



THE UNIVERSITY
of ADELAIDE

UNDERGRADUATE RESEARCH CONFERENCE

adelaide.edu.au

The University of Adelaide

Undergraduate Research Conference

ua.edu.au/urc

Table of Contents	Page
Program	1
Poster Presentations	3
Keynotes	4
Map	5
Abstract Summary List	6
Full Abstracts	8

Program

Time	Mins			
8:30am	30	Registration opens (Inggarni Wardli Atrium)		
9:00am	10	Welcome and Opening Remarks (Conference Room 715, level 7, Inggarni Wardli) Professor Philippa Levy, Pro Vice-Chancellor (Student Learning)		
9:10am	40	<p>Joint Student Keynotes (Conference Room 715, level 7, Inggarni Wardli)</p> <p>Myths & misconceptions: how research will save our money and our lives Joel Driver, Student, Faculty of Sciences</p> <p>Building Bridges and Breaking Stereotypes in Academic Research Tiana Blazevic, Student, Faculty of Arts</p>		
9.50am	10	Move to Parallel Sessions		
		Room 5.56 level 5, Inggarni Wardli	Room 5.57 level 5, Inggarni Wardli	Room 5.58 level 5, Inggarni Wardli
10.00am	20	<p>Dying to Have a Say: Freedom of Speech in Roman Wills Emily Chambers, School of Humanities Faculty of Arts</p>	<p>The Defence of Marital Coercion: Relevant or 'Ridiculous Relic'? Azaara Perakath, Adelaide Law School, Faculty of the Professions</p>	<p>Quantisation Error in Digital Spiking Neural Networks. Lachlan Bateman, School of Electrical and Electronic Engineering, Faculty of ECMS</p>
10.20am	20	<p>Safe Haven and/or Prison: The Complicated Legacy of the Loveday Internment Camp in South Australia Jennifer Ngo, School of Humanities, Faculty of Arts</p>	<p>Do the existing defences of duress and necessity properly recognise the common event of battered wives committing crimes such as social security fraud or theft or prostitution at the behest of their abusive partner? Rebecca Slimming, Adelaide Law School, Faculty of the Professions</p>	<p>Spiking Neural Networks for the Control of Robotic Systems Matthew Astachnowicz, School of Electrical and Electronic Engineering, Faculty of ECMS</p>
10.40am	20	<p>Remote Aboriginal Community Well-Being and South Australia's Driving and Licensing Offences. Appurya Raaj, School of Arts, Faculty of Arts</p>	<p>Outer Space, National Security and Private Rockets; Where is the Line? Joel Lisk, Adelaide Law School, Faculty of the Professions</p>	<p>What People of Reproductive Age Know about Male and Female Fertility: Development and Validation of the Male and Female Fertility Knowledge Inventories Aleksandra Olekalns, School of Psychology, Faculty of Health and Medical Sciences</p>
11.00am	20	Morning Tea (Inggarni Wardli Atrium)		
11.20am	20	<p>The formation of science policy: western and Indigenous interpretations of environmental risk assessments. Jenny Nguyen, School of Social Sciences, Faculty of Arts</p>	<p>Novel Flexible Materials for Wearable Antennas Donald Zhang, School of Electrical and Electronic Engineering, Faculty of ECMS</p>	<p>Metformin attenuates the postprandial fall in blood pressure and slows gastric emptying in type 2 diabetes Malcolm Borg, School of Medicine, Faculty of Health and Medical Sciences</p>

11.40pm	20	<p>Cultural perspectives of Death and Dying in Chinese people: A qualitative study for cultural competency</p> <p>Gregory Low Wei Lang, School of Psychology, Faculty of Health and Medical Sciences</p>	<p>Burr Distribution Approximation for Maritime Surveillance Radar</p> <p>Charlie Tran, School of Electrical and Electronic Engineering, Faculty of ECMS</p>	<p>The prevalence and impact of pancreatic enzyme deficiency in type 2 diabetes</p> <p>Michael Riceman, School of Medicine, Faculty of Health and Medical Sciences</p>
12.00pm	20	<p>Agency and paradiplomacy: The case of Oregon's relations with divided China in the 1980s</p> <p>Natalie Omond, School of Social Sciences, Faculty of Arts</p>	<p>Application of detrital zircon U-Pb geochronology: A study of the Mesoproterozoic Bullita Group, Birrindudu Basin, Northern Australia.</p> <p>Darwinaji Subarkah, School of Physical Sciences, Faculty of Sciences</p>	<p>Diagnostic definition of cerebral palsy in genetic association studies: a systematic literature review</p> <p>Ryan Pham, School of Public Health, Faculty of Health and Medical Sciences</p>
12.20pm	50	Lunch and Poster Presentations (Ingkarni Wardli Atrium)		
1.10pm	20	<p>The aftermath of lack of trust in Ghana</p> <p>Julia Puellbeck, School of Economics, Faculty of the Professions</p>	<p>Calibrating New Isotopic and Morphological Tools for Palaeoecological Forest Reconstructions</p> <p>Heather Duff, School of Physical Sciences, Faculty of Sciences</p>	<p>How do psychologists think chronic pain can be managed using online resources?</p> <p>Kate McKinlay, School of Psychology, Faculty of Health and Medical Sciences</p>
1.30pm	20	<p>Securing the Administrative Appeals Tribunal's Independence: Tenure and Mechanisms of Appointment</p> <p>James Morgan, Adelaide Law School, Faculty of the Professions</p>	<p>The Spatial and Temporal Interactions of Leopards and Mesopredators at Loskop Dam Nature Reserve, South Africa</p> <p>Max Peters, School of Animal and Veterinary Sciences, Faculty of Sciences</p>	<p>Modafinil and Mirtazapine for Management of Amphetamine Withdrawal</p> <p>Caitlin Sweet, School of Medicine, Faculty of Health and Medical Sciences</p>
1.50pm	20	<p>Litigation Funds in Improving Access to Justice and Increasing Corporate Accountability</p> <p>Tim Porter, Adelaide Law School, Faculty of the Professions</p>	<p>Does maternal feed restriction cause changes to progeny IGF-I plasma concentration and hepatic IGF-I mRNA expression in poultry?</p> <p>Joshua Angove, School of Animal and Veterinary Sciences, Faculty of Sciences</p>	<p>Timing and Outcomes of Angiography in NSTEMI Patients in the CADOSA Registry</p> <p>Ella Obst, School of Medicine, Faculty of Health and Medical Sciences</p>
2.10pm	10	Move to Guest Speaker & Refreshments		
2.20pm	45	<p>Joint Academic Keynotes (Conference Room 715, level 7, Ingkarni Wardli)</p> <p>Breaking the Barriers to a Twenty-First Century Education</p> <p>Dr Gareth Pritchard, Lecturer, School of History, Faculty of Arts</p> <p>Science Needs the Humanities</p> <p>Professor Sean Connell, School of Ecology and Environmental Sciences, Faculty of Science</p>	<p>Judges' Deliberations (Judges only) Room 5.57, level 5, Ingkarni Wardli</p>	
3.05pm	10	<p>Closing Address, Announcement of Prize Winners (Conference Room 715, Level 7, Ingkarni Wardli)</p> <p>Professor Philippa Levy, Pro Vice-Chancellor (Student Learning)</p>		
3.15pm	45	Networking and Refreshments		
4.00pm	-	Conference Concludes		

Poster Presentations

Please vote for your favourite poster by filling in the voting cards (supplied on the day during lunch) and placing them in the blue voting post-box on the registration desk.

Time	Min	Inggkarni Wardli Atrium
12.20	50	A qualitative study of urban chicken owners' perceptions of chickens and chicken meat Luke Macauley, School of Psychology, Faculty of Health and Medical Sciences
12.20	50	Ancient eclogite in the Usagaran Belt, Tanzania: Pressure-Temperature constraints and implications for subduction geodynamics Dillon Brown, School of Physical Sciences, Faculty of Sciences
12.20	50	Australian rules football players' experiences of hamstring injury Simon Pearson, School of Psychology, Faculty of Health and Medical Sciences
12.20	50	Comparative effects of proximal and distal small intestinal administration of metformin on plasma glucose and GLP-1, and gastric emptying after oral glucose in type 2 diabetes Malcolm Borg, School of Medicine Faculty of Health and Medical Sciences
12.20	50	Cortical network connectivity and cognition Diana Bol, School of Psychiatry, Faculty of Health and Medical Sciences
12.20	50	Cultural perspectives of death and dying in Chinese people: a qualitative study for cultural competency Gregory Low Wei Liang, School of Psychology, Faculty of Health and Medical Sciences
12.20	50	Decomposition of Radiata Pine Needle Litter and its Effects on Combustion Xiaopeng Bi, School of Mechanical Engineering, Faculty of Engineering, Computer and Mathematical Sciences
12.20	50	Does canopy management influence berry and wine quality? Jacob Long, School of Agriculture, Food and Wine, Faculty of Sciences
12.20	50	Does neonatal exposure to different ruminal microbiota influence the establishment of the ciliated protozoa population in the rumen and subsequent wool growth in sheep? Bianca Agenbag, School of Animal and Veterinary sciences, Faculty of Sciences
12.20	50	Keeping the peace: preserving harmonious relationships between eco-tourists and villagers in Vietnam's northern mountainous region Spencer Platten, School of Social Sciences, Faculty of Arts
12.20	50	Multiple anchors and the MOLE: benefits for elicitation Marianne Clausen, School of Psychology, Faculty of Health and Medical Sciences
12.20	50	Postmodern thought and individual experience: an interpretative phenomenological analysis Natasha Van Antwerpen, School of Psychology, Faculty of Health and Medical Sciences
12.20	50	Rapid and quantitative detection of palladium in solid sample using microwave assisted laser-induced breakdown spectroscopy Ahlam Al Shuaili, School of Chemical Engineering, Faculty of Engineering, Computer and Mathematical Sciences
12.20	50	Rectal stump management after emergency total colectomy for severe acute ulcerative colitis Sergei Bedrikovetski, School of Medicine, Faculty of Health and Medical Sciences
12.20	50	The formation of science policy: western and indigenous interpretations of environmental risk assessments Jenny Nguyen, School of Social Sciences, Faculty of Arts
12.20	50	The identification of the predominant microorganism responsible for causing nectarine (prunus persica) spoilage Katelyn Heinrich, School of Agriculture, Food & Wine, Faculty of Science
12.20	50	The relationship between diabetes mellitus and cognitive function in community-dwelling men Lian Qing Huynh, School of Medicine, Faculty of Health and Medical Sciences
12.20	50	The role of biological nitrogen fixation on legume plants associated with bacteria Jihye Yun, School of Agriculture food and wine, Faculty of Sciences
12.20	50	Understanding cultural background and wellbeing for culturally and linguistically diverse children with refugee or migrant backgrounds Aerlie McGuire, School of Psychology, Faculty of Health and Medical Sciences
12.20	50	Watch and learn: identifying optimal conditions for learning Brittany Child, School of Psychology, Faculty of Health and Medical Sciences

