UQ Winter Research Scholarship Projects in Faculty of Medicine 2018

Read about the program on the https://employability.uq.edu.au/node/215/0#0 page, and apply online from 5 March – 3 April 2018 via https://employability.uq.edu.au/node/215/2#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
- Princess Alexandra Hospital Southside Clinical Unit
- QIMR Berghofer Medical Research Institute
- School of Biomedical Sciences
- 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 RESCUE: Reduce sitting to improve cognitive function in elders
Project 02 Quality indicators for the aged
Project 03 Healthy ageing and well-being in older Indigenous adults
Project 04 Scoping review: Lifecourse factors associated with frailty

Child Health Research Centre

Project 05 Indigenous parents' perceptions of the method of probiotic administration

Princess Alexandra Hospital Southside Clinical Unit

Project 06 Mental health outcomes for people with Treatment Refractory Schizophrenia following clozapine withdrawal

QIMR Berghofer Medical Research Institute

Project 07 The D-Health trial
Project 08 Projects in melanoma research
Project 09 Characterizing the tumour microenvironment of Nasopharyngeal Carcinoma (NPC) and response to EBV-specific T cell adoptive immunotherapy
Project 10 Delineating mechanisms of acquired resistance to kinase inhibitors
Project 11 Micropeptides produced by cancer cells and their role in tumorigenesis

School of Biomedical Sciences

Project 12 Prenatal alcohol programs offspring disease
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UQ Centre for Clinical Research

Project 17 Controlability of complex networks in the brain

UQ Diamantina Institute

Project 18 Pathogenesis and therapy for type 1 diabetes

Project Details

Centre for Health Service Research

Project title:	RESCUE: Reduce sitting to improve cognitive function in elders
Project duration:	30 hours per week for 6 weeks
Description:	This project will assist with a randomised controlled trial to examine whether a 12-week lifestyle program is beneficial for physical and brain health. The student will assist with assist with data management and processing. This will involve checking self-report questionnaires for completion and scanning and uploading data into a database, initialising monitors used to record sitting and movement and downloading data from those monitors, and preparing data for analyses. Other tasks may include searching the literature and formatting manuscripts for publication.
Location:	Building 33, Princess Alexandra Hospital, Woolloongabba
Expected outcomes and deliverables:	Participants will gain skills in the conduct of randomised controlled trials, including data collection, cleaning and analyses. They may have the opportunity to be involved in writing peer-reviewed publications.
Suitable for:	This project would be suitable for students in a health-related discipline.
Primary Supervisor:	Dr Paul Gardiner
Supervisor's contact details:	p.gardiner@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:	Quality indicators for the aged
Project duration:	Up to 36 hours per week for 6 weeks
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:	Building 33, Level 2, 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:	Dianna Ang

Supervisor's contact details:	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:	Healthy ageing and well-being in older Indigenous adults
Project duration:	20 - 36 hours per week for 4 weeks
Description:	Projects are currently underway investigating the prevalence of dementia and healthy ageing in Indigenous communities in the Torres Strait and Far Northern Queensland. A winter scholar is required to assist with work associated with these projects. Tasks may include: assistance with the development and piloting of a healthy ageing assessment tool; working with data from the Australian Aboriginal and Torres Strait Islander Health Survey, or literature searching and the writing up of a scoping review.
Location:	Princess Alexandra Hospital, Woolloongabba
Expected outcomes and deliverables:	Literature search to identify assessment items for inclusion in the healthy ageing 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. Review of data items in the Health Survey. Extraction of variables of interest. Basic analysis of health Survey data. Writing up of results. Systematic literature searches to identify literature for inclusion in the scoping review. Assisting with the writing up of the review.
Suitable for:	An individual with a keen eye for detail, and a willingness to learn new skills. Experience in quantitative data analysis and/or systematic literature searching would be highly regarded.
Primary Supervisor:	Dr Yvonne Hornby-Turner
Supervisor's contact details:	(07) 3176 6636
Note before application:	The supervisor MUST be contacted by students prior to submission of an application

