for:	This project would suit students interested in undertaking research in the field of human neuroscience.
Primary Supervisor:	Professor Michael Breakspear
Primary contact, if not supervisor:	Dr Leonardo Gollo
Supervisor's contact details:	Email: Leonardo.gollo@qimrberghofer.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Brain dynamics following (un-)successful ageing
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	Neurons and the brain exhibit structural adaptations as we age. The functional consequences of such structural changes remain poorly understood. The goal of this project is to characterize changes in brain dynamics associated with ageing. This is a crucial step to identify disruptions in brain dynamics that lead to cognitive impairments.
Location:	QIMR Berghofer Medical Research Institute, Herston
Expected outcomes and deliverables:	Students will gain skills in mathematical modelling and computational neuroscience. Students will be expected to write a short report by the end of the project, detailing their findings. If successful, the work will form part of a future publication.
Suitable for:	This project would suit students with a background in physics, maths, or a related discipline (this is essential), and an interest in computational neuroscience, preferably with some experience in programming (e.g. in MATLAB).
Primary Supervisor:	Professor Michael Breakspear
Primary contact, if not supervisor:	Dr Leonardo Gollo

Supervisor's contact details:	Email: Leonardo.gollo@qimrberghofer.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	How brain dynamics emerge from energy constraints
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	The brain consumes 20% of the body's energy despite constituting only 2% of the body's mass. Optimal brain functioning thus requires careful balancing of the brain's energy budget. This central organising principle has been extraordinarily successful in explaining brain structure, including brain network architectures that minimise wiring length and optimal neural codes for efficient information representation. Despite these successes, most of the brain's energy expenditure is currently unexplained. The question of how metabolic constraints shape neuronal dynamics – particularly at the large scale – remains largely unanswered. A large part of the problem is that existing models of large-scale brain activity do not explicitly include metabolic variables and so are unable to address dynamical constraints on resources such as oxygen and energy. This project aims to develop a biophysical model to understand how the brain's need to optimise its energy resources shapes its activity. The project will involve close engagement with neurophysiological and neuroimaging data.
Location:	QIMR Berghofer Medical Research Institute, Herston.
Expected outcomes and deliverables:	Students will gain skills in mathematical modelling and computational neuroscience. Students will be expected to write a short report by the end of the project, detailing their findings. If successful, the work will form part of a future publication.
Suitable for:	This project would suit students with a background in physics, maths, or a related discipline (this is essential), and an interest in computational neuroscience, preferably with some experience in programming (e.g. in MATLAB).
Primary Supervisor:	Prof Michael Breakspear
Primary contact, if not supervisor:	Dr James Roberts
Supervisor's contact details:	Email: james.roberts@qimrberghofer.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application

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Project title:	Modelling the effects of transcranial magnetic stimulation on large-scale brain dynamics
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	Transcranial magnetic stimulation (TMS) is a non-invasive means for perturbing brain activity using magnetic fields. Although TMS is becoming popular in studies of brain function and as a potential treatment for various neurological and psychiatric disorders, its mechanisms remain poorly understood. Our lab has recently developed a relatively simple mathematical model for how TMS modifies brain activity across different brain regions. In the next phase of this research, we aim to improve the biological realism of the model. This project will contribute to developing a more realistic physiologically-based mathematical model for the large-scale effects of TMS, including comparing the model to data.
Location:	QIMR Berghofer Medical Research Institute, Herston.

Expected outcomes and deliverables:	Students will gain skills in mathematical modelling and computational neuroscience. Students will be expected to write a short report by the end of the project, detailing their findings. If successful, the work will form part of a future publication.
Suitable for:	This project would suit students with a background in physics, maths, or a related discipline (this is essential), and an interest in computational neuroscience, preferably with some experience in programming (e.g. in MATLAB).
Primary Supervisor:	Prof Michael Breakspear
Primary contact, if not supervisor:	Dr James Roberts
Supervisor's contact details:	Email: james.roberts@qimrberghofer.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application

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Royal Brisbane Clinical Unit

Project title:	Drug treatment of headaches in the emergency department
Project duration:	Length of project: 8 weeks Hours expected per week: 20 hrs/wk
Description:	Background: Most headaches are benign and only require symptomatic treatment. Research question: How is the pain, nausea and vomiting currently being treated in the emergency department patient complaining of a headache? Are opioids over prescribed? Is chlorpromazine used indiscriminately irrespective of whether the patient is suffering from a migraine? Methods: A retrospective observation study will be conducted. Data will be sourced from the emergency and hospital databases.
Location:	Department of Emergency Medicine, Royal Brisbane & Women's Hospital, Herston.
Expected outcomes and deliverables:	Learning objectives: 1. Performing a systematic review 2. Formulating a research question 3. Understanding the practicalities of conducting a chart review 4. Collecting an interpreting data 5. Presenting the results at a scientific meeting
Suitable for:	Suitable for applicants interested in clinical research and learning the practicalities of doing a chart review.
Primary Supervisor:	Associate Professor Kevin Chu
Supervisor's contact details:	Email: k.chu@uq.edu.au, (07) 3646 7901
Note before application:	The supervisor CAN be contacted by students prior to submission of an application. **This project is hosted in a hospital department. Depending on the project, there may be additional conditions that apply, e.g. assignment of the student's intellectual property to allow UQ to enter into a student placement agreement with the hospital, evidence of your vaccine-preventable disease status and/or blue cards.**

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Project title:	Proximal tubule epithelial cell (PTEC)-immune cell cross-talk during renal hypoxic injury.
Project duration:	Length of project: 8 weeks Hours expected per week: 32 hrs/wk