Keynotes

Joel Driver, Student, Faculty of Sciences

Joel Driver is a recent graduate from the University of Adelaide's Bachelor of Science (Advanced) program, with majors in Ecology and Evolutionary Biology. While studying his degree, Joel has been involved in independent and collaborative research projects both within the University and externally. Joel has co-authored a report for the Department of Environment, Water and Natural Resources (DEWNR) investigating the effects of fire on arthropod communities and has worked under DEWNR to develop educational resources on the ant fauna of the Adelaide and Mount Lofty Ranges region for use by teachers in South Australian schools. Joel completed a Summer Research Scholarship in December 2016, studying the impacts of grazing on semi-arid rangeland invertebrate communities. He presented his research at the University of Adelaide's 2017 Beacon Conference of Undergraduate Research where he was awarded Best Individual Oral Presentation in the Faculty of Sciences and sponsored to present at the Australasian Conference of Undergraduate Research.



Recently, Joel has been employed at Elevate Education delivering seminars in secondary schools on study and personal achievement strategies and continues to work at the University of Adelaide in the Learning Enhancement and Innovation unit as well as at Teach For Australia as a brand ambassador.

Tiana Blazevic, Student, Faculty of Arts

Tiana Blazevic has recently completed a Bachelor of Advanced Arts with a double major in Classics and History. She is currently in her honours year in Classics. Tiana was not initially accepted into the University of Adelaide because she did not obtain a high enough ATAR. However, after two years of completing an Advanced Diploma in Event Management she was accepted into a BA. By the end of Tiana's first year she was able to transfer into the Advanced Arts Program due to her successful academic results. She has now won a total of six awards in Classics over her three-year degree. Being a classicist, some of Tiana's research revolves mostly around the ancient world: ancient religions, superstitious practices, magic, witchcraft and mythology. The latest research she produced was a cross-disciplinary research project for her final year in her BA Advanced. The project analysed how the Roman classical literature on witchcraft opened up electrifying possibilities for the figure of the witch in French Demonology. However, as she is also a Tour Guide at the Old Adelaide Gaol her other research interest concern exploring South Australia's darker colonial history, specifically women and crime. In 2017 she won Best Oral Presentation at the Australasian Undergraduate Research Conference for her internship report: 'Separate the Whore from the Pure': Assisted Female Immigration and Crime in South Australia, 1854-1859. Tiana's goal is to undertake both a Masters in Philosophy and a Ph.d which will enable her to have a career in both research and teaching.



Dr Gareth Pritchard, School of History, Faculty of Arts

Gareth Pritchard is a graduate of the University of Wales, where he studied History and Russian. After teaching at the University of Glamorgan and Swansea University in the UK, he moved to the University of Canterbury in New Zealand in 2004. In 2011 he migrated across the Tasman to take up a position in the Department of History at the University of Adelaide. He is the author of three books on the history of Europe in the 1940s and 1950s: *The Making of the GDR* (Manchester University Press, 2004), *Niemandland: A History of Unoccupied Germany* (Cambridge University Press, 2012), and – with Vesna Drapac – *Resistance and Collaboration in Hitler's Empire* (Palgrave Macmillan, 2017). Gareth mainly teaches modern European history, with a little medieval and global history on the side. He is also the convenor of the Arts Advanced program in the Bachelor of Arts. As a teacher, Gareth is trying to develop student-centred approaches in which students and staff work together in collaborative research projects.



Professor Sean Connell, School of Ecology and Environmental Sciences, Faculty of Science

Sean Connell is a rebel who constantly reflects on ways to escape intellectual straight-jackets. Despite publishing more than 170 scientific papers and a leading textbook (*Marine Ecology*, Oxford University Press), he is dissatisfied with the way science behaves as researchers and teachers. Looking for solutions, he has created international projects with minds far more thoughtful minds than his.

His current projects seek to bridge the science – humanities gap to change the way scientists write papers and the way scientists message the public. He caused relief in the young, and resistance by the old, to the idea that science-writing is taught to be cryptic, convoluted, ambiguous and a chore to produce. And therefore, readers face bloated publications that are dull, impenetrable and a chore to read.
<https://doi.org/10.1016/j.tree.2017.06.011>



His latest side-project is about optimism. How do we empower people facing persistent news about climate change and environmental destruction? Optimism provides more certainty in challenging times, whereas pessimism dis-empowers. Too many people live a life of learned helplessness, lack of self-respect, pessimism and low emotional resilience. With psychologists from Boston, he is working on how science as researchers and teachers can improve its environmental messaging for both environmental health and our mental-health.

Sean is a finalist in this year's South Australia's Excellence in Research Collaboration Award for leading an optimistic project; biggest marine restoration outside the USA. He is a leading thinker in ocean climate (the ecology of ocean acidification in complex systems) – which he calls his "bread and butter" research (Google Scholar h-index = 56).

Map



▼ Ingkarni Wardli

- 715 Conference room: level 7
- Presentation rooms 5.56 / 5.57 / 5.58: level 5
- Atrium: Ground level

Abstract Summary List

Author(s)	Title	Page
Agenbag, Bianca School of Animal and Veterinary sciences Faculty of Sciences	Does neonatal exposure to different ruminal microbiota influence the establishment of the ciliated protozoa population in the rumen and subsequent wool growth in sheep?	
Al Shuaili, Ahlam School of Chemical Engineering Faculty of Engineering, Computer and Mathematical Sciences	Rapid and Quantitative Detection of Palladium in Solid Sample Using Microwave Assisted Laser-Induced Breakdown Spectroscopy	
Angove, Joshua School of Animal and Veterinary Sciences Faculty of Sciences	Does Maternal Feed Restriction Influence Progeny IGF-1 mRNA Gene Expression and Plasma Concentration in Poultry?	
Astachnowicz, Matthew School of Electrical and Electronic Engineering Faculty of Engineering, Computer and Mathematical Sciences	Spiking Neural Networks for the Control of Robotic Systems	
Bateman, Lachlan School of Electrical and Electronic Engineering Faculty of Engineering, Computer and Mathematical Sciences	Quantisation Error in Digital Spiking Neural Networks	
Bedrikovetski, Sergei School of Medicine Faculty of Health and Medical Sciences	Rectal stump management after emergency total colectomy for severe acute ulcerative colitis	
Bi, Xiaopeng School of Mechanical Engineering Faculty of Engineering, Computer and Mathematical Sciences	Decomposition of Radiata Pine Needle Litter and its Effects on Combustion	
Bol, Diana School of Psychiatry Faculty of Health and Medical Sciences	Cortical network connectivity and cognition	
Borg, Malcolm School of Medicine Faculty of Health and Medical Sciences	Metformin attenuates the postprandial fall in blood pressure and slows gastric emptying in type 2 diabetes	
Borg, Malcolm School of Medicine Faculty of Health and Medical Sciences	Comparative effects of proximal and distal small intestinal administration of metformin on plasma glucose and GLP-1, and gastric emptying after oral glucose in type 2 diabetes	
Brown, Dillon School of Physical Sciences Faculty of Sciences	Ancient eclogite in the Usagaran Belt, Tanzania: Pressure-Temperature constraints and implications for subduction geodynamics	
Chambers, Emily School of Humanities Faculty of Arts	Dying to Have a Say: Freedom of Speech in Roman Wills	
Child, Brittany School of Psychology Faculty of Health and Medical Sciences	Watch and learn: Identifying optimal conditions for learning	
Clausen, Marianne School of Psychology Faculty of Health and Medical Sciences	Multiple anchors and the MOLE: benefits for elicitation	
Dong Zhang, Donald School of Electrical and Electronic Engineering Faculty of Engineering, Computer and Mathematical Sciences	Novel Flexible Materials for Wearable Antennas	