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Project title:	Scoping review: Life course factors associated with frailty
Project duration:	20-36 hours per week for 4 weeks
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 factors across the life course 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 scoping review to identify life course associated with frailty in community dwelling older persons. A 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 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:	Associate Professor Ruth Hubbard
Supervisor's contact details:	y.hornbyturner@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application

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Child Health Research Centre

Project title:	Indigenous parents' perceptions of the method of probiotic administration
Project duration:	20 -30 hours per week for 4-6 weeks
Description:	Australia's Indigenous children have some of the highest rates of middle ear infections (otitis media) in the world. This can result in hearing loss and have a devastating impact on language development, education and future employment. Despite antibiotic treatment and widespread vaccination programs, there has been little change in the prevalence of the disease. We aim to develop a probiotic specifically to treat otitis media in Australian Indigenous children using strains of 'friendly' bacteria from the upper airways of Indigenous children from remote communities. In consideration of an end-point product, we are interested in the perceptions of Indigenous parents in relation to the administration of the probiotic. The successful applicant for this Winter Project will work in collaboration with our team and Indigenous Health Promotion Officers at Deadly Ears to conduct a literature review on perceptions of health and disease and acceptability of different forms of medicine administration in the Australian Indigenous population. There will also be the opportunity to participate in lab-based bacterial interference studies.
Location:	Centre for Children's Health Research, South Brisbane
Expected outcomes and deliverables:	The scholar will gain experience in reviewing the literature and preparing a literature review. They will increase their skills and knowledge in working within the Indigenous health space. The results of the literature review can be presented at a local forum, and depending on the outcome, may constitute a publication. For the interested student, there is the opportunity to acquire hands-on laboratory experience in assisting with bacterial interference studies. This includes making agar, culturing bacteria and analysing results.
Suitable for:	This project is suitable for students interested in Indigenous health. There is a possibility for expanding the project into a HRD for the appropriate candidate.
Primary Supervisor:	Dr Seweryn Bialasiewicz
Primary contact, if not supervisor:	Dr Andrea Coleman
Supervisor's contact details:	seweryn@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:	Mental health outcomes for people with Treatment Refractory Schizophrenia following clozapine withdrawal
Project duration:	20-36 hours per week for 4-6weeks
Description:	Clozapine is reserved for people with treatment refractory schizophrenia who have failed two trials of other anitpsychotics. However, it has the most severe adverse events of all antipsychotics including agranulocytosis and myocarditis. This can lead to precipitous cessation of clozapine, and the risk of severe rebound psychosis. This project will involve a Cochrane-like systematic review of the literature relating to the mental health outcomes of people who are ceased on clozapine. It will include data from RCTs, observational studies and case reports. This information will help inform both clinicians and mental health consumers as to the expected outcomes associated with clozapine cessation, and guide clinical management.
Location:	Princess Alexandra Hospital, Woolloongabba
Expected outcomes and deliverables:	The expectation is that the student will be a co-author on a manuscript for submission to a peer reviewed journal.
Suitable for:	Students with an interest in or experience in systematic reviews of medical literature
Primary Supervisor:	Associate Professor Dan Siskind
Supervisor's contact details:	d.siskind@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application

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QIMR Berghofer Medical Research Institute