Description:	**Background:** Chronic kidney disease (CKD) is the most common chronic disease in Australia. One of the key drivers of CKD is renal hypoxia, where the kidney is deprived of adequate oxygen supply. This project examines the functional relationships between human resident kidney cells (proximal tubule epithelial cells; PTEC) and infiltrating immune cells during hypoxic renal damage. The project builds on novel information generated by our research team in the early stages of CKD and aims to extend the work to the later stages where tissue damage is established and appears irreversible. **Hypothesis:** Hypoxic PTEC recruit and activate tubulointerstitial human immune cells towards a pathogenic phenotype and function. **Aims:** Aim 1 – To define the molecular and phenotypic profile of PTEC under in vitro hypoxic conditions. Aim 2 – Ex vivo characterisation of PTEC under hypoxic conditions (correlations to frozen sections). Aim 3 – To define the immunological drivers of CKD by in vitro co-culture of hypoxic primary PTEC with human leukocytes – in particular, NK cells and Dendritic cell subsets.
Location:	Royal Brisbane and Women's Hospital / QIMR Berghofer Medical Research Institute, Herston.
Expected outcomes and deliverables:	This research project will provide students with in-depth skills of cell-culture, multi-colour flow cytometry, protein detection using Western blotting/ELISA assays, immunohistochemistry and immune-cell interactions using proliferation assays, cytokine expression and apoptosis analysis. Furthermore, students will have an opportunity to generate publications from this research project.
Suitable for:	This project is suitable for potential MPhil or PhD students with a keen interest in clinical research. Participants will gain relevant research skills, including sample collection, database management and competence in complex wet lab techniques.
Primary Supervisor:	Dr Andrew Kassianos
Supervisor's contact details:	Email: andrew.kassianos@qimrberghofer.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application. **This project is hosted in a hospital department. Depending on the project, there may be additional conditions that apply, e.g. assignment of the student's intellectual property to allow UQ to enter into a student placement agreement with the hospital, evidence of your vaccine-preventable disease status and/or blue cards.**

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Project title:	Development of respiratory simulation for the SimMan3G manikin
Project duration:	Length of project: 8 weeks Hours expected per week: 20-30 hrs/wk
Description:	The Simman3G manikin is utilised for many simulations but has present limitations as it does not provide air movement in and out of the lungs. The project aims to modify it to provide appropriate simulation of breathing.
Location:	Department of Anaesthesia, Level 4 Ned Hanlon Building, Royal Brisbane and Woman's Hospital.

Expected outcomes and deliverables:	Respiratory physiology Simulation technology.
Suitable for:	Students familiar with handling silicone materials, and possibly 3D printing. **NOT SUITABLE FOR STUDENTS WITH LATEX ALLERGY.**
Primary Supervisor:	Associate Professor Kersi Taraporewalla
Primary contact, if not supervisor	Dr Heather Reynolds
Supervisor's contact details:	Email: kersi.taraporewalla2health.qld.gov.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application. **This project is hosted in a hospital department. Depending on the project, there may be additional conditions that apply, e.g. assignment of the student's intellectual property to allow UQ to enter into a student placement agreement with the hospital, evidence of your vaccine-preventable disease status and/or blue cards.**

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Project title:	PBM/ Patient Blood Management (PBM): reduce blood transfusion by optimal management of iron deficiency anaemia
Project duration:	Length of project: 8 weeks Hours expected per week: 20 hrs/wk
Description:	BackgroundPBM in Australia has the potential to enable risk reduction and cost saving for many patientsAim PBM- we aim to identify and treat patients with existing iron deficiency anaemia before surgery.
Location:	Department of Anaesthesia, Level 4 Ned Hanlon Building, Royal Brisbane and Woman's Hospital.
Expected outcomes and deliverables:	PBM: Introduction of iron transfusion for preoperative anaemia management. Audit of current practise, implementation of anaemia management service and iron transfusion to improve patient outcomes and publication of results.
Suitable for:	Pre-medical provisional students or those with a background in haematology.
Primary Supervisor:	Associate Professor Kerstin Wyssusek
Primary contact, if not supervisor	Dr Michelle Roets
Supervisor's contact details:	michelle.roets@health.qld.gov.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application. **This project is hosted in a hospital department. Depending on the project, there may be additional conditions that apply, e.g. assignment of the student's intellectual property to allow UQ to enter into a student placement agreement with the hospital, evidence of your vaccine-preventable disease status and/or blue cards.**

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School of Biomedical Sciences

Project title:	Role of NFIX in cerebellar development and medulloblastoma
Project duration:	Length of project: 8 weeks Hours expected per week: 30 hrs/wk
Description:	The balance between appropriate progenitor cell self-renewal and differentiation is the hallmark of tissue and organ homeostasis. Most notably, this fine-tuning