Duff, Heather School of Physical Sciences Faculty of Sciences	Calibrating New Isotopic and Morphological Tools for Palaeoecological Forest Reconstructions	
Heinrich, Katelyn School of Agriculture, Food & Wine Faculty of Sciences	The Identification of the Predominant Microorganism Responsible for Causing Nectarine (Prunus Persica) Spoilage	
Lisk, Joel Adelaide Law School Faculty of the Professions	Outer Space, National Security and Private Rockets: Where is the Line?	
Long, Jacob School of Agriculture, Food and Wine Faculty of Sciences	Does canopy management influence berry and wine quality?	
Low Wei Liang, Gregory School of Psychology Faculty of Health and Medical Sciences	Cultural perspectives of Death and Dying in Chinese people: A qualitative study for cultural competency	
Macauley, Luke School of Psychology Faculty of Health and Medical Sciences	A Qualitative Study of Urban Chicken Owners' Perceptions of Chickens and Chicken Meat	
McGuire, Aerie School of Psychology Faculty of Health and Medical Sciences	Understanding Cultural Background and Wellbeing for Culturally and Linguistically Diverse Children With Refugee or Migrant Backgrounds	
McKinlay, Kate School of Psychology Faculty of Health and Medical Sciences	Use of online resources for pain management: Psychologists' perspectives	
Morgan, James Adelaide Law School Faculty of the Professions	Securing the Administrative Appeals Tribunal's Independence: Tenure and Mechanisms of Appointment	
Ngo, Jennifer School of Humanities Faculty of Arts	Safe Haven and/or Prison: The Complicated Legacy of the Loveday Internment Camp in South Australia	
Nguyen, Jenny School of Social Sciences Faculty of Arts	The formation of science policy: western and Indigenous interpretations of environmental risk assessments	
Obst, Ella School of Medicine Faculty of Health and Medical Sciences	Timing and Outcomes of Angiography in NSTEMI Patients in the CADOSA Registry	
Olekalns, Aleksandr School of Psychology Faculty of Health and Medical Sciences	What people of reproductive age know about male and female fertility: development and validation of the Male and Female Fertility Knowledge Measures	
Omond, Natalie School of Social Sciences Faculty of Arts	Agency and paradiplomacy: The case of Oregon's relations with divided China in the 1980s	
Pearson, Simon School of Psychology Faculty of Health and Medical Sciences	Australian Rules Football Players' Experiences of Hamstring Injury	
Perakath, Azaara Adelaide Law School Faculty of the Professions	The Defence of Marital Coercion: Relevant or 'Ridiculous Relic'?	
Peters, Max School of Animal and Veterinary Sciences Faculty of Sciences	The Spatial and Temporal Interactions of Leopards and Mesopredators at Loskop Dam Nature Reserve, South Africa	
Pham, Ryan School of Public Health	Diagnostic definition of cerebral palsy in genetic association studies: a systematic literature review	

Faculty of Health and Medical Sciences		
Platten, Spencer School of Social Sciences Faculty of Arts	Keeping the Peace: Preserving Harmonious Relationships Between Eco-tourists and Villagers in Vietnam's Northern Mountainous Region	
Porter, Tim Adelaide Law School Faculty of the Professions	Litigation Funds in Improving Access to Justice and Increasing Corporate Accountability	
Puellbeck, Julia School of Economics Faculty of the Professions	The aftermath of lack of trust in Ghana	
Qing Huynh, Lian School of Medicine Faculty of Health and Medical Sciences	The relationship between diabetes mellitus and cognitive function in community-dwelling men	
Raaj, Appurya School of Social Sciences Faculty of Arts	Remote Aboriginal Community Well-Being and South Australia's Driving and Licensing Offences	
Riceman, Michael School of Medicine Faculty of Health and Medical Sciences	The prevalence and impact of pancreatic enzyme deficiency in type 2 diabetes	
Slimming, Rebecca Adelaide Law School Faculty of the Professions	Do the existing defences of duress and necessity properly recognise the common event of domestic violence victims committing crimes such as social security fraud or theft or prostitution at the behest of their abusive partner?	
Subarkah, Darwinaji School of Physical Sciences Faculty of Sciences	Application of detrital zircon U-Pb geochronology: A study of the Mesoproterozoic Bullita Group, Birrindudu Basin, Northern Australia	
Sweet, Caitlin School of Medicine Faculty of Health and Medical Sciences	Modafinil and Mirtazapine for Management of Amphetamine Withdrawal	
Tran, Charlie School of Electrical and Electronic Engineering Faculty of Engineering, Computer and Mathematical Sciences	Improving Maritime Radar Models with the Burr Distribution	
Van Antwerpen, Natasha School of Psychology Faculty of Health and Medical Sciences	Postmodern thought and individual experience: An interpretative phenomenological analysis	
Yun, Jihye School of Agriculture Food and Wine, Faculty of Sciences	The role of biological nitrogen fixation on legume plants associated with bacteria	

Full Abstracts

Does neonatal exposure to different ruminal microbiota influence the establishment of the ciliated protozoa population in the rumen and subsequent wool growth in sheep?

Agenbag, Bianca, School of Animal and Veterinary sciences, Faculty of Sciences

Abstract

Purpose/rationale:

There is strong evidence in monogastric animals that the intestinal microbes play a critical role in the development (Richard, et al. 2005) and function of the immune system (Stokes, 2017), gut/brain communication (Cryan, et al. 2011; Lamb, et al. 2017), and the development of obesity (Turnbaugh, et al. 2008). Less is known, however, of the development and role of the gut microbiota in ruminant animals. Ruminants are essentially born with a sterile rumen, there are no bacteria, fungi or ciliated protozoa present. The neonatal rumen becomes established by maternal and natural inoculation at approximately 3 to 4 weeks of age. Therefore, to my projects interest there is a window of opportunity before the rumen is fully developed to expose the off-spring to microbiota that is different to that of the dams'.

Research question/focus:

My honours project will be quantifying the ciliated protozoa within the rumen using image analysis. Wool growth will also be used as an indirect measure of ciliate populations. There are study-specific questions that will further add to the current knowledge:

- Does rumen inoculation alter ciliate numbers?
- Does this influence wool growth?
- Is there a difference between natural inoculation vs artificial inoculation?
- Will inoculating with different microbiota change the anatomy or fermentation patterns of the young animal? Will it be conducive or detrimental?

Research Methodology:

New born lambs are inoculated via syringe with rumen fluid collected from cannulated ewes that have been fed either a high roughage (Inoculum source 1) or high grain diet (Inoculum source 2). A 16 S R RNA sequence was done to prove that feeding ewes different diets created different bacterial populations and therefore we are essentially inoculating these lambs with microbiota completely different compared to what they would receive from the dam. The inoculation period continues for 7 days after birth and the lambs remain with the ewe the entire time.

References:

- Richard, J.D., Gong, J. and de Lange, C.F.M. 2005. The gastrointestinal microbiota and its role in monogastric nutrition and health with an emphasis on pigs: current understating, possible modulation, and new technologies for ecological studies. Canadian journal of animal science.
- Stokes, C.R. 2017. The development and role of microbial-host interactions in gut mucosal immune development. Journal of Animal Science and Biotechnology.
- Cryan, J.F., O'Mahony, S. 2011. The microbiome: gut to brain axis: from bowel to behaviour. Neurogastroenterology and motility. Pages 187 to 192.
- Lamb, G.V. and Green, J.R. 2017. The gut microbiome and the brain: review article. Current allergy and clinical immunology. Volume 30.
- Turnbaugh, P.J., Bäckhed, F., Fulton, L., Gordon, J.I. 2008. Diet-induced obesity is linked to marked but reversible alterations in the mouse distal gut microbiome. Cell host & microbe. Pages 213 to 223.

Rapid and Quantitative Detection of Palladium in Solid Sample Using Microwave Assisted Laser-Induced Breakdown Spectroscopy

Al Shuaili, Ahlam, School of Chemical Engineering, Faculty of Engineering, Computer and Mathematical Sciences

Co-Presenter: Al-Hadhrani, Ahlam, School of Chemical Engineering, Faculty of Engineering, Computer and Mathematical Sciences

Abstract

Microwave-assisted laser-induced breakdown spectroscopy was demonstrated for palladium detection in solid sample at ambient conditions. The microwave radiation was introduced by a near-field applicator to couple the microwave radiation with the plasma. 75-folds enhancement in palladium's signal with 56-folds improvement in the limit of detection were achieved. A limit of detection of lower than 50ppm was achieved with a laser energy 75-folds lower than the literature. The optimum experimental parameters were investigated for palladium detection for both LIBS and M W-LIBS. A maximum intensity lines at the wavelength of 346.46 nm was observed. An increase in signal to noise ratio was achieved with the increase in microwave power due to the increase in plasma life time. MW-LIBS at ambient condition was found to be promising technique for palladium detection in solid sample.

Does Maternal Feed Restriction Influence Progeny IGF-I mRNA Gene Expression and Plasma Concentration in Poultry?

Angove, Joshua, School of Animal and Veterinary Sciences, Faculty of Sciences

Abstract

Commercial chicken meat birds spend 40% of their life in the egg, meaning developmental programming has enormous potential to grow the industry. Breeder birds experience severe feed restriction, improving their reproductive capabilities, however, prolonged hunger leads to chronic stress. Maternal body weight (BW), controlled by feed restriction severity, influences day 42 male progeny BW. Stress hormones can influence endocrine pathways involved in growth and metabolism and maternal stress during egg development may influence developmental programming mechanisms, impacting progeny growth through hormonal disruptions. This study assessed whether maternal BW influences progeny insulin-like growth factor I liver gene expression and blood plasma concentrations. It is hypothesised that heavy hen progeny will exhibit greater IGF-1 gene expression and blood plasma concentrations. Breeder hens (n = 36) were separated into three groups based on maternal BW (high, medium, low) and fed accordingly to maintain their BW. Eggs were collected from breeders and 180 viable chicks hatched with progeny reared under identical conditions until 42 days of age, where 23 birds per treatment were euthanised. Gene expression levels of IGF-I and other related genes were recorded along with plasma IGF-I concentrations. Maternal low BW (ML) hen progeny exhibited greater IGF-I gene expression compared to maternal high BW (MH) hen progeny (P = 0.020). ML progeny tended to have greater IGF-I receptor (IGF-IR) gene expression (P = 0.097). No variation was identified in other target genes, and there was no difference in progeny plasma IGF-I concentrations (P = 0.697). The study findings suggest IGF-I may not be the primary contributing factor to male progeny body weight variation. Additionally future research is required to investigate key developmental time points influenced by the maternal environment, which effect progeny performance, and to identify hormonal variations associated with avian metabolism and growth that are contributing to differences in progeny growth.

