WESTERN SYDNEY UNIVERSITY

NICM Health Research Institute

Summer Scholarship Research Program 2020

Project Lists

Project 72: Complementary and allied health usage in Australian women with endometriosis

Supervisor(s): Mike Armour - m.armour@westernsydney.edu.au
Principal Supervisor

Justin Sinclair - j.sinclair@westernsydney.edu.au
Second Supervisor

Project description

Endometriosis affects over 830,000 women in Australia alone, causes over 9 billion dollars per year in economic burden and negatively affects all aspects of women's lives. Current treatments, both medical and surgical, often provide only partial symptom control. Our previous research has shown that over three quarters of women in Australia use self-management to control their endometriosis symptoms. We have a large dataset from the ENDOCOST survey we undertook in 2018-2019 which contains information about usage of complementary medicines, therapies and allied health amongst 400 women with diagnosed endometriosis in Australia. This project will explore this dataset to determine the predictive factors for using complementary and allied health as well as the cost of illness burden for using these therapies.

Project Aims

- Determine the prevalence of usage of various types of complementary and allied health (e.g. acupuncture, naturopathy, pelvic physiotherapy, psychologists)
- Explore predictive factors for the use of these services (e.g. pain scores, household income)
- Determine the cost of illness burden related to the usage of these complementary and allied health modalities

Project Methods

Descriptive statistics will be used (means, medians, 95% CI) as well as some correlational statistics such as Spearman's correlation, and depending on the data set once examined in more depth there is a possibility for regression modelling to be used.

Opportunity for Skill Development

- General academic skills – literature searching including MEDLINE and academic writing.
- Intermediate statistical analysis skills in excel and SPSS will be developed.

Students are required to have the following skills/meet the following pre-requisite(s) to apply

Previous experience in performing basic statistics in Excel required.

Project 73: Literature review on the anticancer properties of Australian native fruits and vegetables

Supervisor(s): Deep Jyoti Bhuyan - d.bhuyan@westernsydney.edu.au
Principal Supervisor

Mitchell Low - mitchell.low@westernsydney.edu.au
Second Supervisor

Project description

Cancer causes more than AIDS, tuberculosis, malaria and diabetes combined. In 2018, Australia had the highest incidence rate of all cancers in the world for both sexes. Molecular heterogeneity, late diagnoses, expensive and very few effective therapeutic options and the increased resistance to chemo and radiation therapies are currently some of the biggest challenges in cancer treatment. Severe side effects of many chemotherapeutic regimens also make cancer one of the most challenging diseases to treat. Over 45% of the FDA-approved chemotherapeutic drugs between 1981 and 2010 were derived from natural products (Bhuyan et al., 2018). In the United States, different plant-derived products, either alone or in combination with mainstream chemo and radiotherapies are used by approximately 50 - 60% of cancer patients (Wang et al., 2012, Bhuyan et al., 2017). Therefore, the search for safer alternatives to be used either as mono or combination therapy with the standard drug is becoming a priority in anticancer research.

Native Australian fruits and vegetables are an integral part of Indigenous food and medicine for thousands of years and have been found to have unique nutritional, phytochemical and organoleptic profiles. The role of Australian native fruits such as Davidson's plum, Illawarra plum and Quandong rich in dietary fibre, phenolic compounds and antioxidants in the development of novel functional food products has been previously emphasised. Davidson's plum and Illawarra plum were also reported to have significantly higher (by several folds) antioxidant, total phenolic and anthocyanin contents compared to blueberry (Netzel et al. 2006, 2007, Symonds et al. 2013). Dietary phenolic compounds, anthocyanins and antioxidants derived from other natural sources have been shown to confer anticancer activity in several studies through actions on multiple molecular targets, signalling pathways and tumour microenvironment. However, critical and comprehensive reviews on the anticancer activity of Australian native fruits and vegetables are scarce. Therefore, this project aims to comprehensively review the studies currently available in the literature highlighting the anticancer potential of Australian native fruits and vegetables and their implementation in anticancer drug development in the near future. The findings of this review will be compiled in a logical report format.