	between neural progenitor cell self- renewal and neurogenic differentiation is central to the formation of the human brain. Brain cancers such as medulloblastoma, a cerebellar cancer that is the most common malignant paediatric brain tumour, arise as a direct consequence of a breakdown in progenitor self-renewal and differentiation. The Nuclear factor one (NFI) family of transcription factors have emerged as key regulators in promoting neural progenitor cell differentiation during cerebellar development and, moreover, their misregulation is involved in the aetiology of medulloblastoma. Unfortunately, the molecular mechanisms underpinning NFI-mediated neural progenitor cell differentiation within the cerebellum remain unclear. In this proposal, we aim to show how a key NFI family member, NFIX, regulates the differentiation of neural progenitor cells within the cerebellum, and to interrogate the consequences of NFIX misregulation in medulloblastoma.
Location:	UQ Otto Hirschfeld Building 81, St Lucia Campus.
Expected outcomes and deliverables:	Scholars will gain skills in multiple techniques, including sectioning, histology, microscopy, qPCR and tissue culture. They will be expected to contribute to lab meetings, and to produce an oral presentation at the end of the project.
Suitable for:	This project is open to students with some experience in neuroscience.
Primary Supervisor:	Associate Professor Michael Piper
Supervisor's contact details:	Email: m.piper@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	The use of archival material to inform shark and ray ecology in eastern Australia
Project duration:	Length of project: 8 weeks Hours expected per week: 20 hrs/wk
Description:	This project utilises archival material to inform population studies into sharks and rays using citizen science and genetic data. Many shark and ray species can be identified from individual markings and therefore, photographs or footage provide records of sighting data for these animals which can be mined to investigate patterns of site fidelity and movement as well as indications of abundance and other life history parameters. This part of the project works within the Citizen Science scope of Project Manta, a collaborative research project based out of UQ which investigates the ecology and biology of manta rays in Australian waters. The student will examine archival footage and use matching software to compare photographs from different regions to inform manta ray populations. The student will also assist with archiving genetic tissue material from sharks and rays on the new database: https://www.sharkshareglobal.org.
Location:	UQ Otto Hirschfeld Building 81, St Lucia.
Expected outcomes and deliverables:	Students will gain experience with data collection and collation for existing research programs. They will also gain experience in using spreadsheets for data organisation as well as specialised software.
Suitable for:	Undergraduate students interested in marine biology and ecology, particularly sharks and rays. Students with skills in using spreadsheets and databases are preferred.
Primary Supervisor:	Dr Christine Dudgeon
Supervisor's contact details:	Email: c.dudgeon@uq.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	The role of C5aR2 in Motor Neurone Disease
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	**Background to project:** ALS (or motor neuron disease) is a devastating disease affecting thousands of Australian's. Each day, 2 more Australian's are diagnosed, whilst 2 others die from this disease. There is no effective treatment for this disease, however emerging evidence suggests that the complement system, which is an integral component of innate immunity can shape the progression and severity of this disease. Complement activation cleaves C5 into the bioactive fragment C5a, which modulate the inflammatory response by binding to its receptor C5aR1. Our previous studies in SOD1G93A rats and mice demonstrated that C5aR1 has a pro-inflammatory function. Another receptor of C5a is C5aR2, which its role is not fully understood. Previously, it has been shown that C5aR2 can have pro- or anti-inflammatory properties based on different aspects of the disease. We hypothesise that C5aR2 is increased in ALS to facilitate motor neuron death, and therapeutic modulation of this target, could be a means to slow disease progression. To prove/disprove this, we will examine C5aR2 expression and localisation in the most widely used mouse model of ALS. **Aims and significance of project:** We will pursue the following aims to investigate the potential role of C5aR2 in ALS. Our goal is to identify if this complex has a pathogenic role and is altered in this disease by facilitating motor neuron death. If successful, this could potentially lead to new therapeutics to treat this devastating disease. Aim 1: To characterise the expression of C5aR2 in the lumbar spinal cord during disease progression in the SOD1G93A mouse model of ALS. Aim 2: To determine the cellular localisation of C5aR2 in the lumbar spinal cord during disease progression in the SOD1G93A mouse model of ALS. **Experimental approach and methods to be used by student:** We will utilise the SOD1G93A transgenic mouse model of ALS in this study. This mouse over-expresses a human mutant ALS gene, and progressively develops loss of motor neurons, muscle paralysis and eventual death. We will examine the expression of C5aR2 in the lumbar spinal cord and skeletal muscle at four pre-defined disease stages (pre-symptomatic, onset, mid-symptomatic and end stage) using qPCR and western blotting. We will also examine the localisation of C5aR2 in the spinal cord and skeletal muscle using immunohistochemistry.
Location:	UQ School of Biomedical Sciences, Skerman Building, UQ St Lucia
Expected outcomes and deliverables:	The applicant will gain skills in molecular techniques such as qPCR, western blotting and immunohistochemistry, which are basic skill sets in the laboratory. They will also gain skills in data collection and analyses, where this data will be used as preliminary data plan for further experiments looking at the role of C5aR2 in motor neurone disease.
Suitable for:	Pre-medical provisional students interested in MD-HDR pathway.
Primary Supervisor:	Dr John Lee
Supervisor's contact details:	Email: j.lee9@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Repurposing of clinically approved drugs for neurodegeneration
Project duration:	Length of project: 10 weeks Hours expected per week: 36 hrs/wk

Description:	This project will evaluate the therapeutic potential of repurposing clinically approved drugs in experimental models of neuroinflammation and neurodegeneration. Our group has recently discovered and validated promising new therapeutic targets for Parkinson's disease that can potentially be targeted by repositioning drugs which are currently being used to treat other diseases. This project will test these promising repositioned drug candidates using cell culture models of neuronal death and neuroinflammation which occurs in Parkinson's disease.
Location:	UQ School of Biomedical Sciences, Skerman Building, UQ St Lucia
Expected outcomes and deliverables:	Skills in cell culture, microscopy, molecular biology and proteomics as well as potential research publications.
Suitable for:	Suitable for students with a background or interest in Pharmacology and/or Neuroscience. Pre-medical provisional students interested in MD-HDR pathway.
Primary Supervisor:	Dr Richard Gordon
Supervisor's contact details:	Email: r.gordon1@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Enhancement of retromer function in Parkinson Disease
Project duration:	Length of project: 8 weeks Hours expected per week: 30 hrs/wk
Description:	Retromer is responsible for coordinating protein trafficking from the endosomal compartment and its function has been directly associated with causing Parkinson's Disease. Using cell models we have preliminary data that the enhancement of retromer function reduces the pathological changes within cells. This PhD project will examine ways to enhance the function of retromer and determine if it can prevent the progression of Parkinson Disease. This project will involve performing a series of cell based experiments to evaluate this hypothesis.
Location:	UQ School of Biomedical Sciences, Sir William MacGregor Building, St Lucia
Expected outcomes and deliverables:	Students will gain experience working with in research laboratory including introduction to range of cell biology techniques including labelling biological samples and analysing them using microscopy based techniques.
Suitable for:	This project is open to applications from students with a background/interest in cell biology and/or neurodegenerative diseases.
Primary Supervisor:	Associate Professor Rohan Teasdale
Supervisor's contact details:	Email: r.teasdale@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application. This project has two positions available

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Project title:	Protective effects of triheptanoin in a model of muscular dystrophy
Project duration:	Length of project: 6-10 weeks Hours expected per week: 30-36 hrs/wk
Description:	Muscular dystrophy is a genetic disease leading to early muscle degeneration and early death. We propose that triheptanoin treatment can improve symptoms and muscle structure in the mdx mouse model of muscular dystrophy. This project will evaluate if triheptanoin alleviated muscle degeneration and collagen deposition after triheptanoin and creatine control treatment in these mice using histological methods and microscopy.
Location:	UQ School of Biomedical Sciences, Skerman Building, UQ St Lucia.