Spiking Neural Networks for the Control of Robotic Systems

Astachnowicz, Matthew, School of Electrical and Electronic Engineering, Faculty of Engineering, Computer and Mathematical Sciences

Co-presenters: Makarowsky, Alexander, School of Electrical and Electronic Engineering, Faculty of Engineering, Computer and Mathematical Sciences, Lachlan Bateman, School of Electrical and Electronic Engineering, Faculty of Engineering, Computer and Mathematical Sciences, Elson, Paul, School of Electrical and Electronic Engineering, Faculty of Engineering, Computer and Mathematical Sciences

Abstract

Purpose/Rationale:

Artificial neural networks (ANNs) are biologically-inspired computing devices that model the brains of animals. ANNs are capable of abstract learning behaviours and are effective for solving tasks such as image classification and decision making. Spiking neural networks (SNNs) are the third generation of ANNs and are more biologically realistic than previous models. Spiking neurons communicate through precisely-timed voltage spikes, which more closely match the signalling observed in biological brains. Theoretical results have demonstrated that SNNs can solve problems with fewer neurons than required by previous generations of ANNs. As the processing and timing requirements of conventional ANNs often limit their use in practical robotics applications, the smaller size of SNNs offers considerable potential for a variety of robotics tasks.

Research Question/Focus:

In this work, we aim to demonstrate that a small SNN can be used to control the position of a motor and compare its performance with conventional techniques used in the industry, using a quantitative measure of control performance. Motor control is a fundamental element of many robotics applications and hence this research allows us to assess whether SNNs are capable of replacing these conventional methods.

Research Methodology/Approach:

To generate SNNs that can perform these tasks, we have used biologically-inspired optimisation procedures known as evolutionary algorithms (EAs). A composite metric for measuring motor responses is used to quantitatively compare the performance of SNN controllers against the performance obtainable from classical control approaches.

Preliminary results suggest that SNNs are capable of providing control responses that are similar to classical control techniques. The results align with recently published literature concerning SNN motor control and demonstrate the viability of using EAs to configure SNNs for robotic control applications.

Quantisation Error in Digital Spiking Neural Networks

Bateman, Lachlan, School of Electrical and Electronic Engineering, Faculty of Engineering, Computer and Mathematical Sciences

Abstract

Purpose and Focus:

Spiking Neural Networks (SNNs) are a biologically inspired computing model where information is represented in the precise timing of voltage spikes -- similar to the way information is processed by the brain. Theoretical results have suggested that SNNs have the potential to be powerful and adaptable computing devices, and this has stimulated recent interest to use them for speech recognition and other robot tasks. However, when we attempt to implement SNNs directly in software or on custom digital hardware, the times at which spikes can occur are constrained to multiples of the time step used for numeric computations. Given it is the timing of spikes which bears the information in this computing paradigm, constraining when spikes can occur to a discrete grid introduces a source of error in computations. The aim of this research is to quantify this error in simulation and investigate its implications.

Methodology:

The precision of any computational system is fundamentally limited by the precision of its data representation -- hence to investigate the precision of digital SNNs, we are interested in the precision of the voltage spike data representation and how it varies with the time-step employed. This is quantified in simulation by measuring the round-trip reconstruction error for a series of test signals (numerical data). Each test signal is converted to a voltage spike representation, then we attempt to reconstruct the original signal and measure the discrepancy/error. It is shown that this error tends to decrease as the time-step decreases, but for commonly employed time-steps the error is significant.

Significance:

The implication of this result, from a hardware perspective, is that circuit speed imposes a practical limit on the achievable precision in computations performed by SNNs -- i.e. to perform computations precisely, they must also be performed fast. This is an interesting coupling which is not exhibited by traditional computing paradigms, where in fact, one of speed or precision is generally traded for the other. This raises questions on the suitability of discrete time computing platforms for the implementation SNNs and illustrates a notable challenge which needs to be overcome before they can see widespread engineering applications.

Rectal stump management after emergency total colectomy for severe acute ulcerative colitis

Bedrikovetski, Sergei, School of Medicine, Faculty of Health and Medical Sciences

Abstract

Purpose/Rationale:

The preferred management of the transected rectal stump after emergency total colectomy for acute severe ulcerative colitis has evolved from operations used in the 19th century to those performed today. Contemporary management poses modern challenges ranging from efforts to improve perioperative morbidity and mortality rates to preservation of function and patient centred care. Current management controversies can be categorized into Medical and Surgical:

- Medical: once the bulk of diseased colon is removed, the role topical medical treatment of the rectal stump using enemas and suppositories is unclear. Given the stump is effectively defunctioned, is there any role for further medical treatment?
- Surgical: Should the rectal stump be left in situ in the pelvis, or brought out to the skin as a mucous fistula / stoma?

Each management approach has its own range of likely complications. An intraperitoneal closure often results in a high chance of pelvic sepsis and a high mortality rate compared to a subcutaneous closure or the creation of a mucous fistula. Exteriorisation of the rectal stump however, can lead to high rates of wound infection. There is no consensus between surgeons and gastroenterologists on which form of management is best for a patient with acute severe colitis and the subgroup of acute severe ulcerative colitis.

Research Question/Focus:

Determine which short term or long term management, surgical, medical therapy or both are most suited for the treatment of the rectal stump after emergency colectomy for patients suffering from acute severe ulcerative colitis.

Research Methodology/Approach:

A retrospective cohort study (1993-2018) was performed using the Operating Room Management Information System (ORMIS) and Royal Adelaide Hospital (RAH) inflammatory bowel disease (IBD) databases to identify children and adult patients undergoing (sub) total colectomy with a primary diagnosis acute severe colitis. Baseline demographics, perioperative clinical and surgical variables, incidence of pelvic sepsis, wound infection, overall postoperative complications, mortality and management outcomes were recorded from the medical records. Qualitative data was analysed using an unpaired two sample t-test a K-S test was employed to test for normality of the data. Categorical or binary data was tested using Chi-squared or a Fisher's exact test.

Findings

Rectal stump exteriorization with the addition of enemas was found to be the best form of management with low rate of pelvic sepsis and mortality.

Cortical network connectivity and cognition

Bol, Diana, School of Psychiatry, Faculty of Health and Medical Sciences

Abstract

Purpose/Rationale:

Cortical network connectivity is a key component of cognition, with strong connectivity, particularly between frontal and parietal brain regions, positively associated with several higher cognitive functions. Various studies have investigated this relationship within healthy controls and individuals with neurodegenerative and psychiatric disorders. While these studies provide important insights into the neural processes involved in normal and impaired cognition, they are limited in using standalone neuroimaging techniques that only assess correlations in neural activity between remote brain regions. Combining neuro-stimulation and neuroimaging techniques, such as transcranial magnetic stimulation (TMS) and electroencephalography (EEG), has made it possible to measure how activation of a targeted cortical area propagates to the rest of the brain.

Research Question/Focus:

In this study we paired EEG with TMS to investigate the relationship between cortical network connectivity and cognition in healthy young adults.

Research Methodology/Approach:

Twenty participants (aged 18-27) were assessed through a battery of cognitive tests from the Cambridge Neuropsychological Test Automated Battery (CANTAB), including tests of working memory, attention, and planning. EEG was recorded both at rest (eyes closed and open; 3 minutes each) and during TMS (80 pulses) applied to the left and right prefrontal cortex. The findings provide preliminary evidence supporting the use of TMS-EEG as a tool to measure cortical network connectivity and its role in cognition. Further understanding of the neural mechanisms of normal cognition may have implications for early detection and treatment of disorders associated with cognitive impairment, such as psychiatric mood disorders.

Metformin attenuates the postprandial fall in blood pressure and slows gastric emptying in type 2 diabetes

Borg, Malcolm, School of Medicine, Faculty of Health and Medical Sciences

Abstract

Purpose/Rationale

There is evidence that metformin, the first-line drug treatment for type 2 diabetes (T2DM), has cardioprotective effects in T2DM independent of improvements in blood glucose control. It is now recognised that exposure of the small intestine to nutrients and the concomitant increase in blood flow to the gastrointestinal tract may be associated with a reduction in blood pressure (BP) and, in some cases, postprandial hypotension (a fall in systolic BP of ≥ 20 mmHg within 2 hours of a meal). The latter occurs frequently in T2DM, and is associated with falls, stroke and increased mortality.

There is increasing evidence that slowing of gastric emptying protects against the hypotensive response to meals. Metformin has been shown to slow gastric emptying in animal studies. This has not been shown previously in humans, although suboptimal techniques have been used. We therefore evaluated the acute effects of metformin on BP, heart rate (HR) and gastric emptying following oral glucose in people with T2DM.

Research Question/Focus

The current study was designed to evaluate the hypothesis that metformin attenuates the hypotensive response to oral glucose in T2DM, in association with delayed gastric emptying.

