HONOURS HANDBOOK 2016

Information and projects for prospective students

Bachelor of Food Science and Nutrition (Honours) H418

Bachelor of Exercise and Sport Science (Honours) H442

SCHOOL OF EXERCISE AND NUTRITION SCIENCES

FACULTY OF HEALTH

DEAKIN
UNIVERSITY AUSTRALIA
Worldly

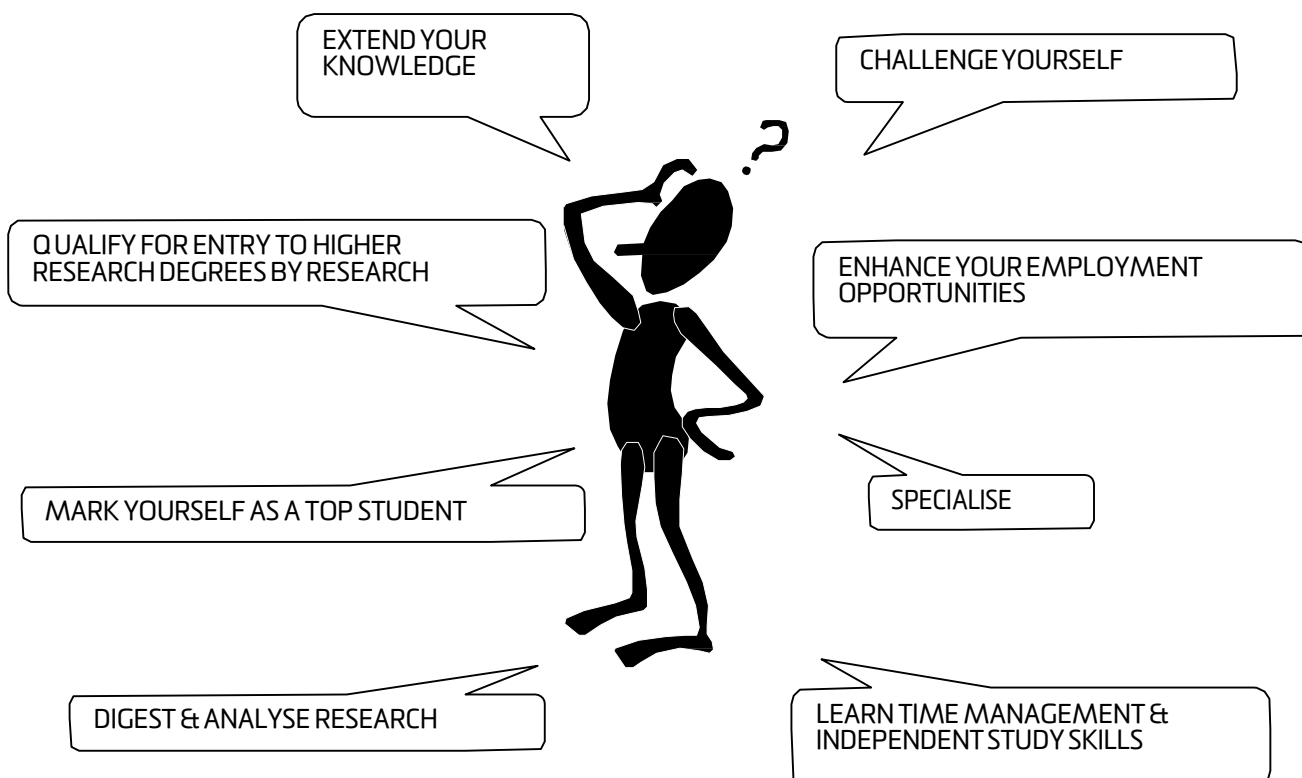# TABLE OF CONTENTS

HONOURS OVERVIEW

The honours program in the School of Exercise and Nutrition Sciences (SENS) builds upon the foundations provided by a three year undergraduate degree. The aim of the program is to provide students with the necessary knowledge and skills to enable them to undertake higher degree studies and advance their professional training.

The School offers the following Type A Honours degrees:

Bachelor of Food Science and Nutrition (Honours)   H418
Bachelor of Exercise and Sport Science (Honours)   H442

All honours programs in the School have common features, specifically:

- Coursework units and a written thesis
- Undertaken over one year full time
- Allocation of a supervisor and co-supervisor

EXTEND YOUR KNOWLEDGE

CHALLENGE YOURSELF

QUALIFY FOR ENTRY TO HIGHER RESEARCH DEGREES BY RESEARCH

ENHANCE YOUR EMPLOYMENT OPPORTUNITIES

MARK YOURSELF AS A TOP STUDENT

SPECIALISE

DIGEST & ANALYSE RESEARCH

LEARN TIME MANAGEMENT & INDEPENDENT STUDY SKILLS

WHY DO HONOURS?

Extend your knowledge

Honours allows you to broaden your understanding of university life and to understand the role of academic research. Students are encouraged to take part in research seminars and forums and to present their research at conferences.

Challenge yourself

Undergraduate learning is not a lot different from high school; you have set concepts you need to know and these are assessed at the end of each unit. On the other hand honours, as in all research, requires you to go and find the answers to questions that are not always clear cut and then work out what you found and why. Not only that you then have to present it in written and oral forms for others to understand. It is a challenge that will not only help you learn more about your chosen field, but also more about yourself.

Qualify for entry to higher degrees by research (PhD and Masters Programs)

Your honours year will provide you with training in all aspects of research; this will prepare you for further research degrees but also up skill you in understanding the complexities of research and its application to industry.

Enhance your employment opportunities

Graduates with a four year degree are sought after in the industry because of their superior skills in research, analysis and communication. The honours degree also allows you to specialise more than your undergraduate degree; having specialist knowledge can be very attractive to potential employers.

Specialise

There are a range of areas that you can specialise in. Your undergraduate degrees in Exercise and Sports Science or Food Science and Nutrition are broad degrees, covering a wide range of topic areas; however Honours lets you develop more specialist knowledge in an area of interest. In exercise and sports science you can investigate aspects of biomechanics, coaching, skill acquisition, motor control, physiology, physical activity and molecular biology. In nutrition and food sciences you can investigate aspects of nutrition, food choice, eating patterns, health effects, food policy and the composition of food.

Mark yourself as a top student

The honours degree makes you different from other graduates: first you have to be a top student to get into the honours program; and second it stamps you as a person willing to pursue the challenges of research and shows that you can operate independently and at a high level of performance.

Digest and analyse research

The skills that you acquire in honours will make you a consummate consumer of research in your area of work but also in general life. When the media quotes statistics and findings from research you will be able to critically evaluate it and draw your own conclusions about the research and to pass accurate information onto your family and work colleagues.

Learn time management and independent study skills

In your honours year the major assessment task, your thesis, is not due for 10 months! As the thesis is worth 50% of your overall grade, a good thesis mark goes a long way to securing a good honours grade overall. Although the thesis is due in October, many critical tasks must be completed well before and often these tasks do not have formal deadlines to motivate you. Through your honours year you will learn the value of pre-planning, setting smaller 'deadlines' for yourself (your supervisor will help, but won't enforce deadlines) and being disciplined to set aside time to work on the important tasks, not just the urgent ones. Self-discipline to work independently is a skill highly sought after by all employers.

WHAT ARE THE CAREER PATHWAYS AFTER HONOURS?

Entry into Research/Research Degrees

Deakin University is interested in providing you with a fulfilling research experience in honours so that you will consider returning to complete a research masters or doctorate. These post-graduate research degrees allow you to further investigate in an area of interest to you and open up a range of career options; in academia, and as a leader in industry.

Students who complete honours also have the opportunity of undertaking research positions within the School or other universities. Such positions allow you to participate in research, including data collection and analysis, in paid employment without committing to a postgraduate research degree.

Careers

There are a range of careers that you can follow after gaining research experience in an honours year. Aside from continuing to work in research as a research officer or assistant, you can gain employment in industry such as in physiology, nutrition, fitness, and in government posts. In sport, you can work in player and team management, sports administration and development, strength and conditioning, sports science, and in coaching. The honours degree allows you to gain some specialist knowledge in one of these areas and apply that knowledge.

REBECCA LEECH
Bachelor of Food Science and Nutrition (Honours) – graduated 2010

Current role/position: PhD candidate (C-PAN); Australian Postgraduate (APA) Scholarship holder, casual research assistant (C-PAN)

"Undertaking the honours program at Deakin was immensely satisfying. While the year was challenging, it provided me with a great opportunity to develop important skills that are highly relevant to many professions. For me, the Honours' program was invaluable in that it enabled me to make an original and important contribution to research and to develop ongoing professional relationships with e supervisors and other academic staff."

JED HUGHES
Bachelor of Exercise and Sports Science (Honours) – graduated 2013

Current role/position: Bachelor of Medicine at Deakin University

"Undertaking completing the honours program at Deakin was a fantastic opportunity to build and develop on my research and interprofessional skills.

My honours project investigated antioxidant supplementation in reactive oxygen species production during exercise and their possible influence on response to exercise training due to their role as metabolic messengers."

BRENT MANSON
Bachelor of Exercise & Sports Science (Honours) – graduated 2014

Current role: Sports Science Trainee at the Australian Institute of Sport

"Undertaking the honours program at Deakin was the perfect progression following my undergraduate degree. I was able to experience working in a research team and gain a greater understanding of what it takes to undertake a research project. Further, I gained a vast set of skills working closely with my supervisor, which have assisted me in my current position.

My honours project investigated the impact of surgical management methods for shoulder instability in elite AFL players."

SAM SHEARMAN
Bachelor of Exercise & Sports Science (Honours) – graduated 2014

"Completing the honours program at Deakin was the most enjoyable and rewarding year of my education to date. Having the opportunity to work one with my supervisors to complete my own project I believe significantly developed my skill set and has now opened many doors for me."

"My project involved investigating the effect of hypoxia on the ability of a mathematical model to predict intermittent exercise performance."

WHAT TYPE OF HONOURS PROJECTS CAN I DO IN SENS?

Who supervises honours projects?

Supervisors closely guide you through this first experience of research. They will assist you in planning your research, data collection and analysis and writing it in thesis format. In addition, they will offer you support in the planning and presentation of your oral assessments. All supervisors are experienced researchers who understand the rigours and requirements of your project and have knowledge of your topic area.

Exercise and sport science

Topic areas in exercise and sport science include: health and injury in work and sport; physical activity; obesity prevention; coaching practices; exercise physiology; women's health; behavioural aspects of sport; skill acquisition; motor control and motor learning; biomechanics and performance analysis; and strength and conditioning.

Food science and nutrition

Topic areas in food science and nutrition include: nutrition choices and eating patterns; salt, appetite control and blood pressure regulation; fatty acids, inflammation, cognition and blood pressure regulation; proteins, sport performance and muscle gain; nutrition and ageing; health effects of phytochemicals and minerals; nutrition and gut bacteria; food choice and perceptions; food policy and safety; and early childhood influences on eating.

How do I choose a topic?

The School provides a list of projects for you to peruse and choose those that interest you. We then advise that you speak to supervisors of these projects to gauge your interest and then to nominate three projects on your preference sheet. We aim to provide you with one of your preferences.

Can I develop my own project?

You are best to take a directed project in this first year of exposure to research, as it allows for the supervisor to direct the research in an area they know well. If you have a passion for something use that for a further degree; Honours is about basic research training.

Refer to the back of this handbook for next years' Honours projects

WHAT HAPPENS IN THE HONOURS YEAR?

This intense year means that you should be able to commit 35 hours a week to your honours qualification. The honours degree is 50% course work and 50% research; both parts count towards your final mark and both are therefore important. The course work is directed towards giving you the necessary research skills to complete your research project, and provides you with research training. There is an emphasis both on writing and presenting your research. There are two units in trimester 1, Research Methods (unit code HBS400) and Developing Research Skills (HSE401). They have lectures and assignments to complete that incorporate aspects of your project. The research project is conducted in second trimester and this is where you complete your data collection, analyse the data and write a thesis (HSE402/HSN414). Aspects of these units are discussed below.

Course work

Literature review and research proposal (HSE401)
You are asked to read and review the previously published research (i.e. the literature) in the area of your project, find aspects that have not been fully investigated and then propose your research that will answer a specific research question. This will provide you with a thorough understanding of your area of research, form the introduction to your thesis and allow you to understand how your research project fits within the current research literature. You will present your literature review and research proposal to your peers as an oral presentation.

Research methods (HBS400)
This unit examines the ethics of research, research design and statistics. Again it is directed towards your research and you can choose to take the quantitative, qualitative or lab-based stream. This unit is designed to help you develop the methods for your research project.

Research project

Data collection and analysis
After you have planned your research and received ethics approval (if required), you are ready to collect your data.

Thesis (HSE402/HSN414)
The final step is to write your research in a thesis format. This 12 000 word document is set out in chapters and describes the existing research literature, your research methods, the results of your research and then discussion of your findings. You will then present your findings at the Faculty honours day at the end of the year.

WHAT ARE THE ADMISSION REQUIREMENTS?

Students must have completed a Bachelor degree, have a mid-credit average (Weighted Average Mark (WAM) of 65) calculated in all the units taken in their degree and to have also completed a major in the discipline involved. Eligible students with degrees from other universities are welcome to complete their honours year at Deakin University.

HOW DO I APPLY FOR HONOURS?

To apply for honours in the School of Exercise and Nutrition Sciences there are three steps:

1.   Choose a project

You should carefully examine the list of honours research projects that the School is offering in 2016 (listed from page 18). For those projects in which you are interested, it is very important that you personally contact the named supervisor (contact details are provided with each project) to discuss the proposed project. This will allow you to determine whether the project meets your career goals and allows the supervisor to determine whether you have the appropriate academic background to complete the research project.

2.   Complete the preference form

You must complete the preference form that appears at the back of this handbook and return it to Tin Partington in the School of Exercise and Nutrition Sciences (Building S1.01 or fax to 9244 6017) by **13 November 2015.**

3.   Submit an online application

To apply for honours you will need to submit an online application at http://www.deakin.edu.au/future-students/applications-enrolments/applications/honours.php. The closing date for timely applications is **27 November 2015.** When applying online you will be required to upload all supporting documents at the last step of the application process. If you are unable to upload your documents, certified hard-copies must be submitted by **6 December 2015.** Note: Only students with degrees from institutions other than Deakin need to attach a copy of their academic transcripts.

HOW ARE PROJECTS ALLOCATED?

Projects are allocated based on a combination of student project preferences, supervisor's student preferences and WAM. Students are advised that allocation to research projects is a competitive process and a student cannot be assured of being assigned to their choice of research project.

The list of available research projects reflects research being undertaken by Deakin staff and the availability of resources at the date of publication. It is the nature of research that projects acquire focus and direction over time and the final project therefore may not be exactly as described.

In rare cases, research staff and resources may become unavailable during the period when the project is being undertaken. If this occurs, the Faculty of Health will offer the student the best available alternative which will provide the opportunity to satisfy course requirements.

WHEN DO I FIND OUT IF I HAVE BEEN ACCEPTED?

The closing date for timely applications is 27 November 2015. It is anticipated that successful candidates will be advised of their offer during December 2015.

Late applications will be considered depending on availability of appropriate supervisors, projects and places up until 27 November 2015.

ADDITIONAL INFORMATION

Scholarships

Continuing students may be eligible for a general Deakin Honours Scholarship if they have achieved outstanding academic results throughout their undergraduate studies. To be eligible you must be an Australian citizen, or holder of an Australian permanent humanitarian visa, and enrolled full time in an end-honours degree at Deakin. Students do not apply for these scholarships; rather they are selected by the Faculty based on your results in your undergraduate degree.

Timelines

February to October: The year is short and intense, beginning with an orientation session in February and completing with your oral presentation of your research in October. In between, there is plenty to keep you busy.

HOW DO I FIND OUT MORE ABOUT HONOURS FOR NEXT YEAR?

Website

There is information on the Deakin University web site under the School of Exercise and Nutrition Sciences: http://www.deakin.edu.au/health/ens

Call for information

The honours *supervisors* are happy to discuss any aspect of honours with you. Their contact details can be found under the relevant honours project at the end of this handbook.

You can also contact the Honours Directors on the contact details provided below:

Dr Glenn Wadley
(Honours Director)
Ph.: (03) 9244 6018
Email: glenn.wadley@deakin.edu.au

Dr Karen Campbell
(Deputy Honours Director)
Ph.: (03) 5227 8414
Email: karen.campbell@deakin.edu.au

Bachelor of Exercise and Sport Science (Honours) (H442)

Bachelor of Food Science and Nutrition (Honours) (H418)

DEAKIN GRADUATE LEARNING OUTCOMES

Learning Outcomes

Deakin Graduate Learning Outcomes describe the knowledge and capabilities graduates have acquired and are able to apply and demonstrate at the completion of their course. They consist of outcomes specific to a particular discipline or profession as well as transferable generic outcomes that all graduates should have acquired irrespective of their discipline area. Learning outcomes are not confined to the knowledge and skills acquired within a course, but also incorporate those that students bring with them upon entry to the course consistent with the Australian Qualifications Framework pathways policy. Deakin's courses are designed to ensure that students develop systematic knowledge and understanding of their discipline or chosen profession appropriate to their level of study. Outcomes are specified at the course level, mapped to course components and are assessed. In professionally-accredited courses, discipline-specific learning outcomes may be defined in part by the relevant professional body.

DEAKIN GRADUATE LEARNING OUTCOMES

1. **Discipline-specific knowledge and capabilities:** appropriate to the level of study related to a discipline or profession

2. **Communication:** using oral, written and interpersonal communication to inform, motivate and effect change

3. **Digital literacy:** using technologies to find, use and disseminate information

4. **Critical thinking:** evaluating information using critical and analytical thinking and judgment

5. **Problem solving:** creating solutions to authentic (real world and ill-defined) problems

6. **Self-management:** working and learning independently, and taking responsibility for personal actions

7. **Teamwork:** working and learning with others from different disciplines and backgrounds

8. **Global citizenship:** engaging ethically and productively in the professional context and with diverse communities and cultures in a global context

Deakin graduates will be able to evidence these capabilities as appropriate to the relevant level criteria of the Australian Qualifications Framework.

The 'Deakin Difference'

Deakin's courses use a combination of cloud and located learning to provide accessible, media-rich, interactive educational experiences which integrate new-media literacy, experiential learning and interdisciplinary teamwork. Work-integrated learning and exposure to international perspectives prepare graduates for employment and life-long-learning in an ever-changing globalised world. These learning experiences and the development and evidencing of graduate learning outcomes create the 'Deakin Difference' — empowering learners for the jobs and skills of the future.

Deakin's professional coursework and research programs develop additional knowledge and capabilities which, depending on the level and professional context, may include leadership, management, independent research, entrepreneurship and personal resourcefulness.

* (Schedule A: Deakin Graduate Learning Outcomes); Approved by Academic Board 2013)

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EXERCISE AND SPORTS SCIENCE HONOURS PROJECTS 2016

1. Wearable tracking device validity to measure movements in team sports

Principal supervisor: **Associate Professor Paul Gastin**
Contact details: **paul.gastin@deakin.edu.au,**
                              (03) 9244 6334

Supervisors profiles
Paul Gastin is a member of the Centre for Exercise and Sport Science Course and previous Course Director for the Bachelor of Exercise and Sport Science. Research interests relate to athlete performance management and training science, including athlete development, assessment of workload, monitoring of adaptation and recovery, and application of technology in the coaching process.

Daniel Wundersitz is a lecturer in biomechanics in the School of Exercise and Nutrition Sciences. He completed his PhD in 2015 at Deakin University. His work over the past 5 years (and research interests) include using wearable tracking devices to assess the physical demands of training and game-play in team sports. He has a particularly interested in the accuracy of wearable tracking technology and how it can be used to improve athlete monitoring.

Project is based at: Burwood

Project description
Direct observation, physical activity questionnaires and laboratory-based equipment are common techniques used to assess human movement. However, these approaches are limited largely due to test-retest reliability issues, the costs associated with the equipment, and the considerable time required to collect and analyse the data. Commercially-available wearable tracking devices have been developed for field team sports and are worn by athletes on their upper back in a sports vest. Such devices typically contain global positioning system (GPS), gyroscope, magnetometer and accelerometer sensors, making it possible to measure movements in team sports. However in order for accelerometers to be used with confidence for these purposes, the data output should be both reliable and valid. Therefore, the present study seeks to validate a wearable tracking device to measure team sport movements.

Methodological approach

20 recreational athletes will be recruited from a convenience sample of Deakin University students. Participants will be selected on the basis of having previously or currently competed in one or more team sports and are free from injury. Participants will be tested during a battery of movements related to team sports. During these sessions, a single wearable tracking device (e.g., MinimaxX S4, Catapult Innovations, Australia) will be worn on each participants upper back. Additionally, data collected will be validated against three-dimensional motion capture.

Necessary skills/knowledge

Interest in research, biomechanics, and computers.

2. Does combined sodium phosphate and sodium bicarbonate supplementation enhance cyclists' performance?

Principal supervisor: Dr. Amelia Carr / Dr. Glenn Wadley
Contact details: amelia.carr@deakin.edu.au
                              (03) 9251 7309

Supervisors profiles
Amelia's primary research interest is in applied physiology, and the effects of nutritional ergogenic aids on athletes' performance. Amelia completed her PhD in Physiology at the Australian Institute of Sport, and her research focuses on the physiological implications and performance effects of nutritional supplements and ergogenic aids in athletes. Amelia is also currently involved in researching the effects of altitude training techniques on athletes' physiology and performance. Previously, Amelia has conducted research contributing to the development of physical performance tests for the Australian Army and Navy, and worked for three years as an applied scientist for the Australian Defence Force.

Louise is a sports dietitian with 35 years of experience in the education and counselling of elite athletes. She has been Head of Sports Nutrition at the Australian Institute of Sport since 1990. She was the team dietitian for the Australian Olympic Teams for the 1996-2012 Summer Olympic Games. Louise's publications include over 200 research papers in peer-reviewed journals and book chapters, and the authorship or editorship of several textbooks on sports nutrition. Louise was a founding member of the Executive of Sports Dietitians Australia and is a Director of the IOC Diploma in Sports Nutrition. She is a member of the Working Group on Nutrition for the International Olympic Committee and was awarded a Medal of the Order of Australia in 2009 for her contribution to sports nutrition. Louise holds a Chair in Sports Nutrition in the Mary MacKillop Institute for Health Research, Australian Catholic University

Co-supervisor
Professor Louise Burke (Head of Sports Nutrition, Australian Institute of Sport)

Project is based at: Burwood

Project description
The project will be conducted in collaboration with the Australian Institute of Sport, and the findings will be implemented to aid with elite Australian cyclists' preparations for the 2016 Olympic Games. The study will investigate the combined effects of two nutritional supplements; sodium bicarbonate and sodium phosphate, on cycling performance. Sodium bicarbonate has been demonstrated to improve athletic performance, particularly in high-intensity events of 1-7 minutes' duration, and can also enhance the body's natural buffering capacity. Sodium phosphate can also enhance endurance capacity and performance. However, it has yet to be determined how these two supplements may work together, in terms of the effect on athletes' performance, and the associated mechanisms.

Methodological approach

This will be a lab-based study, conducted at the Burwood campus. This study will be part of a larger project, involving staff based at the AIS, and several of Deakin's Sport Science and Nutrition staff. The study will involve conducting performance testing specific to cycling, and the preparation and administration of ergogenic aids to research participants. The collection and analysis of capillary and venous blood samples will also be required. The study will also involve statistical analysis of an existing data set.

Necessary skills/knowledge

The selected student should demonstrate:

- An interest in physiology, sports nutrition and their application to athletes' performance.
- Very good attention to detail.
- Well-developed organisational and communication skills.

3. Patterns and predictors performance in Olympic shooting events.

Principal Supervisor: Dr. Dan Dwyer
Contact Details: dan.dwyer@deakin.edu.au
                          (03) 52273476

Supervisor's profile

Dan's research interests centre on the adaptation of existing technology and exploiting emerging technology, to evaluate aspects of sports performance that provide new information that can be used to enhance performance. Dan has used this approach in a variety of ways with sports such as soccer, cycling and rowing. His primary interest is in cycling - monitoring load and modelling performance, and evaluating pedalling technique.