Project Aims

The overarching goal of this project is to review and assess the current scientific literature for identifying the key studies on the anticancer potential of Australian native fruits and vegetables that are widely employed in Indigenous food and medicine. Studies that address the biological and chemical aspects of Australian native fruits and vegetables will be included in this review. This would enable us to understand the key future directions to follow in anticancer drug development from Australian native fruits. This project will have two main aims:

1. To systematically review the current literature on the chemical, biological and anticancer properties of Australian native fruits and vegetables
2. Compile findings of the review in a logical report format

Project Methods

1. An outline of the review will be made
2. Relevant literature will be gathered based on the outline by searching keywords in major scientific databases
3. Papers will be collected and sorted to remove duplicates and irrelevant papers
4. Papers will be reviewed and tables to collect relevant data fill out
5. A report will be drafted
6. Proofreading and internal review of the report will be performed
7. The report will be submitted and presented

Opportunity for Skill Development

- The student will develop research skills in reviewing and understanding scientific literature
- The student will have the opportunity to contribute to research outputs, with the potential for publication
- The student will have the opportunity to interact with NICM HRI researchers and discuss their research interest's future projects and HDR opportunities

Students are required to have the following skills/meet the following pre-requisite(s) to apply

An understanding of/interest in molecular biology and cancer is desirable. Strong comprehension and writing skills.

Project 74: Mindfulness-based interventions for female reproductive health: a scoping review

Supervisor(s): Carolyn Ee - c.ee@westernsydney.edu.au
Principal Supervisor

Mike Armour - m.armour@westernsydney.edu.au
Second Supervisor

Project description

Across the reproductive lifespan, women may experience a number of health conditions including menstrual disorders, PCOS, subfertility or infertility, and disorders and problems during pregnancy/labour/birth and menopause. Conventional medical approaches show limited effectiveness for management of many of these health problems. Mindfulness-based interventions show promise in managing a number of health conditions including psychological problems, but little is known about the use of mindfulness for female reproductive health.

Project Aims

The aims of this scoping review are to:

- Systematically map the extent and range of evidence on mindfulness interventions for female reproductive health across the reproductive life span, and
- Identify gaps in the literature to aid planning and commissioning of future research.

Project Methods

Scoping review methodology will be used. A protocol has been developed including search strategy. The student would assist with searching of databases, screening of search results, data extraction, data analysis (using a charting tool that has been developed) and writing up of the review for publication. All this will be conducted under supervision and with collaboration with our five other co-authors.

Opportunity for Skill Development

- Literature searching
- Use of bibliographic management system
- Understanding of different types of methodology for studies (e.g. clinical trials, vs qualitative studies)
- Understanding of mindfulness-based interventions
- Understanding of scope of female reproductive health conditions
- Scoping review methodology

Students are required to have the following skills/meet the following pre-requisite(s) to apply

The student needs to have some familiarity with conducting a literature search i.e. that it involves searching a database with particular search terms. The student will need to be self-directed, quick to learn, meticulous with record keeping. A clinical background is preferable i.e. not suitable for a basic science student.

Project 75: Developing clinical pathways and evidence summaries to inform practice at an academic integrative HealthCare centre

Supervisor(s): Carolyn Ee - c.ee@westernsydney.edu.au
Principal Supervisor

Suzanne Grant - s.grant@westernsydney.edu.au
Second Supervisor

Project description

Please give a general description of the Project including background, and how this fits within a larger project (if applicable).

Western Sydney Integrative Health is an academic integrative healthcare centre based at NICM on the Westmead Campus. The centre aims to provide evidence-based care for people with chronic disease, using conventional and complementary therapies like herbal remedies, nutraceutical supplements, acupuncture, Chinese herbal medicine, yoga, tai chi and meditation. To inform evidence-based practice, the centre produces clinical pathways and evidence summaries incorporating clinical practice guidelines, and latest evidence on complementary therapies. The student will assist the team in producing these clinical pathways and summaries, particularly in the areas of cancer, cardiovascular health, women's health and/or mental health and chronic pain.

Project Aims

- The aims of this project are to create evidence-based clinical pathways and summaries to inform practice within Western Sydney Integrative health.

Project Methods

Protocols have been developed for the pathways. The student would assist with searching of databases, screening of search results, synthesising evidence, creating pathways and summaries with the supervision of the team.

Opportunity for Skill Development

- Literature searching
- Use of bibliographic management system
- Understanding of how to critically appraise evidence e.g. RCT evidence
- Writing for a medical/health audience
- How to translate evidence into practice

Students are required to have the following skills/meet the following pre-requisite(s) to apply

The student needs to have some familiarity with conducting a literature search i.e. that it involves searching a database with particular search terms. The student will need to be self-directed, quick to learn, meticulous with record keeping and able to think critically and be creative. A clinical background is preferable i.e. not suitable for a basic science student.

