2021-22 HMNS Summer Research Projects

Contents

Dr Emma Beckman

Monitoring and evaluating athletic training in Athletes with Cerebral Palsy who have high support needs

Project title:	**Monitoring and evaluating athletic training in Athletes with Cerebral Palsy who have high support needs**
Project duration:	10 weeks
Expected hours per week	25
Attendance	Some face to face required
Expected started date	29 November 2021 (negotiable)
Number of scholarships available	2
Location	St Lucia
Description:	We know sport/physical activity/exercise is crucial for everyone- but even more so for people with a disability, especially those who have impairments that are moderate to severe. A new Para athletics discipline called FrameRunning has significant promise for people with cerebral palsy who have high support needs but impact of training is yet to be evaluated. This project aims to develop methods to monitor training load in this population and evaluate the impact of training.
Expected outcomes and deliverables:	You will work with athletes with a disability and their families to implement a Frame Running training program (predominantly on Saturday mornings and Tuesday afternoons). You will manage the data derived from the training sessions and learn about service agreements and NDIS reports. You will be required on some afternoons (2.30-3.30pm) and at least every second Saturday morning at the UQ athletics track (8-9am)
Suitable for:	Previous coaching or experience in athletics is beneficial but not essential. Some knowledge of disability and cerebral palsy in particular will also be desirable.
Primary Supervisor:	Dr Emma Beckman
Other info	You are **NOT** required to contact the supervisor prior applying online

Profs Glen Lichtwark, Andrew Cresswell and Dr Luke Kelly

Exploring biomechanical research with application in exercise and sports science

Project title:	**Exploring biomechanical research with application in exercise and sports science**
Project duration:	10 weeks
Expected hours per week	30 hours
Attendance	Attendance required, but some work can be done remotely if needed
Expected started date	29 November 2021 (negotiable)
Number of scholarships available	3
Location	St Lucia
Description:	We have a number of projects looking examining runners and running shoes, muscle energy use during contractions and applied sports science projects (e.g. assessing biomechanical sensors for sports). Students working in this area will work within a team of 3 students across a number of projects, focussing on data collection using 3D motion analysis, force plates and ultrasound imaging. They will learn some advanced analysis techniques to work with biomechanical and physiological data and work with our multi-disciplinary team to communicate the results.
Expected outcomes and deliverables:	Students will get experience in - 1) setting up a 3D motion capture system and making measures of human participants. 2) collecting and analysing 3D motion capture data along with other measures (e.g. force or electromyography) 3) imaging muscles during movement using ultrasound imaging 4) signal processing and basic data collation 5) communicating research findings
Suitable for:	We are seeking motivated exercise and sports science, clinical exercise physiology, or biomedical science students with strong computer and analytical skills as well as a fundamental understanding of biomechanics and motor control. Second year students and above will be prioritised.
Primary Supervisor:	Profs Glen Lichtwark &, Andrew Cresswell and Dr Luke Kelly,
Other info	Please contact the supervisor before applying at g.lichtwark@uq.edu.au

Dr Gregore Mielke

Exploring the optimal doses of physical activity and sedentary behaviour across the lifespan for prevention of non-communicable chronic diseases

Project title:	**Exploring the optimal doses of physical activity and sedentary behaviour across the lifespan for prevention of non-communicable chronic diseases**
Project duration:	10
Expected hours per week	36
Attendance	Most of the activities can be completed remotely
Expected started date	29 November 2021 (negotiable)
Number of scholarships available	1
Location	St Lucia
Description:	This project aims to improve understanding of optimal patterns of physical activity and sedentary behaviour across the lifespan for improved health. Specifically, this project will use data from large cohort studies in Australia, Brazil and Canada to investigate potential critical, sensitive and cumulative effects of physical activity and sedentary behaviour across the lifespan on body composition, bone health, inflammatory and cardiovascular markers, mental health, physical function, and health costs.
Expected outcomes and deliverables:	Students will be given the opportunity to develop skills in statistical analysis, systematic reviews of literature, and contribute to written or visual reports associated with the project. The student may also have the opportunity to generate presentations for local or national conferences. These skills will give the student a substantial advantage with future research activities (e.g., PhD, and research assistant positions).
Suitable for:	Applicants with background knowledge about epidemiology, public health and physical activity are strongly encouraged to apply.
Primary Supervisor:	Dr Gregore Mielke
Other info	You are **NOT** required to contact the supervisor prior applying online