Expected outcomes and deliverables:	This project will reveal to which extent triheptanoin treatment alleviated muscle degeneration and collagen deposition in mdx mice. These data are needed to complete a publication regarding triheptanoin's protective effects in this model.
Suitable for:	This project is open to applications from students with a background in chemistry, biomedical sciences or pre-medical provisional students. Students who are interested in a career in biomedical research are preferred.
Primary Supervisor:	Dr Karin Borges
Supervisor's contact details:	Email: k.borges@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Defining the protein machinery responsible for delivery of proteins from endosomes to the Golgi.
Project duration:	Length of project: 8 weeks Hours expected per week: 30 hrs/wk
Description:	The spatial arrangement of proteins within a cell is of fundamental importance and impacts on all biological processes and pathways. Membranes and proteins are in constant motion within cells and transport pathways control and direct this traffic flow. This flux of internalized and secreted material must be precisely coordinated and this is achieved through a common network of intracellular membrane-bound compartments, the endosomal system. This is achieved by cargo engaging specific sorting machinery to generate endosome-transport carriers (ETCs). Once formed, these carrier vesicles engage the machinery at the target membrane, resulting in cargo delivery to the acceptor organells. Despite their importance, our understanding of molecular machinery that forms these tubular sub compartments and the properties of the resulting ETCs, are still in its infancy. This project will determine the contribution of individual proteins have on the formation of the distinct endosome-transport carrier types and the sorting of a range of cargo actively transported by these vesicles.
Location:	School of Biomedical Science, Sir William MacGregor Building, UQ St Lucia.
Expected outcomes and deliverables:	Students will gain experience working with in research laboratory including introduction to range of cell biology techniques including labelling biological samples and analysing them using microscopy based techniques.
Suitable for:	This project is open to applications from students with a background/interest in cell biology and/or neurodegenerative diseases.
Primary Supervisor:	Associate Professor Rohan Teasdale
Supervisor's contact details:	Email: r.teasdale@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Inflammation and white matter damage in a mouse TBI model
Project duration:	Length of project: 6-10 weeks Hours expected per week: 30-36 hrs/wk
Description:	Traumatic brain injury (TBI) is one of the most debilitating socio-economic problems all around the world. It is a leading cause of deaths and disabilities. This project investigates if metabolic treatments can improve TBI in a mouse model. Immunohistochemistry and microscopy on brain sections (that are already

	collected) will be used to characterise the extent of inflammation and damage to white matter.
Location:	UQ School of Biomedical Sciences, Skerman Building, UQ St Lucia.
Expected outcomes and deliverables:	The project will inform of the time course of inflammation and white matter damage after TBI in our mouse model, which we plan to publish. This will help us to devise the time course of when to assess if metabolic treatments can improve inflammation and white matter damage.
Suitable for:	This project is open to applications from students with a background in chemistry, biomedical sciences or pre-medical provisional students. Students who are interested in a career in biomedical research are preferred.
Primary Supervisor:	Dr Karin Borges
Supervisor's contact details:	Email: k.borges@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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School of Public Health

Project title:	The experience of debt and how it influences women's health
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	**Background and Aims** There is increasing public health and social science interest in understanding socio-economic precariousness and how it influences health. Socio-economic preciousness is characterised by income and resource instability and insecurity (Fieulaine and Apostolidis 2015). Personal debt is becoming recognised as an important socio-economic determinant of health that should be explored further in social epidemiological research (Sweet et al, 2013). A recent systematic review of the relationship between personal unsecured debt and mental and physical health found a significant relationship between debt and mental disorder, depression, suicide completion or attempt, problem drinking, drug dependence, neurotic disorders and self-rated health (Richardson et al, 2013). Most studies reviewed were cross sectional with few longitudinal studies examining the relationship between debt and health. The limited research on gendered differences in experiences of debt and health have found that women experience high rates of debt –related stress and associated mental and physical health issues. Dunn and Mirzaie (2012) examined determinants of consumer debt stress in the United States and found women to be subject to significantly more stress from their debts than men. Although women carry slightly less debt than men, they have significantly less income, so their debt to income ratio is higher. Even controlling for ratio of debt to income, women exhibited more stress. Notably, there is limited research on experiences of debt and health in women aged in their 30's and 40's, who might juggle multiple responsibilities including pressure to build wealth through home ownership, engage in paid employment, child bearing/rearing and aging family member caregiving. This study aims to investigate women' experiences of debt and financial hardship, and the impact these may have on their lives and their health in particular. **Methods** The data to be used come from the Australian Longitudinal Study on Women's

Health 1973-78 cohort. This cohort of 14 247 women were recruited in 1996 (when aged 18-23 years) and have been re-surveyed approximately every 3 years (surveys in 2000, 2003, 2006, 2009, 2012 and 2015). At each survey the women are invited to free write comments on the last page of the survey under the heading "Have we missed anything?". A preliminary investigation of the free written comments reveals that many women are writing about debt, indicating that the project is very feasible.

Data analysis

We have 7 waves of comments that can be linked to the idalias of the women ie we can follow each women who writes in successive surveys.

a) Content analysis will be used initially to identify coding frame based on terms associated with debt, financial hardship, and other terms relevant to the research questions.

b) Once relevant comments have been identified and extracted, the data will then be coded and organised into themes for more detailed thematic analysis in order to answer the research questions.

c) Data will be examined across 7 waves of survey data to find if and how women's discuss debt and financial issues across time.

Thematic analysis will then be used to address the research questions:

- How do women write about debt or financial hardship?
- What is the impact of debt or financial hardship on women and their lives?
- What do women say about the health impact of debt or financial hardship?

It is expected that, in keeping with qualitative methodology, that the research questions will be refined as the research progresses. We are particularly interested in whether we can identify trends in the 1973-78 cohort's comments about debt or financial hardship over time, as they go through life stages such as finishing schooling (with a potential HECs debt), moving residence, gaining employment and then ceasing or reducing employment (temporarily or permanently) with childbearing.

Qualitative longitudinal analysis techniques will be used. Nvivo will be used to assist with the analysis and as a means to coding and organising thematic structures for a), b) and c) approaches listed above. Quantitative data will be used for descriptive purposes including: age, area of residence, living arrangements, income management, education, general health, life events, childbirth, social support and life satisfaction.

The data we are hoping to extract from this project will lead to additional research which will be important in further understanding women's health and informing policy and service provisions in the face of debt and financial hardship.

Specific role of the summer scholar.

This research is being led by Lisa Fitzgerald (who has expertise in qualitative methods and social determinants) and Leigh Tooth (who has expertise in quantitative methods and social determinants). The scholar/s will work with Lisa and Leigh. While the research program is large, a specific achievable role will be agreed upon between the supervisors and scholar/s during initial discussions. For example, scholar/s might be involved in undertaking a literature review, or doing thematic analysis and/or, if time permits, be involved with drafting a paper for publication.

References

Dunn LF, Mirzaie IA. (2012). Determinants of Consumer Debt Stress: Differences by Debt Type and Gender. Working Paper, Center for Human Resource Research.