Project 76: Exploring the neurophysiological mechanisms of exercise in ageing and cognitive decline

Supervisor(s): Diana Karamacoska - d.karamacoska@westernsydney.edu.au
Principal Supervisor

Angelo Sabag - a.sabag@westernsydney.edu.au
Second Supervisor

Genevieve Steiner - g.steiner@westernsydney.edu.au
Third Supervisor

Project description

Physical activity is a key lifestyle factor that can affect the wellbeing of older adults, and is regarded as one of the strongest protective factors for preventing cognitive decline. A plethora of research exists for aerobic and resistance-based training, and there is considerable evidence that mind-body interventions (like yoga and tai-chi) can be efficacious for brain health. Regular exercise is consistently linked to better cognition, however, the mechanisms underpinning this association remain unknown. Only three meta-analyses have assessed these physical activity types in relation to cognitive functioning (Northey et al., 2018; Ross & Thomas, 2010; Snowden et al., 2011), but none have evaluated neurological outcome measures. The current project will review the neurophysiological effects of exercise to determine how these exercises can be implemented to prevent or slow the rate of cognitive decline. This will be done in the form of a systematic review where exercise interventions in healthy older adults and individuals living with cognitive decline or dementia, will be reviewed for their impact on brain function and cognition. This project will generate new insights on how we can best adapt physical activity and empower older adults to reduce their risk of dementia and delay deterioration.

The student will gain practical experience in all areas of the review process. There are opportunities to define the search protocol, search and screen for relevant articles, extract and analyse data, and assist with the reporting of results. The student will also be given insights into the manuscript preparation process, and be invited to contribute as an author on the publication post-award.

Project Aims

This project aims to uncover the neurophysiological mechanisms of exercise in ageing and cognitive decline. Different exercise modalities will be appraised to gain a thorough understanding of their potential to induce neuroplasticity and alter the course of pathophysiological brain ageing. This will be done by answering the following research questions:

- How is neuronal and cognitive functioning affected by physical activity in older adults?
- How does the type, intensity, duration, and frequency of exercise influence neurocognitive outcomes?
- How can physical activity be implemented to prevent or slow the rate of cognitive decline?

Project Methods

A research plan has been drafted to systematically review exercise intervention studies in older adults that utilise neurological and cognitive outcome measures. The general PICO for this research is as follows:

- Population - Adults 65 years and older, with or without cognitive decline
- Intervention - Physical activity
- Comparison - Active control or no intervention
- Outcome – Brain mechanisms, cognition

In consultation with the Supervisors, the student will be involved in the development of a search protocol and criteria for relevant publications. The student will be tasked with the role of database searching, article screening, and the extraction of data pertaining to study characteristics, intervention design, and impact on outcome measures. Together with the Supervisors, the student will assess study quality using the Cochrane Collaboration's risk of bias tool. After synthesising the data, the student will be invited to contribute to the writing of the manuscript and observe the publication preparation and peer-review process post-award.

Regular meetings and consultations will be held with the student to provide training, problem-solving opportunities, and to monitor their progress.

Table 1. Proposed research timeline and post-award opportunities.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Post-Award
Conduct searches	x								
Screen articles		x	x	x					
Synthesise data					x	x	x		
Write and review manuscript								x	x

Opportunity for Skill Development

This project allows for the practical application of the student's skills and knowledge obtained through introductory undergraduate courses such as Professional Health Competencies and Foundations in Evidence-Based Research and Practice. It is an opportunity to develop skills for:

- Conducting literature reviews
- Assessing study quality
- Analysing interventional outcome data
- Reporting research findings by creating summary tables and figures
- Evaluating scientific evidence
- Assisting with the publication preparation and review process
- Collaborating and communicating within a team

Students are required to have the following skills/meet the following pre-requisite(s) to apply

This research project is ideal for enhancing the skills of undergraduate students completing their second or third year of study. Experience within the health sciences will be advantageous, particularly for those with a background or interest in neuroscience, cognition, physiology, or psychology.