Project title:	The D-Health trial
Project duration:	Flexible according to student's availability, however, expected workload is a minimum of 20 hours and maximum of 36 hours per week for a period between 4 and 6 weeks.
Description:	The D-Health Trial: The D-Health Trial is one of the largest trials of vitamin D ever conducted. Over 21,000 Australian adults aged over 65 years were enrolled between 2014 and 2015 and randomised to take either monthly vitamin D or placebo for five years. They are being followed to ascertain health events through self-report and linkage with Australian health databases.
Location:	QIMR Berghofer Medical Research Institute, Herston
Expected outcomes and deliverables:	Students will have the opportunity to learn how a trial as large as the D-Health trial operates. They will contribute to most aspects of the project, including telephoning participants to administer interviews, cleaning data, and dispensing tablets. Students interested in data analysis may have the opportunity to contribute to preliminary analyses.
Suitable for:	This project is suitable for students who have an interest in research into public health using epidemiological approaches. They must have an excellent telephone manner and extremely high attention to detail.
Primary Supervisor:	Associate Professor Rachel Neale
Supervisor's contact details:	Rachel.neale@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:	Projects in melanoma research
Project duration:	Flexible according to student's availability, however, expected workload is a minimum of 20 hours and maximum of 36 hours per week for a period between 4 and 6 weeks.
Description:	Treatment for late-stage melanoma is currently challenging due to the frequent occurrence of drug resistance. To identify new treatment strategies, we have used unbiased genome-wide functional experiments (shRNA and CRISPR) to identify unique melanoma gene dependencies (genes that when knocked out will kill a majority of melanomas, or that will kill drug-resistant melanoma cells). In this project, we are exploring the role of these novel genes to determine their significance as potential drug targets. Students will be responsible for helping characterize one of our identified candidate genes. Potential techniques to be used in this project include (but likely not all) cell culture, proliferation and or other related functional assays, protein analysis via western blots, genetic manipulation via CRISPR gene knock-out, or pharmacological inhibition through small molecule drugs. Project 2: The difference between a benign (safe) mole and a malignant (cancerous) melanoma can be difficult to determine. In most instances, suspect lesins are usually surgically removed, a process which can be both invasive and costly. Furthermore, these lesions frequently end up being classified as benign, resulting in unnecessary procedures. To address this, we have been developing a new, non-invasive approach to determine if lesions are benign or malignant. Potential techniques that students will perform include basic molecular biology techniques, DNA and RNA extraction, transcriptomic and genomic analyses with RT-PCR and PCR, and active trouble shooting to determine the sensitivity and specificity of these approaches.
Location:	QIMR Berghofer Medical Research Institute, Herston
Expected outcomes and deliverables:	Applicants will gain knowledge surrounding the biology and current therapeutic intervention strategies of melanoma; gain expertise in a variety of molecular biology techniques and; may have the opportunity to generate data that will contribute toward a publication. Applicants will be expected to maintain a lab book, follow directions as given by supervisor, analyse results, and generate appropriate figures or graphs relating to their findings. A final report or oral presentation summarising their results may be required at the conclusion of the project.
Suitable for:	This project is open to applications from students with a background in Biomedical Science, Biochemistry and Molecular Biology and have an interest in Cancer Biology
Primary Supervisor:	Professor Nicholas Hayward
Primary contact, if not supervisor:	Dr Ken Dutton-Regester
Supervisor's contact details:	ken.dutton-regester@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:	Characterizing the tumour microenvironment of Nasopharyngeal Carcinoma (NPC) and response to EBV-specific T cell adoptive immunotherapy
Project duration:	30 per week for 5 weeks
Description:	Clinical staging is currently based on histopathological analysis; however, recent studies have shown that enumeration of the type, density and location of tumour infiltrating lymphocytes (referred to as immunoscore), may be of superior