	Fieulaine N, Apostolidis T. (2015). Precariousness as a Time Horizon: How Poverty and Social Insecurity Shape Individuals' Time Perspectives. In Time Perspective Theory; Review, Research and Application (pp. 213-228). Springer International Publishing. Richardson T, Elliott P, Roberts R. (2013) The relationship between personal unsecured debt and mental and physical health: A systematic review and meta-analysis. Clinical Psychology review, 33, 1148-1162. Sweet E, Nandi A, Adam E, McDade T. (2013). The high price of debt: household financial debt and its impact on mental and physical health. Social Science and Medicine, 91, 94-100.
Location:	Herston
Expected outcomes and deliverables:	Opportunities for scholars to gain research skills in qualitative (and possibly quantitative) data analysis and expertise about social determinants of health. It is expected that the outcomes of this research will be reported in a peer reviewed paper.
Suitable for:	Scholars with interest and skills in social determinants of health Scholars with expertise/interest in qualitative research methods.
Primary Supervisor:	Associate Professor Leigh Tooth/ Dr Lisa Fitzgerald
Supervisor's contact details:	Email: l.tooth@uq.edu.au or l.fitzgerald@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Prevalence and burden of substance use disorders
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	Substance use disorders are established causes of global disease burden. This project involves conducting a systematic literature review on the epidemiology of substance use disorders, e.g. cannabis, opioids, amphetamines, cocaine. This work can be used to inform analyses on disease burden attributable to substance use disorders.
Location:	The Park, River Drive, Wacol
Expected outcomes and deliverables:	The student will gain training in epidemiology and research methods relevant to systematic reviews and data extraction. The scholar will gain working experience with in a research team. Expected deliverables will include a systematic review of prevalence of selected substance use disorders, with a high quality dataset created from the data extraction process that can contribute to research projects or papers. There will be opportunities to expand this work into a student research project.
Suitable for:	This project is suitable for a scholar interested in psychiatric epidemiology who wishes to develop skills in conducting systematic reviews of the literature and preparation of data for research projects and papers. It would suit applicants with exceptional reading, speaking, and written communication skills. The suitable scholar would have completed the UQ library systematic reviews and Endnote training (or enrolled to these workshops), and able to commute to Queensland Centre for Mental Health Research at The Park, Wacol.
Primary Supervisor:	Dr Janni Leung
Supervisor's contact details:	Email: j.leung1@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Communicating the benefits of sitting less and moving more
Project duration:	Length of project: 8 weeks Hours expected per week: 24 hrs/wk
Description:	In 2018, a national implementation trial of the Be Upstanding Champion Toolkit will be launched. The Toolkit is a free, online resource designed to support workplaces to sit less and move more. A key component of the Toolkit is a blogsite – designed to provide the latest evidence around the benefits of sitting less and moving more, as well as tips and strategies to support workplaces to achieve this. The proposed project will involve contributing to the blogsite through writing blog articles. This is a fantastic opportunity to enhance your science communication skills, as well as be involved in a world-first initiative. Candidates should have experience with social media and strong communication skills.
Location:	UQ School of Public Health, Herston
Expected outcomes and deliverables:	Blogsite; Champion Forums; Facebook & Twitter feeds.
Suitable for:	The candidate(s) will gain skills in science communication. The analytics embedded within the Toolkit will enable them to see the impact of their work (number of reads; number of downloads). The candidate(s) will also gain "hands-on" experience in translational research and working with industry. There will be the opportunity to be involved in the generation of peer-reviewed publications.
Primary Supervisor:	Candidates should have experience with social media, and strong communication skills.
Primary contact, if not supervisor:	Associate Professor Genevieve Healy
Note before application:	Email: g.healy@uq.edu.au
Project title:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	The case for banning cigarette filters – a policy with potential public health and environmental benefits
Project duration:	Length of project: 8 weeks Hours expected per week: 28-36 hrs/wk
Description:	This literature review will look at a potential policy of banning filters on tobacco cigarettes. Cellulose acetate filters collect and release tars containing many toxins produced by burning tobacco. They provide the illusion of a health benefit, but do not reduce risk for the smoker and may increase the risk of lung cancer. They also make cigarettes easier to smoke, thereby encouraging use. It is estimated that around 4.5 trillion cigarettes are littered worldwide each year, contaminating waterways and natural environments. This review will summarise the research literature on the health and environmental impact of cigarette filters and explore what potential regulatory mechanisms could be used to ban filters being added to manufactured cigarettes.
Location:	UQ School of Public Health, Herston
Expected outcomes and deliverables:	A literature review/manuscript for publication.
Suitable for:	A wide range of students including students from a health-related course (e.g. Public Health, Medicine, Psychology, Nursing etc), environmental studies, law.
Primary Supervisor:	Dr Julie Dean
Primary contact, if not supervisor:	Associate Professor Coral Gartner
Supervisor's contact details:	Email: j.dean@sph.uq.edu.au (or Email: c.gartner@uq.edu.au)

Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Smokefree policies and laws in outdoor spaces
Project duration:	Length of project: 8 weeks Hours expected per week: 28-36 hrs/wk
Description:	This project includes a literature review will look at the implementation of smoke free laws in outdoor venues including university campuses. It will explore what evidence there is for their effectiveness in reducing second-hand smoke exposure and in encouraging smoking cessation. It may also include analysis of data collected from a baseline survey of smoking on campus and attitudes and views toward smokefree policies on university campuses.
Location:	UQ School of Public Health, Herston
Expected outcomes and deliverables:	A manuscript for publication/report
Suitable for:	A range of students would be suitable for this project, but particularly students from a health-related course (e.g. Public Health, Medicine, Psychology, Nursing, dentistry etc).
Primary Supervisor:	Associate Professor Coral Gartner
Primary contact, if not supervisor:	Associate Professor Coral Gartner or Dr Sheleigh Lawler
Supervisor's contact details:	Email: c.gartner@uq.edu.au or Email: s.lawler@sph.uq.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	A clinical trial of nicotine vaporisers for smoking cessation and relapse Prevention
Project duration:	Length of project: 8-10 weeks Hours expected per week: 28-36 hrs/wk
Description:	People with particular co-morbidities, such as HIV, Hepatitis C and Opiate Dependence, are more likely to smoke and less likely to achieve sustained abstinence when making a quit attempt. These populations are also more vulnerable to the harmful effects of tobacco smoke and hence finding new approaches to support these smokers to quit smoking and stay abstinent from smoking is a priority. This project is a pragmatic clinical trial. It aims to test whether it is more effective to offer smokers with co-morbidities access to nicotine vaporisers at the same time as standard quit smoking support or whether these should only be offered to 'treatment failures', that is those who have made a quit attempt with standard treatments but are still smoking at 6 months post treatment.
Location:	UQ School of Public Health, Herston
Expected outcomes and deliverables:	The student will develop skills in set up of a community based pragmatic clinical trial. Assist with preparation of participant materials, testing of surveys etc.
Suitable for:	Students from a health-related course, such as Public Health, Medicine, Psychology, Nursing, dentistry, social work, pharmacy.
Primary Supervisor:	Dr Malcolm Brinn
Supervisor's contact details:	Email: m.brinn@uq.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	The role of the media in health aspects of disasters
Project duration:	Length of project: 10 weeks Hours expected per week: 20 hrs/wk
Description:	This project is an exciting opportunity to undertake an interdisciplinary project – linking public health in disasters and the media. Using Logan as a case study, this qualitative project will examine the role of media in the overall public health response to the 2017 flooding (http://bit.ly/2nKdSl8) from preparedness to rebuilding and recovery, and the role public health professionals in working with the media to ensure messages are appropriate. Given the important role the media can play, understanding how the media and public health and media professionals work together for an effective risk communication response is critical. The successful applicant will be provided with training in undertaking qualitative interviews, data analysis and presentation skills. Must be prepared to travel to Logan. It is expected that the working with the supervisors, this project will result in a manuscript to be submitted to a peer reviewed journal. Interested students are encouraged to discuss the project with Dr Jo Durham before applying. The project will be co-supervised by Dr Jo Durham, Dr Lisa Schubert and Anthony Frangi (School of Communication and Arts, journalist and tutor, http://www.abc.net.au/profiles/content/s2971870.htm), who has earned an international reputation for his work in media and natural disaster coverage.
Location:	UQ School of Public Health, Herston
Expected outcomes and deliverables:	Expected outcomes are: Approximately 10 qualitative interviews completed and analysed with the support of the supervisors, An understanding how the media and public health and media professionals work together for an effective risk communication, A draft manuscript to be submitted to a peer reviewed journal.
Suitable for:	This project this suitable for an under-graduate student in their final year, with an interest in working with people and understanding the role of the media in health aspects of disasters. The applicant should have strong written and spoken skills and be able to work independently as well as part of a team.
Primary Supervisor:	Dr Jo Durham
Supervisor's contact details:	Email: m.durham@uq.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Increasing access to testing, treatment and care for viral hepatitis in at risk migrant populations
Project duration:	Length of project: 10 weeks Hours expected per week: 36 hrs/wk
Description:	This project this suitable for a post-graduate student or under-graduate in their final year, with an interest in working with people and understanding the role of the media in health aspects of disasters. The applicant should have strong written and spoken skills and be able to work independently as well as part of a team. Untreated viral hepatitis is the leading cause of liver cancer in Australia. The burden of viral hepatitis is higher among people born overseas in endemic areas, particularly in Asia and parts of Africa and southern Europe. Furthermore, people from these communities are often diagnosed late. This is important because effective and well tolerated treatments exist to treat and prevent advanced and late stage disease, when patients are diagnosed and linked to treatment and care early. In this project the student will conduct a systematic

	literature review to identify interventions that have worked in Australia and other high income countries to increase access to testing, care and management for at risk migrant communities.
Location:	UQ School of Public Health, Herston
Expected outcomes and deliverables:	Systematic review completed with the support of the supervisor. An understanding interventions that work to increase access to testing, treatment and care for at risk migrant populations. A draft manuscript to be submitted to a peer reviewed journal.
Suitable for:	This project this suitable for an under-graduate student in their final year, with an interest learning how to undertake a systematic review and an interest in migrant health and redressing health inequities. The applicant should have strong written and spoken skills and be able to work independently as well as part of a team.
Primary Supervisor:	Dr Jo Durham
Supervisor's contact details:	Email: m.durham@uq.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	What are the Australian laws on electronic cigarettes?
Project duration:	Length of project: 6-8 weeks Hours expected per week: 20-36 hrs/wk
Description:	A comprehensive review of Australian laws concerning sale, possession and use was done in 2014/2015. There have since been a number of changes and new laws concerning nicotine due to be implemented in 2017. This project will update the review 2014/15 review.
Location:	UQ School of Public Health, Herston
Expected outcomes and deliverables:	Report that will form the basis for a journal article and potentially a book chapter.
Suitable for:	Students from law, pharmacy, public health and related fields.
Primary Supervisor:	Associate Professor Coral Gartner
Supervisor's contact details:	Email: c.gartner@uq.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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Project title:	Refining the estimation of cigarette and alcohol use from wastewater analysis
Project duration:	Length of project: 6-8 weeks Hours expected per week: 20-36 hrs/wk
Description:	Wastewater analysis can be used to estimate population level consumption of substances, such as illicit and licit substances. However in order to back calculate how much of the drug has been consumed, estimates of the excretion rates are needed. This project will review the literature on the excretion of metabolites of nicotine and alcohol in order to develop a reliable correction factor to back-calculate the consumption of these licit substances from measurement of their metabolites in wastewater.
Location:	UQ School of Public Health, Herston
Expected outcomes and deliverables:	Journal article

Suitable for:	Students from a science-related field, particularly chemistry, pharmacy, public health etc.
Primary Supervisor:	Associate Professor Coral Gartner
Supervisor's contact details:	Email: c.gartner@uq.edu.au
Note before application:	The supervisor CAN be contacted by students prior to submission of an application.

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UQ Centre for Clinical Research