Project 77: Literature review on natural treatments for eczema

Supervisor(s): Mitchell Low - mitchell.low@westernsydney.edu.au
Principal Supervisor

Deep Jyoti Bhuyan - d.bhuyan@westernsydney.edu.au
Second Supervisor

Project description

Eczema affects the skin, causing redness, itching, possible oozing and over time rough hard thickened skin may occur. Eczema is an increasingly common disease of early childhood. It is a painful and unsightly disease that can have major effects on a child's development and quality of life. It also affects adults. The prevalence of eczema has been rising over the past few decades and is particularly high in Australia. The rate of population prevalence in Melbourne of observed eczema at 12 months of age is 20.3%. It is estimated that the rate of infants suffering eczema in their first 12 months is 1 in 3.

The increase in the prevalence of eczema is alarming and many factors have been explored to identify and manage its cause. However, the cause still remains unclear. Genetics have been identified to play a role, however the high rate in increase cannot be accounted for by genetics alone. It seems likely that environmental factors play a major role but despite ongoing research clear causes and preventative measures have not eventuated.

While the cause of eczema remains unknown interventions to reduce the prevalence have been limited in effectiveness. There are medical interventions, however they are typically either non-targeted or harsh (oral and topical cortisone and immune suppressants) or lacking in strong efficacy evidence. Improved medical interventions are required to treat the disease in especially the sensitive infant demographic.

Natural products are typically complex and contain multiple compounds that may interact by multiple mechanism to elicit an effect. Natural products are also perceived as safe and may be a preferred long term treatment or a preferred option for sensitive infants. Many natural products have purported benefits for eczema. This project seeks to review the available scientific evidence for the most prevalent natural treatments of eczema.

Project Aims

The overarching goal of this project is to review and assess the current scientific literature for identifying the key studies on natural products used to treat eczema This project will have two main aims:

1. To systematically review the current literature on natural products used to treat eczema
2. Compile findings of the review in a logical report format

Project Methods

1. An outline of the review will be made
2. Relevant literature will be gathered based on the outline by searching keywords in major scientific databases
3. Papers will be collected and sorted to remove duplicates and irrelevant papers
4. Papers will be reviewed and tables to collect relevant data fill out
5. A report will be drafted
6. Proofreading and internal review of the report will be performed
7. The report will be submitted and presented

Opportunity for Skill Development

1. The student will develop research skills in reviewing and understanding scientific literature
2. The student will have the opportunity to contribute to research outputs, with the potential for publication
3. The student will have the opportunity to interact with NICM HRI researchers and discuss their research interest's future projects and HDR opportunities

Students are required to have the following skills/meet the following pre-requisite(s) to apply

An understanding of/interest in microbiology and inflammation is desirable. Strong comprehension and writing skills.

Project 78: Dietary Quality of Adults with Obsessive-Compulsive Disorder Compared to Healthy Controls

Supervisor(s): Jerome Sarris - j.sarris@westernsydney.edu.au
Principal Supervisor

Project description

- Data exists supporting the relationship between dietary quality and mental health; in particular, a poorer quality diet has been linked to a greater association with depressed mood
- To date, no study has explored the relative dietary quality of people with diagnosed Obsessive-Compulsive Disorder (OCD)
- We have recent dietary data (from the Food Frequency Questionnaire; FFQ) from an NHMRC-funded project grant involving 75 participants with diagnosed OCD
- The project aims to compare this data versus a sample of 50 healthy participants
- The project will compare the data (via SPSS) between people with OCD and a healthy control to see if on the FFQ there are differences in levels of macro and micronutrients, and whether on a constructed dietary quality scale there is a difference between groups
- The data will be analysed and written up as a manuscript for submission to a journal for publication.

Project Aims

- To analyse and write-up basic demographic data, comparing characteristics of the OCD sample with a healthy control sample
- To analyse and write-up the macro and micro nutrients and dietary quality of the OCD sample compared to a healthy control sample
- To analyse and write-up the dietary quality of the OCD sample compared to a healthy control sample

Project Methods

- Researching and reading the basic literature around the diet and mental health; and OCD.
- Developing skills around working with the data analysis program SPSS- how to arrange and compute data, and basic analysis techniques e.g. Frequencies, Chi-Squared, T-Tests
- Writing up the draft of a manuscript of this data for publication (with the assistance of the supervisor)

Opportunity for Skill Development

- Developing literature review skills
- Understanding about the relationship between dietary quality and mental health
- Understanding about the condition OCD
- Developing SPSS and data analysis skills
- Learning how to construct and complete an original manuscript for submission

Students are required to have the following skills/meet the following pre-requisite(s) to apply

This project is designed for the more ‘advanced student’.