Dan also collaborates with a group of researchers who use machine learning to interrogate databases of sports results to reveal winning patterns of performance and to provide support when making strategic and tactical decisions.

Co-supervisors

Associate Professor Paul Gastin
Nick Sanders (VIS)

Project based at: Geelong and Victorian Institute of Sport

Project description

Australia has a very good record of performance in Olympic shooting, in recent decades. Shooting competitions require athletes to perform well in a series of rounds that lead to a final. There are many factors that may affect their performance throughout these rounds, including psychological arousal, stress and fatigue. The outcome of every shot fired by every athlete in every round of all major competitions is recorded and is available online. This large database of performance scores provides a very rich opportunity to identify patterns of performance and performance characteristics in early rounds of competition that may predict overall performance. The database also presents an opportunity to determine performance benchmarks that can be used for goal setting by sub-elite athletes.

The present study seeks to;

- Determine whether there are any performance characteristics of shooters in the early rounds of a tournament that predict overall performance
- To characterise the performance of shooters are different levels of performance (medallists, non-medallists, sub-elite)
- Determine the performance benchmarks for shooters that are associated with their long term development.
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Methodological approach

- Aggregate a large database of tournament results from online sources
- Mine the database using machine learning algorithms (Bayesian Networks)

Necessary skills/knowledge

An interest in performance analysis, a willingness to develop Excel skills and learn how to use software.

4. The development of a field test of aerobic capacity for wheelchair athletes

Principal Supervisor: Dr. Dan Dwyer
Contact Details: dan.dwyer@deakin.edu.au
03 5227 3476

Supervisor's profile:
Dan's research interests centre on the adaptation of existing technology and exploiting emerging technology, to evaluate aspects of sports performance that provide new information that can be used to enhance performance. Dan has used this approach in a variety of ways with sports such as soccer, cycling and rowing. His primary interest is in cycling - monitoring load and modelling performance, and evaluating pedalling technique.
Dan also collaborates with a group of researchers who use machine learning to interrogate databases of sports results to reveal winning patterns of performance and to provide support when making strategic and tactical decisions.

Co-supervisor
Dr. Samantha Hoffman

Project based at: Geelong and the Victorian Institute of Sport.

Project description
Australia has some of the best Paralympic wheelchair athletes in the world, including the reigning world champion wheelchair rugby team. Increased funding for Paralympic sports is permitting greater access to sport science support. There is presently the need for a field test of aerobic power that is valid and reliable, predicts VO2max and maximal aerobic speed.
The present study seeks to

- Design a new field test of aerobic capacity and maximal aerobic speed
- Provide information about the reliability of this novel test protocol
- Determine a process of converting the test score to a predicted VO2max

Methodological approach

- Design a test based on existing similar tests (e.g. Beep test and Yo-Yo test)
- Conduct the test on a diverse group of wheelchair athletes whilst measuring VO2
- Repeat the test to determine its reliability

Necessary skills/knowledge:

Availability for field testing in mid-February.

5. Trends, patterns and predictors of injury in the AFL

Principal Supervisor: **Dr. Dan Dwyer**
Contact Details: **dan.dwyer@deakin.edu.au**
                          03 5227 3476

Supervisor's profile
Dan's research interests centre on the adaptation of existing technology and exploiting emerging technology, to evaluate aspects of sports performance that provide new information that can be used to enhance performance. Dan has used this approach in a variety of ways with sports such as soccer, cycling and rowing. His primary interest is in cycling - monitoring load and modelling performance, and evaluating pedalling technique.
Dan also collaborates with a group of researchers who use machine learning to interrogate databases of sports results to reveal winning patterns of performance and to provide support when making strategic and tactical decisions.

Co-supervisors
Associate Professor Paul Gastin
Dr. Jason Bonacci

Project based at: Geelong

Project description
The AFL doctors association (AFLDA) has been tracking injury statistics for two decades and has compiled one of the largest sports injury databases in the world. They have published just two publicly available reports about their injury statistics and have never allowed researchers full access to the database, until now. Dan Dwyer & Paul Gastin have negotiated with the AFLDA and the AFL to obtain a complete copy of the database in order to perform more analyses and generate new information that may help to prevent injuries in the future.
The present study seeks to

- Identify trends in the incidence and type of injuries over time
- Identify factors that are associated with injuries and may be predictors of their occurrence

Methodological approach
- Perform an initial analysis of the database to identify research questions
- Collaborate with the AFLDA and the AFL to choose which questions to pursue
- Identify and implement appropriate statistical tests to answer the research questions

Necessary skills/knowledge
None, other than a willingness to work with a large spreadsheet of results and to learn new statistical techniques

6. Loads and injury risk in Australian football: The case for an integrated load monitoring approach?

Principal Supervisor: Dr. Jacquie Tran
Contact Details: j.tran@deakin.edu.au

Supervisor's profile
Jacquie is a research specialist within Deakin University's Centre for Exercise and Sport Science and the Geelong Cats Football Club. Jacquie has multidisciplinary research interests, including elite athlete preparation and performance, load monitoring, sports analytics, and sports technology.

Co-supervisors
Associate Professor Paul Gastin,
2 x Geelong FC staff members (TBC)

Project is based at: Geelong (Burwood students are welcome to apply)

Project description
Optimal athletic performance arises from a precise, carefully managed, and individualised approach to athlete preparation and load management. In Australian football, match-day performance is influenced by a multitude of factors, many of which are not under the control of coaches and sport scientists (e.g., opposition performance level, environmental factors, home or away game location). Consequently, strategies to prepare elite Australian football players typically focus on maximising player availability for selection and by improving athlete readiness to perform on a weekly basis. Injuries remain the greatest threat to player availability and athlete readiness. Of particular concern are incidences of overuse and soft-tissue injuries, which are thought to occur due to training errors, inappropriate load management, and unaccustomed 'spikes' in load.

In Australian football, external loads are routinely measured to assess the volume of work done (e.g., distance covered, duration of training). This is typically complemented by internal load measurement to assess the individual-specific psychophysiological demands of completing a training session or game (e.g., heart rate monitoring, Rating of Perceived Exertion responses). Recently, several researchers have proposed that the integration of measures that may indicate whether or not an athlete is fresh or fatigued. There is preliminary evidence to support the utility of two integrated measures: an external-internal load ratio, and the Training Stress Balance score (acute load divided by chronic load). However, there is no published research that has direct relevance to the unique demands of elite Australian football. Therefore, the aim of this study is to examine whether an integrated approach to load monitoring provides a sensitive tool for understanding athlete readiness and injury risk in Australian football players.

Methodological approach
- Retrieve training and competition load and injury data from Geelong Cats FC for the 2013, 2014, and 2015 seasons.

- Document typical training and competition loads, and injury characteristics (incidence, type, time lost) across the three seasons.
- Employ statistical modelling procedures to examine the effects of load on injury risk, with load expressed as an external-internal load ratio and as the Training Stress Balance score.

Necessary skills/knowledge

An interest in load monitoring and injury prevention. Some basic data and statistics skills are important; the student should either have some foundational skills or an eagerness to learn. Some familiarity with Australian football will be helpful, but is not essential.

7. Possession chains and team performance in Australian football

Principal Supervisor: Dr. Jacquie Tran
Contact Details: j.tran@deakin.edu.au

Supervisor's profile
Jacquie is a Research Specialist within Deakin University's Centre for Exercise and Sport Science and the Geelong Cats FC. Jacquie has multidisciplinary research interests, including elite athlete preparation and performance, load monitoring, sports analytics, and sports technology.

Co-supervisors
Associate Professor Paul Gastin
1 x Geelong FC staff member (TBC)

Project is based at: Geelong (Burwood students are welcome to apply, but would be encouraged to travel to Geelong to undertake this project)

Project description
In simple terms, successful team performance in Australian football is achieved by one team scoring more points than their opposition. Possession of the ball is highly prized as the team in possession has the opportunity to score. However, the complexities of team sport performance cannot be ignored; scoring is achieved through a series or chain of offensive and defensive actions, which reflect complex interactions between players on both teams. A chain encompasses the sequence of possessions from the point at which one team gains possession (e.g., via a kick-in, stoppage, or opposition turnover) to the point at which that team loses possession (e.g., following a goal or behind scored, stoppage, or turnover).

In the Australian Football League (AFL), extensive in-game statistics are recorded for all teams, including possession chain data. Rich information exists within these data sets, such as metres gained, time in possession, the specific players involved in a chain, types of disposals utilised (handballs and kicks), and ball location at the start and end of a chain. At present, experiential knowledge and expert opinion exists within AFL clubs with respect to the important features of team possession, which is subsequently used to guide the development of tactical strategies. Yet there is limited research that has systematically examined what aspects of team possession are most important to goal scoring and team success in Australian football. Therefore, the aim of this study is to identify the major features that characterise effective and ineffective team possession, and examine their association with goal scoring and match outcomes in AFL. The findings from this work will contribute new empirical evidence to further inform coaches in their development of performance-enhancing tactical strategies.

Methodological approach
- Retrieve possession chain data (recorded by Champion Data) for all teams and matches played in the 2015 season.

- Document and quantify the key features of possession chains for winning and losing teams.
- Use classification techniques (e.g., decision tree analysis) to:
  - Determine the features of a possession chain that increase goal-scoring probability,
  - Identify whole-match trends in possession chains that increase the probability of winning a match.

Necessary skills/knowledge

An interest in performance analysis. Some foundational skills in basic statistics or an eagerness to learn. Some familiarity with Australian football is preferred, but is not essential if the individual is willing to learn more about the sport and its major tactical considerations.

8. What is the effect of shoe ageing on cushioning properties and running biomechanics?

Principal supervisor: Dr. Jason Bonacci
Contact details: jason.bonacci@deakin.edu.au
(03) 5227 2634

Supervisor's profile
Dr. Jason Bonacci is a lecturer in Anatomy and Biomechanics in the School of Exercise and Nutrition Sciences. Dr. Bonacci is a practicing physiotherapist and active researcher in the area of lower limb neuromuscular control and performance. Dr. Bonacci's research interests include the mechanical and neuromuscular adaptations that occur with training and injury. He has a particular interest in understanding the mechanisms of musculoskeletal injury and the evidence underpinning the management of such injuries.

Co-supervisor
Dr. Paul Collins

Project is based at: Geelong

Project description
Footwear is thought to play an important role in the prevention of musculoskeletal injury by absorbing external shock due to ground impact. The midsole of a running shoe is constructed from EVA foam and is critical for the absorption of energy from ground impact. However, EVA degrades with use and thus the shoe cushioning capability decreases with ageing. Our research has shown that a shoe's ability to absorb energy at impact can decrease by as much as 50% within 50 km of running. This change in shoe performance may induce alterations in running biomechanics and increase injury risk; yet there has been little research examining the relationship between changes in shoe cushioning properties and running biomechanics. The aim of this study is to determine the extent of shoe degradation that occurs with running and how that degradation relates to running biomechanics.

Methodological approach

This project is a collaboration with researchers in the School of Engineering and will involve shoe material measurements in conjunction with high level biomechanical analysis (3D motion analysis, EMG, kinetic data). The student will be required to develop high level skills in the collection and analysis of biomechanical data. A group of runners will be recruited and asked to complete a pre-determined number of kilometres over a given time period. A comparison of shoe cushioning capability and running biomechanics will be performed over this time period to determine the effect of shoe degradation on cushioning performance and running biomechanics.

Necessary skills/knowledge
It is preferred that the candidate has a strong desire to progress research in the field of biomechanics and neuromuscular control and has an interest in material properties and design.

9. Do landing postures associated with ACL injury risk also place the patellofemoral joint at risk?

Principal supervisor: **Dr. Jason Bonacci**
Contact details: **jason.bonacci@deakin.edu.au**
                                  (03) 5227 2634

Supervisor's profile
Dr. Jason Bonacci is a lecturer in Anatomy and Biomechanics in the School of Exercise and Nutrition Sciences. Dr. Bonacci is a practicing physiotherapist and active researcher in the area of lower limb neuromuscular control and performance. Dr. Bonacci's research interests include the mechanical and neuromuscular adaptations that occur with training and injury. He has a particular interest in understanding the mechanisms of musculoskeletal injury and the evidence underpinning the management of such injuries.

Co-supervisors
Dr Natalie Saunders
Aaron Fox

Project is based at: Geelong predominately but can be based at Burwood.

Project description
Athletes who sustain an Anterior Cruciate Ligament (ACL) injury are at a greater risk of developing patellofemoral joint osteoarthritis (PFJ OA). At present it is not known if the PFJ OA is a consequence of the ACL injury or if these athletes demonstrate high PFJ loading prior to injury. High PFJ reaction forces are known to contribute to PFJ stress and repetitive stress to the joint can lead to degenerative changes. The position and loading of the lower limb during a landing task can elevate PFJ stress and increase the risk of an ACL injury. The aim of this study is to determine if PFJ reaction forces are higher during landing postures that are associated with ACL injury risk than those landings that are not.

Methodological approach

This project will utilise existing biomechanical data including 3D motion analysis and kinetic data. The student will be required to develop high level skills in the analysis of biomechanical data and biomechanical modelling. PFJ reaction forces during a sport specific landing task will be compared between individuals who demonstrate high-risk landing postures and those who do not.

Necessary skills/knowledge
It is preferred that the candidate has a strong desire to progress research in the field of biomechanics and neuromuscular control.

10. Minute by minute: Coaching behaviours that count.

Principal supervisor: **Dr. Julia Walsh**
Contact details   **Julia.walsh@deakin.edu.au**
                             (03) 9246 8729

Supervisor's profile
Julia is a senior lecturer in sport coaching on the Burwood campus. Her expertise is in coach development, communication, and mentoring. She has been instrumental in shaping coach education macro structures in the UK. Current research includes an investigation of knowledge transfer from one generation of coaches to the next with Basketball Victoria.

Co-supervisor
Dr. Fraser Carson

Project is based at: Burwood

Project description
This research aims to identify coaching behaviours that enhance or reduce the quality of training outputs. The training environment is the basic building block for performance and it is a complex task to ensure players are ready to compete at their best for an event or for the start of the competitive season. Effective coaches prepare training down to the minute and integrate many factors into their training plan and session, for example, player development needs, game tactics and strategy, psychological preparation, culture and team building, and recovery. There are examples of coaches who plan their communication and teaching strategies. Every minute is valued in the high performance training environment. There is a cost for losing minutes in training or trying to catch up on training minutes, for example, reduction in recovery time, it is the law of diminishing returns.

The aim of this research is to identify crucial coaching behaviours that lead to lost minutes in training and develop strategies to assist the coach plan for these events and recognise cues in action to help with decision making in the training environment.

This research is nuanced by using two forms of behavioural observation and moving the research beyond exploration to explanation, understanding and strategy development to enhance training outcomes. The two forms of coach behaviour observation are (1) systematic observation, and (2) the coach's perception and reflections of coaching behaviours that impact training outputs.

Primary questions

- What coaching behaviours are critical for enhancing quality training outputs?
- How do those coaching behaviours impact training outputs?
- What are the antecedents to coaching behaviours that enhance and reduce quality training outputs?
- What strategies and cues can the coach use to enhance training outputs?

Methodological approach
This research uses a case study approach, the main unit of analysis is the coach and the context is the training environment in a women's national league basketball program in Australia. The data collection includes collecting behavioural data using a validated systematic observational tool designed to measure frequency and nature of coaching behaviours, and analysis of coaching transcripts from each training session. To assist in triangulation other evidence including training documents and interviews with the coach will form part of the analysis.

Necessary skills/knowledge
An interest in coaching and knowledge of basketball or team sports.

11. A novel exercise rehabilitation program and its impact on wellbeing and function in clients with low back pain.

Principal supervisor: **Dr. Luana Main**
Contact details: **luana.main@deakin.edu.au**
     (03) 924 45030

Co-supervisors
Dr.Clint Miller
Associate Professor Daniel Belavy

Supervisors profiles
Dr. Luana Main's research focus has been on the psycho-biological monitoring of training in athletes. In part her work seeks to identify possible physiological mechanisms behind the development of fatigue in response to stress exposure (physiological +/ psychological), and at the same time, identify ways to non-invasively monitor athletes health and well-being. Currently Luana is now also exploring these same research questions in occupation and clinical contexts with the view to optimise health and wellbeing outcomes for people in these settings.

Dr. Clint Miller has been an Accredited Exercise Physiologist in private practice for over 10 years and has worked predominately with musculoskeletal injury and disease. His research is focussed on the use of clinical exercise for improvements in physical function, performance, body composition, and work productivity in adults with musculoskeletal and cardiometabolic disease. He is interested in the relationship between lifestyle related factors, exercise participation and its influence on measures of physical function and performance with a particular emphasis on ADL's including those related to occupational demands.

A/Prof Daniel Belavy joined Deakin in July 2014 from the Center of Muscle and Bone Research at the Charité University Medical School in Berlin, Germany. He completed PhD (2007) at The University of Queensland. In 2007 he was awarded a 2-year post-doctoral fellowship from the Alexander von Humboldt Foundation in Germany to continue his work on the topic of bed-rest at the Charité in Berlin and was later head of "spaceflight physiology" within the Center of Muscle and Bone Research. His work in the last 10 years has focused on the impact of bed-rest (spaceflight simulation) and exercise on muscle, bone, neuromuscular function and the interverterbral disc. For his first projects at Deakin, he will be looking at exercise and the spine.

Project is based at: Burwood

Project description
This honours project is to be conducted as part of a larger study investigating the impact of two different rehabilitation programs for recovery of musculoskeletal injury. In this study, patients will be treated for 6 months and adaptations to muscle and intervertebral disc changes will be measured (via magnetic resonance imaging scanning). In addition muscle strength, performance and endurance, spine bone density, body composition, and the assessment of how muscle activation occurs in the brain will also be investigated.

Methodological approach

Specifically this honours project will look at how measures of perceived wellbeing change over the course of the two different rehabilitation programs. Similar to load monitoring in sport, fortnightly training, mood and pain data will collected using the athlete monitoring software "Smartabase". In addition to this, questionnaire data about participant's injury and its impact on their work and quality of life will be collected at baseline, 3 months and 6 months. This data will be compared to available physiological and functional outcomes data.

Necessary skills/knowledge

An interest in exercise rehabilitation would be valuable and an appreciation for various athlete monitoring techniques. Ideally we would be looking for someone willing to get involved early.

12. The utility of athlete monitoring to improve self-regulation in junior elite athletes.

Principal supervisor: **Dr. Luana Main**
Contact details: **luana.main@deakin.edu.au**
                           (03) 9244 5030

Co-supervisor
Aaron Silk

Supervisors profiles
Dr. Luana Main's research focus has been on the psycho-biological monitoring of training in athletes. In part her work seeks to identify possible physiological mechanisms behind the development of fatigue in response to stress exposure (physiological +/ psychological), and at the same time, identify ways to non-invasively monitor athletes health and well-being. Currently Luana is now also exploring these same research questions in occupation and clinical contexts with the view to optimise health and wellbeing outcomes for people in these settings.

Aaron's research area is within the physically demanding occupation space, with a recent focus on strength and conditioning and load monitoring in these contexts. Through conduct of a three-year field-based research project delivering new physical performance standards for military personnel and three years leading the Fit for Duty research stream within the Occupational Exercise Science Group (including 18 months in a research officer position) Aaron brings with him vast experience engaging with, and delivering high-quality outcomes for industry (including partners such as Australian Defence Force, SES, Victoria Police, Bunnings, and Banyule City Council) and conducting applied research in the field.

Project is based at: Geelong

Project description
Monitoring athlete wellbeing is essential to guide training and detect any progression towards negative health outcomes and associated poor athletic performance. It has also been established that subjective measures effectively reflect the response of an athlete to training, whilst the process of their use also facilitates improved confidence and communication between all end-users. A further purported benefit of subjective measures for athlete monitoring is the potential for them to increase athletes' self-awareness and may lead to an improved ability to self-regulate.

Methodological approach

Specifically, this honours project will look at how a newly-implemented athlete monitoring tool changes athletes' self-awareness over the course a school term. Data will be collected using a mixed methods approach (questionnaire and focus groups).

Necessary skills/knowledge
An interest in athlete monitoring. Some experience working with high school students.
A willingness to learn qualitative research methodologies.
Someone that enjoys having conversations with a range of different people would be well suited to this project.

13. The utility of athlete monitoring in the sport school context.

Principal supervisor: Dr. Luana Main
Contact details: luana.main@deakin.edu.au
                              (03) 9244 5030

Co-supervisor
Aaron Silk

Supervisors profiles
Dr. Luana Main's research focus has been on the psycho-biological monitoring of training in athletes. In part her work seeks to identify possible physiological mechanisms behind the development of fatigue in response to stress exposure (physiological +/ psychological), and at the same time, identify ways to non-invasively monitor athletes health and well-being. Currently Luana is now also exploring these same research questions in occupation and clinical contexts with the view to optimise health and wellbeing outcomes for people in these settings.

Aaron's research area is within the physically demanding occupation space, with a recent focus on strength and conditioning and load monitoring in these contexts. Through conduct of a three-year field-based research project delivering new physical performance standards for military personnel and three years leading the Fit for Duty research stream within the Occupational Exercise Science Group (including 18 months in a research officer position) Aaron brings with him vast experience engaging with, and delivering high-quality outcomes for industry (including partners such as Australian Defence Force, SES, Victoria Police, Bunnings, and Banyule City Council) and conducting applied research in the field.

Project is based at: Geelong

Project description
Monitoring athlete wellbeing is essential to guide training and detect any progression towards negative health outcomes and associated poor athletic performance. It has also been established that subjective measures effectively reflect the response of an athlete to training, whilst the process of their use also facilitates improved confidence and communication between all end-users. However, in sport schools systematic athlete monitoring programs are often absent, in an environment where there is also the added challenge of students being involved in multiple sports, some with overlapping seasons.

Methodological approach

Specifically, this honours project will look at how measures of perceived wellbeing change over the course of the two different school terms. Data will be collected using the athlete monitoring software "Smartabase" and if possible, compared to output from some form of wearable technology (i.e. fit-bits or similar) with the view to assess their utility as an ongoing systematic athlete monitoring program within the sport school context.

Necessary skills/knowledge

An interest in athlete monitoring.

14. Why not train our oldies like our athletes?

Principal supervisor: **Dr. Natalie Saunders**
Contact details: **natalie.saunders@deakin.edu.au**
                                    (03) 9246 8284

Co-supervisor
Dr Clint Miller

Supervisors profiles
Dr. Natalie Saunders is a lecturer in Clinical Exercise Physiology and is currently also working as an Accredited Exercise Physiologist. In 2006 she completed her PhD titled 'Characteristics of the female landing pattern' which aimed to understand neuromuscular control during landings in netball. Her research interests include neuromuscular control and biomechanics in a functional context, in particular understanding the various loads on the human body that results in injury, prevents injury or is related to the rehabilitation of various structures.

Dr. Clint Miller has been an Accredited Exercise Physiologist in private practice for over 10 years and has worked predominately with musculoskeletal injury and disease. His research is focussed on the use of clinical exercise for improvements in physical function, performance, body composition, and work productivity in adults with musculoskeletal and cardiometabolic disease. He is interested in the relationship between lifestyle related factors, exercise participation and its influence on measures of physical function and performance with a particular emphasis on ADL's including those related to occupational demands.

Project is based at: Burwood

Project description
As we age, our physical performance declines, and this leads to reduced physical function and increased falls risk. Our reaction time, agility, our ability to move our limbs at speed (power), and making decisions while we move gradually decline. If any one of these factors limit an athlete's performance, they are addressed by implementing a very specific training regime. Current training protocols for older adults do not fully consider all of these factors sufficiently, and therefore lack training specificity. This honours project will determine whether older adults (50 to 85 years) would feel sufficiently comfortable to undertake a novel exercise training program consisting of over speed training, high velocity resistance training, challenging dynamic balance and agility tasks, and metronome paced limb co-ordination training. Evidence from this study will support the formation of a large randomised controlled trial to address physical function, independence and falls rates in older adults.

