2019 HMNS Winter Research Projects

List of available projects

Dr Tom Bailey

What does sex have to do with it? Brain blood flow regulation during exercise in females

Project title:	**What does sex have to do with it? Brain blood flow regulation during exercise in females**
Project duration:	*4 weeks* (24 June to 19 July 2019)
Expected hours per week	*20*
Number of scholarships available	*1*
Location	St Lucia
Description:	The project will look at the differences in brain blood flow during exercise in older adults, and the effect of female ageing and menopause. Specifically, focusing on how sex differences might influence arterial adaptations through exercise, and the possible effects on cognitive function.
Expected outcomes and deliverables:	Scholars may gain skills in data collection and analysis, recruiting and managing participants. They will have the opportunity to get insights in knowledge and skills including ultrasound imaging of large arteries and brain blood vessels. A comprehensive overview of exercise testing and cognitive testing. They will be asked to work independently and closely with other researchers as part of a research team, and may be asked to assist with participant recruitment, manage and enter data into spreadsheets using Excel, and coordinate participant visits. They will gain professional skills including time management, and responsibility for their own work ethic.
Suitable for:	This project is open to applications from students with a background in exercise physiology or biomedical science, or similar subjects, who already have some knowledge of lab procedures and are interested in working with older participants.
Primary Supervisors:	Dr Tom Bailey, Stefanie Rüdiger (UQ PhD candidate)
Further info:	If there are any questions regarding the tasks or the project, students can contact Stefanie Rüdiger for further information prior to their application (s.rudiger@uq.edu.au)

Dr Veronique Chachay

The dietary intake of patients with motor neurone disease: assessment, characterisation and comparison with estimated requirements.

Project title:	**The dietary intake of patients with motor neurone disease: assessment, characterisation and comparison with estimated requirements.**
Project duration:	4 weeks from 24th June to 19th July.
Expected hours per week	25-30 hours per week
Number of scholarships available	TBA
Location	St Lucia and Royal Brisbane Women's Hospital
Description:	Motor neuron disease (MND) is a rapidly progressing neurodegenerative disease with up to 50 different characteristic phenotypic expressions, poor prognostic (the average survival is 3 years from diagnostic), and no known treatment to date. Weight loss and change in body composition are predictive of rapid progression to death. Weight loss is the result of negative energy balance (NEB), where energy expenditure outweighs energy intake. Hyper-metabolism measured in some patients may explain NEB, but not universally amongst all patients. Reduced appetite, lack of drive for eating is anecdotally reported by patients with MND. Reduced appetite implies reduced dietary intake, and increased risk of malnutrition, with the consequence of weight loss, change in body composition (loss of lean body mass), and poor nutrition status (such as risk of severe protein and micronutrient deficiency). Poor nutrition status results in its own health consequences that may exacerbate disease progression. This project is part of an overarching project investigating the causes of loss of appetite, and the efficient strategies to counter these. During this scholarship, you will participate in analysing the self-reported dietary intake of patients enrolled in the overarching study. You will characterise this intake on the background of estimated nutritional requirements and reference to biochemical pathways involved in this disease. You will assist in the interpretation of results for the development of strategies to be trialled in an intervention.
Expected outcomes and deliverables:	Scholars will gain skills in dietary data processing and statistical analysis, experience in interpreting results and contributing to manuscript writing. Scholars will be exposed to multidisciplinary meetings to discuss research results, and to investigation methodology used in the overarching project.
Suitable for:	This project is open to applicants with a background in nutrition and dietetics, with experience in using the FoodWorks software, 4th or 5th year UQ enrolled students only. Attention to details, a sound knowledge of nutritional requirements, and self-initiative are a must.
Primary Supervisor:	Dr Veronique Chachay: v.chachay@uq.edu.au
Further info:	Applicants should first contact the supervisor to determine suitable background.