Project title:	Assessment and treatment of depression and anxiety in Dementia
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	Depression and anxiety in those with dementia lead to poorer outcomes with reduced quality of life, poor functional status and worsening cognition. Depression occurs in 20-30% of people with Alzheimer's disease and is even higher in vascular dementia (44%), and dementia with Lewy bodies (DLB) (43%). Anxiety occurs in up to 75% of people with dementia. Depressive and anxiety disorders are both implicated as a risk and a prodrome for dementia, with some studies indicating that depression may increase the rate of conversion from mild cognitive impairment (MCI) to dementia. Despite their high prevalence, depression and anxiety in dementia are under-recognised and under-treated. This study will perform a literature review on the topic of diagnosis and treatment of depression and anxiety in dementia for publication.
Location:	UQ Centre for Clinical Research, Herston
Expected outcomes and deliverables:	Scholars will gain skills in conducting systematic reviews and opportunity to generate publications.
Suitable for:	Psychology or medical students interested in MD-HDR pathway.
Primary Supervisor:	Dr Nadeeka Dissanayaka
Supervisor's contact details:	Email: n.dissanayaka@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Cognitive decline in Parkinson's disease: Early identification and treatment
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	Cognitive deficits are common in Parkinson's disease and upto 80% of patients are demonstrated to develop into dementia at advanced stages. This project will investigate methods to identify cognitive decline, specifically mild cognitive impairment (prodromal dementia), at early disease. The project will also review literature on current treatment of cognitive deficits in PD.
Location:	UQ Centre for Clinical Research, Herston
Expected outcomes and deliverables:	An opportunity to generate publications.
Suitable for:	Psychology or MD students interested in the MD-HDR pathway.
Primary Supervisor:	Dr Nadeeka Dissanayaka
Supervisor's contact details:	Email: n.dissanayaka@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Simulation of brain network
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	We will investigate how different types of node interconnectivity patterns affect simulated electrical activity patterns (EEG) in network models of brains. The aim of this project is to identify the relationships between network topology and collective dynamics observed in EEG signals. We hypothesize that topology and wiring pattern of a network are central in the emergence of a collective behaviour (or emergent dynamics). The successful candidate will simulate a number of network models to infer the EEG-like dynamics [1]. 1. Wallace E, Benayoun M, van Drongelen W, Cowan JD (2011) Emergent Oscillations in Networks of Stochastic Spiking Neurons. PLOS ONE 6(5): e14804.
Location:	UQ Centre for Clinical Research, Herston
Expected outcomes and deliverables:	Student involved in this project will gain skills in the following domains: 1. Network theory and simulation of large-scale brain network. 2. Have a great opportunity to learn how to develop a MATLAB program in order to generate network models with respect to the nature of EEG features. 3. Have a window of opportunity to generate a unique multidisciplinary scientific article that embeds mathematics onto neuroscience for better understanding of how human brain-network operates.
Suitable for:	This project is suitable to applications from students with a background in Applied Mathematics, Physics and Electrical Engineering with ODE/Matlab and/or C/C++ knowledge with an interest in HDR pathway.
Primary Supervisor:	Dr Steve Mehrkanoon
Supervisor's contact details:	Email: s.mehrkanoon@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Patterns of EEG in network models of human brains
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	We will investigate how different types of node interconnectivity patterns affect simulated EEG patterns in network models of brains. We will mathematically and statistically compare the output of the models analysed/simulated by the Honours student with human EEG-driven network patterns. Knowledge of the systems of differential equations, and some numerical methods would be very useful. We will initially study the publication: Which Model to Use for Cortical Spiking Neurons? and extend the ideas to more complex network models such as those used in Dynamics of Networks of Leaky-Integrate-and-Fire Neurons. In particular, dynamics of the Hindmarsh-Rose neuron model will be mathematically analysed and simulated both individually and on networks. Related publications are as follows: Parameter-sweeping techniques for temporal dynamics of neuronal systems: case study of Hindmarsh-Rose model [3], Piecewise-linear approximation of the Hindmarsh–Rose neuron model [4]. [1] IEEE TRANSACTIONS ON NEURAL NETWORKS, VOL. 15, NO. 5, SEPTEMBER 2004 1063 Which Model to Use for Cortical Spiking Neurons? Eugene M. Izhikevich [2] Dynamics of Networks of Leaky-Integrate-and-Fire Neurons, ChapterNetwork Science, pp 217-242 [3] Barrio, Roberto and Shilnikov, Andrey. Parameter-sweeping techniques for temporal dynamics of neuronal systems: case study of Hindmarsh-Rose model, The Journal of Mathematical

	Neuroscience, 2011,1(1),1-6 [4] Storace, Marco. and Linaro, Daniele. and Lange, Enno de., The Hindmarsh–Rose neuron model: Bifurcation analysis and piecewise-linear approximations, Chaos: An Interdisciplinary Journal of Nonlinear Science, 2008, 18, 3, 033128-1 033128-10.
Location:	UQ Centre for Clinical Research, Herston
Expected outcomes and deliverables:	Student will gain the following skills: 1. Biomedical data-driven modelling in a research partner engagement. 2. Translation of the knowledge of differential equations into simulation of network models of brain.3. Have a unique opportunity to learn computational neuroscience and signal processing techniques. 4. Have an opportunity develop a scientific article with the first author role as well as to develop a future research plan for higher graduate degree. 5. Have a unique opportunity to learn neonatal human brain structure and function.
Suitable for:	This project is open to applications from students with a background in mathematics, physics, electrical engineering and biomedical engineering interested in HDR pathway.
Primary Supervisor:	Dr Steve Mehrkanoon
Supervisor's contact details:	Email: s.mehrkanoon@uq.edu.au
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Project title:	Optimisation of bacterial proteome analysis of probiotics using Liquid Chromatography and Multiple Reaction Monitoring Mass Spectrometry
Project duration:	Length of project: 8 weeks Hours expected per week: 30-36 hrs/wk
Description:	**Background** Probiotics have been used to maintain healthy mucosal membrane. We recently study the bacterial proteome of antibiotic resistant bacteria under antibiotic pressure. Further, we have performed preliminary study to explore the bacterial proteome of probiotics. Our preliminary results with the proteome of probiotics could not identify the bacteriocins from the proteome data. The proteome data from antibiotic resistant bacteria analysed using liquid chromatography mass spectrometry (LCMS) showed four times identified proteins more than the proteome data of probiotics. The proteome analysis using LCMS provide non-targeted approach of the bacterial proteome. Following the analysis using LCMS, the targeted approach using multiple reactions monitoring mass spectrometry (MRM) will be able to provide closer and more accurate proteome analysis in term of the levels of protein expression. **Aim** We aim to optimise the probiotic proteome analysis using liquid chromatography mass spectrometry and multiple reaction monitoring mass spectrometry. **Hypothesis** 1. Bacteriocins and other proteins responsible for bactericidal activity of probiotics can be identified using LCMS. 2. The level of expression of bacteriocins and other proteins can be quantified using MRM. **Approach** The student will use LCMS and MRM to analyse 6 probiotic strains to optimise

	the methods. We have performed further optimisation of LCMS. The MRM method will need to be developed.
Location:	UQ Centre for Clinical Research, Herston
Expected outcomes and deliverables:	Optimised method of bacterial proteome analysis using multiple reaction methods that can be used to quantify the level of expression of proteins of interest. Bacteriocins and other proteins associated with bactericidal activity of probiotics can be detected and quantified.
Suitable for:	Student with microbiology and protein expression interest. This scholarship will be suitable for at least 3rd year student.
Primary Supervisor:	Dr Hanna Sidjabat
Supervisor's contact details:	Email: h.sidjabat@uq.edu.au Phone: 07 3346 6073
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