Methodological approach

This will be a cross sectional study to determine suitability and acceptability of a novel training intervention for adults aged 50-60 years, 61-65 years, 66-70 years and 71+years.

Necessary skills/knowledge

Sound exercise science base with attention to detail, good interpersonal skills

15. Is the single leg squat the answer for detecting ACL injury risk in netball?

Principal supervisor: Dr. Natalie Saunders
Contact details: natalie.saunders@deakin.edu.au
(03) 9246 8284

Supervisor's profile
Dr. Natalie Saunders is a lecturer in Clinical Exercise Physiology and is currently also working as an Accredited Exercise Physiologist. In 2006 she completed her PhD titled 'Characteristics of the female landing pattern' which aimed to understand neuromuscular control during landings in netball. Her research interests include neuromuscular control and biomechanics in a functional context, in particular understanding the various loads on the human body that results in injury, prevents injury or is related to the rehabilitation of various structures.

Co-supervisors
Dr. Jason Bonacci
Aaron Fox

Project is based at: Burwood (however the students could be based at Geelong and liaise with research staff in Burwood via face-to-face and phone meetings)

Project description
ACL injuries are common in netball, and being able to identify players at risk and intervene is the ideal scenario to reduce injury rate. It is challenging however to use a simplified screening task to accurately identify which players may be at risk of injury. When we conduct biomechanical analysis we can measure joint moments and literature exists linking, for example, knee abduction moments with possible increased ACL injury risk. Our research group recently completed a study showing 3D analysis of a single leg squat linked with 'at-risk' measures taken during a 3D analysis of the netball leap landing. The next step, and goal of this project, is to determine if we can identify players who are potentially at a greater risk of injury from video observations of single leg squats.
The skill set developed through this study will give student a good understanding of biomechanical measures and analyses that could be applied in most biomechanics laboratories.

Methodological approach

This project will utilise existing biomechanical data including 3D motion analysis, force plate, and video data. The student will be required to develop skills in video-based movement analysis and integrating this with biomechanical data. While data does not need to be collected for this project, it is expected that projects utilising biomechanical equipment will be undertaken over the year that the student can be involved with to familiarise themselves with data collection processes.

Necessary skills/knowledge
It is preferred that the candidate has a strong desire to progress research in the field of biomechanics and neuromuscular control.

16. Gaining a better understanding of walking gait following spinal cord injury to help improve functional outcomes

Principal supervisor: **Dr. Natalie Saunders**
Contact details: **natalie.saunders@deakin.edu.au**
     (03) 9246 8284

Supervisor's profile
Dr. Natalie Saunders is a lecturer in Clinical Exercise Physiology and is currently also working as an Accredited Exercise Physiologist. In 2006 she completed her PhD titled 'Characteristics of the female landing pattern' which aimed to understand neuromuscular control during landings in netball. Her research interests include neuromuscular control and biomechanics in a functional context, in particular understanding the various loads on the human body that results in injury, prevents injury or is related to the rehabilitation of various structures.

Co-supervisors
Dr. Jason Bonacci
Dr. Anna Murphy
Dr. Corey Joseph

Project is based at: Geelong but co-hosted by Monash Health, Cheltenham

Project description
The characteristics of walking in adult patients with Spinal Cord Injury (SCI) have to date been poorly described in the literature. This project aims to identify and quantify the more common/prevalent gait abnormalities observed in this population in order to better understand the impact a spinal cord injury has on a patients walking pattern.
This is a retrospective study analysing three dimensional gait data collected as part of normal patient care. Participants will be recruited from the Monash Health Clinical Gait Analysis Service (CGAS). Patients who have already been referred to, and attended the CGAS will be asked for their consent to have data regarding their walking characteristics to be included in the study. An estimated 40 patients with SCI will be asked to voluntarily contribute their gait analysis data to the study.
The decision on treatment options for spasticity management in SCI is implicated by many factors. Gait analysis contributes to this decision making process by providing scientific evidence that helps to identify the cause of compensations due to neuromuscular inefficiencies. It is imperative that the gait characteristics of these populations are well documented and understood so that recommendations for treatment are based on a good understanding of the inter-relationships.

Methodological approach

This study is a retrospective observational study of gait abnormalities in patients diagnosed with SCI or MS. Three dimensional gait analysis data obtained for patients attending the CGAS as part of normal care between January 2006 and December 2014 will be group analysed to identify common gait abnormalities.
Participants that meet the inclusion criteria will be contacted by the CGAS via mail to obtain informed consent for their already collected gait data to be included in the group analysis.
The gait analysis involves collecting measurements related to gait kinematics, gait kinetics, spatio-temporal measures, video of participants' walking, clinical measurements of lower limb joint range or motion, muscle strength, muscle tone (using modified ashworth scale) and muscle spasticity (using the Tardieu scale). Demographic details include progression of illness, complete medical history and details of previous management and interventions relating to gait characteristics.

Necessary skills/knowledge

Advanced Biomechanics

17. The effect of surfing on exercise-induced affective states

Principal supervisor: **Dr. Peter Kremer**
Contact details: **peter.kremer@deakin.edu.au**
        (03) 52273396

Supervisor's profile:
I am a senior lecturer in sport and exercise behavior with the School of Exercise and Nutrition Sciences based at the Waurn Ponds Campus. I have extensive research experience, broad knowledge and skills in academic and applied sport and exercise psychology, and expert knowledge of both quantitative and qualitative research methods.

Co-supervisor
Fraser Carson

Project is based at: Either at Waurn Ponds or Burwood

Project description
The physiological health benefits of physical activity and exercise are well documented. More recent evidence also indicates that physical activity and exercise also provide a range of psychological benefits as well. Surfing is a popular leisure time activity. Anecdotally, surfers report a number of positive psychological effects (e.g. enhanced positive mood) following surfing and internationally a number of programs now use surfing as an activity to facilitate promote positive mental health. This study will empirically examine exercise-induced mood alteration following a single bout of surfing. It will also examine the time course of such effects over a 24 hour period post-exercise.

Methodological approach
Quantitative survey interviews (pen and paper & phone/Smart phone methods) will be use to capture self-report measures of mood before, immediately following and 24 hours following participants have completed a single bout of surfing.

Necessary skills/knowledge
Some knowledge of surfing, surf locations, and surf language would be helpful.

18. Reflections on the use of hypnosis for increasing motivation to exercise

Principal supervisor: Dr. Peter Kremer
Contact details: peter.kremer@deakin.edu.au
                                   (03) 52273396

Supervisor's profile

I am a senior lecturer in sport and exercise behavior with the School of Exercise and Nutrition Sciences based at the Waurn Ponds Campus. I have extensive research experience, broad knowledge and skills in academic and applied sport and exercise psychology, and expert knowledge of both quantitative and qualitative research methods.

Co-supervisor

Fraser Carson

Project is based at: Either at Waurn Ponds or Burwood

Project description

A variety of psychological techniques are used by sport and exercise psychologists to build exercise motivation. One psychological technique that is being more frequently used is hypnosis. Despite the increased use of hypnosis in many health and wellbeing settings and the anecdotal evidence that hypnosis provides quicker and better results than traditional psychological approaches, there is still a very limited amount of research in this area. This study will retrospectively explore the experiences and perceptions of participants having used hypnosis to increase their exercise motivation.

Methodological approach

As is common practice within the literature in this area of study, a multiple-case study design will be utilized. Specifically open-ended, semi-structured interviews with sample of individuals engaged with hypnosis to increase exercise motivation for exercise. A standardized interview guide will be established for all participants, which facilitates the acquisition of qualitative data while standardizing and minimizing interviewer effects by asking the same questions, in the same words, in the same order of presentation (Patton, 1990). Open-ended interviews also allow the participants to identify a broad range of influencing factors without being constrained by the investigators preconceived notions.

Necessary skills/knowledge

Some understanding of interviewing techniques would be beneficial.

19. Spaceflight simulation (bed-rest), exercise and nutrition and their effects on the musculoskeletal system.

Principal supervisor: **Dr. Timo Rantalainen**
Contact details: **t.rantalainen@deakin.edu.au;**
d.belavy@deakin.edu.au

                     (03) 9244 6606

Co-supervisor
Associate Professor Daniel Belavy

Supervisors profiles
The majority of the supervision for this project will be provided by A/Prof. Belavy

A/Prof Daniel Belavy joined Deakin in July 2014 from the Center of Muscle and Bone Research at the Charité University Medical School in Berlin, Germany. He completed PhD (2007) at The University of Queensland. In 2007 he was awarded a 2-year post-doctoral fellowship from the Alexander von Humboldt Foundation in Germany to continue his work on the topic of bed-rest at the Charité in Berlin and was later head of "spaceflight physiology" within the Center of Muscle and Bone Research. His work in the last 10 years has focused on the impact of bed-rest (spaceflight simulation) and exercise on muscle, bone, neuromuscular function and the interverterbral disc. For his first projects at Deakin, he will be looking at exercise and the spine.

Dr. Timo Rantalainen joined Deakin in August 2013 as a lecturer in biomechanics from the Department of Health Sciences, University of Jyväskylä, Finland. He completed his PhD (2010) at The University of Jyväskylä, Finland. Since January 2014 Dr. Rantalainen has worked on an Alfred Deakin Postdoctoral Research Fellowship on effects of dual-task training program on dual-task gait performance. His work has been mainly on estimating lower body skeletal loading with methods varying from examining cross-sectional associations to flexible multibody dynamics full-body modelling. During his PhD, and post-doctoral research he has acquired skills in implementing various image analysis methods, which will be applied in developing computer-assisted segmentation methods to be used in this honours project.

Project is based at: Burwood

Project description
Prolonged bed-rest is used as a model to simulate the effects of spaceflight on the human body and it is an experimental model of extreme inactivity. In this particular project, 12 men underwent three repeated bouts of 21 days of strict bed-rest with 5 months break in between. As part of a cross-over design (i.e. each subject did 3 bed-rest phases each as part of a different group), we will examine the impact of:
    a) resistive vibration exercise
    b) resistive vibration exercise plus protein supplementation and
    c) no intervention (control)

In this project we are interested in three different areas, each of which are potential honours topics:

- Muscle wasting in the lower-limbs and the impact of exercise and the additional nutrition intervention.
- Bone marrow fat changes. Bone marrow fat of the spine is important in blood cell production. There is some evidence to suggest that being inactive promotes the development of more fat within bone marrow and has negative consequences for blood cell populations.
- Spinal intervertebral disc deterioration and the impact of the interventions.

Methodological approach

Magnetic resonance imaging scans to enable quantification of the lower limb muscles, spine bone marrow fat and intervertebral discs were performed before bed-rest, on day 3 and day 21 of bed-rest and then 6 days and 28 days after bed-rest. These images will be used in analysis.

Necessary skills/knowledge

Interest in research.

20. Objective combat sports performance assessment using wearable sensors

Principal supervisor: **Dr. Timo Rantalainen**
Contact details: **t.rantalainen@deakin.edu.au**
       (03) 9251 7256

Co-supervisor
Daniel Wundersitz

Supervisors profiles
Dr. Timo Rantalainen joined Deakin in August 2013 as a lecturer in biomechanics from the Department of Health Sciences, University of Jyväskylä, Finland. He completed his PhD (2010) at The University of Jyväskylä, Finland. Since January 2014 Dr. Rantalainen has worked on an Alfred Deakin Postdoctoral Research Fellowship on effects of dual-task training program on dual-task gait performance assessed with wearable sensors (inertial measurement units).

Daniel Wundersitz is a lecturer in biomechanics in the School of Exercise and Nutrition Sciences. He completed his PhD in 2015 at Deakin University. His work over the past 5 years (and research interests) include using wearable tracking devices to assess the physical demands of training and game-play in team sports. He has a particularly interested in the accuracy of wearable tracking technology and how it can be used to improve athlete monitoring.

Project is based at: Burwood

Project description
People of all ages practice and compete in combat sports worldwide, and multiple combat sports are included in the Olympics. The objective measurement of combat sports is essential for understanding the physical and technical demands related to performance. Fundamental to furthering these understandings is the need to accurately collect specific information relating to the type, intensity and frequency of activities performed. While sports-specific activities in actual competition can and have been monitored labour-intensively by analysing video recordings, there is a demand for more convenient activity analysis tools and methods. Inertial measurement units (IMU) that contain multiple sensors (i.e. accelerometer, gyroscope and magnetometer) can be used in a non-laboratory environment and features of the IMU signal (i.e. peak amplitude, min amplitude, etc.) may be used to automatically classify combat sport movements.

Aim:
Therefore, the present study seeks to develop and validate an objective activity classification system using wearable IMU sensors. It is well-established that objective athlete monitoring enables training regimes and consequent performance to be optimised. Developing the proposed monitoring method could be expected to improve upon the current combat sport athlete monitoring practices, avoiding overload injuries, and improve overall performance.

Methodological approach

20 combat sport athletes will be recruited through the Australian Karate Federation and Melbourne Taekwondo Centre. Participants will be selected on the basis of having previously or currently competed at a national level. Participants will be tested during a battery of tests composed of components related to physical and motor abilities, and basic skills of both Taekwondo and karate (e.g. KSAT). Additionally, simulated combat (three 3-minute rounds, with 1-minute rest intervals) as per the current rules will be performed. During these sessions, IMU's will be worn on each participants wrist (two), ankles (two) and lower back (one; n=5). Additionally, heart rate and respiratory gasses will also be collected. Energy consumption will be evaluated based on IMUs, validated against heart rate, and respiratory gasses.

Necessary skills/knowledge

Interest in research, biomechanics, and computers.

21. The physiology of Blood Flow Restriction Exercise #1

Principle supervisor: **Dr. Stuart Warmington**
Contact details: **stuart.warmington@deakin.edu.au**
(03) 9251 7013

Supervisor's profile
My research focus is to better understand and apply exercise to benefit muscle health. The principal direction in this respect is to understand the mechanisms governing a blood flow restriction exercise (BFRE) as a model, and to develop this exercise method to improve muscle health and functional outcomes in populations where loss of muscle is highly prevalent. To this effect my research group has been working on a variety of projects from acute assessments of haemodynamic stress in both young and older adults as well as training studies to identify the effects of BFRE on muscle growth, strength and fatigue.

Co-supervisor
Dr. Timo Rantalainen

Project is based at: Burwood

Project description
It's been shown that when low-load resistance exercise is performed under blood flow restriction (BFR), that the gains in muscle size and strength are similar to the gains achieved with high-resistance strength straining. This novel outcome is in contrast to the fact that the greatest gains in such indicators of muscle health are most commonly thought to be achieved only with high-resistance strength training. Given BFR exercise utilises only low-resistance, it may provide a substantial benefit to clinical groups where strength training proves beneficial, but where high-resistance strength training is not recommended due to the implied clinical risk.
However, BFR exercise, or KAATSU, has been little used outside Japan, and this project will build on current work in our lab that is proving BFR to be a revolution in training athletes, special populations and the community.
Therefore, this project will aim to examine the physiological responses to BFR training (possibly with a clinical focus), always with a view to more widespread prescription of this type of training in the community.

Methodological approach
This project will involve recruitment and testing of healthy volunteers, and possibly clinical participants, to examine the physiological responses to BFR exercise or training. This will be done by examining controlled exercise under a variety of BFR conditions. Factors that may be assessed include metabolic and cardiac responses, oxygen consumption, HR, blood pressure, blood lactate and respiratory parameters, and importantly muscle strength and hypertrophy.

Necessary skills/knowledge

This project would suit students interested in exercise physiology, clinical exercise, exercise performance assessment and strength and conditioning. The student should be enthusiastic towards exercise prescription and monitoring, as well as exercise as a clinical treatment. Testing procedures and data collection will utilise non-invasive techniques such as an advance metabolic cart to assess oxygen consumption and cardiac parameters, as well as blood pressure and typical risk factors associated with exercise.

FOOD SCIENCE HONOURS PROJECTS 2016

22. Chinese and Australian perception of food with added MSG

Principal supervisor: Dr. Gie Liem
Contact details: gie.liem@deakin.edu.au
(03) 924 46039

Supervisor's profile
Dr. Gie Liem is a senior lecturer in the area of consumer and sensory science

Co-supervisor
Professor Russell Keast

Project is based at: Burwood

Project description
There is a common misunderstanding that Mono Sodium Glutamate (MSG) is harmful when added to food. However, this misunderstanding is not supported by scientific evidence and mostly based on a myth. MSG is often added to Asian food to increase liking.
Australian consumers might have a negative expectation of foods with added MSG. This could potentially affect their liking of these foods. Such influence of MSG might be less prominent in Chinese consumers because MSG is part of their national cuisine.

We want to investigate the influence of MSG on Australian and Chinese consumers' liking of food. This research will broaden our understanding of cross cultural differences in taste perception and liking in relation to MSG.

Methodological approach

Participants will be asked to fill out questionnaires and to taste various products.

Necessary skills/knowledge
Knowledge of sensory science is preferred

23. Nutritional composition of new food products

Principal supervisor: Dr. Julie Woods
Contact details: j.woods@deakin.edu.au
                              (03) 9251 7272

Supervisor's profile
Julie is a senior lecturer in public health nutrition with an interest in food policy, food regulation and food supply issues and their impact on food consumption. She is the Co-Convener of the Food and Nutrition Special Interest Group of the Public Health Association of Australia and is involved in a range of advocacy and research activities in relation to food policy and food supply.

Co-supervisor
Professor Mark Lawrence

Project is based at: Burwood

Project description
Australian's diets are increasingly comprised of manufactured food and foods eaten away from home. These products are constantly changing, may have excess energy, saturated fat, sugar and salt levels and have significant nutrition and health implications. Public health researchers and practitioners face major complexities in understanding what these changes are and their relationships to diet and health outcomes.
The food processing industry have made a number of commitments and participate in a number of initiatives to improve and optimise the nutritional quality of their food products.
There have been attempts at understanding the nutritional composition of the food supply but this hasn't extended to new products and the contribution these make to nutritional composition of the food supply. This project will investigate the opportunities to collect data on new food products and will investigate the nutritional composition of new products over a set period of time to determine if manufacturers are complying with their commitments.(1-5)

This project will provide the student the opportunity to develop:
- skills in data collection and analysis
- skills in critical analysis of industry and public health nutrition initiatives
- an understanding of the composition of foods and the contribution to nutritional intakes.

Methodological approach
This project will first investigate the available food databases and information sources to establish the best approach to capture the range of foods involved. Then data on nutritional composition (sourced from Nutrition Information Panels) of all new foods over of 4 month period will be collected and analysed.

Necessary skills/knowledge

This project is suited to someone with
- Knowledge of public health nutrition
- attention to detail and good organisational skills

24. Aroma analysis of chilled, stored beef by GC-O

Principal supervisor: **Dr. Megan Thornton**
Contact details: **megant@deakin.edu.au**
                             Phone: 92517261

Supervisor's Profile:
Dr. Thornton is a Lecturer in the area of Food Chemistry and Food Analysis in the School of Exercise and Nutrition Sciences. She teaches at an undergraduate level, and is a member of the Centre for Advanced Sensory Science (CASS). Her research involves the analysis and identification of the chemical compounds which make up the aroma of foods, and how these can differ between varieties and over time. This research is strongly related to sensory science and consumer acceptability of foods.

Co-supervisor
Professor Russell Keast

Project is based at: Burwood

Project description
What is responsible for the formation of off-flavours in chilled, stored beef? Australia is the world's third largest exporter of beef, with much of its exports heading to Asia. This multi-billion dollar industry is heavily reliant on high quality produce, with flavours and aroma that are acceptable to consumers. The post-mortem storage of beef products is of utmost importance, as time between slaughter and consumption in an overseas market may be 4-6 months, and the development of off-flavours during this time adversely influences consumer liking of the meat products. This project will look at the development of off-flavours and odours in vacuum-packed chilled beef over storage. You will analyse the beef at different time points across storage to identify any changes in the aroma profile. Analysis will be conducted using Gas Chromatography-Olfactory analysis, and results will be linked with sensory analysis being conducted by a PhD student. This project will develop your skills in the use of GC instrumentation and the Olfactory system, as well as your understanding of the link between sensory science and analytical chemistry. This project is ideal for anyone looking for a future in food research/ analysis, sensory science, or in an analytical flavour laboratory.

Methodological approach
Gas Chromatography-Olfactory analysis

Necessary skills/knowledge
A basic understanding of Gas Chromatography.

25. Aroma analysis of varieties of Strawberries by GC-O

Principal supervisor: **Dr. Megan Thornton**
Contact details: **megant@deakin.edu.au**
                      (03) 9251 7261

Supervisor's profile
Dr. Thornton is a Lecturer in the area of Food Chemistry and Food Analysis in the School of Exercise and Nutrition Sciences. She teaches at an undergraduate level, and is a member of the Centre for Advanced Sensory Science (CASS). Her research involves the analysis and identification of the chemical compounds which make up the aroma of foods, and how these can differ between varieties and over time. This research is strongly related to sensory science and consumer acceptability of foods.

Co-supervisor
Professor Russell Keast

Project is based at: Burwood

Project description
Why are some strawberries so deliciously sweet, and others so sour? This project seeks to answer just that. You will analyse various varieties of strawberries (mmm, yum!) for their aroma to identify compounds which contribute to the smell of strawberries, as well as any differences that occur between varieties. Analysis will be conducted using Gas Chromatography-Olfactory analysis, and results will be linked with sensory analysis being conducted by a current PhD student. This project will develop your skills in the use of GC instrumentation and the Olfactory system, as well as your understanding of the link between sensory science and analytical chemistry. This project is ideal for anyone looking for a future in food research or analysis, sensory science, or in an analytical flavour laboratory.

Methodological approach
Gas Chromatography-Olfactory analysis

Necessary skills/knowledge
A basic understanding of Gas Chromatography.

26. The importance of taste on dietary choice, behaviour and intake in a group of university students.

Principal supervisor   **Dr. Sara Cicerale**
Contact details: **sara.cicerale@deakin.edu.au**

Supervisor's profile:
Dr. Sara Cicerale is a lecturer within the School of Exercise and Nutrition Sciences and a member of the Centre for Advanced Sensory Science (CASS). Dr. Cicerale conducts research in the area of consumer perception and preference of food.

Co-supervisor
Professor Russell Keast

Project is based at: Burwood

Project description
There are many reasons why we choose the food we eat, however the taste of food has been commonly cited by consumers as being an important factor in food choice. This study will examine the self-reported importance of taste on personal dietary choices and whether this factor varies across demographic groups, is associated with dietary behaviours, lifestyle choices and dietary intake.

Methodological approach
This study will involve the use of cross-sectional data (obtained from a Food Frequency Questionnaire and a Food and Diet Questionnaire) in a cohort of adults undertaking a nutrition unit at university. Secondary analysis of this previously collected data via SPSS will be performed.

Necessary skills/knowledge
Basic SPSS knowledge, literature searching experience, excellent time management skills, ability to work independently and as part of a team, and an interest in sensory science and its relation to dietary choice and intake.

27. Effect of manufacturing operations and packaging on salt adhering properties of nuts

Principal supervisor: **Dr. Shirani Gamlath**
Contact details: **shirani.gamlath@deakin.edu.au**
(03) 9251 7267

Supervisor's profile

Dr. Shirani Gamlath has actively established a research program on use of novel functional/healthful ingredients in product development and application of novel processing technologies such as extrusion technology and high pressure processing to retain nutritional and bioactive components in foods. This field encompasses knowledge and expertise in a number of areas including food manufacturing, product development, packaging technologies, novel food processing technologies and product evaluation. Shirani has experience in product development with cereals, legumes and fruits and also product evaluation based on nutritional, physicochemical and sensory analysis.