Dr Li-Ann Leow

Moving to obtain rewards

Project title:	**Moving to obtain rewards**
Project duration:	4 weeks (24 June to 19 July 2019)
Expected hours per week	30 hours
Number of scholarships available	1
Location	St Lucia
Description:	We move to attain a more rewarding state (e.g., reaching for a cup of coffee). Our efficient patterns of movements are acquired through a lifetime of motor learning, however, we still do not fully understand the complexities of how motor learning occurs, and how the brain areas involved interact during motor learning, and how motor control is affected by rewards. Little is known about how we are able to acquire multiple motor skills at once, and exactly what mechanisms determine the longer-term consolidation and persistence of this learning.
Expected outcomes and deliverables:	You will be directly involved in collecting behavioural data. We collect extensive data about movements (either using force-transducer, robotic arm (i.e., the vBOT), digitizing tablet, etc). Depending on assigned study, participants may receive non-invasive brain stimulation, or brain electrical activity will be collected using electroencephalography. You may also be involved in preliminary processing of data. This project offers you the opportunity to acquire advanced skills in motor control research and neuroscience research.
Suitable for:	This project is open to applications from students taking courses/active interests in psychology, cognitive neuroscience, motor control, and human movement. Conscientiousness and initiative are particularly valued.
Primary Supervisor:	Li-Ann Leow
Further info:	Please contact Dr Leow by email (l.leow@uq.edu.au) before application submission.

A/Prof Osmond and Prof Philips

Sport, Stories and Survival: Examining Cherbourg's Past and Present

Project title:	**Sport, Stories and Survival: Examining Cherbourg's Past and Present**
Project duration:	4 weeks (24 June to 19 July 2019)
Expected hours per week	20 hrs/week
Number of scholarships available	1
Location	St Lucia [Possible visits to Queensland State Archives in Brisbane and the Ration Shed Museum in Cherbourg]
Description:	Background: The Cherbourg Aboriginal Settlement was established in 1904 approximately 250 kilometres north-west of Brisbane, and is recognised as one of Queensland's most famous (and infamous) Indigenous settlements. Sport has played an incredibly important role from the inception of Cherbourg until contemporary times and the Winter Program will make a significant contribution to examining the cultural, social, and political complexities of sport at Cherbourg. This analysis of sport will inform us about a little-known period of our history when Indigenous people were essentially excluded from mainstream Australia and when Aboriginal people gradually and incrementally engaged in sport to create a collective identity, to test themselves in Anglo-Australian competitions, and as a barometer of 20th-century race relations. Aims: This project aims to: • Collaboratively work with the research team to ensure that Cherbourg sporting stories are recorded/preserved • Research and collate written records to share with the community • Explore and share personal memories and meanings • Individually, contribute to the process of healing through history making • Collectively, contribute to reconciliation efforts through collective memory making and recording these memories
Expected outcomes and deliverables:	The student intern will develop skills in historical research and benefit from participating in the project through exposure to the larger research context in which this project sits. More broadly, the student intern will gain an understanding of Aboriginal Australian culture, develop skills in engaging with Aboriginal sport history, and gain additional preparation for future interactions with Indigenous people during their professional lives after graduation. Key tasks are to: • Conduct literature searches where appropriate • Assist with archival and library research • Contribute to database development • Organise oral history interviews with individuals, if appropriate, to share and record personal memories and meanings

	• Liaise with Aboriginal groups and memory institutions to make appropriate documents and materials available
Suitable for:	UQ-enrolled students only. Ideally, but not necessarily, applicants should have taken at least one of the HMNS sociocultural courses (e.g., sport history, sport sociology) and be motivated to work with and learn alongside Indigenous cultures.
Primary Supervisor:	Professor Murray Phillips & Associate Professor Gary Osmond
Further info:	Potential applicants are encouraged to contact: Professor Murray Phillips & Associate Professor Gary Osmond School of Human Movement and Nutrition Sciences g.osmond@uq.edu.au; m.phillips@uq.edu.au

Dr Tina Skinner

The MyeEx Study: The Effect of an Individualised Exercise Intervention on Functional, Biological and Quality of Life Outcomes in Patients with Multiple Myeloma