Research Methodology/Approach

10 diet-controlled T2DM patients were studied on two occasions in a double-blind, randomised, crossover design. Participants received either metformin 1g, or saline, via an intraduodenal catheter, 60 minutes before ingesting a 50g glucose drink labelled with ^{13}C -acetate (a radioisotope used to evaluate gastric emptying by breath test). BP, HR and gastric emptying were evaluated over 3 hours.

Results/Conclusion

Metformin attenuated the fall in systolic BP and slowed gastric emptying without any effect on diastolic BP and HR, compared with control. These effects may contribute to the favourable cardiovascular profile of metformin and provide a novel therapeutic approach to postprandial hypotension.

Comparative effects of proximal and distal small intestinal administration of metformin on plasma glucose and GLP-1, and gastric emptying after oral glucose in type 2 diabetes

Borg, Malcolm, School of Medicine, Faculty of Health and Medical Sciences

Abstract

Purpose/Rationale:

Both glucagon-like peptide-1 (GLP-1), released primarily from the ileum and colon after meals, and the rate of gastric emptying, are important in postprandial glucose regulation. GLP-1 lowers blood glucose, in part by slowing gastric emptying, and its secretion is enhanced by metformin, the first-line drug therapy for type 2 diabetes (T2DM). We hypothesised that application of metformin to the distal, as opposed to the proximal, gut may therefore enhance GLP-1 secretion and the therapeutic effect of metformin.

Research Question/Focus:

This proof of concept study aimed to determine whether administration of metformin into the "distal" (190cm distal to pylorus), compared with the "proximal" gut (13cm distal to pylorus), would enhance the glucose-lowering effect of metformin in T2DM, in association with augmented GLP-1 secretion and slower gastric emptying.

Research Methodology/Approach:

10 diet-controlled T2DM were studied on three occasions in a double-blind randomised cross-over fashion. On each day, subjects received one of three treatments via a transnasal multi-lumen catheter positioned in the small intestine: (i) proximal + distal saline (control), (ii) proximal metformin (1000mg) + distal saline, or (iii) proximal saline + distal metformin (1000mg), followed after 60 minutes by ingesting a 50g glucose drink labelled with ^{13}C -acetate (a radioisotope used to evaluate gastric emptying by breath test). Blood samples, for measurement of plasma glucose and GLP-1 were collected prior to and following the oral glucose at frequent intervals for 4 hours. Breath samples were also collected to evaluate gastric emptying.

Results/Conclusion:

The glucose-lowering effects of proximal and distal metformin were significant, relative to control, and comparable. Proximal metformin augmented GLP-1 secretion and slowed gastric emptying, while distal metformin was associated with numerically, but insignificantly, greater GLP-1 secretion and slower gastric emptying than control. These observations suggest that the site of gastrointestinal administration is not critical to the glucose-lowering capacity of metformin.

Ancient eclogite in the Usagaran Belt, Tanzania: Pressure-Temperature constraints and implications for subduction geodynamics

Brown, Dillon, School of Physical Sciences, Faculty of Sciences

Abstract

Subduction consumes the Earth's oceanic crust and is the primary geodynamic expression of the Earth. When and how did subduction-driven plate tectonics begin on Earth? These questions are controversial, and still unresolved. Eclogites are metamorphic rocks that form at high pressures and low to medium temperatures, typically in subduction regimes. The interrogation of mineral assemblages that preserve evidence of having reached eclogite-facies conditions thus provide insight into the geodynamics and thermal state of subduction regimes. One of the first appearances of such assemblages in the geological record is documented in the Palaeoproterozoic Usagaran Belt in central Tanzania, where ca. 2 Ga relic eclogite-facies assemblages are preserved. Given the antiquity of the Usagaran eclogitic assemblages, they offer an exceptional framework in assessing the geodynamic expression of plate tectonics in the early Earth. Mineralogical features within the Usagaran relic eclogites are consistent with metamorphism to high-pressures. Mineral equilibria forward modelling using the thermodynamic calculation program, THERMOCALC, coupled with compositional zonation in garnet, indicates that these rocks reached minimum pressures of 20-21 kbar. The peak temperature for these rocks was constrained at 700-750 °C, using elemental concentrations in the metamorphic mineral rutile. The subsequent exhumation history is characterised by a near-isothermal trajectory and a pressure decrease to 5-7 kbar, consistent with a rapid retrograde evolution. These results support a geodynamic expression of ancient subduction that is comparable to the modern Earth. Thus, the emergence of modern-style subduction can be constrained to the Palaeoproterozoic.

Dying to Have a Say: Freedom of Speech in Roman Wills

Chambers, Emily, School of Humanities, Faculty of Arts

Abstract

Purpose/Rationale:

The foundation of the Roman Empire confirmed the erosion of political privileges for the masses, particularly that of free speech. Given our current experiences of a political environment whose increasing volatility leads to moves towards censorship (such as the use of the term 'fake news' to discredit anti-Trump journalism), it is pertinent to reflect upon this period of Empire, and how people found ways to express politically dissident views despite the threat of retribution - even death.

Research Focus:

With overt acts of free speech seemingly impossible, Romans found new ways to express their opinions about the emperor. The last will and testament of a Roman was one such outlet of subversive speech. In Roman culture, the will was popularly held to reflect the testator's true character, with one writer going so far as to claim that Romans "only [told] the truth once in their lives, in their will" (Luc. Nigr. 30).

Research Methodology/Approach:

Surprisingly then, little has been written on outspokenness in Roman wills; what scholarly material exists only deals with the topic of free speech incidentally. My honours thesis began to fill this gap. I undertook a close reading of several case studies under emperors of the first dynasty, and I demonstrated the variety of subversive speech acts used against the emperor in Roman wills. I also contextualised these examples within the broader culture of will-writing, which shows the various means (omission, disinheritance, and abuse) by which the Roman testator could pass negative judgement in their will.

My investigation determined that the will was not, however, invulnerable to censorship. I discovered a correlation between an emperor's reputation for seizing inheritances from wills, and an increase in self-censorship within Roman wills. A choice had to be made: to stay silent and protect the will from an emperor's greed; or to seize this one, final chance to speak out.

Watch and learn: Identifying optimal conditions for learning

Child, Brittany, School of Psychology, Faculty of Health and Medical Sciences

Abstract

Purpose/Rationale:

Our capacity to learn associations between stimuli in the environment is fundamental to cognition and informs much of our everyday behaviour. Individuals' learning performance varies, suggesting that it may be possible to identify an optimal set of conditions under which learning can be maximised. Learning relies on several cognitive systems, including short-term memory. As short-term memory is a finite resource, it follows that learning environments placing a heavy burden on this cognitive system may not offer optimal conditions for learning. To test this, we evaluated associative learning performance under different conditions of short-term memory load. In doing so, we sought to improve current understandings of the conditions under which learning is diminished, which has implications for identifying conditions that foster optimal learning.

Research Question/Focus:

Our research focus was to investigate whether conditions of heightened short-term memory demands produce impairments in learning.

Research Methodology/Approach:

Sixty participants completed an associative learning task in which they learnt the side-effect (outcome) associated with 24 fictitious medications (cues). In the control condition, cues were immediately followed by their outcomes. In the delay condition, we increased short-term memory demands by placing a 4-second temporal delay between cues and outcomes. In the interference condition, we placed an additional burden on short-term memory by introducing a 4-second secondary task between cues and outcomes in which participant's verified simple addition and subtraction equations as true/false. Learning performance was operationalised as participants' accuracy in predicting cue outcomes. We found a significant decrease in learning performance in the interference condition relative to the control and delay conditions. In contrast, learning was not impaired in the delay condition. This suggests that brief temporal delays in the learning environment may produce only negligible learning impairments, but that such impairments may be radically amplified in the presence of interfering events during these delays.

Multiple anchors and the MOLE: benefits for elicitation

Clausen, Marianne, School of Psychology, Faculty of Health and Medical Sciences

Abstract

Purpose / Rationale:

In the face of uncertainty, industry and government often rely on people's estimates to guide decisions (Wolfson, 2001). Such estimates are useful, but also prone to systematic errors, known as cognitive biases (Kahneman, Slovic, & Tversky, 1982). One particularly robust bias arises from 'anchoring', where people tend to produce estimates that are close to numbers that they have recently seen, regardless of the number's relevance (Tversky & Kahneman, 1974). More-Or-Less Elicitation (MOLE) is a computerised tool that can be used in place of human estimation to overcome these systematic cognitive biases. Herein, we tested the MOLE's ability to limit the impact of anchors.

Research Question / Focus:

The primary aim of this research is to expand upon previous studies (Welsh & Begg, 2018; Welsh et al., 2008, 2009) by specifically testing the MOLE's ability to overcome the effect of anchoring. Secondly, the effect that anchoring has on estimates will be assessed - to ascertain whether anchoring is having a detrimental effect and, therefore, confirm that the MOLE is a useful tool that could be used to improve the quality of estimates in professional settings.

Research Methodology / Approach:

The study recruited N = 62 participants (38 females and 24 males) aged between 18 and 65 years (M = 31.15, SD = 12.81). The study asked participants to estimate the results of Australian Football League (AFL) matches; participants were initially presented with an anchor value, then they either provided a direct estimate or used the MOLE. As expected, direct estimates correlated to anchor values ($r = .27$), indicating that anchoring occurred. Further, a greater degree of anchoring was associated with less accurate estimates ($r = -.33$). In contrast, there was no evidence of anchoring when estimates were produced by the MOLE ($r = .02$).