Students are required to have some basic knowledge of using the data analysis program SPSS and basic data analysis methodology. They are needing good literature searching and writing skills, and a strong interest in producing a manuscript for publication (with supervisor support).

Project 79: Effect of Tai Chi on cognitive function in older adults with mild cognitive impairment: A systematic review and meta-analysis

Supervisor(s): Guoyan (Emily) Yang - e.yang@westernsydney.edu.au
Principal Supervisor

Diana Karamacoska - d.karamacoska@westernsydney.edu.au
Second Supervisor

Genevieve Steiner - g.steiner@westernsydney.edu.au
Third Supervisor

Project description

Dementia is a syndrome in which there is deterioration in memory, thinking, behaviour and the ability to perform everyday activities. Worldwide, around 50 million people have dementia and there are nearly 10 million new cases every year. An early stage of cognitive decline, known as mild cognitive impairment (MCI) is a target group for early intervention. Currently, pharmacologic treatments to improve cognition or slow the disease progression have limited benefits.

Physical activity is well-researched behavioural intervention for cognitive functioning. Tai Chi is an increasingly popular mind–body exercise with physical, cognitive, social, and meditative components in the same activity. The multiple components in Tai Chi may work in a diverse and synergetic way to improve cognition. Tai Chi provides low to moderate aerobic, agility, and mobility training, which are each believed to affect cognitive function through unique neurophysiological pathways. Tai Chi includes training in sustained attentional focus and multitasking. The meditative component of Tai Chi may be beneficial in enhancing attention and executive functions; it may also improve cognition by mitigating the known effects of anxiety and depression on cognition through stress-related pathways. Social interaction and support in Tai Chi may have further benefits for cognition in older adults.

Over the last years, the beneficial effects of Tai Chi have been documented in older adults with MCI, cognitive impairment, and dementia. Three previous systematic reviews support the potential of Tai Chi to attenuate age-related cognitive declines. In recent years, a number of randomised controlled trials have reported the beneficial effects of Tai Chi on cognition. However, these studies have not been comprehensively summarised and analysed on effect of Tai Chi for cognitive functions in older adults with MCI.

Project Aims

The aims of this systematic review and meta-analysis of randomised controlled trials is to investigate:

- Effects of Tai Chi on cognitive function in older adults
- Safety of Tai Chi in older adults with cognitive impairment

Project Methods

Literature search: According to pre-defined search strategy, electronic literature searches will be conducted using major English and Chinese databases, including PubMed, Embase, the Cochrane Library, China National Knowledge Infrastructure (CNKI), VIP Journal Integration Platform (VIP) and Wanfang database. Grey literature and clinical trial register will also be searched.

Study selection: According to the eligibility criteria, potential studies will be selected by screening title, abstract, and full-text.

Data collection: Data will be collected using pre-defined data extraction form.

Risk of bias assessment: Cochrane Collaboration's risk of bias tool will be used to assess bias for each study.

Grading the quality of evidence: GRADEpro application will be sued to assess the quality of evidence in relation to each outcome included in the 'Summary of Findings' table.

Synthesis of results: Data will be summarised using mean difference (MD) with 95% confidence interval (CI) for continuous outcomes and risk ratio (RR). Cochrane's RevMan software will be used for statistical analysis. Data will be pooled if I2 statistic was less than 75% indicating acceptable heterogeneity.

Literature search, study selection, data collection, risk of bias assessment, grading the quality of evidence are required to be conducted by two researchers independently. The student will contribute as one of the researcher in the process. Any disagreement about the decisions will be solved by discussion, with a third researcher involved if necessary. The student will also participate in data analysis using RevMan software.

Opportunity for Skill Development

1. Advanced database searching. The student will learn how to: identify keywords and related terms, apply advanced database searching techniques to the research question, modify the search to improve relevancy.
2. Critical thinking. The student will learn how to use Cochrane Collaboration's Risk of Bias tool and the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach to critically assess quality of evidence.
3. Communication skills. Conducting systematic review is a team work.
4. Project management skills. The student will learn how to schedule to meet the milestones and deadlines.
5. Professional skills. Opportunity to learn how to use EndNote and excel to manage data, RevMan software to do data analysis, and EndNote to create in-text citations and a reference list.
6. Writing a manuscript. Following PRISMA reporting guideline, the student will learn how to summarise the results and draft a manuscript.