Co-supervisor

Mick Stevens (External)

Project is based at: Burwood and A Food Manufacturing Company

Project description

One of the Food manufacturing activities in a food company involves roasting and salting tree nuts. A scientific study is proposed to improve the roasting/salting operations to achieve a better quality of product with better adherence of salt onto the 'cooked' nut. The proposed study would involve identifying which factors are involved in salt adhering to the nut and also the rate of loss from the product under normal distribution activities. Results of this information can then provide guidance on a range of experiments which could be conducted to assist with a more effective adherence of salt onto the surface of the nut.

There will be opportunity for a summer internship (during November to January) for the interested student at the Food Company in 2015. Please contact the Principle supervisor for more details.

Methodological approach

More details on the methodological approach of the study will be available to the interested student by contacting the Principle supervisor. The student will be able to develop necessary skills during the internship with the company.

Necessary skills/knowledge

The student will need to be confident in laboratory skills, to be well organised. All training will be provided by supervisors but a basic knowledge of product manufacturing, laboratory skills and statistical analysis would be useful.

28. Discovery: Is carbohydrate the 7th taste?

Principal supervisor: **Professor Russell Keast**
Contact details: **russell.keast@deakin.edu.au**
(03) 92446944

Supervisor's profile
Russell is a Lecturer in the area of Sensory Science in the School of Exercise and Nutrition Sciences. He teaches at undergraduate level and also supervises higher degree students. Professor Keast leads the Centre for Advanced Sensory Science (CASS) and is an active researcher in sensory science, with particular emphasis on how individual differences in our chemical senses (taste, smell, chemical irritation) may influence health.

Co-supervisors
Dr. Gie Liem
Dr. Sara Cicerale

Project is based at: Burwood

Project description
This project is an exciting high-impact hands-on experience into the area of sensory science. Carbohydrates are one of the three classes of macronutrient whose breakdown products are identified by the sense of taste. Our sense of taste could be described as a nutrient detection system and the Centre for Advanced Sensory Science at Deakin University has been instrumental in identifying fat as the sixth taste, in addition to sweet, sour, salty, bitter and umami. Emerging evidence also suggests existence of a seventh taste responsive to carbohydrate. We have evidence that carbohydrate, independent of sweetness, is also a taste and this project will help establish carbohydrate as a taste quality. This project is specifically aimed at students thinking of a going on to a PhD program.

Methodological approach
You will be involved in the organization and management of a lab based sensory/nutrition study, from data collection through to analysis and interpretation. You will be part of the CASS team that includes multiple PhD students and researchers.

Necessary skills/knowledge
Understand basic concepts of sensory testing, along with food and nutritional knowledge. Must have excellent work ethic and time management skills.

29. Impact of overweight and obesity on iron status in premenopausal women

Principal supervisor: **Associate Professor Lynn Riddell**
Contact details: **lynn.riddell@deakin.edu.au**
    (03) 9251 7270

Supervisor's profile
Lynn is an Associate Professor in Nutritional Sciences within the Centre for Physical Activity and Nutrition Research, School of Exercise and Nutrition Sciences. She teaches lifespan nutrition to postgraduate nutrition students and teaches into undergraduate lifespan nutrition, assessing food intake and activity and growth and development. Lynn is currently leading a large research project investigating iron and zinc status in adult women, the impact on their health and the effectiveness of a mobile phone app in improving status. She routinely supervises honours and masters research students and is currently supervising two PhD students and co-supervising a further four.

Co-supervisors
Dr. Alison Booth
Karen Lim

Project is based at: Burwood

Project description
The prevalence of iron deficiency in women of reproductive age in Australia is estimated to be approximately 12% of the population although estimates vary across studies. Iron deficiency is typically diagnosed with a blood sample measuring serum ferritin and haemoglobin concentrations. Serum ferritin is known to be elevated during conditions of inflammation in the body such as ill health. Overweight and obesity has also been shown to be associated with chronic inflammation. Potentially the ability to identify women with iron deficiency may be impaired in women who are overweight or obese. This project will investigate the relationship between overweight and obesity, markers of inflammation and iron status in women aged between 18-50 years.

Students undertaking this project will gain valuable experience in micronutrient nutrition, data management, statistical analysis, and will gain a strong understanding the literature surrounding determinants of iron status and the wide ranging health consequences of overweight and obesity. These are particularly important skills for any student wishing to work in Dietetics or nutrition promotion areas. There may be an opportunity to publish the findings in a peer-reviewed journal and/or to present the findings at a local conference.

Methodological approach

The data required for this project have already been collected as part of Karen Lim's PhD studies. Using a cross-sectional study design, women were recruited from Melbourne and Sydney during 2010 to 2014. Women were included in the study if they were not pregnant or breast feeding currently or in the past 12 months. Blood samples have been analysed for c-reactive protein, serum ferritin and haemoglobin concentrations in 355 women. Anthropometric data including body weight, height were measured during face to face interview. Approximately half of the cohort also have waist circumference measurements. This project will involve investigating the relationship between weight status and markers of iron and inflammation and exploring the sensitivity and specificity of diagnosing overweight and obese women with iron deficiency before and after correcting for inflammation.

Necessary skills/knowledge

Skills required for completing this project (e.g. use of SPSS) will be developed throughout the program, as required.

30. Changes in body composition following acute spinal cord injury

Principle supervisor: **Associate Professor Tim Crowe**
Contact details: **tim.crowe@deakin.edu.au**
                                  (03) 9251 7266

Supervisor's profile
Tim is a nutrition academic and Accredited Practising Dietitian. He teaches across the undergraduate and postgraduate programs in nutrition dietetics in the areas of nutritional physiology and biochemistry as well as the applied role of nutrition in disease prevention and management, particularly obesity, diabetes and cancer. He is actively involved in several areas of nutrition research including specialised nutrition in the prevention of surgical complications; malnutrition identification; and nutrition support in wound healing.

Co-supervisor
Kate Desneves, Austin Health

Project is based at: Burwood and Austin Health, Austin Campus Heidelberg & Royal Talbot Rehabilitation Campus Kew

Project description
Acute spinal cord injury (SCI) can lead to malnutrition, with loss of lean body mass (LBM) as a result of an initial hypermetabolic response to the stress of injury as well as an abrupt decrease in activity because of paralysis. Conversely, throughout the rehabilitation phase weight gain is common due to SCI patients having lower fat free mass and therefore significantly decreased resting energy expenditure (Buchholz et al. 2003), as well as decreased activity levels. Retrospective studies show a high prevalence of overweight and obesity in this patient group (Gupta et al. 2006) and a higher incidence of lifestyle diseases than the general population (Wahman et al. 2010).

Assessment of nutritional needs in this population is challenging, with multiple factors affecting nutritional status, the unreliability of weight measurements and a lack of appropriate reference values. The aim of this study is to monitor body composition using bioelectrical impedance across a patient's journey from acute to rehabilitation. By measuring segmental body composition it is hoped that we may be able to determine the best marker of nutritional status and when to cease oral nutrition support and focus on prevention of weight gain.

Methodological approach
This is an observational study of patients admitted to the Victorian Spinal Cord Service with a new spinal cord injury. Weight and body composition (using BIA) and skinfold and circumference measures will be measured at fortnightly intervals until patients are discharged. Dietary Intake will also be assessed and compared to estimate energy, protein and fluid requirements.

Necessary skills/knowledge
Dietary analysis, IT skills, understanding of the role of nutrition in disease, and the ability to work in a hospital environment as part of a medical research team. This work will be performed within the Nutrition and Dietetics Department, Austin Health.

31. Nutritional content and availability of food and beverages provided in vending machines

Principal supervisor: **Associate Professor Sarah McNaughton**
Contact details: sarah.mcnaughton@deakin.edu.au
                                   (03) 92517842

Supervisor's profile
Associate Professor McNaughton is a public health nutritionist and Accredited Advanced Practising Dietitian in the Centre for Physical Activity and Nutrition Research (C-PAN). Current research interests focus on the assessment of dietary patterns, diet quality and indicators of a healthy diet and the impact of specific dietary patterns on chronic disease outcomes, particularly cardiovascular disease and type 2 diabetes.

Co-supervisor
Dr Julie Woods

Project is based at: Burwood

Project description
The food environment may be an important determinant of food choices and dietary intake. As part of Healthy Together Victoria and the Achievement program, Deakin University is undertaking development of a Healthy Eating Action Plan. Healthy food environments and food provision on campus is major focus of the plan. One key aspect of the food environment relates to food and beverage vending machines. In order to understand the food environment at Deakin University, and to provide baseline data for future evaluation of the Deakin University Action Plan, this project aims to assess the content and availability of food and beverages provided in vending machines with Deakin University. There may also be the possibility to conduct a quantitative survey of consumers attitudes to food and beverages provided in vending machines.

This project will provide the student the opportunity to:
- develop skills in data collection and conduct nutritional assessments of food products
- develop skills in critical analysis of public health nutrition evidence
- develop skills in analyzing, presenting and interpreting nutrition-related data
- develop an understanding of food environments and how organizational food policies can impact on nutrition behaviours

Methodological approach
This project will involve an audit of vending machines across Deakin University to assess the products sold in terms of availability, price/cost, nutritional content and other aspects related to advertising and promotion of foods and beverages in vending machines. A quantitative survey of people purchasing products from vending machines may also be incorporated into this project.

Necessary skills/knowledge

This project is suited to someone

- with knowledge of public health nutrition.
- attention to detail and good organisational skills

32. Understanding meal patterns in young adults

Principal supervisor: **Associate Professor Sarah McNaughton**
Contact details: **sarah.mcnaughton@deakin.edu.au**
                              (03) 92517842

Supervisor's profile
Associate Professor McNaughton is a public health nutritionist and Accredited Advanced Practising Dietitian in the Centre for Physical Activity and Nutrition Research (C-PAN). Current research interests focus on the assessment of dietary patterns, diet quality and indicators of a healthy diet and the impact of specific dietary patterns on chronic disease outcomes, particularly cardiovascular disease and type 2 diabetes.

Co-supervisor
Dr. Katherine Livingstone

Project is based at: Burwood

Project description
The Australian Dietary Guidelines provide advice on the amounts and types of foods to consume each day and each week. However, currently, they do not provide guidance on other aspects of eating behaviour such how foods are actually eaten as meals. Examining food intakes at the level of meal provides evidence on the way people actually consume foods, and has the potential to lead to evidence for the development of messages and strategies promoting simple and feasible changes to food habits in the population. Meal patterns is a concept encompassing timing, frequency, spacing and sequencing of meals or eating occasions throughout the day. A further component of meal pattern is the social context or the situational and contextual factors that accompany the meal, such as the eating location, presence of others and what activities were occurring while eating.

Young adults are a major focus for this project as they are a particularly important target group as they are a major risk group for weight gain and eat particularly poor diets. Young adults frequently report time constraints as a major barrier to healthy eating which may influence meal structure including preparation and content of meals.

Potential research projects include
- examining the validity of short questions to assess meal patterns
- examining associations between cooking skills, meal patterns and diet quality
- examining how main meals and snacks contribute to food and nutrient intakes, and how this varies according to sociodemographic factors

This project will provide the opportunity to develop:
- in-depth knowledge on nutrition concerns and nutrition promotion for young adults
- skills in critical analysis of public health nutrition evidence

- potential to develop skills in data collection and coding dietary intake data using national food composition databases
- skills in analyzing, presenting and interpreting nutrition-related data

Methodological approach

This research project involves participants completing a 4-day food record, completed using a Smartphone app. For each meal or eating occasion, the Smartphone food diary asks participants to record the foods and beverages consumed using a photograph of the meal, describe the food types and the amounts eaten. They are also asked questions about the context of the eating occasion such as where they ate, who they ate with, what they were doing when eating (e.g. watching tv), who prepared the meal, cooking methods used and meal preparation time and where the main ingredients were purchased. Participants will also complete an online question about the potential influences on their eating habits. Data analysis will involve basic statistics (mean, frequencies and cross-tabulations).

Necessary skills/knowledge

This project is suited to someone with a background in nutrition, attention to detail and good organisational skills. Some experience in the analysis of data is desirable or a willingness and interest in acquiring these skills. Further training and support will be provided.

33. Frequency of home meal preparation and diet quality

Principal supervisor: **Dr. Alison Booth**
Contact details: **alison.booth@deakin.edu.au**
                        (03) 925 17211

Supervisor's profile
Dr. Alison Booth is a Lecturer in Nutritional Sciences within the School of Exercise and Nutrition Sciences. She teaches undergraduate and postgraduate nutrition students and supervises Honours students and co-supervises two PhD students. Dr Booth is a member of the Centre for Physical Activity and Nutrition Research and her current research focuses on improving dietary-related behaviour in adults.

Co-supervisors
Associate Professor Lynn Riddell
Dr. Lisa Newman

Project is based at: Burwood

Project description
Data was collected from students enrolled in HSN 101 "Food: Nutrition, Culture and Innovation" from 2011 to 2015. Participants completed a food and diet questionnaire which asked for the participant's demographic characteristics, Body Mass Index (BMI) and dietary behaviours such as how often they cook meals for themselves at home, and frequency of take away meal consumption. Dietary intake was assessed using a food frequency questionnaire (FFQ). The aim of the project will be to explore the association between frequency of consumption of home cooked meals, take away meals and diet quality.

Students undertaking this project will gain valuable experience in dietary analysis, statistical analysis, and will gain a strong understanding the literature surrounding diet quality and meal preparation. These are particularly important skills for any student wishing to work in Dietetics or nutrition promotion areas. There may be an opportunity to publish the findings in a peer-reviewed journal and/or to present the findings at a local conference.

Methodological approach
The honours student will explore associations between diet quality and frequency of home meal preparation (and take away consumption) using statistical methods in SPSS. Diet quality will be determined based on a previously developed Australian Diet Quality Index (ADQI) in conjunction with the FFQ.

Necessary skills/knowledge
Skills required for completing this project (e.g. use of SPSS) will be developed throughout the program, as required.

34. Assessing dairy intakes of young children - informing nutrition promotion

Principle supervisor: **Associate Professor Karen Campbell**
Contact details: karen.campbell@deakin.edu.au
                            (03) 52278414

Co-supervisor
Dr. Alison Spence

Supervisors profiles
Karen Campbell is a senior researcher and unit chair in population nutrition and obesity prevention. She has a well-developed profile nationally and internationally for her research in the area of childhood obesity prevention; impacts of parenting and home environments on child lifestyle behaviours; and the design and evaluation of complex interventions. These randomised controlled trials include interventions to promote the development of healthy eating and active play from birth; interventions to reduce children's sodium intake; and interventions that seek to promote healthy gestational weight outcomes. Scaleability is a key feature of Karen's research. This is evidenced by the state level adoption of Melbourne InFANT Program, a program that seeks to support families with young children to get healthy eating and active play behaviours embedded from the beginning of life.

Alison is a Lecturer in Nutrition and Population Health, with a passion for promoting the nutrition, health and wellbeing of young children and their families. Her research focusses on understanding children's dietary behaviours, and investigating practical strategies to promote and improve young children's diet quality, maternal modelling and feeding practices, and family meals. She also teaches into both undergraduate and postgraduate nutrition courses.

Project is based at: Burwood or Geelong.

Project description
As diets of young children are likely to influence their intakes and health throughout life, research into the eating habits of young children is vital. As children's dairy intakes are important determinants of their life-long bone health, understanding these intakes may help to inform nutrition messages for parents, and public health approaches to improve young children's nutrition. This project will examine young children's dairy intakes compared to dietary guidelines, the main foods sources of dairy at different ages, and changes/tracking across the ages 9 months to 5 years.

This project will involve secondary analysis using data from the Melbourne InFANT Program (2008-2013) [1, 2]. This was a novel health promotion trial involving young children, and is the only Australian study with multiple 24 hour recall data available for children under two years of age.

This project will provide the opportunity to develop:

- in-depth knowledge on nutrition issues in early childhood and nutrition promotion in early childhood
- skills in critical analysis of public health nutrition evidence
- skills in analyzing, presenting and interpreting dietary intake data

Methodological approach

Dietary data has been collected via multiple 24 hour recalls for 300-500 children at ages 9 months, 1.5 years, 3.5 years and 5 years. Data from each of these age groups will be analysed to determine the proportion of children meeting dietary guidelines for dairy foods, the main dairy food sources, and changes/tracking across the ages 9 months to 5 years. Depending on the student's interests, analyses may also assess whether any differences are associated with factors such as socioeconomic position.

Necessary skills/knowledge

This project is suited to a student interested in childhood nutrition and dietary assessment. It will require good organisational skills, attention to detail and confidence with programs like excel. Previous experience in data analysis is desirable but not essential, though the student should understand basic statistics and be keen to learn about data analysis.

35. Assessing whether young children eat differently on weekends compared to weekdays - informing nutrition promotion

Principal supervisor: **Dr. Alison Spence**
Contact details: **a.spence@deakin.edu.au,**
                       (03) 9246 8280

Supervisor's profile
Alison is a Lecturer in Nutrition and Population Health, with a passion for promoting the nutrition, health and wellbeing of young children and their families. She teaches into both undergraduate and postgraduate nutrition courses. Her research focusses on understanding children's dietary behaviours, and investigating practical strategies to promote and improve young children's diet quality, maternal modelling and feeding practices, and family meals.

Alison will return from maternity leave in early 2016 – prior to this time, please contact the co-supervisor, Associate Professor Sarah McNaughton, about this project.

Co-supervisor
Associate Professor Sarah McNaughton
sarah.mcnaughton@deakin.edu.au,
(03) 9241 7842

Project is based at: Burwood

Project description
As diets of young children are likely to influence their intakes and health throughout life, research into the eating habits of young children is vital. Understanding whether children eat less healthily on the weekends may help to inform nutrition messages for parents, and public health approaches to improve young children's nutrition. This project will examine whether the diets of young children differ between weekdays and weekend days.

This project will involve secondary analysis using data from the Melbourne InFANT Program (2008-2013).[1, 2] This was a novel health promotion trial involving young children, and is the only Australian study with multiple 24 hour recall data available for children under two years of age.

This project will provide the opportunity to develop:
- in-depth knowledge on nutrition issues in early childhood and nutrition promotion in early childhood
- skills in critical analysis of public health nutrition evidence
- skills in analyzing, presenting and interpreting dietary intake data

Methodological approach

Dietary data has been collected via multiple 24 hour recalls for 300-500 children at ages 9 months, 1.5 years, 3.5 years and 5 years. Data from one or more of these age groups will be analysed to determine whether intakes differ between weekdays and weekend days at each age. The analysis will focus on intakes of energy, discretionary foods, and the five food groups. Depending on the student's interests, analyses may also assess whether any differences are associated with factors such as socioeconomic position.

Necessary skills/knowledge

This project is suited to a student interested in childhood nutrition. It will require good organisational skills, attention to detail and confidence with programs like excel. Previous experience in data analysis is desirable but not essential, though the student should understand basic statistics and be keen to learn about data analysis.

36. Dietary intake and cognitive function in older adults

Principal supervisor: **Dr. Catherine Milte**
Contact details: catherine.milte@deakin.edu.au
(03) 92468280

Supervisor's profile:
Dr. Catherine Milte is a Registered Nutritionist in the Centre for Physical Activity and Nutrition Research (C-PAN). Current research interests focus on the role of a diet, in particular dietary patterns and indicators of a healthy diet on chronic disease, mental health and cognitive function in older age.

Co-supervisors
Associate Professor Sarah McNaughton
Dr. Katherine Livingstone

Project is based at: Burwood

Project description
Dementia is a leading cause of disability and burden among older adults. As there is currently no known cure, the prevention of cognitive decline is an important strategy for public health intervention. There is some evidence that consumption of a healthy diet may reduce the risk of cognitive decline and subsequently dementia in older age. However, large-scale studies of nutrition and cognitive decline in older age in the Australian population are rare.

The aim of this project is to examine whether dietary intake is associated with cognitive function in older adults. This project will provide the opportunity to develop:
- skills in analyzing, presenting and interpreting dietary intake data
- skills in use of statistical analysis software
- an understanding of the conduct of epidemiological studies
- an understanding of the role of good nutrition in brain health and function in older age

Methodological approach
This project involves secondary statistical analysis of data collected from a study of older adults. The WELL study is a cohort study of 4082 adults aged 55-65 years living in urban and rural areas of Victoria in 2010 (1). Participants were randomly selected from the Australian electoral roll. Self-report questionnaires were used to collect information on food intake, physical activity and anthropometry in 2010 and at follow-up in 2014. A subgroup of 745 participants also underwent an assessment of memory and cognitive function during a short telephone interview. For this project, you will investigate relationships between dietary intake and cognitive function.

Necessary skills/knowledge
- Attention to detail and good organisational skills
- Knowledge of nutrition

- Some experience in the analysis of data using SPSS or STATA is desirable or a willingness and interest in acquiring these skills
- Further training and support will be provided

37. Dietary intake and depression in older adults

Principal supervisor: **Dr. Catherine Milte**
Contact details: catherine.milte@deakin.edu.au
(03) 92468280

Supervisor's profile
Dr. Catherine Milte is a Registered Nutritionist in the Centre for Physical Activity and Nutrition Research (C-PAN). Current research interests focus on the role of a diet, in particular dietary patterns and indicators of a healthy diet on chronic disease, mental health and cognitive function in older age.

Co-supervisors
Associate Professor Sarah McNaughton
Dr. Katherine Livingstone

Project is based at: Burwood

Project description
Poor mental health is a leading cause of disease burden among older adults. Depression is common in older age and is increasingly linked to lifestyle risk factors, including poor diet. There is some evidence that consumption of a healthy diet may reduce the risk of depression in older age. However, large-scale studies of nutrition and mental health in older age in the Australian population are rare.

The aim of this project is to examine whether dietary intake is associated with depression in older adults. This project will provide the opportunity to develop:
- skills in analyzing, presenting and interpreting dietary intake data
- skills in use of statistical analysis software
- an understanding of the conduct of epidemiological studies
- an understanding of the role of good nutrition in mental health in older age

Methodological approach
This project involves secondary statistical analysis of data collected from a study of older adults. The WELL study is a cohort study of 4082 adults aged 55-65 years living in urban and rural areas of Victoria in 2010 (1). Participants were randomly selected from the Australian electoral roll. Self-report questionnaires were used to collect information on food intake, physical activity and anthropometry. In 2014, participants completed a follow-up questionnaire to collect information on self-reported depression symptoms. For this project, you will investigate relationships between dietary intake and depression.

Necessary skills/knowledge
- Attention to detail and good organisational skills
- Knowledge of nutrition
- Some experience in the analysis of data using SPSS or STATA is desirable or a willingness and interest in acquiring these skills
- Further training and support will be provided

References

- McNaughton SA et al. (2012). Understanding determinants of nutrition, physical activity and quality of life among older adults: The Wellbeing, Eating and Exercise for a Long Life (WELL) Study. Health and Quality of Life Outcomes, 2012 10:109. doi:10.1186/1477-7525-10-109.

38. Feeding practices in Australian infants born preterm

Principal supervisor: **Dr. Ewa Szymlek-Gay**
Contact details: **ewa.szymlekgay@deakin.edu.au**
                                 (03) 9244 5404

Supervisor's profile
Dr. Ewa Szymlek-Gay is a researcher at the Centre for Physical Activity and Nutrition Research. Her research focuses on iron and zinc nutrition in vulnerable population groups including infants, pre-school children, pre-menopausal women, and vegetarians. Ewa is particularly interested in the development of food-based strategies to enhance the content and bioavailability of iron and zinc in diets consumed by at-risk population groups, and the impact of these dietary interventions on subsequent growth, health, and cognitive development.

Co-supervisor
Dr. Rachel Laws

Project is based at: Burwood

Project description
Poor nutrition in infancy may result in delayed development, significant morbidity, impaired cognitive function, behavioural problems, reduced growth, and metabolic programming which can predispose children to chronic diseases in later life. Adequate nutrition is therefore critical to promote and support child growth. Infants, however, are vulnerable to poor nutrition because of their particularly high nutrient needs in relation to their body size and energy intakes. Optimal nutrition is of particular importance to infants born preterm (before 37 completed weeks of gestation) as they are at even greater risk for poor micronutrient status. In Australia, over 8% of babies are born preterm each year yet very little is known about feeding practices of these infants once they have been discharged from hospital. This information is essential for designing future intervention strategies aimed at improving nutrient intakes in infants born preterm.