Novel Flexible Materials for Wearable Antennas

Dong Zhang, Donald, School of Electrical and Electronic Engineering, Faculty of Engineering, Computer and Mathematical Sciences

Co-presenter:

David Kimtai, Dennis, School of Electrical and Electronic Engineering, Faculty of Engineering, Computer and Mathematical Sciences

Abstract

The emergence of wearable intelligent systems has benefited from high performance antennas which are used for communication including monitoring of patients in hospitals, defence, navigation, tracking and public safety. Conventional antennas use a laminate of ceramic materials. Those conventional materials have typical drawbacks including but not limited to being hard and lacking in flexibility, and being vulnerable to impact which may lead to breakage or variation in performance. In this project we used antenna theory and computer simulation software to evaluate the use of different materials for antennas. The substrates materials should be lightweight, small size, flexible and robust for the realization of various types of wearable antennas integrated into clothing with an aim to achieve good communication characters without much variation in performance.

In this paper, the available dielectric materials bought and measured include felt, fleece, foam, leather and rubber with relative permittivity range from 1.21 to 6.50 achievable in which the best and the worst losses need to be compromised. Two types of antennas for operation in the industrial, scientific, and medical frequency band (ISM band) will be considered. The first one is an omnidirectional flat-monopole type antenna, based on a square substrate integrated cavity radiating between four eyelets shorting. The antennas effectively create a square loop of magnetic currents along the length of the patch. The second one is a directive PIFA-type antenna with two eyelets shorting in the aperture of three side walls. These two types of applications of the omni and directional antennas are on-body communication between sensors and off-body communication to a base station. The expected findings are, by using the above two types of planner antennas models, the most suitable materials in modelling with good communication efficiency. The ongoing fabricated prototypes need to be tested to compare with the simulation and the designation.

Calibrating New Isotopic and Morphological Tools for Palaeoecological Forest Reconstructions

Duff, Heather, School of Physical Sciences, Faculty of Sciences

Abstract

Purpose/Rationale

The ability to identify forest architecture in the geologic past has implications for our understanding of palaeoecological processes. Canopy closure (or density of foliage) effects atmospheric circulation, rainfall patterns and climates. Closed canopy forests are easily identified from leaf fossil assemblages because they are characterised by strong gradients of light that influence the chemistry and morphology of leaves. However, few studies utilize multiple leaf characteristics in a single reconstruction.

Research Question/Focus

Using leaf area index (LAI) to quantify canopy closure, this research has calibrated isotopic and morphological leaf traits from 150 leaves from the modern closed canopy Daintree Rainforest in Queensland for the basis of a more powerful, multiproxy tool for canopy reconstructions. Environmental anomalies (drought and canopy closure gaps) were included because their potential to impact the gradient and consequently, our ability to accurately reconstruct canopy closure.

Research Methodology/Approach

Changes in carbon isotope ratios ($\delta^{13}\text{C}$), leaf mass per area (LMA), epidermal cell undulation index (cell wall curvature, UI) and cell area (CA) all correlated with LAI from the canopy to the understory and are appropriate in a proxy for reconstructions from fossil leaf characteristics. However, the magnitude of responses varied between species, several had no response in cell wall curvature (UI). While these traits do characterise the internal distribution of light intensity, it highlights the requirement for further species-specific calibrations on modern equivalents for each attribute.

Leaf measurements from beneath a gap in the canopy and those from a drought experiment did not deviate from the general gradient caused by LAI. Further investigations into inter-trait variations demonstrate that $\delta^{13}\text{C}$, CA and UI correlate with LMA, and CA correlates with UI. This is promising for a proxy that can use a combination of traits for stronger reconstructions, rather than a single trait as previous studies investigated.

The Identification of the Predominant Microorganism Responsible for Causing Nectarine (Prunus Persica) Spoilage

Heinrich, Katelyn, School of Agriculture, Food & Wine, Faculty of Sciences

Co-Presenters:

Dangerfield, Lucy, Faculty of Sciences, Fechner, Nicole, Faculty of Sciences, Lockwood, Tahlia, Faculty of Sciences

Abstract

In Australia, over 50% of fruit and vegetables produced are wasted; 20% before harvest (Gustavsson et al. 2011) and over \$10 million/year of food is lost to fungal spoilage (Pitt & Hocking 1997). To combat this, the identification of common spoilage organisms such as fungi, bacteria and yeast is a crucial part of managing and minimising food wastage. Nectarines (*Prunus persica*) are part of a niche market and serve as a representative of all stone fruits, in the Rosacea family. Nectarines provide perfect conditions for growth of filamentous fungi because of their high-water content, low pH, and nutrient rich environment (Food2Market, 2018). The aim of this investigation was to identify the predominant spoilage organism in a sample of nectarine.

Initially, macroscopic observations were made to determine whether spoilage was caused by a filamentous fungus, yeast or bacteria. Using a dissecting microscope colony shape, texture and spore bearing structures were noted. Dry weight and pH were also measured and the specimen was subcultured onto selective media to isolate the spoilage organism. Specimen slides from pure cultures were prepared and microscopic observations made to identify type of hyphae, spore bearing structures and size. Metabolic tests for starch, lipid and glucose breakdown were performed using agar to determine amylase and lipase activity as well as acidification with an indicator.

Fruit rot is known to be a common spoilage organism of nectarines causing damage to trees and fruit loss (DEPI, 2017) with two fungi being the main cause; *Monilinia* spp. (brown rot) and *Rhizopus* spp. (soft rot) (Marni et al, 2004). Preliminary observations revealed white, fluffy mycelium growing on the nectarine indicating infection by a filamentous fungus. Microscopic examination showed septate hyphae and chains of conidia while metabolic results were positive for glucose and lipid breakdown, features consistent with the common spoilage pathogen *Monilinia*.

Department of Environment and Primary Industries (DEPI), 2017, Brown-rot of stone fruits, Victoria State Government, Available at: <http://agriculture.vic.gov.au/agriculture/pests-diseases-and-weeds/plant-diseases/fruit-and-nuts/stone-fruit-diseases/brown-rot-of-stone-fruits> [Accessed 12 June 2018]. Food2Market Clemson University, South Carolina. 2018. Available at https://www.clemson.edu/extension/food/food2market/documents/ph_of_common_foods.pdf [Accessed 07 May 2018]. Gustavsson, J., Cederberg, C. and Sonesson, U. (2011). Global Food Losses and Food Waste. Food and Agriculture Organization of the United Nations, [online] p.7. Available at: <http://www.fao.org/docrep/014/mb060e/mb060e00.pdf> [Accessed 8 Jun. 2018]. Marni, M., Gregori, R., and Donati, I. (2004) Postharvest control of *Monilinia laxa* and *Rhizopus stolonifer* in stone fruit by peracetic acid, Postharvest Biology and Technology, vol 33, p 319-325. Pitt J. and Hocking A. D. (1997) Fungi and Food Spoilage, (2nd edn.), Blackie Academic Publishers.

Outer Space, National Security and Private Rockets; Where is the Line?

Lisk, Joel, Adelaide Law School, Faculty of the Professions

Abstract

Outer space is fast becoming a popular domain for both corporate and government actors. There are numerous levels to the regulation of outer space, with international and domestic laws frequently coming into conflict. The current structure of international law places a significant responsibility burden on nations, a burden that can risk the economic and security interests of a country. With many commercial operators leaping at the opportunity to exploit outer space, nations have responded by developing comprehensive licencing and supervisory regimes that protect against a variety of sovereign risks while still trying to promote industry. Small companies focused on innovation rarely want to negotiate complicated laws but must to operate in the outer space domain.

Looking internationally, this study considers the balance between commercial incentivisation and protection of national security interests in domestic space legislation. Domestic regimes are tailored to their nation, they adopt distinct legislative motifs, reflect national sentiments, and feature different regulatory bodies to police compliance, and as such there are significant points of difference between national space laws. Reviewing the primary and secondary space-related legislation from a broad variety of nation's representative of the actors in outer space, this study examines the terms of national space law regimes and the commercial implications of them while looking towards the best legislative practices that promote commercial activities while effectively managing national risk.

Does canopy management influence berry and wine quality?

Long, Jacob, School of Agriculture, Food and Wine, Faculty of Sciences

Co-Presenters:

Williams, Benjamin, School of Agriculture, Food and Wine, Faculty of Sciences, Gangell, William, School of Agriculture, Food and Wine, Faculty of Sciences, Kelly, Jack, School of Agriculture, Food and Wine, Faculty of Sciences

Abstract

The superior quality of Australian wines has made them highly competitive in domestic and international markets. Viticulturalists have traditionally used a variety of management practices to alter the main chemical compositions that determine grape quality (acidity, alcohol, tannin and fruit flavour). Better quality could be achieved through the altering of the vine canopy, by means of bunch thinning, shoot thinning, or removal of specific leaves. Subject to the particular environmental conditions present, a canopy management technique can be implemented across a vineyard to produce a canopy structure that enhances ripening by providing favourable leaf and berry exposure to the sun. Our research project in the second year course Foundations in Plant Science aimed to determine how different canopy management techniques affected berry and wine quality. Five methods were applied at pre-veraison (prior to fruit ripening) to Shiraz vines growing at the Waite campus: A control (C), leaf plucking around bunches (LP1) and in the mid canopy (LP2), shoot thinning (ST) and bunch thinning (BT). Titratable acidity (TA), Total Soluble Solids (TSS) and phenolic content were measured in fruit before analysing phenolics and sensory profile of wine made from the bunches (where n=9 representing 3 technical replicates for each of 3 biological replicates). When compared to the control, the TA in grapes was only significantly lower in the LP2 treatment while TSS was significantly higher in the BT treatment. However, shoot and bunch thinning had an impact on taste of wine (particularly bitterness). Therefore, the control group appears to provide the best management strategy for high wine quality. However, this experiment only examined one vineyard in one year. To be of greatest benefit to the Australian wine industry, further research should therefore examine how different environmental pressures combined with varying canopy management techniques affect grape and wine quality.