Prof Helen Truby
NTools and Resources for Early Life Nutrition

Project title:	**NTools and Resources for Early Life Nutrition**
Project duration:	6 weeks
Expected hours per week	28
Attendance	Remote working is possible as long as the student has internet access and attendance on campus is not required
Expected started date	29 November 2021 (negotiable)
Number of scholarships available	1
Location	St Lucia
Description:	This project comprises a desk top review of existing Australian tools and resources available to support families and early child care workers knowledge and skills about nutrition. All existing resources will be identified and a database built based with each resource being categorised into suitability for age group as follows 0-12 months, 1-3 years and 3-5 years. An excel database will house this information including a quality rating scale for each identified resource, how to access the resource and date it was created. Once completed, a analysis will inform the need for new resources based on gaps in existing resources. This gap analysis will feed forward into a new project which aims to deliver an open access suite of resources for early childhood nutrition.
Expected outcomes and deliverables:	Deliverables An excel based database of current nutrition and food tools and resources for the under 5 year olds in Australia. This will be curated by (1) intended target audience for each resource, 2) where it is available from 3) cost of the resource 4) quality of the resource Skills The student will develop a through understanding and knowledge of existing tools and resources available for nutrition education for families with children < 5 years of age and for child care workers Develop skills and experience in using Excel database
Suitable for:	The applicant may have an interest in nutrition and food provision for the early years of life. They will need to be organised and systematic in their approach to identify all available resources for this target group in Australia. The applicant will need to have basic skills in developing a database using Excel and is expected to be able to work reasonably independently.
Primary Supervisor:	Prof Helen Truby
Other info	You are **NOT** required to contact the supervisor prior applying online

Dr Keane Wheeler

'Jumping the Gap': how sport can be used to promote STEM learning in Aboriginal and Torres Strait Islander communities

Project title:	**'Jumping the Gap': how sport can be used to promote STEM learning in Aboriginal and Torres Strait Islander communities**
Project duration:	10 weeks
Expected hours per week	36
Attendance	Remote working is possible as long as the student has internet access and attendance on campus is not required
Expected started date	29 November 2021 (negotiable)
Number of scholarships available	2 Scholarships
Location	St Lucia
Description:	The current study will evaluate the efficacy of fundamental movement skill biomechanical data collected using wearable technologies and then used during an intervention to engage children in science, technology, engineering and mathematics (STEM) based subject areas. This study will involve gathering published scientific research articles and analysing the efficacy of sport in providing STEM based learning for Aboriginal and Torres Strait Islander children and communities. The concept behind STEMfit is that the program combines physical activity, with wearable technologies to create a fun learning experience in schools that meets national curriculum learning objectives. The STEMfit program (intervention) material will be used in conjunction with teachers and schools who are experienced in educational engagement and have an interest in providing the best opportunities to learn STEM subjects using innovative methods. The results of this project will help to inform further projects that provide sustainable programs, informed by the direct experiences of participants, to enhance the educational outcomes for diverse learners and have a long lasting effect on their education and career prospects.
Expected outcomes and deliverables:	Students can expect to explore the following questions: answers to the following research questions: 1. What does experiencing programs like STEMfit program mean for Aboriginal and Torres Strait Islander peoples and communities? 2. What have been the Aboriginal and Torres Strait Islander childrens' educational experiences been in the lead-up to primary and high school? 3. What effect does sport based programs have on their sense of identity and self-esteem, especially as a scientist and in progressing to a career in STEM? 4. How can educational aspirations and outcomes for Aboriginal and Torres Strait Islander peoples be enhanced through the use of STEM? 5. How can the STEMfit program build educational connections with, and increase educational outcomes for Aboriginal and Torres Strait Islander peoples and communities? An expected outcomes from this program is the prepare a manuscript for submission to a peer reviewed journal for publication.
Suitable for:	Ideal applicant profile: 1. Great team member 2. Ability to work independantly as part of a team 3. Exceptional communication skills including written 4. High end research skills including searching for literature
Primary Supervisor:	Dr Keane Wheeler
Other info	You are NOT required to contact the supervisor prior applying online, but Dr Keane Wheeler can be contacted for questions, via email keane.wheeler@uq.edu.au

Dr Michalis Stylianou

Before-school physical activity levels, correlates and support strategies

Project title:	**Before-school physical activity levels, correlates and support strategies**
Project duration:	10 weeks
Expected hours per week	Approximately 25-30 hours per week
Attendance	The project can be completed on campus or remotely
Expected started date	29 November 2021 (negotiable)
Number of scholarships available	1
Location	St Lucia
Description:	Before-school physical activity opportunities may appeal to schools as they do not interfere with curricular time. Physical activity programs based in this period may be effective for enhancing physical activity levels and on-task behaviour. However, before-school physical activity opportunities are less common than those delivered in other periods of the day, and little is known about before-school physical activity levels, locations or correlates among Australian adolescents. Developing a deeper contextual understanding of physical activity patterns and correlates is critical for supporting schools with targeted approaches to address physical inactivity. Accordingly, this project aims to understand before-school physical activity levels, correlates and how to support active opportunities based in this period. Through a co-design process, stakeholder-identified barriers and facilitators, and evidence from additional data sources (e.g., correlates of accelerometer-measured before-school physical activity) will be evaluated.
Expected outcomes and deliverables:	The selected applicant will gain skills associated with managing quantitative and qualitative data. One component of this project will involve conducting a modified Delphi study to co-design an implementation framework with school stakeholders. This may require the student to assist with designing and administering survey instruments, and to work with data from focus groups, stakeholder surveys and physical activity measurements. The student may also have the opportunity to work towards a paper for publication with the supervisors.
Suitable for:	This project would be suitable for 2nd or 3rd 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
Other info	Please contact the supervisor **before applying** at uqmstyli@uq.edu.au

Prof Prof Timothy Carroll

How does the human brain control fast movements with our eyes and hands?