Project title:	The MyeEx Study: The Effect of an Individualised Exercise Intervention on Functional, Biological and Quality of Life Outcomes in Patients with Multiple Myeloma
Project duration:	4 weeks from 24th June to 19th July.
Expected hours per week	36 hours per week
Number of scholarships available	1
Location	St Lucia.
Description:	Multiple myeloma (MM) is an incurable blood cancer. New treatments are helping people live longer, but the inevitable relapse and substantial disease- and treatment-related side effects of MM reduce patients' quality of life. In almost 99% of the patients with multiple myeloma, fatigue, pain and decreased physical functioning were the most common problems that affect their health–related quality of life. Health-related quality of life has been shown to correlate with survival both in newly diagnosed and in relapsed, refractory MM, so interventions which improve fatigue, pain and physical functioning may also influence life expectancy. Exercise has been shown to be beneficial in other cancer populations both during and following treatment, with significant positive effects on fatigue, bone mineral density, immune function, and quality of life. However randomised controlled trials have yet to investigate the effect of exercise on these parameters in MM. Participants will be randomized into an individualised exercise intervention or usual care in a wait-list control. The intervention will involve 12 weeks of two supervised group exercise and one home-based session a week, with gradual transition to home exercise. Primary and secondary outcome measures will be assessed on both groups at baseline and every 12 weeks for 9 months, including MM-specific quality of life, fatigue and pain questionnaires and bone health. We hypothesize that compared to usual care, exercise will be safe, feasible, acceptable and improve the bone pain and quality of life of patients with MM. This will be the first RCT on the impact of exercise on quality of life, especially bone/back pain, in MM. High quality evidence supporting a beneficial effect of exercise in this unique population will enable new recommendations.
Expected outcomes and deliverables:	Being a winter scholarship student within this project will present with a number of learning opportunities, including, but not limited to: - helping run supervised exercise sessions with people with myeloma; - helping run supervised exercise testing sessions with people with myeloma; - assisting with data collection and entry; - gaining experience with administration procedures within a randomised controlled trial study.

Suitable for:	This project is suitable for any student who meets the following criteria: Essential: - Willing and able to attend early morning testing and training sessions. - Excellent communication skills - High level attention to detail Desired: - Previous experience working with individuals with cancer - Previous experience working with older adults in an exercise setting - Students who have completed an exercise science technical skills subject (or equivalent)
Primary Supervisor:	Dr Tina Skinner: t.skinner@uq.edu.au
Further info:	Students may contact the supervisor.

An evidence-based intervention ("Fit for Treatment") to prevent cancer treatment-induced toxicities in cancer patients: An effectiveness-implementation hybrid study

Project title:	**An evidence-based intervention ("Fit for Treatment") to prevent cancer treatment-induced toxicities in cancer patients: An effectiveness-implementation hybrid study**
Project duration:	4 weeks from 24th June to 19th July.
Expected hours per week	36 hours
Number of scholarships available	1
Location	St Lucia
Description:	**Background** Cancer patients frequently experience significant side effects as a result of their cancer treatments. Cancer-related fatigue is a common and debilitating condition which can significantly negatively affect quality of life. It is estimated that 70-90% of cancer patients will experience fatigue (Johnson et al., 2012). Meanwhile neurotoxicity development is another example of a common cancer treatment-related side effect, which is gaining significant attention. Furthermore, the devastating cardiotoxic effects of cancer treatments, such as chemotherapy, are well documented (Bowles et al., 2012; Cardinale et al., 2015). The aetiology of fatigue in cancer patients is not well known. However, current theories propose the dysregulation of physiologic, biochemical and psychological systems (Johnson et al., 2012). Meanwhile neuropathy can present in the periphery (Chan et al., 2015) or centrally (Cardinale et al., 2015). Peripheral neuropathy encompasses autonomic, sensory and motor symptoms (Chan et al., 2015). Central neurotoxicity, comprising deficits in executive function and memory (Cheung et al., 2015). The usual response to neurotoxicity is to reduce the treatment dose, which unfortunately diminishes the chances of survival (Chan et al., 2015). Even with dose reductions, neurotoxicity can be permanent (Chan et al., 2015). In the context of an already distressing cancer diagnosis, neurotoxicity can therefore cause substantial and persistent pain, social or functional disability (Chan et al., 2015). In regards to chemotherapy-induced cardiotoxicity, a retrospective cohort study of women with invasive breast cancer found that compared to controls not receiving chemotherapy, five-year incidence of heart failure and/or cardiomyopathy was significantly increased for all chemotherapy treatment types, and increased sequentially each year following treatment completion (Bowles et al., 2012). Exercise has already shown to be the most effective method in managing fatigue during and following cancer treatment (Johnson et al., 2012). In regards to chemotherapy-related neurotoxicity, our team and others (Chan et al., 2015; Wonders, 2014; Anderson et al., 2015) have demonstrated that exercise can modify neurotoxic effects after treatment. Exercise probably regenerates central and peripheral neural structures and moderates the inflammatory cytokines (Cheung et al., 2015; Chan et al., 2015) linked to chemotherapy-induced neural injury (Chan et al., 2015; van Waart et al., 2015; Park et al., 2015). We have also demonstrated that women with breast cancer will engage with exercise despite chemotherapy-induced side effects like fatigue. For example, in 2013, we piloted an RCT of an exercise-focused "wellness after breast cancer" intervention. In June 2016, we completed data collection (N=190) in the subsequent multisite blinded RCT (NHMRC APP1056856). Women' intense interest in managing chemotherapy-induced neural dysfunction is a feature of both studies. The pilot and interim data also demonstrate strong associations between greater physical activity and overall post-chemotherapy quality of life and function. Intervention participants reported