The aim of this project is to investigate feeding practices of Australian infants who were born preterm.

This project will provide the opportunity to develop:
- skills in online data collection
- in-depth knowledge regarding the importance of feeding practices to preterm infants
- skills in critical analysis of public health nutrition evidence
- skills in analysing, presenting and interpreting data

Methodological approach

In this project, you will recruit parents of infants born preterm. You will also develop an online survey which you will use to collect information on feeding practices of the infants. You will undertake quantitative data analysis to answer your research question.

Necessary skills/knowledge

- Attention to detail and good organisational skills.
- Some experience in the analysis of data is desirable or a willingness and interest in acquiring these skills. Further training and support will be provided.

39. Zinc intakes in young Australian children

Principal supervisor: **Dr. Ewa Szymlek-Gay**
Contact details: **ewa.szymlekgay@deakin.edu.au**
(03) 9244 5404

Supervisor's profile

Dr. Ewa Szymlek-Gay is a researcher at the Centre for Physical Activity and Nutrition Research. Her research focuses on iron and zinc nutrition in vulnerable population groups including infants, pre-school children, pre-menopausal women, and vegetarians. Ewa is particularly interested in the development of food-based strategies to enhance the content and bioavailability of iron and zinc in diets consumed by at-risk population groups, and the impact of these dietary interventions on subsequent growth, health, and cognitive development.

Co-supervisor

Associate Professor Karen Campbell

Project is based at: Burwood

Project description

Zinc is a key nutrient for optimal growth and development and inadequate intakes during childhood can lead to deficiency. Inadequate zinc status during the first years of life can compromise growth, and impair sensory and immune development. To design effective strategies for the prevention of zinc deficiency in children, it is crucial to determine their intakes, identify dietary patterns associated with low intakes, and determine main contributors of zinc in their diets. Very little data exist on zinc intakes in children under two years of age in Australia.

This project will examine intakes, food sources and potential determinants of zinc in infants and toddlers. It will also examine dietary factors that may influence zinc absorption.

This project will provide the opportunity to develop:
- in-depth knowledge regarding zinc metabolism
- skills in analysing dietary data
- skills in critical analysis of public health nutrition evidence
- skills in analysing, presenting and interpreting data

Methodological approach

This project will involve analysis of data from infants and toddlers who took part in the Melbourne Infant Feeding, Activity and Nutrition Trial (InFANT) Program. The Melbourne InFANT Program was carried out in 2008-2010 and involved 542 infants living in Melbourne. Demographic and socio-economic data were collected from each infant by questionnaire, and anthropometric measurements were taken during home visits at 9 and 18 months of age. Dietary intake was assessed by 3 x 24-hour

recalls and these data will be used to determine intakes of zinc at 9 and 18 months of age and the major food sources of zinc in the diet. The demographic, socio-economic, anthropometric, and dietary data will be used to identify possible predictors of low zinc intakes in these young Australian children.

Necessary skills/knowledge
- Attention to detail and good organisational skills.
- Experience with Microsoft Excel is required.
- Some experience in the analysis of data is desirable or a willingness and interest in acquiring these skills. Further training and support will be provided.

40.Assessment of the impact of public health and philanthropic organisations working in partnership with That Sugar Film for health promotion and advocacy purposes

Principal supervisor: **Dr. Julie Woods**
Contact details: **j.woods@deakin.edu.au**
                           (03) 9251 7272

Supervisor's profile
Julie is a senior lecturer in public health nutrition with an interest in food policy, food regulation and food supply issues and their impact on food consumption. She is the Co-Convener of the Food and Nutrition Special Interest Group of the Public Health Association of Australia and is involved in a range of advocacy activities in relation to food policy.

Co-supervisor
Jane Martin, (Executive Manager, Obesity Policy Coalition)

Project is based at: Burwood and Cancer Council

Project description
Rates of overweight and obesity in Australia have been influenced by changes in the food environment, including the increased availability and marketing of packaged food and drinks high in added sugar. There is growing evidence of an association between added sugar, weight and negative health outcomes (including diabetes, cardiovascular disease and some cancers). Australia's Dietary Guidelines recommended that the consumption of added sugar be limited for improved health.

Australian Filmmakers have recently partnered with a number of health groups and philanthropic organisations, in the development and dissemination of "That Sugar Film". These partners include the Obesity Policy Coalition, Good Pitch Australia, the George Institute for Global Health, Diabetes Australia, YMCA and the Documentary Australia Foundation. These partners have offered advice to the film-makers regarding health promotion and advocacy and participated as panel members in post screening Q & A's across Australia.

These groups are interested in measuring the impact of their partnership with this novel film to promote health messages and progress systemic advocacy. For example, this project may involve a literature review of how to best measure the social impact of partnerships of this nature for advocacy purposes, and then undertake a rigorous evaluation of the partnerships impact to inform future partnerships and systemic advocacy efforts.

This project will provide the student the opportunity to develop:
- skills in qualitative data collection and analysis
- skills in critical analysis of public health nutrition and advocacy evidence

- an understanding of policy advocacy and how it can influence consumer awareness, behavior change and government (and others) actions
- skills in the evaluation of health promotion projects or advocacy.

Methodological approach

This project will involve identifying and interviewing key stakeholders to determine the impact of OPC participation.

Necessary skills/knowledge

This project is suited to someone with
- knowledge of policy advocacy and how its impact may be measured
- attention to detail and good organisational skills
- good communication skills

41. Associations between dietary intake and health related quality of life in older men and women.

Principal supervisor: **Dr. Susan Torres**
Contact details: **susan.torres@deakin.edu.au**
    (03) 9244 6189

Supervisor's profile
Dr. Susan Torres is an accredited practicing dietitian and senior lecturer in Nutrition and Dietetics in the School of Exercise and Nutrition Sciences. Her current research assesses the relationship between indicators of mental health and dietary intake. She has conducted intervention studies assessing the impact of dietary modifications and weight loss on mood, anxiety and blood pressure responses to stress. Recently, Dr Torres has been investigating how stress response differs in lean versus obese individuals and the impact of lifestyle interventions on quality of life.

Co-supervisors
Dr. Stella O'Connell
Dr. Catherine Milte

Project is based at: Burwood

Project description
Health promotion strategies in the elderly are increasingly focused on identifying ways to improve quality of life rather than just extending the lifespan. Optimal nutrition can make a significant contribution to improving quality of life in the elderly.

The aim of this study is to determine the association between diet and quality of life in community-dwelling adult men and women.

Methodological Approach
The honours student will have access to baseline data from existing databases of lifestyle interventions (diet and physical activity trials) conducted in adult men and women at risk of falls. This study will involve the cross sectional analysis of quality of life as measured by the SF36 questionnaire and dietary intake by 24-hour recalls.

Necessary skills/knowledge
Good communication and organisational skills.

42. The effect of exercise combined with calcium-vitamin D3 enriched milk on health-related quality of life in older men at risk of falling

Principal supervisor: **Dr. Susan Torres**
Contact details: **susan.torres@deakin.edu.au**
    (03) 9244 6189

Supervisor's profile
Dr. Susan Torres is an accredited practicing dietitian and senior lecturer in Nutrition and Dietetics in the School of Exercise and Nutrition Sciences. Her current research assesses the relationship between indicators of mental health and dietary intake. She has conducted intervention studies assessing the impact of dietary modifications and weight loss on mood, anxiety and blood pressure responses to stress. Recently, Dr. Torres has been investigating how stress response differs in lean versus obese individuals and the impact of lifestyle interventions on quality of life.

Co-supervisors
Dr. Stella O'Connell
Dr. Catherine Milte

Project is based at: Burwood

Project Description
Health-related quality of life as measured by the SF36v1 subscales and the summary Physical and Mental Component Score will improve in older men who undergo a 12-month program of exercise and calcium/vitamin D supplementation administered separately and together.

Methodological Approach
In this 18-month randomised controlled trial, 180 men aged 50-79 years were randomised to four groups, two that included an exercise intervention: exercise plus calcium-vitamin D3 enriched milk and exercise alone (the exercise intervention group*), and two that did not: calcium-vitamin D3 enriched milk alone and a control group (the control group*). SF36 questionnaires were completed at baseline, 6 and 12 months to measure quality of life. Demographic details and anthropometric measurements, medical history, 3-day food diary, and CHAMPS physical activity questionnaires were completed along with serum vitamin D and parathyroid levels.

Necessary skills/knowledge
Good communication and organisational skills.

43. Impact of a room service model in an acute care facility

Principal supervisor: **Judy Appleton**
Contact details: **Judith.appleton@deakin.edu.au**
(03) 92517255

Supervisor's profile
My career objective is to develop innovative solutions for excellence in food provision in both community and institutionalised settings. Since graduating as a dietitian, my work has encompassed broad and specialised dietetic clinical experience, including the role of Food Service Manager and Chief Dietitian. My current position as an Associate Lecturer at Deakin University in the Dietetics postgraduate and Food and Nutrition undergraduate programs, has involved successful submission of ethics applications for continued research in the area of food provision.

Co-supervisors
Dr. Claire Margerison
Karen Peters

Project is based at: Burwood
Project site: Epworth Hospital, Richmond

Project description
The room service model provides patients with the opportunity to choose food on demand, whereby a meal order can be lodged and delivered within forty five minutes.
This project will identify the impact of the room service model on meeting the nutritional needs of patients, as well as identifying patient groups where the room service model may have a negative impact.

Opportunities/skill development
The student will conduct their research in one of Melbourne's leading private not for profit hospitals, providing an excellent opportunity to research a paradigm shift in the way meals are provided to patients in a multi-disciplinary setting.
This research could be presented at a number of conferences and submitted for journal publication.

Methodological approach
- conduct a literature review of the advantages and disadvantages of the traditional model of patient meal provision
- identify current trends and innovations in patient meal selection
- determine traditional barriers to patient's meeting their nutritional requirements e.g. fasting, diet code changes, missed meals and how the room service model addresses some of these issues e.g. more timely response to patient's food preferences, patient diet code changes, accurate tracking of patient whereabouts, reduced missed meals for procedures/tests.
- conduct patient satisfaction surveys

- determine food intake data and food waste, comparing how data differs from data in the public domain based on traditional distribution models.
- identification of patient groups where the room service model has a negative impact, including other limitations.

Outcome

Shifting to a room service model may have unexpected positive and negative impacts which could be explored and defined, forming the basis of discussion and recommendations.

Necessary skills/knowledge

The following are required:
- Good verbal and communication skills
- Ability to research, collate and identify existing material
- Knowledge and interest in food service nutrition
- Ability to develop a draft working document
- Ability to plan the project and work to an appropriate time frame

44. Dietary sources and sodium content of food provided to pre-school aged children in childcare centres

Principal supervisor: **Professor Caryl Nowson**
Contact details: **caryl.nowson@deakin.edu.au**
(03) 52479245

Supervisor's profile
As a dietitian and nutrition scientist, Professor Nowson has a longstanding interest in diet related to chronic diseases associated with ageing. There is a real impetus to keep people healthier well into old age, with the predicted large increase in the proportion of older people in Australia. Professor Nowson's specific research interests are based around dietary approaches to prevent hypertension and osteoporosis. As the genesis of the diseases in aging start early in life, her research includes evaluation of lifestyle strategies implemented in childhood to reduce chronic disease in later life. She has conducted a number of community-based intervention studies assessing the impact of dietary modification on blood pressure and risk factors of osteoporosis

Co-supervisors
Dr. Katie Lacy
Siobhan O'Halloran
Dr. Carley Grimes

Project is based at: Geelong

Project description
Understanding the contribution of sodium from meals served at Long Day Care centre (LDCCs) to young children's diets is important, as this age group frequently consumes excess sodium and the meals consumed at LDCCs are likely to make a major contribution to total daily sodium intake. Data collection includes a visual plate assessment (pre-post child consumption) which will provide data on the amount of sodium consumed; the completion of a cooking practices questionnaire which will provide information about discretionary salt use by cooking staff and analysis of menus and recipes which will determine the sodium content of the lunches provided by the LDCC. Telephone interviews will also be conducted with a sub-group of parents to assess intake and use of salt in the home setting. This project will provide the opportunity for a student to develop skills in dietary methodology, skills related to measuring food intake in an institutional setting, skills in gathering dietary intake in pre-school children and skills in dietary interviewing and appropriate statistical analysis of resulting data.

Methodological approach
Menu analysis utilising food works, direct observation and estimation of food provided and served to children aged 3-5 year attending long day care centres.

Necessary skills/knowledge
Knowledge of food sources of nutrients, familiar with Foodworks dietary analysis program. Required to undergo working with children police check.

Other details
This Honours project is part of a larger project being undertaken by Siobhan O'Halloran as a component of her PhD studies.

45. Implementing a policy formulation tool to promote healthy and sustainable diets

Principal supervisor: **Professor Mark Lawrence**
Contact details: **lawrence@deakin.edu.au**
(03) 9244 3789

Supervisor's profile
Mark is a public health nutritionist with over 30 years' experience in food policy. He is actively involved in public health nutrition research analysing the development of policies and programs, such as the Dietary Guidelines, designed to protect and promote the nutritional health of populations. He is particularly interested in how and why evidence is used in food sustainability and food systems policy research. Mark has published the equivalent of over 80 scientific papers and currently is an investigator on 5 research projects totaling over $6million. He is an advisor to the WHO and FSANZ, a member of the Commonwealth Department of Health's NRV advisory committee, and a former member of the NHMRC's Dietary Guidelines working committee.

Co-supervisor
Dr. Julie Woods

Project is based at: Burwood

Project description
The policy challenges arising from public health nutrition and environmental sustainability problems are unprecedented. Public policy actions are required to achieve healthy and sustainable diets (HSD). A food policy formulation tool to promote HSDs has been developed (see http://journals.cambridge.org/repo_A99JgPBQ/Q1NOo). The tool's effectiveness will depend on its successful implementation. The objectives of this project are:
- Compare and contrast the food policy formulation tool with alternative approaches for promoting HSDs
- Identify and prioritise policy activities in accordance with the tool's design
- Analyse the opportunities and challenges for implementing these priority policy activities
- Prepare recommendations for the implementation of the policy formulation tool

The project will NOT extend to the implementation of the policy formulation tool or evaluating outputs from its implementation (these activities may become the basis of a future more extensive research project, e.g. PhD study).

Methodological approach

- Literature review of current best practice for food policy formulation, development, implementation and evaluation to promote healthy and sustainable diets as well as identification of food policy priorities
- Semi-structured interviews with food system stakeholders

- Thematic analysis of interview responses and documentary analysis

Necessary skills/knowledge

- An interest and commitment to the promotion of healthy and sustainable diets.
- An understanding of food system's thinking
- Knowledge of food policy (what it is and why it is important)
- Knowledge of public health nutrition (what it is and why it is important)
- A preparedness to develop skills and expertise in social and policy science
- Good writing and communication skills
- Students with a particular interest in and commitment to publishing their project findings and pursuing future PhD studies are especially welcomed to apply for this Honours project.

46. Sushi stores and salad bars or burgers and burritos? Do the types of takeaway food stores in Melbourne neighbourhoods vary by socioeconomic disadvantage?

Principal supervisor: Dr. Lukar Thornton
Contact details: lukar.thornton@deakin.edu.au
(03) 92445029

Supervisor's profile
Dr. Thornton is a Senior Research Fellow within the Centre for Physical Activity and Nutrition Research (C-PAN) at Deakin University, Australia. His expertise spans the disciplines of geography, behavioural epidemiology and public health. Dr. Thornton's current program of research predominantly explores environmental exposures related to eating behaviours. He also conducts work that investigates socioeconomic predictors of eating behaviours and the role of the built environment on other health behaviours (e.g. physical activity and alcohol consumption). The results of his research have been cited in key policies and programs aimed at the development of health-promoting built environments.

Co-supervisor
Dr Karen Lamb

Project is based at: Burwood

Project description
The types of food store located within our neighbourhood play a role in our food purchasing decisions. Increasingly, research suggests that variations in food store availability by neighbourhood disadvantage contributes to socioeconomic inequalities in health. There have been a number of published studies which have examined differences in the number of food store types between neighbourhoods of varying levels of socioeconomic disadvantage, with most focusing on supermarkets and fast food chains. Studies that have considered takeaway food stores have tended to groups these into a single category without consideration of the different types of food stores that may exist. By exploring the types of takeaway food stores in neighbourhoods and how these differ by area-level socioeconomic disadvantage, this study will make a novel contribution to the food environment literature.

Methodological approach
Using an audit tool developed by the supervisors, the student will be required to undertake audits of neighbourhoods to assess the number and type of takeaway outlets present. Neighbourhoods will be sampled from the least, mid and most socioeconomically disadvantaged areas of Melbourne. Data will be analysed to investigate whether socioeconomic differences exist.

Necessary skills/knowledge
The prospective student will need to have the ability to work independently, problem-solve, undertake fieldwork, and have good attention to detail. Statistical training in appropriate analytical approaches will be provided.

47. How do workers pace their physical performance? Do the breaks help?

Principal supervisor: Dr. Brad Aisbett
Contact details: brad.aisbett@deakin.edu.au
(03) 9244 6474

Supervisor's profile
My research uses exercise science research to enable workplaces to promote and preserve the health and safety of workers in physically demanding occupations, such as firefighters, soldiers and construction workers. In the past five years, I have worked with over 20 separate organizations across eight Australian states and territories in the areas of job-specific fitness, hydration, and fatigue.

Co-supervisor
Dr. Nicky Ridgers

Project is based at: Burwood

Project description
The project will evaluate how workers' physical activity between manual labour tasks (e.g., lift, dig, carry) impacts their performance across a workday.

A number of researchers suggest that workers in physically demanding jobs (e.g., construction, agriculture) learn to pace their efforts across their workday. The research team has already collected some data to suggest that when tired, workers decrease their physical activity between, whilst still maintaining performance on, their major tasks. But, we cannot confirm this finding without more testing. The honours project will help the research team answer this question. The answer has important implications for workplace productivity and fatigue management for core Australian industries such as construction, agriculture and emergency service workers.

Methodological approach
The honours student would work as a part of a larger research team. The honours student would help design the physical work circuit to simulate the lift, carry, dig and strike movements common to many physically demanding occupations. Thereafter, they would help to recruit and test participants performing these movements. They would record the participants' physical performance on the major tasks, but also their physiological responses before, during and their performances and their physical activity levels between tasks. After data collection finished, the honours student would be taught how to analyse the results to answer the question - does workers' physical activity between manual labour tasks impact their task performance?

The skills and knowledge attained through working on the honours project would be applicable to a range of employment and further education contexts. Designing and conducting physical performance testing is a fundamental skill in many workplaces, including the military, civilian emergency services and elite sport. These same skills, together with entry-level statistical analysis, are often sought after by research teams when looking for research assistants. Finally, the honours experience provides an excellent grounding for future research training through masters or PhD pathways.

Necessary skills/knowledge
It is desirable (but not essential) for the selected student to have:
- An interest in applying exercise science knowledge to occupational settings;
- An interest in physical activity monitoring;
- Good communication and organisational skills; and
- Some understanding of statistical techniques.

48. Sleeping with one ear open: how working 'on-call' impacts your overnight stress levels

Principal supervisor: Dr. Brad Aisbett
Contact details: brad.aisbett@deakin.edu.au
(03) 9244 6474

Supervisor's profile
My research uses exercise science research to enable workplaces to promote and preserve the health and safety of workers in physically demanding occupations, such as firefighters, soldiers and construction workers. In the past five years, I have worked with over 20 separate organizations across eight Australian states and territories in the areas of job-specific fitness, hydration, and fatigue.

Co-supervisor
Dr. Sarah Jay (Central Queensland University, SA)

Project is based at: Burwood

Project description
The project will evaluate whether participants experience increased stress levels, as measured by pre-bedtime and overnight measures of heart rate and heart rate variability, when they are expecting to be woken overnight by an alarm or 'call'.

The project is part of a larger, federally-funded research project investigating whether our 'on-call' workers (e.g., firefighters, SES volunteers, doctors, etc.) actually sleep well when they 'know' they could get called overnight. At present, two-million Australians are on-call providing essential 24-hour services. Right now we assume that all sleep is created equal, but some workers report feeling less rested after an on-call night, regardless of whether they have been called or not. The honours project will help the research team work out if on-call workers are actually under more stress when on-call and whether this stress negatively affects their sleep. If participants' stress levels are higher when waiting for an overnight call, then workplaces need to consider revising their fatigue management systems for on-call workers.

Methodological approach
The honours student would work as a part of a larger research team. Data collection would happen across four trips (all flights and accommodation would be paid for by the research team) at the Appleton Institute sleep laboratory in Adelaide, South Australia. During data collection, the student would help the team collect a variety of physiological measures, including overnight measures of stress and sleep, and daytime measures of mental performance. Between data collection trips, the student would focus their analysis on the overnight heart rate and heart rate variability data collected when participants were waiting for an overnight call. Data analysis, writing and face-to-face meetings would primarily occur at the Deakin University Burwood Campus.

The skills and knowledge attained through working on the honours project would be applicable to a range of employment and further education contexts. Specifically,

the understanding, measurement and analysis of sleep and stress markers would provide good grounding for future work in the occupational health and safety teams of organisations where shift-work is common. Further, sleep and stress measurements are becoming increasingly prevalent in elite sport. Finally, the honours experience provides an excellent grounding for future research training through masters or PhD pathways.

Necessary skills/knowledge
It is desirable (but not essential) for the selected student to have
- An interest in applying exercise science knowledge to occupational settings;
- An interest in sleep physiology / circadian rhythms;
- Good communication and organisational skills; and
- Some understanding of statistical techniques.

49. What are the physically demanding tasks involved in nursing?

Principal supervisor: **Dr. Brad Aisbett**
Contact details: **brad.aisbett@deakin.edu.au**
                                (03) 9244 6474

Supervisor's profile
My research uses exercise science research to enable workplaces to promote and preserve the health and safety of workers in physically demanding occupations, such as firefighters, soldiers and construction workers. In the past five years, I have worked with over 20 separate organizations across eight Australian states and territories in the areas of job-specific fitness, hydration, and fatigue.

Co-supervisors
Dr. Amelia Carr
Professor Julie Considine, (School of Nursing & Midwifery)

Project is based at: Burwood

Project description
The project will identify and characterise the physically demanding tasks required by nurses working in a metropolitan hospital.

Nurses are integral to hospital healthcare. They are usually the primary contact for the patient and their family members. It is well known that nurses work long hours, often in emotionally- and mentally-challenging environments. In comparison, we know far less about the physical requirements of nursing. This sort of information is critical to understand the injury risks nurses face and how they can be avoided. An essential first step is to survey nurses on the physical tasks they perform, how often they perform them and how important these tasks are. This type of information has been used, in the military, police, and fire agencies to design testing and training materials to help preserve workers' health and safety. To our knowledge, no such information is available for nurses, despite the critical roles they play in hospitals worldwide.

Methodological approach
The honours student would work as a part of a larger research team comprising researchers and staff members from Eastern Health. They will read previous research using job task analyses to identify physically demanding tasks. Thereafter they will read and synthesize existing Eastern Health materials documenting nursing duties. The student will work with the research team to identify a short list of core nursing tasks and then survey current nurses on how demanding, frequent and important these tasks are on the job. They will then present the aggregate results and identify similarities or differences between the physically demanding jobs in nursing and other safety-critical occupations.

The skills and knowledge attained through working on the honours project would be applicable to a range of employment and further education contexts. Specifically, identifying the critical job tasks is a fundamental skill for workers employed in occupational health and safety roles. These roles are commonplace in most major organisations, across retail, manufacturing, construction, the military and emergency

services. The honours experience also provides an excellent grounding for future research training through masters or PhD pathways.

Necessary skills/knowledge

It is desirable (but not essential) for the selected student to have

- An interest in applying exercise science knowledge to occupational settings;
- An interest in healthcare; and
- Good communication and organisational skills;

50.Developing children's motor skills - does park design assist or hinder?