	prognostic significance. Indeed, a positive correlation of immune cells infiltrates with survival has now been shown in several types of cancers. Since tumours such as Nasopharyngeal Carcinoma (NPC) are heterogeneous in nature, extension of this immunoscore to an immune contexture that also incorporates functional information on the intra-tumoral immune cells may be necessary to fully understand how immune infiltrates influence prognosis. In particular, in the context of immunotherapy, immunological parameters may be important predictors of response to therapy. This project has two broad objectives: A. To generate a comprehensive immune contexture profile of primary and relapse NPC tumours using a combination of mIHC and multispectral imaging analyses B. To combine autologous adoptive T cell-based immunotherapy with immune contexture analysis to identify potential predictive markers of clinical response. We have developed a validated mIHC protocol that will allow us to link in situ immune profiling with clinical response to adoptive immunotherapy. Aim1: Immune contexture profiling of primary and relapse NPC tumours We have developed a validated multiplexed immunohistochemistry (mIHC) protocol that will allow for automated quantification of phenotype and spatial distribution of immune cells populations within formalin fixed paraffin embedded (FFPE) tissues. This mIHC assay and digital image analysis form the experimental basis for this project. Experimental Plan: We have a cohort of 17 NPC biopsies from primary and relapse NPC tumour samples. These tumour samples are being used for immune contexture analysis using Opal protocol. A number of combination of antibodies specific for tumour markers, immune cells lineage markers and immune-modulators are used in these assay. To date, we have designed three panels of markers, each with a combination of five antibodies. We have completed the standardization and staining of three panels on 17 NPC biopsies. Following staining, these tissues sections are being analysed by multispectral imaging using Vectra digital pathology slide scanner in combination with Inform image analysis software which enables quantitative per cell analysis on stained tissue sections through its pattern recognition learning algorithm. Expected outcome: These studies will allow us to: (a) develop a comprehensive immune contexture profile of NPC tumours, and (b) functionally characterise tumour-infiltrating T cells from NPC biopsies. Aim 2. Clinical assessment of immune contexture in relation to clinical response to adoptive immunotherapy Once the critical parameters of immune profiling for NPC are established, we will extend our studies to formally assess immune contexture in the setting of NPC adoptive immunotherapy. These studies will be carried out using a cohort of twenty seven NPC tumour biopsies from the patients who have been diagnosed with primary disease and are enrolled for autologous adoptive immunotherapy. Expected outcome: Immune contexture analyses of NPC tumour will provide prognostic biomarkers for clinical response to adoptive immunotherapy.
Location:	QIMR Berghofer Medical Research Institute, Herston
Expected outcomes and deliverables:	Student will be able to demonstrate an advanced knowledge of routine tissue processing, tissue preparation, microtomy, routine and specialized histochemical and histological staining procedures with the opportunity to practice fluorescent Immunohistochemistry procedure. Student will gain a theoretical understanding of, and hands on experience with Vectra 3.0 Automated Quantitative Pathology Imaging System. Student will also learn fundamental image processing, segmentation and analysis techniques to address specific quantitative questions and troubleshoot the common problems that occur in the course of quantitative

	imaging experiment. Student may also be asked to give an oral presentation at the end of their project.
Suitable for:	Please highlight any particular qualities that you are looking for in applicants. NB: Program is only open to UQ students in 2018. The training of winter scholarships are not suitable for MD Students.
Primary Supervisor:	*Prof Rajiv Khanna*
Supervisor's contact details:	*Rajiv.Khanna@qimrberghofer.edu.au*
Note before application:	The supervisor can be contacted by students prior to submitting an application.

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Project title:	Delineating mechanisms of acquired resistance to kinase inhibitors
Project duration:	20-36 hours per week for 4-6 weeks
Description:	Background: Drug resistance has limited the efficacy of almost all targeted therapeutic agents used to treat cancers. Although some of the most successful anti-cancer drugs to emerge in the last 2 decades are kinase inhibitors, they are invariably associated with relapse due to development of resistance during the course of treatment. In this project, we will derive and characterize drug resistant clones to delineate mechanisms of acquired resistance to kinase inhibitors. This research work has the potential to reveal clinically relevant drug resistance mechanisms for some of the widely used anti-cancer agents. These resistance mechanisms could be targeted to achieve durable responses to cancer therapy. Aim: Delineating mechanisms of acquired resistance to kinase inhibitors Hypothesis: Unbiased investigation of drug resistant cancer cells by employing genomic, transcriptomic and proteomic methods can reveal clinically relevant mechanisms of acquired drug resistance to small molecule kinase inhibitors used in cancer treatment Approaches 1) Generate drug resistant derivatives of cancer cell lines by subjecting them to selection pressure under targeted kinase inhibitors that are in clinical use 2) Genomic, transcriptomic, proteomic and phosphoproteomic characterization of drug resistant clones 3) Determine molecular basis of acquired resistance by integrating multi-omics data 4) Determine novel therapeutic intervention strategies to target acquired drug resistance
Location:	QIMR Berghofer Medical Research Institute, Herston
Expected outcomes and deliverables:	Scholars will gain experience in cell culture, drug treatment, deriving drug resistant clones, cell-based assays, analysis of genomic, transcriptomic and proteomic data and mouse xenograft studies depending on the need
Suitable for:	Suitable for honours, Ph.D. or clinical students
Primary Supervisor:	Dr. Harsha Gowda
Supervisor's contact details:	Harsha.Gowda@qimrberghofer.edu.au
Note before application:	The supervisor can be contacted by students prior to submitting an application.