Cultural perspectives of Death and Dying in Chinese people: A qualitative study for cultural competency

Low Wei Liang, Gregory, School of Psychology, Faculty of Health and Medical Sciences

Abstract

Census data have shown growth of Chinese people residing in Australia over many decades; the emergence and predominance of Chinese communities in Australia indicate the need for healthcare professionals to recognize and respect Chinese cultural perspectives when treating Chinese patients. A major differentiating cultural understanding is the conceptualisation of death and dying. Current research on Chinese culture regarding end of life highlights attitudes reflecting cultural and religious roots. Discussions about death in traditional Chinese culture is taboo. This means research on this topic with Chinese people is challenging. Given the cultural diversity of Australia and its Western approach to healthcare, research towards the ever-growing Chinese population on death and dying is highly relevant and may be helpful for the cultural competency of healthcare professionals, particularly when working with Chinese patients facing chronic life-limiting illnesses and in palliative care. This study aims to contribute to existing literature about the cultural perspectives of Chinese people in Australia towards healthcare, specifically with regards to death and dying.

Interpreters constitute an important role for Chinese people, many of whom may not be native English speakers. Given the cultural sensitivity of discussing death, for researchers, interpreters can offer insights about end of life experiences with patients, rather than researchers speaking to the patient, which may cause distress. A purposive sampling approach was employed to recruit Chinese interpreters, who participated in qualitative interviews.

Through an inductive approach of thematic analysis, preliminary analysis revealed age of the patient, differences in language translations, and perceived qualities of professionals as important themes. Findings from this study serve to raise awareness of the differing cultural perspectives of Chinese people in Australia towards death and dying, and may contribute to the cultural competency of healthcare professionals towards delivering culturally appropriate and quality patient-care.

A Qualitative Study of Urban Chicken Owners' Perceptions of Chickens and Chicken Meat

Macauley, Luke, School of Psychology, Faculty of Health and Medical Sciences

Abstract

Rationale:

Although urban chicken ownership has been increasing in recent years, reasons these chickens are kept are unclear. While chickens are traditionally considered food producers in Western contexts, previous research suggests chickens kept in suburban households may be considered companion animals. Many chicken owners may be attached and bonded to their chickens, but many may also continue to eat chicken meat - a phenomenon called the meat paradox, in which individuals care for animals but still eat them. The meat paradox has not been studied specifically in relation to chickens. Perceptions of chickens' roles are apparently flexible, and are likely to vary over time and by individual. Given the human tendency to selectively anthropomorphise and empathize with animals, human relationships with animals can be analysed using social psychological principles. Therefore, researching how people determine whether chickens are deserving of care or consumption, or both, will further understanding of psychological processes of empathy towards animals and people, contributing to both human and animal welfare.

Research question:

How do people who keep chickens view chicken meat?

Methodology:

This study uses a qualitative design as the study of chickens in human-animal bonds is relatively unexplored in psychological research. Open-ended one-on-one interviews with chicken-eating urban chicken owners allow exploration of participant attitudes with both breadth and depth. This will allow participant insights to emerge and be further explored. Thematic analysis of interviews will be used to highlight similarities and differences across collected data and flexibly respond to participant insights.

Preliminary findings:

This research is currently in the data collection stage with four interviews completed. Early analysis shows the utilitarian view of chickens as being produced and existing purely for human use and consumption, regardless of occasionally also being companion animals.

Understanding Cultural Background and Wellbeing for Culturally and Linguistically Diverse Children With Refugee or Migrant Backgrounds

McGuire, Aerie, School of Psychology, Faculty of Health and Medical Sciences

Abstract

Acculturation is a term used to describe the processes of cultural change and mutual adaptation which occur for different cultural groups when they come into prolonged contact. Within psychology, Berry's acculturation framework has been used extensively to examine adaptive outcomes for individuals from refugee and migrant backgrounds, based on the relative importance they place on either maintaining their cultural identity or seeking connection with the host culture. To date, acculturation theory has not been extensively explored for children of primary school age.

It is widely accepted that refugee and migrant children in Australia face numerous post-settlement challenges which can impact upon their wellbeing, and that further research is required to address this. As such, this study sought to examine the merit of further research adopting an acculturation approach when considering applied outcomes for this group of children. This research focus was addressed through engaging with primary school teachers about their experiences working with refugee and migrant children from culturally and linguistically diverse backgrounds, and about their views on issues of cultural maintenance, cultural connection and wellbeing for these students.

This project took the form of a qualitative interview study with twelve primary school teachers from primary schools and Intensive English Language programs in South Australia. Interviews were individual and semi-structured, with a focus on prioritising the views and experiences of participants. Transcribed interviews are to be examined using Thematic Analysis, in order to identify themes and patterns of meaning across the data. While the data analysis phase is currently still in progress, initial results have indicated that all participants greatly value cultural diversity within their classrooms, and see it as an important aspect of wellbeing for their students.

It is hoped that the results from this study will contribute to important knowledge about wellbeing outcomes for this group, as well as to theoretical understandings of acculturation theory as it applies to children.

Use of online resources for pain management: Psychologists' perspectives

McKinlay, Kate, School of Psychology, Faculty of Health and Medical Sciences

Abstract

Purpose/Rationale

Chronic pain is a worldwide epidemic, with challenges pertaining to its high prevalence, complexity, management, psychosocial impact and economic impact. As such, there is growing interest towards the development and use of non-pharmacological therapies such as digital and online resources. These resources promote people to independently manage their pain and can be accessed through computers and electronic hand-held devices, as apps, pain programs, discussion forums and information websites. Research has investigated health professional and patient perspectives of the usefulness of online resources for pain management, with mixed results and a lack of clear direction on how to improve online resources. To date, there is no literature detailing psychologists' insights and understandings, which is unexpected due to their involvement in the development of online resources and their integral role in pain management.

Research Question/Focus

The purpose of the present study is to explore psychologists' perspectives towards the use of online resources for pain management.

Research Methodology/Approach

A qualitative design was used to conduct in-depth semi-structured interviews with 8 psychologists who work with patients who live with chronic pain. A qualitative approach using thematic methods of analysis was chosen to enable a descriptive and rich explanation of psychologists' views towards the use and usefulness of online resources for pain management.

Significance and Originality of Findings

Preliminary findings will be presented outlining the perceived facilitators and barriers of the use of online resources such as apps, pain programs, discussion forums and information websites, their usefulness, and recommendations of how online resources should be tailored for pain management. These findings will contribute to this area through an unexplored specialised psychological perspective, with their recommendations potentially informing the formulation of appropriate and tailored online resources for the management of chronic pain.

Securing the Administrative Appeals Tribunal's Independence: Tenure and Mechanisms of Appointment

Morgan, James, Adelaide Law School, Faculty of the Professions

Abstract

The Administrative Appeals Tribunal ('AAT') must be independent from inappropriate influence, and the perception of such influence, in order to effectively discharge its duties of de novo merits review of government decisions.

It is critical that members of the AAT be positioned such that their decisions are not influenced by inappropriate outside considerations, in a similar vein to the judicial independence of Chapter III courts. Were it otherwise, the Australian public could have little confidence in the AAT's ability to perform its crucial administrative justice role with impartiality and fairness.

In the context of tribunal member appointment, it is vital that denial of reappointment cannot be wielded as a tool of retaliation against tribunal members, for making merits review decisions which the government-of-the-day deem to be objectionable. It is the very essence of the AAT's merits review function that its members must be capable of freely disagreeing with decisions made by the government. The risk of arbitrary retribution by the government of the day (whether a founded or unfounded concern in reality) cannot be permitted to weigh as a factor in the minds of AAT members when exercising their merits review function.

Drawing on recent controversies surrounding the AAT in 2017, my research concludes that the current mechanisms of AAT member reappointment expose the AAT to a risk of inappropriate influence by the government of the day, or at least a risk of public perception to that effect. Based off of my research into legal academic schools of thought on merits review tribunals, I propose the creation of an independent reappointment committee for the AAT.

Safe Haven and/or Prison: The Complicated Legacy of the Loveday Internment Camp in South Australia

Ngo, Jennifer, School of Humanities, Faculty of Arts

Abstract

Focus: In 1946, when the Loveday Internment camp in South Australia closed, it left behind a complicated wartime legacy. During World War II, Loveday housed well over 5,000 prisoners of war and 'enemy aliens', the label given to Australian residents who were considered security threats. The vast majority of these people were racially Japanese, German and Italian, some of whom had lived in Australia their whole lives.

However, Loveday was a remarkable camp by international standards. Internees engaged in sport, craftwork and paid labour, with the camp celebrated as a powerhouse of production for the Australian war effort. Prisoners of war often considered Loveday to be a haven in contrast with the treatment they had faced at the hands of other foreign powers.

Simultaneously, though, internees were desperate to leave. 135 people died at Loveday and, while most died from illnesses associated with old age, there were instances of attempted suicide, escapes and even one murder. This begs the question: What is the true historical legacy of Loveday?

Rationale: Exploring this history is crucial because the Loveday camps were authorised and administrated by state forces. The Australian government is responsible for what transpired in these camps, and understanding what we did critically can help us better understand what Australia is capable of in wartime.

I conclude that the Loveday legacy is not something for the Australian government, or public, to be ashamed of. Its complex nature is explained by an inherent contradiction: Loveday was a humanely run internment camp nestled within an inhumanely applied policy. Individuals had vastly different experiences depending on their backgrounds. However, broadly speaking, the policy of internment and the unwillingness of security forces to separate groups with different political allegiances took a human toll on most internees, many of whom were loyal to Australia.