Principal supervisor: **Dr. Helen Brown**
Contact details: **hbrown@deakin.edu.au**
                              (03) 92446327

Supervisor's profile
Dr. Brown is a lecturer in Sport Coaching and Physical Activity in the School of Exercise and Nutrition Sciences. She is also a researcher in the Centre for Physical Activity and Nutrition research (C-PAN). Her research focuses on children's physical activity and has a keen interest in the development of fundamental motor skills in children.

Co-supervisors
Dr. Jenny Veitch
Dr. Lisa Barnett

Project is based at: Burwood

Project description
Parks and playgrounds offer significant opportunities for children of all ages to be active and develop their physical motor skills. This is important as many children are engaging in low levels of physical activity and are not meeting physical activity recommendations. Little is known about how active children are when playing at a playground or how different playground designs may encourage engagement in different levels of physical activity or develop various components of their fundamental motor skills/physical literacy. This aim of this project is to objectively measure (i.e. using accelerometers) the activity levels of children (aged 5-8 years) in a variety of playground settings.

Methodological approach
This project will involve the use of accelerometers to measure activity levels, observation tools to audit playgroup equipment and perform direct observations of children's play, and surveys to measure children's perceived competence. The student will gain skills in participant recruitment, data collection using accelerometers, and downloading, cleaning and analysing data.

Necessary skills/knowledge
This project will involve data collection and data analyses. Ideally students should have completed HSE203. Some experience in the analysis of data using SPSS or STATA is desirable, or a willingness and interest in acquiring these skills. Further training and support will be provided.

51. Innovative strategies for engaging adolescent girls in sport.

Principal supervisor: Dr. Helen Brown
Contact details: hbrown@deakin.edu.au
(03) 92446327

Supervisor's profile
Dr. Brown is a lecturer in Sport Coaching and Physical Activity in the School of Exercise and Nutrition Sciences. She is also a researcher in the Centre for Physical Activity and Nutrition research (C-PAN). Her research focuses on sport participation and coaching and she has a particular interest in motivations and barriers for sport participation among females.

Co-supervisors
Dr. Jenny Veitch
Prof Jo Salmon

Project is based at: Burwood

Project description
Specific physical activities, such as sport participation, offer a potential vehicle through which to engage youth in physical activity. Sport has been shown to contribute to overall physical activity levels during adolescence (Booth et al 2004, Katzmarzyk et al 1998) and evidence exists that sport participation in youth may lead to greater involvement in physical activity over time (Nelson 2011). Of concern is evidence that sport participation rates start to decline in late childhood and continue to decline with age. Gaining an understanding of the underlying factors that contribute to, or restrict sport participation in youth will help develop strategies for preventing declines in sport participation. This topic therefore has political importance for the current federal government, particularly with the introduction of their Sporting Schools Australia initiative which aims to engage more children in more sport based activity within schools and convert their interest into club based settings. This project aims to provide valuable evidence to support engagement in sport and ensure sporting clubs are safe, welcoming and inclusive.

Methodological approach
This study will involve exploration of strategies used by community groups, state sporting associations and relevant organisations to increase sport engagement of adolescent girls. Data obtained from interviews and surveys conducted with sporting groups and state sporting associations in 2015 will be analysed to identify and determine which approaches seem most feasible and effective.

Necessary skills/knowledge
This project will suit a student who is well organised and has good communication skills. A good understanding of Excel would be an advantage.

52. "Is happiness as simple as a walk in the park?" The association between visiting parks and mental health in adults

Principle supervisor: Dr. Megan Teychenne
Contact details: mteych@deakin.edu.au
(03)92446910

Supervisor's profile

Dr. Megan Teychenne is a behavioural epidemiologist and lecturer in Physical Activity and Health in the School of Exercise and Nutrition Sciences at Deakin University. She has a growing profile nationally and internationally for her research in the area of physical activity, sedentary behaviour and mental illness (particularly anxiety and depression), with a key focus on targeting 'at-risk' population groups including women (including postpartum and prenatal women) and socio-economically disadvantaged adults. Currently she supervises one Honours student, one Masters Student and one PhD student.

Co-supervisors

Dr. Jenny Veitch
Dr. Helen Brown

Project is based at: Burwood

Project description

Parks are located in most neighbourhoods, they are generally free to access, offer a variety of opportunities for physical activity and can serve diverse populations. Some evidence suggests that physical activity undertaken in parks may have greater psychological and physiological benefits than activity in other settings. However, little is known about how visitation to parks and specific features of parks may be associated with mental health. It is important to investigate the association between parks (visitation and features) and mental health as this information will add to the small body of existing knowledge which may inform future intervention and planning development to promote better mental health in the population.

This aim of this project is to investigate associations between park usage, park features, and mental health (i.e. depressive symptoms and well-being) among adults living in Melbourne.

Methodological approach

This project will be nested within the REVAMP study, which is a 3-year ARC Linkage funded study led by Dr Veitch, and will involve secondary analysis of existing data collected in 2013 and 2015. Self-reported survey data from approximately 1500 adults from two areas of Melbourne (low and high SES) will be analysed. This Honours project will involve conducting cross-sectional data analyses to investigate the link between park features (i.e. park visitation, perceptions of neighbourhood parks, activity in parks) and mental health (i.e. depressive symptoms and well-being).

Necessary skills/knowledge
The student should have excellent communication and interpersonal skills
Excellent organisational skills
Completion of HSE203, HSE212 or HSE316 desirable

53. Healthy body, healthy mind, healthy mum? The association between lifestyle factors and risk of post-natal depression.

Principle supervisor: **Dr. Megan Teychenne**
Contact details: **mteych@deakin.edu.au**
                        (03) 9244 6910

Supervisor's profile
Dr. Megan Teychenne is a behavioural epidemiologist and lecturer in Physical Activity and Health in the School of Exercise and Nutrition Sciences at Deakin University. She has a growing profile nationally and internationally for her research in the area of physical activity, sedentary behaviour and mental illness (particularly anxiety and depression), with a key focus on targeting 'at-risk' population groups including women (including postpartum and prenatal women) and socio-economically disadvantaged adults. Currently she supervises one Honours student, one Masters Student and one PhD student.

Co-supervisors
Dr Catherine Milte
Paige van der Pligt

Project is based at: Burwood

Project description
Lifestyle factors (e.g. physical inactivity, sedentary behaviour and poor dietary intake) have been linked to increased risk of a number of chronic health problems including overweight/obesity, type 2 diabetes and cardiovascular disease. Of recent interest, is the link these lifestyle factors have with risk of depression. Since risk of depression is particularly prevalent in new mothers, it is important to investigate the association between lifestyle factors such as physical activity, sedentary behaviour and healthy eating and risk of post-natal depression. Such information will add to the small body of existing knowledge and inform future intervention development promoting healthy lifestyles to new mothers.

The aim of this project is:

To investigate the association between lifestyle factors (physical activity, sedentary behaviour and healthy eating) and risk of post-natal depression in women.

Methodological approach
The READI study included 4,349 women living is disadvantaged neighbourhoods across Victoria. Secondary statistical analyses will be performed using cross-sectional survey data previously collected from the READI study.

Necessary skills/knowledge
The student should have excellent communication and interpersonal skills
Excellent organisational skills
HSE203 (essential), HSE212 or HSE316 desirable

54. The InSpire study: Evaluating the impact of a print- and web-based intervention to increase physical activity among socio-economically disadvantaged women

Principle supervisor: Dr. Megan Teychenne (Burwood) & Dr. Shannon Sahlqvist (Geelong)
Contact details: mteych@deakin.edu.au
(03) 9244 6910

Supervisors profiles
D. Megan Teychenne is a behavioural epidemiologist and lecturer in Physical Activity and Health in the School of Exercise and Nutrition Sciences at Deakin University. She has a growing profile nationally and internationally for her research in the area of physical activity, sedentary behaviour and mental illness (particularly anxiety and depression), with a key focus on targeting 'at-risk' population groups including women (including postpartum and prenatal women) and socio-economically disadvantaged adults. Currently she supervises one Honours student, one Masters Student and one PhD student.

Dr. Shannon Sahlqvist is a Lecturer in Physical Activity and Health (Geelong). Shannon's research focuses on developing and evaluating population based physical activity interventions, in particular those that promote active travel. She has led the development and evaluation of a website-delivered physical activity intervention targeted at middle-aged adults.

Project is based at: Burwood or Geelong

Project description
Socio-economically disadvantaged women are more likely to be physically inactive and engage in higher levels of sedentary behaviour (e.g. television viewing) than less disadvantaged women. However, few successful strategies have been designed to increase physical activity and reduce sedentary behaviour in this target group. One possible approach is to utilise the use of a mediated intervention including print and web delivery.

To that end, women living in socio-economically disadvantaged areas of Melbourne were recruited and randomly allocated to receive either print and web materials or to a wait-list control group. At baseline and again following the three-month intervention all participants were instructed to wear an accelerometer (movement monitor) for one week to measure both physical activity and sedentary behaviour. At the same time, participants completed a questionnaire to further elucidate their physical activity and sedentary behaviour as well as important influences of these behaviours

This Honours project **aims** to evaluate the effectiveness of the print and web-based materials at encouraging increases in physical activity and reductions in sedentary behaviour among women living in low socioeconomically disadvantaged   areas.

Methodological approach
Accelerometer and survey data have already been collected from 50 women. These data will be analysed using appropriate techniques to determine any changes, both within and between groups, in physical activity and sedentary behaviour as well as key influences on these behaviours.

Necessary skills/knowledge:
The student should have excellent communication and interpersonal skills. Excellent organisational skills.
Completion of HSE203 (essential), HSE212 or HSE316 desirable.

55. Fitbits: Activity promoting gadgets or gimmicks?

Principal supervisor: Dr. Nicky Ridgers
Contact details: nicky.ridgers@deakin.edu.au
(03) 9244 6718

Supervisor's profile
I am a Senior Research Fellow within the Centre for Physical Activity and Nutrition Research. My research focuses on measuring physical activity and sedentary behaviour patterns in different populations using a range of cutting-edge monitoring technologies. I am interested in whether commercially available wearable technologies (such as Fitbits) can be used to raise awareness of physical activity levels and change behaviours.

Co-supervisor
Dr. Helen Brown

Project is based at: Burwood

Project description
Annual sales growth of activity/fitness trackers (such as FitBits, Nike Fuelband, Jawbone UP etc) has reached 500% over the last three years. These activity/fitness trackers provide people with the opportunity to track their physical activity and features within the monitors and accompanying apps aim to provide feedback against activity goals. However, little research has examined whether these monitors actually increase physical activity levels. This research project has important implications for understanding how people use these technologies and how they may be embedded into broader health promotion and monitoring programs.

Methodological approach
The honours student will undertake secondary analyses of data collected as part of the Raising Awareness of Physical Activity Study. They will analyse Fibit data collected from adolescents over a 6-week period, and questionnaire data that examines the use of the Fitbit and the associated app during this time.

This project will provide an opportunity to develop an understanding of current wearable monitoring technologies, develop skills in analysing monitor data collected over an extended period of time, and interpreting survey data. Such skills and knowledge can be applied to a range of settings, including health promotion, and sport and exercise sciences.

Necessary skills/knowledge
This project will suit students interested in the assessment of activity levels and energy expenditure using cutting-edge technologies. Some knowledge of using Microsoft Excel and basic analytical skills is desirable (but not essential).

56.Is childhood obesity associated with a decrease in muscle strength and function leading to a decreased ability to perform everyday functional tasks?

Principal supervisor: **Dr. Nicky Ridgers**
Contact details: nicky.ridgers@deakin.edu.au
(03) 9244 6718

Supervisor's profile
I am a Senior Research Fellow within the Centre for Physical Activity and Nutrition Research. My research focuses on measuring physical activity and sedentary behaviour patterns in different populations using a range of cutting-edge monitoring technologies.

Co-supervisor
Dr. Rachel Duckham

Project is based at: Burwood

Project description
This project will determine if childhood obesity is associated with a decrease in motor performance including muscle strength and function and the decrease ability to perform every day functional tasks. Whilst it is well established that paediatric obesity increases the risk of early onset cardiometabolic diseases such as type 2 diabetes and cardiovascular disease, there is less consensus about its consequences on the developing musculoskeletal system. Of the limited research performed to date, the majority has focused on the impact of childhood obesity on bone health, with little known about the influence on motor performance such as balance, muscular strength and function. A decrease in muscle function early in life may increase the risk of early onset sarcopenia (muscle loss), a condition associated with poor physical function, quality of life and an increased risk for falls and fracture.

Methodological approach
This will be a cross sectional study that will involve the recruitment of school aged children age 5 to 12 years. The student will assist with the recruitment of participants, and undertake measurements of total and site-specific body composition; physical activity, balance, reaction time and muscle strength and function using state of the art equipment such as bio-electrical impedance, SenseWear, and accelerometers. This project will give the student a unique opportunity to recruit, collect and analysis data. Furthermore the student will gain skills and knowledge in a vast range of physiological measurement techniques.

Necessary skills/knowledge

Although no prior skills are required the student should have a strong desire to work with school-aged children in the area of physical activity and musculoskeletal health. The student should be self-motivated, with the ability to work independently and have good attention to detail.

57. The Chauffer Driven Generation: Exploring ways to encourage children to walk to school.

Principle supervisor: **Dr. Shannon Sahlqvist**
Contact details: **shannon.sahlqvist@deakin.edu.au**
     (03) 92517782

Supervisor's profile
Dr. Shannon Sahlqvist is a Lecturer in Physical Activity and Health (Geelong). Shannon's research centres around the promotion of walking and cycling, in particular for transport. She has experience in developing and evaluating both individual, and population-wide interventions aimed at increasing walking and cycling.

Co-supervisor
Dr. Jenny Veitch

Project is based at: Burwood or Geelong

Project description
Many young people do not participate in a sufficient level of physical activity. Subsequently, interest has turned to the promotion of active travel to school (walking and cycling) as a way of incorporating physical activity into the daily lives of young people. In an effort to increase the proportion of children who walk or cycle to school Manningham City Council, in Melbourne's north-east, have helped participating schools to implement Active Travel Plans. An Active Travel Plan is a document prepared by the school community in collaboration with a range of stakeholders capturing a range of actions to encourage students and their families to choose healthy, safe and environmentally friendly ways of travelling to and from school. To determine the impact of implementing Active Travel Plans, Manningham City Council have collected quantitative data on school children's travel behaviour as well as the proposed correlates of active travel. This Honours project therefore **aims** to evaluate the impact of Manningham City Council Active Travel Plans on school travel behaviour.

Methodological approach
Self-report data on children's travel behaviour has been collected from several schools within Manningham City Council's boundary. These data will be analysed using appropriate techniques to determine any changes in active travel as well as changes in proposed correlates of active travel. Process evaluation of the Active Travel Plans will also be conducted. Participating schools will be invited to participate in a qualitative study exploring their experiences with implementing the schools Active Travel Plan.

Necessary skills/knowledge
HSE203 Exercise Behaviour – Essential
HSE212 Physical Activity Promotion and Evaluation / HSE316 Physical Activity and Health – Desirable

58. Exercise rehabilitation for musculoskeletal injury: impact on MRI disc properties and functional capacity.

Principal supervisor: **Dr. Steve Fraser**
Contact details: **steve.fraser@deakin.edu.au**
                                (03) 924 46012

The majority of the supervision for this project will be via Dr. Miller and Associate Professor Daniel Belavy.

Co-supervisors
Dr Clint Miller
Associate Professor Daniel Belavy

Supervisors profiles
Dr. Steve Fraser is interested in the role of accredited exercise physiologist led exercise programs for individuals with chronic disease such as diabetes, obesity, cancer, and musculoskeletal injury and disease. The primary aim of this body of research is to provide additional evidence for the incorporation of exercise to improve the usual care of individuals with chronic disease. This will likely improve their clinical status, fitness, function, and quality of life.

Dr Clint Miller has been an Accredited Exercise Physiologist in private practice for over 10 years and has worked predominately with musculoskeletal injury and disease. His research is focussed on the use of clinical exercise for improvements in physical function, performance, body composition, and work productivity in adults with musculoskeletal and cardiometabolic disease. He is interested in the relationship between lifestyle related factors, exercise participation and its influence on measures of physical function and performance with a particular emphasis on ADL's including those related to occupational demands.

Associate Professor Daniel Belavy joined Deakin in July 2014 from the Center of Muscle and Bone Research at the Charité University Medical School in Berlin, Germany. He completed PhD (2007) at The University of Queensland. In 2007 he was awarded a 2-year post-doctoral fellowship from the Alexander von Humboldt Foundation in Germany to continue his work on the topic of bed-rest at the Charité in Berlin and was later head of "spaceflight physiology" within the Center of Muscle and Bone Research. His work in the last 10 years has focused on the impact of bed-rest (spaceflight simulation) and exercise on muscle, bone, neuromuscular function and the interverterbral disc. For his first projects at Deakin, he will be looking at exercise and the spine.

Project is based at: Burwood

Project description
Chronic lower back pain is the most common cause of job-related disability and a leading contributor to absenteeism. The best form of rehabilitation and how it

modifies disc function has not been clearly elucidated. This honours project is part of a larger study investigating the impact of an exercise physiologist led approach versus physiotherapy treatment for low back pain. In this study, patients will be treated for 6 months and adaptations n a series of body systems such as muscle and disc changes (via magnetic resonance imaging scanning), muscle strength, performance and endurance, spine bone density, body composition, and muscle activation will be investigated. Specifically for this honours project, depending on your interests, we will define what aspects of the data you examine.

If you are interested in musculoskeletal rehabilitation in your career, this project will give you additional skills and enable you to distinguish yourself from others in the workforce.

Methodological approach
This study is a six month randomised controlled trial comparing an exercise physiologist led rehabilitation program to traditional physiotherapy treatment. Key outcome measures will be collected using magnetic resonance imaging (MRI) and functional measures of physical performance.

Necessary skills/knowledge
Sound exercise science base, good interpersonal skills.

59. The impact of exercise training and nutritional supplementation on cardiovascular risk in prostate cancer survivors treated with androgen deprivation therapy

Principal supervisor: **Dr. Steve Fraser**
Contact details: **steve.fraser@deakin.edu.au**
    (03) 924 46012

Supervisor's profile
Dr. Steve Fraser is interested in the role of accredited exercise physiologist led exercise programs for individuals with chronic disease such as cancer, diabetes, obesity, and chronic kidney disease. The primary aim of this body of research is to provide additional evidence for the incorporation of exercise to improve the usual care of individuals with chronic disease. This will likely improve their clinical status, fitness, function, and quality of life.

Co-supervisor/s
Professor Robin Daly

Project is based at: Burwood

Project description
In Australia, prostate cancer is the most commonly diagnosed male cancer. Earlier detection and better treatment have resulted in improved cancer survivorship. One of the treatments, androgen deprivation therapy, is now commonly administered for all stages and grades of prostate cancer. It has been estimated that greater than 26,500 Australian men are currently receiving androgen deprivation therapy. Adverse effects of androgen deprivation therapy include negative alterations to musculoskeletal health, cardiometabolic risk (including increased diabetic risk, increased adiposity) and health-related quality of life. Exercise training has been shown to positively affect these adverse effects; however the role of nutritional supplementation in this population remains unknown. This honours project is part of a larger study and will investigate the changes in cardiometabolic risk after a 12 month exercise training and nutritional supplementation intervention.

Methodological approach
This is a randomised controlled trial comprising of an exercise and nutritional supplementation group and a usual care group.
The project will involve:
- Recruitment of men living with prostate cancer treated with androgen deprivation therapy
- Performing fitness assessments and interpreting cardiometabolic risk markers including blood pressure, blood lipids, waist circumference
- Training and/or coordinating the training of participants over a six months
- Data entry and analysis of cardiometaoblic risk markers.

Necessary skills/knowledge
An interest in clinical exercise physiology, chronic disease/cancer, and performance analysis. The ability to work as part of a team; high level of independence and time management. Availability to perform testing and occasional training outside of normal working hours would be desirable but not essential. A strong understanding of Microsoft Excel is an advantage.

60. The impact of exercise training and nutritional supplementation on risk of sarcopenia in prostate cancer survivors treated with androgen deprivation therapy.

Principal supervisor: Dr. Steve Fraser
Contact details: steve.fraser@deakin.edu.au
(03) 924 46012

Supervisor's profile
Dr. Steve Fraser is interested in the role of accredited exercise physiologist led exercise programs for individuals with chronic disease such as cancer, diabetes, obesity, and chronic kidney disease. The primary aim of this body of research is to provide additional evidence for the incorporation of exercise to improve the usual care of individuals with chronic disease. This will likely improve their clinical status, fitness, function, and quality of life.

Co-supervisor
Professor Robin Daly

Project is based at: Burwood

Project description
In Australia, prostate cancer is the most commonly diagnosed male cancer. Earlier detection and better treatment have resulted in improved cancer survivorship. One of the treatments, androgen deprivation therapy, is now commonly administered for all stages and grades of prostate cancer. It has been estimated that greater than 26,500 Australian men are currently receiving androgen deprivation therapy. Adverse effects of androgen deprivation therapy include negative alterations to musculoskeletal health (including accelerated muscle mass loss), cardiometabolic risk and health-related quality of life. Exercise training has been shown to positively affect these adverse effects; however the role of nutritional supplementation in this population remains unknown. This honours project is part of a larger study and will investigate the changes in risk of sarcopenia after a 12 month exercise training and nutritional supplementation intervention.

Methodological approach
This is a randomised controlled trial comprising of an exercise and nutritional supplementation group and a usual care group.
The project will involve:
- Recruitment of men living with prostate cancer treated with androgen deprivation therapy
- Performing fitness assessments and interpreting DXA measures of lean body mass
- Training and/or coordinating the training of participants over a six months
- Data entry and analysis of fitness and functionality outcomes.

Necessary skills/knowledge
An interest in clinical exercise physiology, chronic disease/cancer, and performance analysis. The ability to work as part of a team; high level of independence and time management. Availability to perform testing and occasional training outside of normal working hours would be desirable but not essential. A strong understanding of Microsoft Excel is an advantage.

61. Do mums' tears impact young children's behaviours? Associations between maternal mood and television viewing with young children's television viewing

Principal supervisor: **Dr. Trina Hinkley**
Contact details: **trina.hinkley@deakin.edu.au**
                                 (03)9251 7723

Supervisor's profile
I am a full-time researcher in early childhood physical activity and sedentary behaviours. I have worked and researched in the areas of child public health and epidemiology over the last nine years and am passionate about supporting healthy outcomes in children. My research focuses on physical activity and sedentary behaviours – particularly screen use – during the early childhood period (birth to five years). This includes influences on those behaviours, health outcomes, and identifying and implementing strategies to support healthy levels of those behaviours in our children. I am particularly interested in the influence of physical activity and screen use on children's well-being. Projects I am currently involved with include the HAPPY Study which follows 1000 children from their preschool years into late primary school and Active Minds, Happy Kids, which targets reductions in the use of screens and improvements in well-being and cognitive functioning in preschoolers.

Co-supervisor
Dr. Megan Teychenne

Project is based at: Burwood

Project description
It may help to explain why the topic is important and what outcomes (i.e. skill development or careers) or opportunities there are for the student.
Imagine you have a young child … maybe even two or three. You're struggling to cope with life at times – the demands of parenthood perhaps, trying to keep your relationship on an even keel, fitting work in somewhere, not to mention time for yourself. And you really want to give your kids the best start to life they can possibly have. Sometimes all you want to do is flick on the telly and flop in front of it. You wonder if this is a problem … but you don't really know how it might impact on your kids.

This project aims to investigate maternal mood (risk of depression), maternal television viewing and the impact of those on young children's television viewing. Little is known about the associations between these things and whether or not maternal risk of depression might ultimately influence child television viewing, which has been shown to be detrimental to a number of health and developmental outcomes. Early childhood is a critical time for growth and development and understanding which factors might influence that is crucial for developing programs to support the best start to life possible.