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Project title:	Micropeptides produced by cancer cells and their role in tumorigenesis
Project duration:	20-36 hours per week for 4-6 weeks

Description:	Background: For several years, it is known that human genome has ~20,000 protein coding genes. Transcriptome sequencing studies in the past decade have revealed that a large portion of human genome is transcribed. However, most of it is thought to be non-coding. Recent studies have revealed that some of the annotated non-coding RNAs harbor small open reading frames that code for micropeptides/small peptides. We have previously discovered several small ORFs in annotated non-coding RNAs and UTR regions of mRNAs (*Nature. 2014 509(7502):575-81*). Various studies in the last five years have demonstrated that micropeptides regulate several functions including development, muscle performance and DNA repair. Ribosome profiling studies (Ribo-Seq) have also revealed the possibility of many small open reading frames that could potentially code for micropeptides. It appears that several micropeptides encoded by human genome are yet to be discovered. Until then, various cellular functions regulated by these micropeptides and their role in various human diseases remains out of bounds for systematic investigation. Aim: Identification of micropeptides produced by cancer cells Hypothesis: Cancer cells produce micropeptides that are involved in regulating tumorigenesis Approaches: 1) Cell culture 2) Isolation of micropeptides from cancer cell lines 3) Identification and characterization of micropeptides by mass spectrometry 4) Characterization of role of micropeptides in tumorigenesis
Location:	QIMR Berghofer Medical Research Institute, Herston
Expected outcomes and deliverables:	Scholars will gain experience in cell culture, protein isolation and estimation, sample preparation for mass spectrometry analysis, data analysis and carrying out cell-based assays using cancer cell lines
Suitable for:	Suitable for honours, Ph.D. or clinical students
Primary Supervisor:	Dr. Harsha Gowda
Supervisor's contact details:	Harsha.Gowda@qimrberghofer.edu.au
Note before application:	The supervisor can be contacted by students prior to submitting an application.

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School of Biomedical Sciences

Project title:	Prenatal alcohol programs offspring disease
Project duration:	20 hours per week for 4 weeks
Description:	Alcohol consumption amongst women of reproductive age is widespread in Australia (~80%). Given that ~50% of all pregnancies are unplanned, there is the potential to expose the early embryo to alcohol before the pregnancy has even been detected. Although the teratogenic effects of alcohol on the fetus are well-documented, particularly the impacts on the brain and subsequent behavioural deficits, the programming of other aspects of offspring health by more moderate exposures to alcohol are less well defined. The Moritz laboratory has developed several preclinical models of alcohol exposure that are relevant to common patterns of alcohol consumption in reproductive age women. This includes a chronic, low dose throughout pregnancy; an acute, binge exposure later in pregnancy; and a moderate exposure just around the periconceptional period (PCP) in which the dam is