Project title:	**How does the human brain control fast movements with our eyes and hands?**
Project duration:	10
Expected hours per week	25
Attendance	must be on campus
Expected started date	29 November 2021 (negotiable)
Number of scholarships available	2
Location	St Lucia
Description:	The capacity to produce fast and accurate visually-guided movement was crucial for survival long before animals evolved a cerebral cortex, suggesting that basic control systems may be conserved across species. This project will test the extent to which the human brain controls reaching movements via structures and control mechanisms known to be used for rapid eye movements, and for prey capture by lower vertebrates such as fish. The notion that complex, human limb movements can be controlled by primitive sub-cortical systems challenges conventional thinking about movement-related brain activity, and has important implications for the design of human-machine interfaces and training protocols in rehabilitation, industry and sport. During the scholarship, we will be conducting experiments that involve simultaneous measurement of eye and finger (pointing) movements, while stimulating the brain to disrupt processing in visual cortex and motor cortex. The purpose is to test the hypothesis that a mid-brain structure known to be critical for control of saccadic eye movements, can also generate the metrics for visually-guided arm reaches. Winter scholars will have an opportunity to gain experience with these methods, and to come to grips with the underlying neurophysiology.
Expected outcomes and deliverables:	Scholars will gain skills in data collection, data analysis and visualisation, and will have the opportunity to contribute to the fundamental neurophysiology that underpins the control of human limb movements.
Suitable for:	This project is open to UQ students with an interest in human neuroscience, who are motivated to develop skills in electrophysiology (e.g. EMG), non-invasive brain stimulation (e.g. TMS), and kinematic analyses. An aptitude for, or experience in using, custom computer software and electronic communication systems is desirable.
Primary Supervisor:	Prof Prof Timothy Carroll
Other info	Please contact the supervisor **before applying** at timothy.carroll@uq.edu.au

A/Prof Tina Skinner

Inflammation and body composition; Responses to high intensity interval training in breast, prostate and colorectal cancer survivors

Project title:	**Inflammation and body composition; Responses to high intensity interval training in breast, prostate and colorectal cancer survivors**
Project duration:	8-10 weeks
Expected hours per week	25-32
Attendance	Face to face required.
Expected started date	29 November 2021 (negotiable)
Number of scholarships available	1
Location	St Lucia
Description:	This study involves 6 months of HIIT in breast, prostate and colorectal cancer survivors. The participants are tested at baseline, 1, 3 and 6 months where we are looking at their body composition, cardiovascular fitness, inflammatory levels, gut microbiome and fatigue. Participants are required to complete 3 HIIT sessions per week.
Expected outcomes and deliverables:	Applicants will gain experience working with a clinical population like cancer survivors, they will be conducting both testing and training sessions on a weekly basis. Additionally students will be exposed to data collection and processes and procedures. You will learn how to run a battery of physiological tests, conduct exercise sessions in clinical populations, organise and enter data and have exposure to project management. Finally students will have the opportunity to analyse a data set learning research/statistical skills if this is of interest to them.
Suitable for:	Good communication and interpersonal skills Organised Attention to detail Uses Initiative Have an understanding of technical skills
Primary Supervisor:	A/Prof Tina Skinner, Morgan Farley
Other info	Please contact Megan Farley before applying at morgan.farley@uq.net.au

Dr Veronique Chachay

Mediterranean diet and inflammatory bowel disease

Project title:	**Mediterranean diet and inflammatory bowel disease**
Project duration:	8 weeks
Expected hours per week	25-30
Attendance	Project can be completed remotely if required
Expected started date	29 November 2021 (negotiable)
Number of scholarships available	1
Location	St Lucia
Description:	The project is part of an overarching PhD project conducted at the RBWH and UQ. The aim of the overarching study is to investigate the safety, feasibility and efficacy of an anti-inflammatory diet prescription designed to dampen inflammatory pathways, in conjunction with standard medical therapy, on disease activity, and the gut microbiota composition in individuals with mild to moderate inflammatory bowel disease. The scholarship project will involve assisting the lead investigator in processing dietary intake, adherence and physical activity data issued from the study, utilising specific research software.
Expected outcomes and deliverables:	Exposure to: - the running of randomised controlled clinical trial - multiple investigation tools - data processing and analysis - Redcap data management software - Foodworks dietary intake analysis software - multi-disciplinary research team meetings - dietetics consultation in the hospital setting
Suitable for:	The applicant will be a first year Master of Dietetics Studies student with interest in clinical nutrition, with good organisation and communication skills, attention to detail, and willingness to learn from new experiences.
Primary Supervisor:	Dr Veronique Chachay
Other info	Please contact the supervisor **before applying** at v.chachay@uq.edu.au