Methodological approach

Recruitment and data collection for this project are complete and therefore this project will involve secondary data analysis. You will be required to undertake quantitative data analysis to answer your research question. It is likely that there will be opportunity to experience some field work on a related project.

Necessary skills/knowledge

This project would suit students interested in young children's health behaviours. You should have excellent communication and interpersonal skills. A large part of this project will involve analysis of data. Basic statistical knowledge or a willingness to learn is important. Statistical training and support will be provided.

62.Highly active and no TV? Or lots of TV and no physical activity? Identifying factors associated with young children's patterns of physical activity and screen time.

Principal supervisor: Dr. Trina Hinkley
Contact details: trina.hinkley@deakin.edu.au
     (03) 9251 7723

Supervisor's profile
I am a full-time researcher in early childhood physical activity and sedentary behaviours. I have worked and researched in the areas of child public health and epidemiology over the last nine years and am passionate about supporting healthy outcomes in children. My research focuses on physical activity and sedentary behaviours – particularly screen use – during the early childhood period (birth to five years). This includes influences on those behaviours, health outcomes, and identifying and implementing strategies to support healthy levels of those behaviours in our children. I am particularly interested in the influence of physical activity and screen use on children's well-being. Projects I am currently involved with include the HAPPY Study which follows 1000 children from their preschool years into late primary school and Active Minds, Happy Kids, which targets reductions in the use of screens and improvements in well-being and cognitive functioning in pre-schoolers.

Co-supervisor
Dr. Kylie Hesketh

Project is based at: Burwood

Project description
It may help to explain why the topic is important and what outcomes (i.e. skill development or careers) or opportunities there are for the student.

Think about when you were a young child … those years before you started school. What memories do you have of what you did then? Running around outside being active? Watching lots of DVDs or TV? Perhaps lots of running around *and* lots of TV?

The preschool period is a critical developmental period when the foundations for health behaviours are established and reinforced. Some children participate in lots of health-enhancing physical activity and little potentially detrimental screen time. Others are not as fortunate. This project will investigate which factors in young children's lives, such as family circumstance and parental influences, might be associated with young children participating in appropriate levels of physical activity and screen time. Identifying these types of factors is crucial for informing programs to support the best start to life possible for our children.

Methodological approach
Recruitment and data collection for this project are complete and therefore this project will involve secondary data analysis. You will be required to undertake quantitative data analysis to answer your research question. It is likely that there will

be opportunity to experience some field work on a related project.

Necessary skills/knowledge
This project would suit students interested in young children's health behaviours. You should have excellent communication and interpersonal skills. A large part of this project will involve analysis of data. Basic statistical knowledge or a willingness to learn is important. Statistical training and support will be provided.

63. Investigating the effects of aerobic exercise on cognition and brain activation in sedentary young and older adults

Principal supervisor: Dr. Wei-Peng Teo
Contact details: weipeng.teo@deakin.edu.au
(03) 9244 5229

Supervisor's profile
I am a neuroscientist and an exercise physiologist with a passion for understanding how the brain changes and adapts itself across the lifespan. In particular, my research interests are to investigate the neurophysiological mechanisms that affect cognition (i.e. memory and mood) and motor function (i.e. fine and gross motor skills) as we age, and the effects that exercise has on brain function. Specifically, my research goals are to identify the most optimal exercise parameters such as exercise mode, frequency, duration and time-of-day that will confer the greatest benefit to brain health and function. My research will be significant for informing best practice in exercise rehabilitation to improve overall health and quality of life in clinical populations with cognitive and motor impairments such as Parkinson's and Alzheimer's disease.

Co-supervisors
Dr. Helen MacPherson
Ashlee Hendy,

Project is based at: Burwood

Project description
Aerobic exercise such as walking, jogging and swimming has been shown to confer a range of health benefits to cardiovascular, respiratory, metabolic, muscle and brain function. In particular, there is now emerging evidence to suggest that long-term aerobic exercise is beneficial for maintaining healthy brain function that will result in a greater preservation of cognitive abilities and mood as we age. In humans, studies using various brain imaging techniques suggest that increased aerobic fitness in healthy older adults is associated with reduced age-related atrophy of the brain and increased activation in regions that support executive function and memory that are most vulnerable to aging. However, it is not known if short-term aerobic exercise can confer cognitive or physiological benefits on a group of sedentary young and older adults. Therefore the aim of this study is to investigate the cognitive and neurophysiological effects of a 2-week aerobic training intervention in healthy sedentary young and older adults. The findings from this study will, for the first time, provide evidence for the benefits of short-term aerobic exercise on cognitive function and brain activation in a young and ageing population.

Methodological approach
We aim to recruit 15 young (age 18-30 years) and 15 older adults (age 60-75 years) to participate in a 2-week aerobic training program. Each participant will attend 3 weekly cardiorespiratory training sessions lasting between 30-45 mins. All participants

will undergo a series of cognitive and neurophysiological tests before and after the training intervention to measure working memory and attention, brain activation and excitability. The cognitive measures include the *Rey Auditory Verbal Learning Test* and *Profile of Mood States*, while neurophysiological measures will include *Near Infrared Spectroscopy* and *Transcranial Magnetic Stimulation* to measure brain activation and excitability respectively.

Necessary skills/knowledge
Basic anatomy and physiology, Motor learning and skill acquisition

64. Investigating the effects of strength training on cognition and brain activation in sedentary young and older adults

Principal supervisor: **Dr. Wei-Peng Teo**
Contact details: **weipeng.teo@deakin.edu.au**
                        (03) 9244 5229

Supervisor's profile

I am a neuroscientist and an exercise physiologist with a passion for understanding how the brain changes and adapts itself across the lifespan. In particular, my research interests are to investigate the neurophysiological mechanisms that affect cognition (i.e. memory and mood) and motor function (i.e. fine and gross motor skills) as we age, and the effects that exercise has on brain function. Specifically, my research goals are to identify the most optimal exercise parameters such as exercise mode, frequency, duration and time-of-day that will confer the greatest benefit to brain health and function. My research will be significant for informing best practice in exercise rehabilitation to improve overall health and quality of life in clinical populations with cognitive and motor impairments such as Parkinson's and Alzheimer's disease.

Co-supervisors
Dr Helen MacPherson
Ashlee Hendy,

Project is based at: Burwood

Project description
Strength training is a popular mode of exercise for improving and maintaining muscle strength and size in young and old people. Although the benefits on strength training on musculoskeletal health have been widely reported, recent evidence suggests that brain adaptations occur even in the absence of any changes in muscle size and strength. There is also further evidence to suggest that strength training can improve measures of balance and gait in clinical populations that have cognitive impairments (i.e. Parkinson's and Alzheimer's disease). Indeed, several randomised control trials have demonstrated that long-term resistance training can improve working memory and attention in healthy ageing individuals and people with mild dementia. However in spite of the increasing evidence for the use of strength training to improve cognitive function, it is still unclear as to how short-term strength training can impact on brain function. Therefore the aim of this project is to investigate the use of a 2-week strength training on cognitive function and brain activation in young and older adults.

Methodological approach
We aim to recruit 15 young (age 18-30 years) and 15 older adults (age 60-75 years) to participate in a 2-week resistance training program of the lower limb. Each participant will attend 3 weekly resistance training sessions lasting between 30-45 mins and will consist of 4 basic lower limb resistance exercises (i.e. Squats, deadlines, lunges and hamstring curls). All participants will undergo a series of cognitive and

neurophysiological tests before and after the training intervention to measure working memory and attention, brain activation and excitability. The cognitive measures include the *Rey Auditory Verbal Learning Test* and *Profile of Mood States*, while neurophysiological measures will include *Near Infrared Spectroscopy* and *Transcranial Magnetic Stimulation* to measure brain activation and excitability respectively.

Necessary skills/knowledge
Basic anatomy and physiology, Motor learning and skill acquisition

65. Monitoring underage supply of alcohol in community sports clubs

Principal supervisor: Dr. Peter Kremer
Contact details: peter.kremer@deakin.edu.au
     (03) 52273396

Supervisor's profile
I am a senior lecturer in sport and exercise behavior with the School of Exercise and Nutrition Sciences based at the Waurn Ponds Campus. I have extensive research experience, broad knowledge and skills in academic and applied sport and exercise psychology, and expert knowledge of both quantitative and qualitative research methods.

Co-supervisor
Associate Professor Paul Gastin

Project is based at: Either at Waurn Ponds or Burwood

Project description
Alcohol consumption by adolescents is a serious problem in Australia, with a national prevalence study finding that 51% of secondary students aged 12-17 years old have consumed alcohol in the past year. This early initiation of alcohol consumption occurs despite the minimum legal purchase age being 18 years of age in Australia, suggesting that policies and practices around access and supply of alcohol to underage consumers need to be strengthened. A significant number of Australians are involved in local sporting clubs, either as participants or spectators, and there is a growing body of evidence suggesting that this is a key environment in which the misuse of alcohol takes place. A recent report shows that nearly 70% of sporting clubs receive sponsorship from alcohol related sources and that for 60% of those clubs the benefit received is through cash payments of >$1000. Clubs reciprocate this sponsorship primarily through visual signage around the club and on the club website. It is suggested that the relationship between alcohol sponsorship and sporting clubs has created an environment that fosters the misuse of alcohol amongst members. Liquor licencing and Responsible Service of Alcohol (RSA) laws are an important environmental structure in sporting clubs that influence alcohol related behaviours. However studies have shown that both training and adherence to RSA laws are often lacklustre in sporting clubs. There is evidence that it is common for youth below the legal age of 18 to be supplied with alcohol in sporting clubs. Therefore community sporting clubs present an important avenue in which to reduce the supply of alcohol to underage youth.

Methodological approach
This study will use a cross-sectional study design whereby alcohol sales monitoring will be conducted in community sporting clubs. Monitoring will be conducted using a randomised selection of (n~30) sporting clubs from across the Geelong, Colac and

Ballarat regions (nb. for Melbourne-based students it should be possible to adjust the survey region to a metropolitan area). Clubs will cover a range of sports but principally be larger sporting club environments having alcohol supply facilities (bar) – these will primarily include cricket clubs, Australian Rules football clubs, soccer clubs and rugby clubs as well as broader sporting clubs (i.e. clubs where multiple sports exist). Alcohol sale monitoring will be conducted using purchase surveys to investigate how easy it is for people under 18 years of age to purchase alcohol in local sporting clubs without the required age identification. This method is based on previously used procedures for alcohol sale monitoring in retail outlets. The alcohol purchase survey involves sending a pseudo-underage purchaser (a young person) into a sporting club to attempt to purchase alcohol.

Necessary skills/knowledge
No necessary skills/knowledge is required for this project. An interest in working within a community sporting club context and around health issues, particularly alcohol consumption, confronting young people would be beneficial.

66. ARE HAIR CORTISOL LEVELS RELATED TO INDIVIDUAL CHARACTERISTICS IN A COHORT OF DISADVANTAGED WOMEN AND CHILDREN?

Principal supervisor: **Dr. Anne Turner**
Contact details: **anne.turner@deakin.edu.au**
    (03) 9244 6950

Supervisor's profile
Dr. Anne Turner is a Senior Lecturer in Human Physiology in the School of Exercise and Nutrition Sciences and a researcher in the Centre for Physical Activity and Nutrition Research (C-PAN). Her research interests are in the physiology and endocrinology of stress and its impact on human health. In particular, she is interested in modifiable lifestyle factors (such as diet and exercise) that influence cortisol, adrenaline, noradrenaline, heart rate and blood pressure responses to psychological stress and the consequences for human health.

Co-supervisors
Professor Kylie Ball
Dr. Dana Olstad

Project is based at: Burwood

Project description
Disadvantaged communities provide adverse psychosocial exposures that have been linked to high levels of stress. Since cortisol is incorporated into hair as it grows, the recently developed technique of measuring cortisol concentrations in samples of hair collected from the scalp allows us to gain an understanding of a person's exposure to cortisol over the preceding 3-month period. This project will consider if concentrations of cortisol in hair are related to individual characteristics in a cohort of disadvantaged women and children. By having a better understanding of factors that are associated with stress, we will be better placed to develop strategies to alleviate stress and improve health outcomes in disadvantaged communities.

Methodological approach
Hair cortisol was measured in 86 women and 29 children (males and females) participating in the Resilience for Eating and Activity Despite Inequality (READI). As part of the READI study, data relating to individual characteristics and to eating and physical activity patterns were collected at baseline (2007/2008) and at 3-year (2010/2011) and 5-year (2012/2013) follow-up. The 5-year (2012/2013) follow-up coincides with the hair cortisol measures. This project will involve re-visiting data that have already been collected to assess if hair cortisol levels are:

- associated with the severity of disadvantage
- different between boys and girls
- different between married and unmarried women
- influenced by level of education
- influenced by level of income
- different between full-time and part-time workers
- different between smokers and non-smokers

This project is part of a larger project which also involves other researchers. The honours student on this project will learn valuable skills in analysis and interpretation of data working with a large data set and will also learn valuable skills in working within a large research team.

Necessary skills/knowledge
This project will suit a student who is well organised and has good communication skills.

67. Do perceived stress levels or a novel objective measure of stress (hair cortisol) predict 3-year weight gain in women and/children?

Principal supervisor: Dr. Anne Turner
Contact details: anne.turner@deakin.edu.au
(03) 9244 6950

Supervisor's profile
Dr. Anne Turner is a Senior Lecturer in Human Physiology in the School of Exercise and Nutrition Sciences and a researcher in the Centre for Physical Activity and Nutrition Research (C-PAN). Her research interests are in the physiology and endocrinology of stress and its impact on human health. In particular, she is interested in modifiable lifestyle factors (such as diet and exercise) that influence cortisol, adrenaline, noradrenaline, heart rate and blood pressure responses to psychological stress and the consequences for human health.

Co-supervisors
Professor Kylie Ball
Dr. Dana Olstad

Project is based at: Burwood

Project description
Disadvantaged communities provide adverse psychosocial exposures that have been linked to high levels of stress, and this may provide one explanatory pathway linking socioeconomic disadvantage to increased prevalence of obesity. We recently conducted a study in which we measured perceived stress and used hair cortisol analysis to objectively quantify associations between stress and body mass index (BMI) in women and children living in socioeconomically disadvantaged neighbourhoods. While we found an association between perceived stress and BMI measured at the time of hair collection, we found no association between hair cortisol levels and BMI. Nevertheless, it remains possible that hair cortisol levels may predict weight gain in women and/or children over the coming years. This project will consider if levels of perceived stress and/or concentrations of cortisol in hair predict weight gain in women and/or children 3/4 years later.

Methodological approach
Perceived stress and hair cortisol levels were measured in 86 women and 29 children (males and females) participating in the Resilience for Eating and Activity Despite Inequality (READI). As part of the READI study, weight, body mass index (BMI) and data relating to eating and physical activity patterns were collected at baseline (2007/2008) and at 3-year (2010/2011) and 5-year (2012/2013) follow-up. The 5-year (2012/2013) follow-up coincides with the hair cortisol measures. This project will involve contacting the women and mothers of the children who provided hair samples for cortisol measurement to undertake another survey of weight, BMI, eating and physical activity patterns to determine if perceived stress levels and/or hair cortisol concentrations predict weight gain after 3/4 additional years.

This project is part of a larger project which also involves other researchers.

Necessary skills/knowledge
This project will suit a student who is well organised and has good communication skills.

68. Is there a genetic basis for differences in the magnitude of the cortisol response to stress?

Principal supervisor: Dr. Anne Turner
Contact details: anne.turner@deakin.edu.au
(03) 9244 6950

Supervisor's profile
Dr. Anne Turner is a Senior Lecturer in Human Physiology in the School of Exercise and Nutrition Sciences and a researcher in the Centre for Physical Activity and Nutrition Research (C-PAN). Her research interests are in the physiology and endocrinology of stress and its impact on human health. In particular, she is interested in modifiable lifestyle factors (such as diet and exercise) that influence cortisol, adrenaline, noradrenaline, heart rate and blood pressure responses to psychological stress and the consequences for human health.

Co-supervisors
Professor Aaron Russell
Dr. Sisitha Jayasinghe

Project is based at: Burwood

Project description
When a person's cortisol responses to psychological stress are excessive, they may be at increased risk of developing cardiovascular disease, type 2 diabetes, depression and anxiety. There are several enzymes that are involved in the production pathway of cortisol. Activity of the CYP17 enzyme can significantly impact the cortisol output from the adrenal gland. Different numbers of copies of the alleles (e.g. 0, 1 or 2) for this enzyme (namely CYP17 ACS- and CYP17 ACS+) can have a significant impact on the 3D structure of CYP17 and its enzymatic activity. In animal models, it has been shown that the aforementioned variations in numbers of copies of these alleles can significantly affect cortisol production from the adrenal gland. However, it is not known if there are such differences in the number of copies of these alleles in human subjects.

The aims of this study are to identify if there are inter individual differences in the number of CYP17 ACS- and CYP17 ACS+ alleles that code for CYP17 and to assess if there is a relationship between the number of alleles and the magnitude of the cortisol response to psychosocial stress in human subjects. We expect to find genetic differences between individuals that are linked to the magnitude of their cortisol response to psychological stress. Such findings will be important for the prevention of stress-related chronic diseases.

Methodological approach
We have conducted a study in which we have measured the plasma cortisol response to psychosocial stress in 43 women aged 30-50 years. Recently, the women were invited back to our laboratory and a single sample of whole blood was collected from each of the participants. All blood samples are currently stored in

freezers in secure lab spaces. In this project, the honours student will undertake laboratory analysis to identify the CYP17 alleles. The student will learn valuable lab skills and will work alongside other researchers in our lab. These data will then be linked to existing cortisol profiles for these women to identify links between genetic differences and the magnitude of the cortisol response to stress.

This project is part of a larger project which also involves other researchers.

Necessary skills/knowledge
This project will suit a student who is well organised and has good communication skills.

69. GLUT4 translocation in skeletal muscle following acute exercise

Principal supervisor: Dr. Chris Shaw
Contact details: chris.shaw@deakin.edu.au
(03) 5227 3394

Supervisor's profile
Dr. Chris Shaw is a Senior Lecturer in the School of Exercise and Nutrition Sciences. His research focuses on the physiological and metabolic adaptations to exercise which underpin improvements in sports performance and the health benefits of exercise. He is particularly interested in how acute and chronic exercise influence fat and glucose metabolism in skeletal muscle.

Co-supervisor
Dr. Kirsten Howlett

Project is based at: Geelong

Project description
Muscle contraction stimulates glucose uptake into skeletal muscle in an intensity dependent manner. This increase in glucose transport is dependent on the translocation of the glucose transporter (GLUT4) from intracellular stores to the surface membrane. In addition, GLUT4 translocation appears to be more responsive to insulin in the hours following exercise which contributes to the improvement in insulin sensitivity. Changes in GLUT4 location and its association with related trafficking proteins may underlie the post-exercise increase in insulin-stimulated glucose uptake.

This project will apply fluorescence imaging techniques on human skeletal muscle biopsies to investigate the translocation of GLUT4 and related proteins following moderate intensity continuous exercise and high intensity interval exercise.

Methodological approach
- Moderate intensity continuous and high intensity interval exercise
- Preparation of human skeletal muscle biopsies
- Immunofluorescence microscopy to assess the location of GLUT4 and related proteins

Necessary skills/knowledge
An interest in the area of exercise physiology, muscle metabolism and/or biochemistry is required. Some experience with human exercise testing and/or analytical laboratory skills are desirable but not essential. All techniques will be taught as part of honours training.

70.Understanding how endogenous glucose production is regulated in response to multiple mixed meals.

Principal supervisor: Dr. Clinton Bruce
Contact details: clinton.bruce@deakin
(03) 924 46684

Supervisor's Profile
Dr. Bruce's research group is focused on understanding the regulation of carbohydrate and lipid metabolism in skeletal muscle and liver. Within this broad area, we have two themes: 1) understanding and defining the mechanisms which contribute to impaired glucose metabolism in obesity, insulin resistance and type 2 diabetes; and 2) examining the role of lipids in regulating skeletal muscle function.

Co-supervisor
Dr. Greg Kowalski

Project is based at: Burwood

Project description
Blood glucose represents an important fuel source for the body. The tight regulation of blood glucose levels is essential for good health. Indeed, when control of glucose metabolism is disrupted, as in diabetes, the risk of complications such as cardiovascular disease increases dramatically. The key organ in controlling blood glucose levels is the liver. Under fasting conditions, glucose levels are maintained by a constant supply from the liver. Following a meal, glucose production by the liver is suppressed while hepatic glucose uptake and disposal are increased. The liver therefore plays a critical role in regulating glucose homeostasis and any impairment in hepatic glucose handling can lead to excessively high glucose levels, emphasising the importance of understanding the regulation of hepatic glucose metabolism in both health and disease. Studies examining the regulation of hepatic glucose production have been limited to examining the response following a single mixed meal. While this has yielded important information, it does not accurately represent what happens throughout the course of day where multiple mixed meals are consumed. Therefore, the aim of this project is to examine what happens to endogenous glucose production in response to multiple mixed meals consumed throughout the course of a day.

Methodological approach
- Recruitment of healthy individuals.
- Mixed meal feeding studies including the addition of a glucose stable isotope to measure endogenous glucose.
- Blood sampling for the measurement of hormones (insulin, glucagon) and substrates (free fatty acids, triglycerides).
- Gas chromatography mass spectrometry for the analysis of the glucose stable isotope in blood samples.

Necessary skills/knowledge

An interest in the area of nutritional physiology, glucose metabolism and/or biochemistry is required. Some experience with human testing and analytical laboratory skills are desirable but not essential. All techniques will be taught as part of honours training.

71. The effects of Selenoprotein S expression on skeletal muscle growth and development.

Principle supervisor: **Dr. Craig Wright**
Contact details: **craig.wright@deakin.edu.au**
03 95247 9266

Supervisor's profile:
Dr. Wright is a lecturer in the School of Exercise and Nutrition Sciences based at the Waurn Ponds Campus. A key focus of his research program is investigating the molecular mechanisms regulating skeletal muscle growth in exercise and disease.

Co-supervisor
Dr. Nicole Stupka

Project is based at: Geelong (Waurn Ponds). There may be some travel to Burwood required.

Project description
Excess inflammation and cellular stress are hallmarks of chronic muscle wasting diseases, including Duchenne Muscular Dystrophy (DMD), and lead to compromised repair and poor muscle contractile function. However, acute inflammation is required for effective muscle growth and development and supressing inflammation leads to impaired muscle function. Selenoprotein S (SEPS1) is an antioxidant protein that is protective against inflammation, oxidative and ER stress, and although SEPS1 is highly expressed in skeletal muscle, little is known about its function in skeletal muscle. Here we propose to add to this data and investigate the role of SEPS1 in skeletal muscle growth and development using *in vitro* cell culture techniques.

Methodological approach
Using a widely studies *in vivo* skeletal muscle cell line we will manipulate the level of Selenoprotein S expression, to assess the effects of SEPS1 on muscle growth. Following experimentation, cells will be harvested for gene and protein analysis. Microscopy techniques will be utilised for structural analysis.

Necessary skills/knowledge
Course work in exercise physiology, biochemistry and/or molecular biology would be advantageous. All laboratory techniques will be taught to the student as part of the honours training.

72. The Effects of Resistance Exercise Training in Intermittent Hypoxia on Immune Function.

Principal supervisor: **Dr. Craig Wright**
Contact details: **craig.wright@deakin.edu.au**
                          03 95247 9266

Co-supervisor
Aaron Silk

Supervisors profiles
Dr. Wright is a lecturer in the School of Exercise and Nutrition Sciences based at the Waurn Ponds Campus. A key focus of his research program is investigating the molecular mechanisms regulating skeletal muscle growth in exercise and disease. He has a particular interest on exercise immunology and its link to muscle growth and development.

Aaron's research area is within the physically demanding occupation space, with a recent focus on strength and conditioning and load monitoring in these contexts. Through conduct of a three-year field-based research project delivering new physical performance standards for military personnel and three years leading the Fit for Duty research stream within the Occupational Exercise Science Group (including 18 months in a research officer position) Aaron brings with him vast experience engaging with, and delivering high-quality outcomes for industry (including partners such as Australian Defence Force, SES, Victoria Police, Bunnings, and Banyule City Council) and conducting applied research in the field.