	exposed during ovulation, conception and pre-implantation embryo development. Two of these models have been well characterised in terms of impacts on the metabolic health of adult offspring (the PCP and chronic model) and indicate that prenatal alcohol can result in a tendency to develop a 'taste' for a high fat diet, an increased propensity for obesity, and results in glucose intolerance and insulin insensitivity. However, the binge model has been relatively understudied in these areas. This model exposes the fetus to a relatively high level of alcohol at embryonic day 13.5 and 14.5, a period well within the 1st trimester equivalent in human pregnancies (~5th-7th week of pregnancy), when women often don't know that they are pregnant and have not yet altered their drinking habits. This is a peak period of organogenesis and thus a critical window during development where alcohol exposure has the potential for profound effects on offspring health. Recent studies of Australian women of reproductive age indicate that this high level, 'special occasion', drinking is a prominent mode of alcohol consumption and thus can pose a potential risk to the health of the fetus in an undiagnosed pregnancy. Given the already high rates of obesity and metabolic disease in the Australian population, which at current projections are likely to rise, it is important to understand how this prevalent lifestyle factor can potentially contribute to this burden of disease.
Location:	Sir William MacGregor Building (64), UQ St Lucia Campus
Expected outcomes and deliverables:	By participating in this project, students can expect to gain experience in using a preclinical (animal) model to understand how a maternal insult can program disease in offspring. They will gain hands-on experience in experiments looking at metabolism and food preference and will assist with data collection and analysis. This project is expected to contribute to a publication on the metabolic outcomes of offspring exposed to a 'binge' alcohol exposure.
Suitable for:	This project would be suitable for a student with a background in physiology or endocrinology, or a pre-medical provisional student.
Primary Supervisor:	Professor Karen Moritz
Primary contact, if not supervisor:	Dr Lisa Akison
Supervisor's contact details:	k.moritz@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 effects of placental function on pregnancy complications
Project duration:	24 hours per week for 6 weeks
Description:	The Placenta is the central regulator of pregnancy success. A range of pregnancy complications result from placental dysfunction leading to long term health complications for both the mother and child. This project will investigate placental stress signalling in a range of pregnancy disorders including gestational diabetes and pre eclampisa to understand pathways which can be targeted to treat these conditions.
Location:	Sir William MacGregor Building (64), UQ St Lucia Campus
Expected outcomes and deliverables:	This project will allow students to gain skills required for a successful career in research. Students will be offered the opportunity to learn multiple laboratory techniques from an experienced research team. Students will be asked to participate in laboratory meetings and present their research findings to the lab group in a friendly interactive format.
Suitable for:	Students interested in a career in research or with a hope to pursue further study in a field which would benefit from understanding complications of pregnancy.
Primary Supervisor:	Dr James Cuffe

Supervisor's contact details:	j.cuffe1@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:	Metabolic treatments for epilepsy
Project duration:	30 hours per week for 6 weeks
Description:	Although many people with epilepsy can be successfully treated with drugs or surgery, about 45% still suffer from seizures. To this end the laboratory is seeking new metabolic treatments to improve energy metabolism in the epileptic brain and to prevent seizures.
Location:	Skerman Building (65), UQ St Lucia Campus
Expected outcomes and deliverables:	Increased understanding of energy deficiency in epilepsy models. Progress regarding development of new metabolic treatments.
Suitable for:	Any 2nd or 3rd yr student, BIOC2000 a plus
Primary Supervisor:	Associate Professor Karin Borges
Supervisor's contact details:	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:	Harnessing the immune system to battle ovarian cancer: A novel approach using non-coding RNAs
Project duration:	36 hours per week for 5-6 weeks
Description:	We are interested in developing novel nano-therapeutic methods to overcome immune suppression in ovarian cancer. Ovarian cancer is the most deadly type of gynaecologic disease with more than 1500 new cases being diagnosed each year in Australia. The high recurrence rate is a major challenge in the clinical management of high grade serous ovarian cancer. While stimulating our own immune system to recognize and attack tumour cells represents an attractive means to facilitate complete elimination of tumours, emerging data suggest that many of the immunotherapy tools, such as immune checkpoint inhibitors, are minimally active in ovarian cancer. We aim to develop effective strategies to enhance the infiltration and function of cytotoxic T lymphocytes in ovarian tumours and to develop clinically feasible means to monitor T-lymphocytes activity in tumours following therapy. Ultimately, strategies developed in this project could harness the power of the immune system to eliminate tumours and significantly increase the survival of patients with ovarian cancer. We are seeking a motivated undergraduate student who is interested in contributing to a large project involving nanotechnology and cancer biology, and who is eager to learn how to develop effective strategies to enhance anti-tumour immunity. The student will learn critical laboratory skills and knowledge needed to develop new strategies to enhance the infiltration and function of cytotoxic T lymphocytes in ovarian tumours. In addition, the student will gain experience in developing novel nanoparticle platforms for tumour-targeted delivery. He/She will gain experience in working in a multidisciplinary environment, obtain hands-on training from the lab head and a postdoctoral fellow, and contribute to an exciting project in the area of cancer nanomedicine and immunology. Students are strongly encouraged to contact the primary supervisor (Dr. Sherry Wu) prior to applying for this scholarship opportunity.
Location:	Sir William MacGregor Building (64), UQ St Lucia Campus
Expected outcomes and deliverables:	The student will learn critical laboratory skills and knowledge needed to develop new strategies to enhance the infiltration and function of cytotoxic T lymphocytes in ovarian tumours. In addition, the student will gain experience in