UQ Diamantina Institute

Project title:	Macrophage functions in bacterial infections
Project duration:	Length of project: 8 weeks Hours expected per week: 36 hrs/wk
Description:	This project will investigate novel molecular pathways in pathogen sensing and macrophage control of pathogenic bacteria using molecular, cell biological, immunological and biochemical techniques.
Location:	UQ Diamantina Institute, Translational Research Institute, Woolloongabba
Expected outcomes and deliverables:	1. hands-on experimental training in relevant techniques, 2. experimental design, 3. data analysis and interpretation, 4. critical literature assessment, 5.verbal presentation skills
Suitable for:	Students with excellent understanding of immunology and microbiology (BIOL3003, MICR3000) or equivalent who wish to pursue Honours and/or HDR.
Primary Supervisor:	Associate Professor Antje Blumenthal
Supervisor's contact details:	Email: a.blumenthal@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Use of 3-D patient derived renal cell carcinoma spheroids to test new therapies
Project duration:	Length of project: 6 weeks Hours expected per week: 20hrs/wk
Description:	Project Background: Renal cell carcinoma (RCC) is a deadly and difficult-to-treat cancer, especially when it has metastasised from the original kidney tumours to secondary sites like brain, lung and liver. We have established novel and practical methods to monitor therapeutics for RCC patients using 3-D culture of patient tumours. Tyrosine kinase inhibitors (TKIs) have been relatively successful, but recently interest has re-emerged for the use of immunotherapeutics. We will investigate novel combination therapies using our model. This project will contribute to realistic individualized treatment plans for RCC patients. Research question, hypothesis and aims: Despite advances in RCC therapies including various targeted drugs approved in recent years, metastatic RCC is still incurable and fatal because of the heterogeneity of patients' responses. The hypothesis is that a personalized therapeutic approach is the key to improving

	RCC patient outcome. The specific aim is to establish novel models to assess therapeutic effects on primary patient RCC cultures in vitro using real time cell-cycle analysis and state-of-the-art multiphoton microscopy (MPM). Methods: Aberrant cell cycle progression is a hallmark of solid tumors; therefore cell cycle analysis is an invaluable technique to study cancer cell biology and to assess therapeutic effects. We will use flow cytometry and specialised microscopy to determine the effect of therapies on RCC cells within their natural environment in real-time. Novel TKI drugs and immunotherapeutics will be trialed, singly and in combination, using the 3D patient-derived RCC model. Innovation: There is no published information about the spatio-temporal dynamics of RCC cell division in vivo. This will be the first time anyone has imaged the cell cycle over the course of RCC tumorigenesis in vivo and will generate new mechanistic insights into RCC biology and responses to therapy.
Location:	UQ Diamantina Institute, Translational Research Institute, Woolloongabba
Expected outcomes and deliverables:	The student will increase their understanding of kidney cancer and other associated diseases. They will have an opportunity to participate in writing a small review article and an original research article and give a small seminar. As well, they will learn some core lab skills such as cell culture, microscopy and histology, molecular biology techniques, and some specialised techniques for 3-D spheroid growth.
Suitable for:	This project is open to applications from students with a background in molecular biology and biochemistry, especially pre-medical program students.
Primary Supervisor:	Glenda Gobe
Supervisor's contact details:	Email: g.gobe@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application.

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Project title:	Determining the mechanism of inhibitory antibodies
Project duration:	Length of project: 8 weeks Hours expected per week: 36hrs/wk
Description:	Antibody is a vital defence mechanism of the host immune system and protects against infection. Recently however, we identified that some patients with the lung disease bronchiectasis and Pseudomonas infection had a type of antibody that actually protects their colonising bacteria from immune killing. This inhibitory factor was identified as high titres of IgG2 antibody specific to P. aeruginosa O-antigen. The results suggested that the IgG2 bound the O-antigen (a target distal from the cell surface) where it either held complement away from the bacterial membrane, or physically blocked access of protective antibodies. Crucially, patients with impaired serum killing had worse lung function than patients with normal serum killing. These results led us to perform a novel treatment method for two critically ill patients, using plasmapheresis to remove the inhibitory antibody. Both patients improved dramatically after treatment and for a significant period of time there were no exacerbations, antibiotic usage was much reduced and Pseudomonas was undetectable in the sputum. Although exciting, several vital questions about the mechanism of serum-killing inhibition remain. This project will explore the role of antibody subtype, affinity and avidity in the inhibition of serum mediated killing.
Location:	UQ Diamantina Institute, Translational Research Institute, Woolloongabba
Expected outcomes and deliverables:	This project will perform work that will make part of a publication. The student will gain skills in both microbiology and immunology.
Suitable for:	This project is suitable for students with an interest in host-pathogen interactions.

Primary Supervisor:	Dr Timothy Wells
Supervisor's contact details:	Email: timothy.wells@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application

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Project title:	Optimising the N-acetylcysteine dose regimen for managing paracetamol overdose using mechanistic biomarkers
Project duration:	Length of project: 8 weeks Hours expected per week: 28-30hrs/wk
Description:	Acetaminophen (APAP) toxicity is the foremost cause of acute liver injury in the Western world, and accounts for most drug overdoses in the United States, the United Kingdom, Australia and New Zealand. The current diagnosis of APAP overdose and treatment evaluation are based on the APAP and alanine aminotransferase (ALT) levels in peripheral blood, and estimation of APAP ingested. However, limitations of these approaches have been well-described. Ingestion of APAP does reported by patients is unreliable and ALT lacks specificity. APAP levels in peripheral blood have less diagnostic value in patients with long-term exposure to APAP. Thus, it is imperative to discover and validate more sensitive and specific translational biomarkers of APAP-induced hepatotoxicity. This project will investigate novel mechanistic imaging biomarkers to characterise changes in liver haemodynamic following a APAP overdose and N-acetylcysteine treatment; compare mechanistic imaging biomarkers to recent developed serologic ones such as in terms of the sensitivity, specific, and predictability of treatment response; use the technologies to compare the impact of various NAC dosing regimens in APAP overdose (with a potential scaling up to findings to make recommendations on the use of NAC in humans).
Location:	UQ Diamantina Institute, Translational Research Institute, Woolloongabba
Expected outcomes and deliverables:	Students will gain experimental skills such as cell culture, animal handling experiences, imaging techniques, data collection and analysis. Students have an opportunity to generate publications from their research output and this project has capacity to be a PhD project.
Suitable for:	Student with a background in Biomedicine and Biological Science.
Primary Supervisor:	Dr Xiaowen Liang
Supervisor's contact details:	The supervisor MUST be contacted by students prior to submission of an application
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