Students are required to have the following skills/meet the following pre-requisite(s) to apply

General Microsoft Office skills: be proficient with Word and Excel.

Project 80: Synergy of natural compounds on endothelial survival against oxidative stress

Supervisor(s): Xian (Phoebe) Zhou - p.zhou@westernsydney.edu.au
Principal Supervisor

Chun Guang Li - c.li@westernsydney.edu.au
Second Supervisor

Project description

Combination therapy presents a systematic approach in tackling complex pathological conditions such as cardiovascular diseases (CVD). Some natural products have been identified to have powerful anti-oxidant activities. Such activity can protect cells from oxidative stress (an important risk factor for CVD) and prevent dysfunction of the endothelium (inner surface of blood vessels); which inhibits the development of CVD. Moreover, their combined use was suggested to exert enhanced biological effects and/or multi-target behaviour for various diseases. It is therefore plausible that the combination of these two compounds serve as a more suitable cardio protective agent, rather than the singular compounds. This study aims to investigate the optimal combination of natural products in the protection of the endothelium against oxidative stress using cellular model or literature review. Determining the combined activity of natural products provides early evidence of a combination therapy that will assist in the current management of CVD.

Dr Phoebe Zhou and Professor Chun-Guang Li are leading a 3-year project regarding the combination of curcumin-resveratrol in protecting endothelium against oxidative stress in vitro and in vivo. The abovementioned proposal fits into the topic of this project, and will provide useful information of other compounds candidates for the comprehension of the project.

Project Aims

Our overall aim is to identify natural products that are plausible to have in the protection of endothelium against oxidative stress; which may be beneficial for the management of cardiovascular diseases (CVD).

The specific objectives for this project are to:

1. Investigate combined effects of some lead natural compounds (i.e. luteolin, glycyrrhizin, baicalein) in restoring cell viability on endothelial cells against oxidative stress
2. Determine the possible synergy using computer software

Project Methods

Aim 1: All cellular bioassays will be conducted on endothelial cells, EA.hy926 cells. The potential synergistic effects of selected compounds at a fixed ratio will be studied on H2O2 – induced impaired cell viability by standard MTT (3-(4,5-dimethylthiazol2-yl)-2,5-diphenyltetrazolium bromide) assay.

Aim 2: The generated dose-response curves from each assay will be used to analyse synergy by combination index (CI) and isobologram models.

If the access to the NICM laboratory is not available due to COVID-19, the student will conduct a literature review on the compounds that show synergy against oxidative stress on endothelium from previous published studies.

Opportunity for Skill Development

The student will have the opportunity to develop the basic skill of cell culture, cell revival, and oxidative stress related cell bioassay.

The student will be trained with data analysis and will be introduced to synergy of combination drug therapy and cardiovascular-related research.

Alternatively, the student will be trained for literature review with a certain topic and academic writing.

Students are required to have the following skills/meet the following pre-requisite(s) to apply

The student is required to have the basic knowledge of cell growth, oxidative stress and endothelium, and basic skill of cell culture.

Project 81: Literature review on the anti-inflammatory effects of terpenes in medicinal cannabis

Supervisor(s): Mitchell Low - mitchell.low@westernsydney.edu.au
Principal Supervisor

Justin Sinclair - j.sinclair@westernsydney.edu.au
Second Supervisor

Project description

Cannabis is gaining increasing interest for its potential medicinal properties. The major focus on cannabis in recent decades has been its illicit mind-altering use. The major psychoactive compound present in cannabis is ∆9 THC, hence the major body of research has been focused on the of ∆9 THC.

There are a large number of phytochemicals identified in cannabis with its medicinal properties being attributed to the flavonoids, terpenes and cannabinoids. Furthermore, interactions among these groups are reputed to have a synergistic effect however no scientific evidence has emerged to support this. Many of the non-psychoactive components have shown anti-inflammatory properties. Based on the increasing understanding of the complexity of cannabis for medicinal purposes, the role of all chemical groups is important to understand to ensure the safe and effective use of cannabis as a medical intervention. This project is focused on reviewing the available literature on the anti-inflammatory properties of terpenes present in cannabis.