improvements in Functional Assessment of Cancer Therapy (FACT)—Breast Subscale scores in physical and functional well-being, and FACT—General total scores (intervention: d = 0.54, d = 0.50, d = 0.48, respectively; control: d = 0.22, d = 0.11, d = 0.05, respectively) (Anderson et al., 2015). In relation to cardiovascular disease risk, the optimal exercise 'dose' it is not yet known to prevent chemotherapy-related cardiovascular toxicities.

Considerable evidence indicates that exercise during treatment could manage fatigue (Johnson et al., 2012), prevent neurotoxicity (Chan et al., 2015; Rock et al., 2012) and possibly cardiovascular toxicities (Lenihan, 2017). Hence key cancer organisations now recommend intra-cancer treatment exercise programs (Park et al., 2015; Rock et al., 2012; Vivovksy et al., 2014). Despite their acknowledged benefits, such programs are rare. Health services can be reluctant to offer intra-treatment programs on the assumption that patients are too unwell to exercise during treatment, although our clinical experience indicates otherwise. For example, to test feasibility, in 2015 Al-Mitchell offered a twice-weekly, 6-week intra-treatment exercise program for chemoradiation patients. Program uptake was good (N=150), with most patients completing the program. The logical next step is to implement and evaluate a toxicity-targeted intervention during cancer therapy. We have developed the evidence-based 'Fit for Treatment' (FFT) intervention for this reason.

This effectiveness-implementation hybrid project (Curran et al., 2012) is underpinned by the Ottawa Model for Research Use (OMRU) (Graham & Logan, 2004). Hybrid designs introduce interventions to clinical settings through complementary intervention testing and the development of context-relevant translation strategies (Curran et al., 2012). The 'effectiveness' component provides robust data that can accelerate the uptake of urgently-needed innovations in practice (Bernet et al., 2013). The OMRU-guided 'implementation' component thoroughly assesses the target environment, determines relevant transfer strategies, evaluates clinical adoption, and scopes the potential for context-specific sustainability and wider adoption (Graham & Logan, 2004). The three elements of OMRU are:

1) Inputs, which are the intervention testing, plus a comprehensive situation appraisal. The appraisal explores the structural and cultural aspects of the practice environment that influence intervention uptake.
2) Processes, which comprise the methods used to transfer knowledge about the intervention.
3) Outputs, which are the patient, clinician and organisational evaluations of the intervention's impact and translation potential.

Aims

The aims of this effectiveness-implementation hybrid project are to demonstrate that:

1) The intervention is feasible as standard practice at Princess Alexandra Hospital (PAH).
2) FFT intervention participants have superior treatment outcomes to non-participants.