Project is based at: Geelong (Waurn Ponds). There may be some travel to Burwood required.

Project description
While chronic endurance training is linked to increased illness in athletes, it is yet to be established if resistance exercise also leads to the same susceptibility. What little evidence there is, suggests that resistance training has a less pronounced effect on the immune system (Koch et al). Similarly, intermitted exposure to normobaric hypoxia appears to have beneficial adaptations to immune function where intermittent exposure <60minutes for 7-14 days at ~10% oxygen, augments humoral and cellular components of innate immunity. Therefore it is interesting that the immune response to resistance exercise in intermittent hypoxia has not been well established.

Methodological approach
This project will involve the recruitment, training, and testing of recreationally healthy participants during the performance of an 8-week resistance training program in either normobaric hypoxia or normobaric normoxia to assess acute and chronic immune function responses. Specifically, the student will quantify blood markers of immune function.

Necessary skills/knowledge
Course work in exercise physiology and exercise prescription would be advantageous. All laboratory techniques will be taught to the student as part of the honours training.

73. The Effects of Resistance Exercise Training in Intermittent Hypoxia on Muscle Hypertrophy and Performance. NOTE this project is no longer available

Principal supervisor: **Dr. Craig Wright**
Contact details: **craig.wright@deakin.edu.au**
03 95247 9266

Co-supervisor
Aaron Silk

Supervisors profiles
Dr. Wright is a lecturer in the School of Exercise and Nutrition Sciences based at the Waurn Ponds Campus. A key focus of his research program is investigating the molecular mechanisms regulating skeletal muscle growth in exercise and disease. He has a particular interest on exercise immunology and its link to muscle growth and development.

Aaron's research area is within the physically demanding occupation space, with a recent focus on strength and conditioning and load monitoring in these contexts. Through conduct of a three-year field-based research project delivering new physical performance standards for military personnel and three years leading the Fit for Duty research stream within the Occupational Exercise Science Group (including 18 months in a research officer position) Aaron brings with him vast experience engaging with, and delivering high-quality outcomes for industry (including partners such as Australian Defence Force, SES, Victoria Police, Bunnings, and Banyule City Council) and conducting applied research in the field.

Project is based at: Geelong (Waurn Ponds). There may be some travel to Burwood required.

Project description
While it is generally well established that to train for muscle hypertrophy certain acute training variables (i.e. intensity, repetitions, sets, rest) should be prescribed. In recent years, alternate training methods utilising a variety of loads (some as low as 20% 1RM) while applying restriction to the blood flow to the exercising muscles have been investigated. The effectiveness of these methods has been explained by the build-up of metabolic by-products which create an internal environment favourable for muscle hypertrophy. Researchers have suggested that the factor responsible for this effect is the lower level of available oxygen to the working muscles. Therefore, this project aims to investigate the acute and chronic effects of intermittent whole-body normobaric hypoxia on markers of muscle hypertrophy and performance.

Methodological approach
This project will involve the recruitment, training, and testing of recreationally healthy participants during the performance of an 8-week resistance training program in either normobaric hypoxia or normobaric normoxia, to assess muscle hypertrophy and performance.

Necessary skills/knowledge
Course work in exercise physiology and exercise prescription would be advantageous.
All laboratory techniques will be taught to the student as part of the honours training.

74. How are mitochondria synthesised following endurance exercise?

Principal supervisor: **Dr. Glenn Wadley**
Contact details: **glenn.wadley@deakin.edu.au**
     (03) 92446018

Supervisor's profile

Dr. Wadley is a senior lecturer in the School of Exercise and Nutrition Sciences. A key focus of his research program is investigating the molecular mechanisms regulating skeletal and cardiac muscle adaptations following exercise. These topics have important implications for the treatment and prevention of Type 2 diabetes and cardiovascular disease. His current research projects utilize a range of approaches from human exercise trials down to animal and cell culture experiments to investigate these areas. Some of Dr. Wadley's projects are currently funded by the National Health and Medical Research Council (NHMRC) of Australia, Deakin University and he has received substantial funding from the Heart Foundation. Most of his previous Honours students have been successful in obtaining entry to competitive postgraduate programs including PhD, Medicine and Master of Dietetics.

Co-supervisor

Professor Aaron Russell

Project is based at: Burwood

Project description

Some of the major health benefits of endurance training are increased mitochondrial content (synthesis), antioxidant defences and insulin sensitivity and reduced oxidative stress in skeletal muscle. microRNA are small non-coding ribosomal nucleic acid (RNA) molecules that are expressed in skeletal muscle and are involved in regulating these adaptive responses of muscle to endurance training. Furthermore, we have shown that the expression levels of many microRNA's are increased following exercise in skeletal muscle of humans. There is now evidence in cell culture that microRNA move (translocate) from the cytosol of the cell to the mitochondria to help stimulate mitochondrial synthesis. Therefore, studies are now required to examine if microRNA's translocate to the mitochondria in human skeletal muscle following endurance exercise. Healthy active participants will be recruited and first complete a VO2max test. On a separate day they will complete a bout of endurance exercise with muscle biopsies taken before and after exercise. The nuclear, cytosolic and mitochondria fractions of the muscle will be isolated and the microRNA levels measured. Thus, this project will provide important insights into the mechanisms that stimulate muscle to adapt to endurance exercise training. The skills students would develop from this Honours project are ideally suited to students wishing to pursue postgraduate study in biomedical or exercise physiology research (such as a PhD) or even medicine.

Methodological approach

Exercise screening and VO2max testing of healthy volunteers. Laboratory techniques include protein extraction, real-time PCR analysis, western blotting and enzymatic assays. All these techniques will be taught as part of the honours training.

Necessary skills/knowledge

Course work in exercise physiology/metabolism is required. Coursework in biochemistry and/or molecular biology is an advantage but not necessary. All laboratory techniques will be taught to the student as part of the honours training.

75. Understanding the fate and metabolism of an omega-3 fatty acid named docosapentaenoic acid at a molecular level.

Principal supervisor: **Dr. Gunveen Kaur**
Contact details: **Gunveen.Kaur@deakin.edu.au**
(03) 92468288

Supervisor's profile
Dr. Gunveen Kaur is a Lecturer in Nutritional Sciences at the School of Exercise and Nutrition Sciences, Deakin University. Gunveen obtained her PhD in 'Nutrition and Molecular Biology' and her research mainly focuses on fatty acid and lipid metabolism. Gunveen is interested in investigating relationship between nutrition and impairments in muscle metabolism, and how these relate to lifestyle diseases such as obesity and type 2 diabetes. She is particularly interested in a long chain polyunsaturated fatty acid known as Docosapentaenoic acid (DPA), its metabolism and health effects.

Co-supervisor
Dr. Clinton Bruce
Project is based at: Burwood

Project description
Docosapentaenoic acid (DPA) is a long chain n-3 polyunsaturated fatty acid found in our diet through fish and lean red meat. Recent studies have shown that DPA is an important bioactive fatty acid that improves lipid metabolism and reduces inflammation in various cell culture and animal models. Previous animal studies have shown that after DPA supplementation, DPA accumulates in tissues such as adipose, liver, muscle and heart. However unlike other two well-known omega-3 fatty acids (EPA and DHA), little is known about how DPA supplementation influences the lipid profile and glucose metabolism in tissues. This study will therefore aim to investigate how DPA influences the lipid profile of tissues and to examine potential mechanisms responsible for effects on cellular lipid content as well as investigate its effects on glucose metabolism. This will provide important fundamental information required to understand mechanisms for the beneficial health effects of DPA. This project will provide the student with knowledge in lipid metabolism, skills in animal experimentation in the field of nutrition and lipid metabolism, scientific writing and a possible publication.

Methodological approach
Undertaking this project will involve animal (in vivo) experiments. Our group routinely uses advanced physiological, biochemical (metabolomics/lipidomics/flux analysis) and molecular biology techniques that involve metabolite, protein, RNA and DNA analysis.

Necessary skills/knowledge
An interest in the area of nutritional physiology, glucose and lipid metabolism and/or biochemistry is required. Some experience with human testing and analytical laboratory skills are desirable but not essential. All techniques will be taught as part of honours training.

76. Effect of Electrical Pulse Stimulation (EPS) on human muscle cell growth

Principal supervisor: **Dr. Paul Della Gatta**
Contact details: **pauldg@deakin.edu.au**
    (03) 924 46527

Supervisor's profile
Dr. Della Gatta is a Project Manager in the School of Exercise and Nutrition Science. His research is focused on understanding the molecular factors regulating skeletal muscle growth, regeneration and function. Since finishing his PhD in 2011, Dr. Della Gatta has worked on numerous projects within the school with roles including the coordination of a number of clinical and exercise trials, development of human skeletal muscle cells lines, experimental conception, design and troubleshooting, various molecular analyses of biological and tissue samples, protocol development and the co-supervision of 1 PhD student and 2 honours students.

Co-supervisor
Professor Aaron Russell

Project is based at: Burwood

Project description
Exercise elicits stimuli to promote positive skeletal muscle adaptations and is seen as one of the most potent interventions to maintain whole body health and maintain healthy muscle mass. However, our knowledge of how exercise promotes muscle growth is limited. One of the major limitations that has hampered our understanding of exercise-induced muscle growth is the absence of a suitable *in vitro* experimental model that mimics exercise. While correlative changes in molecular factors can be measured in human muscle after exercise, it is not possible to establish their precise roles in muscle health. The invasive nature of the muscle biopsy technique limits sampling opportunities. Also, the muscle biopsy itself may inadvertently be contaminated with blood and other cell types that reside within skeletal muscle tissue and may give rise to false positive observations. Growing human skeletal muscle cells in culture allows better control of experimental design and thus provides more valuable and accurate insights into skeletal muscle growth, regeneration, metabolism and atrophy. In recent years, several international research groups have adopted the use of electrical pulse stimulation (EPS) to contract rodent skeletal muscle cells in culture and thus developed the ability to simulate an exercise-like *in vitro* model. However, this work has limitations, as it was completed using rodent muscle cells and these cells may not be representing the responses that occur in human skeletal muscle tissue. Therefore, the aim of this project is to establish the effect of EPS on the growth and hypertrophy of human skeletal muscle cells in culture and establish the molecular mechanisms by which muscle contraction may induce muscle growth.

Methodological approach

Human skeletal muscle cells will be grown, differentiated and subjected to different electrical pulse stimulation protocols. Following experimentation, cells will be harvested for gene and protein analysis (using polymerase chain reaction and western blotting, respectively). Immunocytochemistry will also be performed to visualise the development of structural and contractile proteins and to measure cell size.

Necessary skills/knowledge

An understanding and interest in muscle physiology and function is desired. Laboratory skills will be taught during the year.

77. Understanding protein remodelling during differentiation of human muscle cells

Principal supervisors: **Dr. Severine Lamon and Dr. Victoria Foletta**
Contact details: **severine.lamon@deakin.edu.au**
victoria.foletta@deakin.edu.au
(03) 9244 6527

Supervisors profiles
Severine and Victoria are both post-doctoral research fellows in the Centre for Physical Activity and Nutrition Research (C-PAN) within the School of Exercise and Nutrition Sciences. Our focus of interest is the understanding of the molecular factors that regulate skeletal muscle structure, development and metabolism in response to exercise, ageing and disease. To achieve this goal, our research group uses human, animal and cell culture models.

Co-supervisor
Dr. Greg Kowalski

Project is based at: Burwood

Project description
Cultured skeletal muscle cells are a common model used to investigate human muscle development. We are interested in the interplay of protein synthesis and protein degradation processes during muscle cell remodelling that occurs with muscle cell development (proliferation and differentiation) in both young and old individuals. We have recently developed a unique stable isotope tracer method based on deuterated water incorporation, which allows us to study the synthesis rates of proteins in cells, tissues and organisms in unprecedented detail. We will also use a cell-based assay to measure ubiquitin proteasomal activity, a process involving specific type of protein degradation. Both protein synthesis rates and ubiquitin proteasomal activities will be measured concurrently during myogenesis of cultured muscle cells from young and aged individuals. This project will characterise and establish key, fundamental remodelling events skeletal muscle cells undergo during their development, and establish if differences are apparent in young versus aged human muscle cells in culture.

Methodological approach
Human muscle cells will be grown and differentiated using our established tissue culture methods. Deuterated water will be used to label and follow the newly synthetised molecules in the cells. This process will be monitored using gas chromatography-mass spectrometry technology (GC-MS). Protein degradation will be investigated using a Proteasome-Glo cell-based assay, which measures three markers of proteasomal activity.

Necessary skills/knowledge
Knowledge or interest in molecular and muscle biology and in basic statistics. Lab skills will be taught during the year.

78. Skeletal muscle adaptations in response to exercise training

Principal supervisor: Dr. Kirsten Howlett
Contact details: kirsten.howlett@deakin.edu.au
(03) 5227 2563

Supervisor's profile
Dr. Kirsten Howlett is a Senior Lecturer in the School of Exercise and Nutrition Sciences. Her research program is focused on understanding the physiological and metabolic responses to exercise with the aim of providing insight into the role of exercise in the maintenance of good health, and prevention and treatment of disease.

Co-supervisor
Dr. Chris Shaw

Project is based at: Waurn Ponds

Project description
Exercise training results in skeletal muscle adaptations that can improve physiological and metabolic processes. In skeletal muscle, the extracellular matrix (ECM) is known to provide structural support, although recent research highlights that remodelling of the ECM in skeletal muscle may be an important adaptation following exercise training that influences metabolic and physiological functions. Both endurance and resistance exercise training can influence collagen turnover, but less is known about the training effects on other components of the ECM. The aim of this study will be to determine whether components of the ECM and associated enzymes are altered in skeletal muscle from trained and untrained humans.

Methodological approach
- Recruitment and testing of endurance trained and untrained individuals
- Maximum aerobic capacity determined by incremental workload test
- Skeletal muscle biopsy sampling
- Analysis of gene and protein expression

Necessary skills/knowledge
An interest in the area of exercise physiology, muscle metabolism and/or biochemistry is required. Some experience with human exercise testing and analytical laboratory skills are desirable but not essential. All techniques and skills will be taught as part of honours training.

79. How does physical activity in childhood improve the adult heart?

Principal supervisor: Dr. Glenn Wadley
Contact details: glenn.wadley@deakin.edu.au
(03) 92446018

Supervisor's profile

Dr. Wadley is a senior lecturer in the School of Exercise and Nutrition Sciences. A key focus of his research program is investigating the molecular mechanisms regulating skeletal and cardiac muscle adaptations following exercise. Most relevant to this project is his research exploring the early life environment, particularly the impact of exercise and nutrition during postnatal and juvenile development on later adult health. These topics have important implications for the treatment and prevention of Type 2 diabetes and cardiovascular disease. Some of Dr Wadley's projects are currently funded by the National Health and Medical Research Council (NHMRC) of Australia, Deakin University and he has received substantial funding from the Heart Foundation. Most of his previous Honours students have been successful in obtaining entry to competitive postgraduate programs including PhD, Medicine and Master of Dietetics.

Co-supervisor

Prof Aaron Russell

Project is based at: Burwood

Project description

We have found in rats that a few weeks of regular exercise during juvenile development (i.e. before adolescence), results in bigger hearts in adulthood. This is despite them being sedentary for their entire adult lives and long after the training effects should have worn off. It is possible one of the molecular mechanisms to explain these surprising findings could be due to exercise altering microRNA (miRNAs) levels during cardiac development. MiRNA's are small noncoding ribonucleic acids (RNAs) that are known to function by inhibiting protein translation or enhance messenger RNA degradation. Therefore, the aim of this project is to examine if mimicking the effect of endurance exercise by altering the miRNA expression of hearts will lead to bigger (and possibly healthier) hearts in these rats. The skills students would develop from this Honours project are ideally suited to students wishing to pursue postgraduate study in nutrition, biomedical or exercise physiology research (such as a PhD) or even medicine.

Methodological approach

Laboratory techniques including animal handling, protein extraction, RNA extraction, real-time PCR analysis, western blotting and enzymatic assays. It is not expected students have these skills prior to Honours and all these techniques will be taught as part of the honours training.

Necessary skills/knowledge
Course work in one of the following is required: exercise physiology/metabolism, biochemistry, molecular biology or nutrition. All laboratory techniques will be taught to the student as part of the honours training.

80. How does eating junk food in pregnancy lead to the early onset of obesity in the offspring?

Principle supervisor: **Dr. Stéphanie Bayol**
Contact details: **stephanie.bayol@deakin.edu.au**
(03) 92446524

Supervisor's profile
Dr. Stéphanie Bayol is a molecular physiologist in the School of Exercise and Nutrition Sciences at Deakin University. Her main research interest is to examine how maternal nutrition during pregnancy and lactation influences offspring development, growth and health into adult life. This is done at the cell and molecular levels using animal models of maternal obesity. Her research has made important contributions to understanding how maternal nutrition initiates obesity and related disorders in offspring.
Dr. Bayol holds French and British qualifications in Biomedical Sciences, Biochemistry, Cell and Molecular Biology and Molecular Physiology.

Co-supervisor
Dr. Glenn Wadley

Project is based at: Burwood

Project description
Growing evidence indicates that overeating when pregnant and breastfeeding promotes obesity and associated disorders, such as type 2 diabetes, in the offspring. However, the cell and molecular mechanisms by which this is mediated are largely unknown. Establishing such mechanisms are crucial for the development of targeted interventions to prevent obesity from the early stages of life.
We have developed a rat model to study the effects of maternal overeating on the offspring. With this model, we have shown that offspring born to obese mothers develop an exacerbated preference for junk food. This leads to the early onset of obesity. The current project seeks to further establish the mechanisms by which maternal obesity affects the development of the offspring and leads to the early onset of metabolic disease after birth. This will be carried out using a range of cell, molecular and physiological measurements.

Methodological approach
Pregnant and lactating rats are fed either a lean control diet or a cafeteria "junk food" diet. After weaning, some of their offspring are given a lean diet and others a cafeteria diet to induce obesity by the end of adolescence. Tissue samples are collected at birth, weaning and the end of adolescence to measure any changes in gene expression and metabolism that explain why they develop metabolic diseases.

Necessary skills/knowledge
A background in nutrition and/or exercise physiology are required. Students will be fully trained in the cell and molecular biology techniques required to complete the project.

81. Project title: The physiology of Blood Flow Restriction Exercise #2

Principle supervisor: **Dr. Stuart Warmington**
Contact details: **stuart.warmington@deakin.edu.au**
                                (03) 9251 7013

Supervisor's profile
My research focus is to better understand and apply exercise to benefit muscle health. The principal direction in this respect is to understand the mechanisms governing a blood flow restriction exercise (BFRE) as a model, and to develop this exercise method to improve muscle health and functional outcomes in populations where loss of muscle is highly prevalent. To this effect my research group has been working on a variety of projects from acute assessments of haemodynamic stress in both young and older adults as well as training studies to identify the effects of BFRE on muscle growth, strength and fatigue.

Co-supervisor
Dr. Timo Rantalainen

Project is based at: Burwood

Project description
It's been shown that when low-load resistance exercise is performed under blood flow restriction (BFR), that the gains in muscle size and strength are similar to the gains achieved with high-resistance strength straining. This novel outcome is in contrast to the fact that the greatest gains in such indicators of muscle health are most commonly thought to be achieved only with high-resistance strength training. Given BFR exercise utilises only low-resistance, it may provide a substantial benefit to clinical groups where strength training proves beneficial, but where high-resistance strength training is not recommended due to the implied clinical risk.
However, BFR exercise, or KAATSU, has been little used outside Japan, and this project will build on current work in our lab that is proving BFR to be a revolution in training athletes, special populations and the community.
Therefore, this project will aim to examine the physiological responses to BFR training (possibly with a clinical focus), always with a view to more widespread prescription of this type of training in the community.

Methodological approach
This project will involve recruitment and testing of healthy volunteers, and possibly clinical participants, to examine the physiological responses to BFR exercise or training. This will be done by examining controlled exercise under a variety of BFR conditions. Factors that may be assessed include metabolic and cardiac responses, oxygen consumption, HR, blood pressure, blood lactate and respiratory parameters, and importantly muscle strength and hypertrophy.

Necessary skills/knowledge
This project would suit students interested in exercise physiology, clinical exercise, exercise performance assessment and strength and conditioning. The student should be enthusiastic towards exercise prescription and monitoring, as well as exercise as

a clinical treatment. Testing procedures and data collection will utilise non-invasive techniques such as an advance metabolic cart to assess oxygen consumption and cardiac parameters, as well as blood pressure and typical risk factors associated with exercise.

65A Project title: The feasibility of a resistance training intervention for improving physical activity, physical fitness and self-efficacy in adolescent girls

Principal supervisor: Dr Helen Brown
Contact details: hbrown@deakin.edu.au
(03)92446327

Supervisor's profile
Dr Brown is a lecturer in Sport Coaching and Physical Activity in the School of Exercise and Nutrition Sciences. She is also a researcher in the Centre for Physical Activity and Nutrition research (C-PAN). Her research focuses on sport participation and coaching and she has a particular interest in motivations and barriers for sport participation among females.

Co-supervisors
Dr Megan Teychenne / Prof Jo Salmon

Project is based at: Burwood

Project description
Traditional school models of 'fitness' and sport are largely centred on skill acquisition across a range of disciplines, participation in organised school sports events and the development of cardiovascular fitness. Despite some specialised programs, there is little evidence of young female students being exposed to complex or concurrent resistance training modalities in school, or with suitably qualified supervision. Revised NSCA guidelines support the implementation of early age (10-16 years) resistance and plyometric interventions for girls. This project therefore aims to develop, implement and assess a program designed specifically for adolescent girls.

Methodological approach
This project will involve the implementation of a 10 week intervention using a pre-post test design to assess feasibility of a program specifically designed for adolescent girls. It will involve:

- Pre and post-intervention baseline data of participants undertaking:
    - Illinois agility test
    - 505 and modified 505 test
    - L-test
    - 20 meter straight line sprint
    - Actual lifting capacity across a range of complex resistance movements
- Improvements and changes in:
    - Self-efficacy and self-confidence/self-esteem
    - Perceived motor competence
    - Enjoyment of participation in training sessions and subsequent participation in other sports

Necessary skills/knowledge
This project will suit a student who is well organised and has good communication skills. A good understanding of Excel would be an advantage.

School of Exercise and Nutrition Sciences
2016 HONOURS PROJECT PREFERENCE FORM

Name: _____   Deakin student ID: _____

Address: _____ P/C _____

Mobile: _____   Home: _____

Email: _____   Date: _____

Applicants are advised that allocation to research projects is a competitive process and an applicant cannot be assured of being assigned to their choice of research projects.

Please nominate below up to four preferences, in order of preference, for honours in 2016:

1st preference - Project no: _____ Supervisor: _____

Project title: _____

It is strongly encouraged that you speak to the supervisor of your first preference

Have you personally spoken with the supervisor about the project? (please circle)   Yes   No

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2nd preference - Project no: _____ Supervisor: _____

Project title: _____

Have you personally spoken with the supervisor about the project? (please circle)   Yes   No

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3rd preference - Project no: _____ Supervisor: _____

Project title: _____

Have you personally spoken with the supervisor about the project? (please circle)   Yes   No

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4th preference - Project no: _____ Supervisor: _____

Project title: _____

Have you personally spoken with the supervisor about the project? (please circle)   Yes   No

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If you are NOT offered one of the above projects would you consider an offer of an honours project in a related area? (please circle)   Yes   No

Please list any other projects you may consider if you are not offered your top 4:

_____

_____

Please return this form to Tin Partington, tin.partington@deakin.edu.au at the School of Exercise and Nutrition Sciences (S1.01; phone: 9244 5032) by 13 November 2015 or fax to 9244 6017 for timely applications. Late applications will be considered depending on availability of appropriate supervisors, projects and places up until 27 November 2015.