Project Aims

The overarching goal of this project is to review and assess the current scientific literature for identifying the key studies on the anti-inflammatory properties of terpenes in cannabis. This project will have two main aims-

1. To systematically review the current literature on the anti-inflammatory effects of terpenes in cannabis
2. Compile findings of the review in a logical report format

Project Methods

1. An outline of the review will be made
2. Relevant literature will be gathered based on the outline by searching keywords in major scientific databases
3. Papers will be collected and sorted to remove duplicates and irrelevant papers
4. Papers will be reviewed and tables to collect relevant data fill out
5. A report will be drafted
6. Proofreading and internal review of the report will be performed
7. The report will be submitted and presented

Opportunity for Skill Development

1. The student will develop research skills in reviewing and understanding scientific literature
2. The student will have the opportunity to contribute to research outputs, with the potential for publication
3. The student will have the opportunity to interact with NICM HRI researchers and discuss their research interest's future projects and HDR opportunities

Students are required to have the following skills/meet the following pre-requisite(s) to apply

An understand of, or interest in, medicinal cannabis and plant photochemistry is desirable. So too basic knowledge about the tole inflammation has in human physiology. Students with such interests and skills, along with strong comprehension, grammar and writing skills, are encouraged to apply.

Project 82: The effect of high intensity interval training vs moderate intensity continuous training on liver fat: A systematic review and meta-analysis

Supervisor(s): Angelo Sabag - a.sabag@westernsydney.edu.au
Principal Supervisor

Dennis Chang - d.chang@westernsydney.edu.au
Second Supervisor

Project description

Overweight and obesity play a critical role in the pathogenesis of many chronic conditions. Whilst bodyweight is a powerful predictor of cardiometabolic dysfunction, the location of adipose tissue, particularly in and around the visceral organs, is associated with the progression of conditions such as cardiovascular disease and diabetes, independent of bodyweight. Exercise is a cornerstone therapy for the prevention and management of many cardiometabolic diseases including metabolic dysfunction-associated fatty liver disease (MAFLD), which is independently associated with the duration and severity of diabetes. The findings from our recent randomised controlled trial showed that as little as 12 minutes of high intensity interval training (HIIT) per week were comparable to higher volumes of moderate intensity continuous training (MICT) for the reduction of liver fat and glycemia. However, these findings were limited by the low sample size of the study. Therefore, we aim to assess the available literature and perform a systematic review and meta-analysis to compare the effectiveness of HIIT vs MICT for liver fat reduction. As caridometabolic health deteriorates with age, this project will be designated under the healthy aging area in health and wellbeing.

Project Aims

- The aim of this study is to assess available literature and compare the efficacy of HIIT VS MICT for reductions in liver fat via systematic review and meta-analysis.
- These findings will help elucidate the dose-response nature of liver fat reductions following aerobic exercise.
- The findings from this study can then be used by governing bodies and clinicians to inform exercise guidelines and tailored interventions for the management of cardiometabolic health in at-risk individuals.

Project Methods

Using keywords related to exercise and liver fat, summer scholarship student/s will perform searches in 5 electronic databases including Medline, CInahl, AMED, Web of Science, SportDiscus, and Embase to identify studies involving: both HIIT and MICT interventions; >4 weeks in length; and direct measures of liver fat. After eliminating duplicates, search results will be screened by the summer scholarship student/s and myself against the eligibility criteria, and studies that could not be eliminated by title or abstract will be retrieved and assessed for eligibility. Once deemed eligible, the summer scholarship student will complete data extraction of eligible studies into relevant tables and documents. Results will then be pooled and analysed by myself or another senior researcher using software provided by the institute. Risk of bias and study quality will be assessed by the summer scholarship student/s using Egger's funnel plot test and modified Downs and Black checklist, respectively. While the majority of the manuscript write up will be undertaken by myself, summer scholarship students will be able to assist with this process and make a meaningful contribution to the publication.

Opportunity for Skill Development

The summer scholarship student/s will have a unique opportunity to develop research skills and acquire hands-on experience in a real-world research environment. Specifically, students will also gain the following experience:

- Further their ability to critically appraise scientific literature
- Learn how to perform a comprehensive systematic review and meta-analysis
- Begin to develop a research track record with the opportunity to acquire a publication

Students are required to have the following skills/meet the following pre-requisite(s) to apply

- Attention to detail.
- Interest in research methods and lifestyle interventions for health.
- Currently studying a degree in biomedical or health sciences including: sport and exercise, physiotherapy, nutrition, podiatry, integrative medicine, or medical science. (Exceptions for outstanding applicants will be considered.)