	developing novel nanoparticle platforms for tumour-targeted delivery. He/She will gain experience in working in a multidisciplinary environment, obtain hands-on training from the lab head and a postdoctoral fellow, and contribute to an exciting project in the area of cancer nanomedicine and immunology. The student will be required to contribute to other research activities in the laboratory, be a good lab citizen, and present his/her work in written or oral presentation format.
Suitable for:	This project is open to applications from students with a background in biomedical sciences, pharmacy, or biomedical engineering, who is interested in exploring research as a career path.
Primary Supervisor:	Dr. Sherry Wu
Supervisor's contact details:	sherry.wu@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:	Sensory processing in zebrafish
Project duration:	36 hours per week for 6 weeks
Description:	Our lab builds light-sheet microscopes, combines them with genetically-encoded indicators of neural activity, and uses them to image activity in all of the neurons in zebrafish brains while they respond to stimuli. We are interested in the pathways that information follows through the brain as the outside world is perceived and interpreted, and on the ways that these pathways change in disease states such as autism and schizophrenia. We have positions for biologists, physicists, mathematicians, and neuroscientists, especially those interested in spanning discipline boundaries.
Location:	School of Biomedical Sciences, UQ St Lucia Campus
Expected outcomes and deliverables:	Experience in microscopy, optical physics, neuroscience, and bioinformatics
Suitable for:	Particularly suitable for optical physicists and computational biologists who are interested in transitioning to neuroscience
Primary Supervisor:	Associate Professor Ethan Scott
Supervisor's contact details:	ethan.scott@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:	Controlability of complex networks in the brain
Project duration:	36 hours per week for 5 weeks
Description:	We are interested in the analysis of complex networks using computational and mathematical techniques. Such complex network can be inferred from the human brain. The goal of this project is to develop a theoretical-computational technique to assess the formation and evolution of brain network in the newborn infants.
Location:	UQ Centre for Clinical Research, UQ Herston Campus
Expected outcomes and deliverables:	The student will gain mathematical skills in brain data analysis, and have an opportunity to publish the outcomes of his/her project.
Suitable for:	Second/third year undergraduate students in school of mathematics and physics are highly encouraged to apply for this project. Third year undergraduate students in Electrical Engineering are also encouraged to apply

Primary Supervisor:	Dr Steve Mehrkanoon
Supervisor's contact details:	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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UQ Diamantina Institute

Project title:	Pathogenesis and therapy for type 1 diabetes
Project duration:	36 hours per week for 6 weeks
Description:	**i) Immunotherapy in type 1 diabetes** Our laboratory focuses on investigating the immune defects leading the destruction the insulin producing cells of the pancreas and type 1 diabetes and studying immunotherapeutic strategies to correct these defects. We are investigating using a nanoparticle delivery system containing islet antigen and an immunomodulatory drug to reinstate T cell tolerance in a model of type 1 diabetes. The project will utilise animal models, in vitro assays of cellular function and flow cytometry to study immunological tolerance in this system. **ii) Gut microbiota - host interactions in type 1 diabetes** The gut microbiota has been shown to be disturbed in type 1 diabetes and this is linked to genetic risk and the environment. We are investigating the link between inflammation in the gut and the pancreas and the microbiota. We use human samples and animal models to characterise gut and pancreas derived proteins as well as sequencing the bacteria present in the gut. This project combines wet and dry lab techniques and may include proteomics, sequencing and bioinformatics.
Location:	UQ Diamantina Institute, TRI Building, Woolloongabba
Expected outcomes and deliverables:	The student will be exposed to an active research environment and learn techniques that may include multi-colour flow cytometry, animal disease model of type 1 diabetes, proteomics, sequencing or histology. They will also be involved with experimental design, data analysis and interpretation.
Suitable for:	Students with a background in at least one of these subjects: immunology, microbiology or bioinformatics.
Primary Supervisor:	Dr Emma Hamilton-Williams
Supervisor's contact details:	e.hamiltonwilliams@uq.edu.au
Note before application:	The supervisor MUST be contacted by students prior to submission of an application

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