Hypotheses

1) The intervention will be feasible as standard practice at the PAH hospital. This will be achieved and/or demonstrated via:
    - The discussion and resolution of factors which may influence intervention uptake in the PAH clinical environment, which may include (but are not limited to):
        - Clinician promotion of the intervention to patients
        - Convenient and affordable access of exercise training facilities to patients
        - Introduction of the intervention into standard clinical practice
    - That compared to usual care, the exercise intervention will be cost effective (i.e. cost per patient for the intervention will not significantly differ compared to usual care)

	• Adherence to the exercise intervention will be above 80% • There will be no intervention-related adverse events 2) Compared to the control group, participants in the tailored intra-treatment exercise program will demonstrate: • Superior outcomes, defined as: a. Lower ratings of fatigue b. Higher ratings of cognitive function c. Higher ratings of health-related quality of life d. Lower peripheral neuropathy interference e. Lower peripheral neuropathy symptom intensity f. Lower neuropathic pain g. Superior sensory function h. Superior vascular structure and function i. Superior Autonomic Nervous System (ANS) function j. Less cytokine (TNF-α, IL-2, IL-Iβ, IL-6 and IL-8) anomalies k. Higher ratings of cardiovascular fitness and strength l. Higher levels of physical activity
Expected outcomes and deliverables:	Scholars will gain skills in data collection and analysis. Scholars will also have the opportunity to be involved in exercise training for people with cancer.
Suitable for:	This project is open to applications from students with a background in human movement and/or nutrition sciences.
Primary Supervisor:	Dr Tina Skinner: t.skinner@uq.edu.au
Further info:	The student is welcome to contact the supervisor prior to submitting the application.

Peer support for the maintenance of high intensity interval training and health in cancer survivors

Project title	**Peer support for the maintenance of high intensity interval training and health in cancer survivors**
Project duration:	*4 weeks : 24 June-19 July*
Expected hours per week	*36 hours per week per scholarship holder*
Number of scholarships available	*2*
Location	*St Lucia*
Description:	Using peer-support to improve exercise adherence and the health of cancer survivors beyond the duration of a short-term supervised training program.
Expected outcomes and deliverables:	Being a winter scholarship student within this project will present with a number of learning opportunities, including, but not limited to: - helping run supervised exercise sessions with people with cancer. - helping run supervised exercise testing sessions with people with cancer. - assisting with data collection and entry. - gaining experience with administration procedures within a randomized control trial study.
Suitable for:	This project is suitable for any student who meets the following criteria: Essential: - Willing and able to attend early morning testing and training sessions. - Excellent communication skills - High level attention to detail Desired: - Previous experience working with individuals with cancer - Previous experience working with older adults in an exercise setting - Students who have completed an exercise science technical skills subject (or equivalent)
Primary Supervisor:	Dr Tina Skinner: t.skinner@uq.edu.au
Further info:	Students may contact the supervisor.

Dr Michalis Stylianou

Before-school physical activity programs: A systematic review

Project title:	Before-school physical activity programs: A systematic review
Project duration:	4 weeks (24 June to 19 July 2019)
Expected hours per week	Approximately 25-30 hours per week
Number of scholarships available	1
Location	St Lucia
Description:	Before-school physical activity programming is a promising approach for alleviating the clash between the educational and public health agendas of schools. Such programs do not take time away from academic subjects and may therefore be a more attractive option for schools. Before-school physical activity programs have the potential to help enhance children's physical activity as well as other outcomes, including readiness to learn and multiple aspects of school engagement. However, no studies have thus far attempted to synthesise outcomes associated with before-school physical activity programs. Accordingly, the aim of this project is to conduct a systematic review of the literature examining the impact of before-school physical activity programs on physical activity, school engagement, and other outcomes.
Expected outcomes and deliverables:	The selected scholar will gain skills in conducting a systematic literature review, which involves searching different databases, screening articles for inclusion, extracting information from articles, and evaluating the quality of articles. The student may also have the opportunity to generate presentations for local or national conferences, or work towards a paper for publication with the supervisors.
Suitable for:	This project would be suitable for 3rd and 4th year UQ enrolled students with a background and/or interest in physical activity, and its application in paediatrics/school settings.
Primary Supervisor:	Dr Michalis Stylianou
Further info:	Students interested in this project are encouraged to contact Dr Michalis Stylianou at m.stylianou@uq.edu.au