Methodology: To make this argument, I have relied on the historical method of source criticism in order to create a narrative. The sources I have used include government documents, news articles, oral histories captured by other historians and secondary academic sources. I have attempted to create an empirically sound narrative that paints a broad picture of the camp and does not simplify the variety of experiences they had.

The formation of science policy: western and Indigenous interpretations of environmental risk assessments

Nguyen, Jenny, School of Social Sciences, Faculty of Arts

Abstract

Purpose/rationale:

Indigenous land and water rights are protected under international law but on a local level this has not been the case for the Ngarrindjeri people, traditional owners of the lands surrounding the lower Murray lakes. It is estimated that Indigenous water allocations make up less than 1% and a result, this impacts their wellbeing and cultural safety. A risk assessment is one of the key mechanisms to address environment and stakeholder concerns. It also forms a key part of natural resource management in Australia.

This study will focus on the western and Indigenous interpretations of environmental risk assessments. Specifically, understand the implications of the different interpretations in creation of policy.

Research focus/question:

The formation of science policy: western and Indigenous interpretations of environmental risk assessments.

Research method:

I conducted qualitative analysis using information sources which include legal documents, government reports and grey literature. To research this project, I undertook a systematic literature review to analyse western and Indigenous values. Through this, I was able to critique current risk assessment structures and identify opportunities for integration of values from two diverse worldviews.

Significance of originality and findings:

After analysing models of risk assessment, this research has been able to provide evidence of benefits in creating inclusive frameworks. These benefits are evident in regards to building social justice, advancing science and innovation and strengthening socio-cultural relationships with the First Nation tribes. The key purpose is to help inform decision makers on the likely outcomes of using inclusive practices of risk assessments and advise of the benefits that may occur.

Timing and Outcomes of Angiography in NSTEMI Patients in the CADOSA Registry

Obst, Ella, School of Medicine, Faculty of Health and Medical Sciences

Abstract

Purpose/Rationale:

Best practice care for non-ST-elevation myocardial infarction (NSTEMI) patients involves timely referral for angiography. International guidelines suggest angiography within 24hrs is optimum for high risk NSTEMI patients, the ideal timing within this window remains unclear.

Research question/focus:

What is the effect on in hospital mortality, stroke and re-infarction of very early (<12hrs) angiography compared to early intervention (12-24hrs from presentation) in high risk NSTEMI patients?

Research methodology/approach:

This study retrospectively analysed data from the Coronary Angiography Database of South Australia (CADOSA). CADOSA captured 5011 NSTEMI patients at major South Australian hospitals between 2012 and 2016. Patients who waited longer than 24hrs, were low risk or who experienced cardiac arrest or cardiogenic shock within 24hrs of their procedure were excluded (n=4524). The remaining 487 high risk patients were categorised according to timing of angiography from admission (<12hrs (n=146) or 12-24hrs (n=341)) and rates of in hospital all cause death, stroke and reinfarction between the groups was evaluated. The rates of adverse events including stroke, major bleeding, heart failure, new requirement for dialysis, red cell transfusion and cardiac tamponade were also evaluated.

Results:

In a real-world sample of NSTEMI patients the lowest rate of the in-hospital efficacy outcome was observed in patients who underwent angiography within 12hrs of admission (2.1% vs 2.6%), although this was not significantly different from the early group (12-24hrs) (OR 0.77 (95%CI 0.21-3.53), p=0.703). However, rates of procedure adverse events were increased in the very early group compared to the early group (10.3% vs 4.4%, OR 2.49 (95%CI 1.18-5.85), p=0.013).

Conclusion:

It is not evident from this study if very early or early angiography intervention is favourable for NSTEMI management, however it appeared that very early intervention was associated with increased adverse events. Further research is needed to fully evaluate the risks and benefits of prompt intervention.

What people of reproductive age know about male and female fertility: development and validation of the Male and Female Fertility Knowledge Measures

Olekalns, Aleksandr, School of Psychology, Faculty of Health and Medical Sciences

Abstract

Rationale

Involuntary childlessness and infertility remain global public health issues, with couples experiencing complicated grief and loss, and feelings of depression, anxiety and disempowerment. Previous research reveals poor understanding of natural age-related fertility decline and risk factors for infertility in male and female populations, resulting in preventable, or at least modifiable, fertility issues. According to the Information-Motivation-Behavioural Skills Model, knowledge is an initial prerequisite for enacting a health behaviour.

Research Question/Focus

To date, two measures are commonly used to assess people's fertility knowledge, both of which have not been suitably tested for validity and reliability. Both fail to measure a broad range of knowledge related to lifestyle factors affecting fertility, common misconceptions about infertility and basic knowledge of infertility treatments. Furthermore, they do not differentiate between male and female infertility risks, despite a substantial body of evidence indicating the influence of both male and female health in conception. The focus of this research is to develop two psychometrically sound measures specific to knowledge about male and female fertility.

Research Methodology

People of reproductive age participated in a quantitative cross-sectional research study. The new measures will be assessed using item and scale content validity indexes, item difficulty and discrimination analyses and point bi-serial correlation. The dimensional characteristics of the measures will be determined using Exploratory Factor Analysis. Subsequently analysis of internal consistency and tests of convergent, divergent and concurrent validity will be undertaken. Preliminary findings will be presented.

Significant and Originality of Findings

This project develops two measures that future researchers can use to reliably quantify what people know about fertility. Psychometrically strong measures will enable researchers to accurately assess fertility knowledge and to explore how such knowledge, together with motivation and behavioural skills, may be able to minimise the risk of involuntary childlessness due to modifiable fertility issues.

Agency and paradiplomacy: The case of Oregon's relations with divided China in the 1980s

Omond, Natalie, School of Social Sciences, Faculty of Arts

Abstract

Rationale

Involuntary childlessness and infertility remain global public health issues, with couples experiencing complicated grief and loss, and feelings of depression, anxiety and disempowerment. Previous research reveals poor understanding of natural age-related fertility decline and risk factors for infertility in male and female populations, resulting in preventable, or at least modifiable, fertility issues. According to the Information-Motivation-Behavioural Skills Model, knowledge is an initial prerequisite for enacting a health behaviour.

Research Question/Focus

To date, two measures are commonly used to assess people's fertility knowledge, both of which have not been suitably tested for validity and reliability. Both fail to measure a broad range of knowledge related to lifestyle factors affecting fertility, common misconceptions about infertility and basic knowledge of infertility treatments. Furthermore, they do not differentiate between male and female infertility risks, despite a substantial body of evidence indicating the influence of both male and female health in conception. The focus of this research is to develop two psychometrically sound measures specific to knowledge about male and female fertility.

Research Methodology

People of reproductive age participated in a quantitative cross-sectional research study. The new measures will be assessed using item and scale content validity indexes, item difficulty and discrimination analyses and point bi-serial correlation. The dimensional characteristics of the measures will be determined using Exploratory Factor Analysis. Subsequently analysis of internal consistency and tests of convergent, divergent and concurrent validity will be undertaken. Preliminary findings will be presented.

Significant and Originality of Findings

This project develops two measures that future researchers can use to reliably quantify what people know about fertility. Psychometrically strong measures will enable researchers to accurately assess fertility knowledge and to explore how such knowledge, together with motivation and behavioural skills, may be able to minimise the risk of involuntary childlessness due to modifiable fertility issues.

Australian Rules Football Players' Experiences of Hamstring Injury

Pearson, Simon, School of Psychology, Faculty of Health and Medical Sciences

Abstract

Purpose/Rationale:

Hamstring injuries are the cause of the greatest number of games missed through injury in the AFL each year. Although considerable medical research has been undertaken, from a psychological perspective, hamstring injury has been under-researched. Developing greater understanding of psychological factors that influence return-to-sport (RTS) outcomes can contribute to hamstring injury management, as has been demonstrated in relation to Anterior Cruciate Ligament (ACL) injuries.

Research Question/Focus

This project explores the nature of players' experiences of, and sense-making around, injury to their hamstring, in addition to the rehabilitation and return-to-sport phases of this sporting injury.

Research Methodology/Approach

Due to the multi-factorial nature of hamstring injury and management, and the scarcity of research exploring players' experiences of this injury, a qualitative research approach is used. Semi-structured interviews of 20 players' will allow an exploratory, flexible methodological approach to collect rich and in-depth reports relating to the experiences of injury. Three phases of the injury experience will be the focus of the interviews: initial injury; rehabilitation; and RTS. The semi-structured interview questions are influenced by the findings of previous research on sporting injuries, which have demonstrated a range of psychological responses in relation to injury, rehabilitation and RTS. The topic of ACL injury has received most research attention, in particular, demonstrating a relationship between higher levels of fear of re-injury and lower levels of RTS. The emotional responses of athletes to injury will also be explored, with previous research demonstrating such responses to be unpredictable and changeable, and to influence RTS outcomes. Examples of exploratory-based questions used are: Can you tell me about your most recent hamstring injury? How did RTS go for you? Examples of semi-structured questions include: Did you worry at all about re-injuring your hamstring during rehabilitation? Tell me about your emotions when you RTS? Thematic analysis will be used to analyse the data, identifying salient themes that emerge from the data.

The Defence of Marital Coercion: Relevant or 'Ridiculous Relic'?

Perakath, Azaara, Adelaide Law School, Faculty of the Professions

Co-Presenter:

Tran, Jasmyn, Faculty of the Professions

Abstract

Purpose/Rationale

As part of the South Australian Law Reform Institute's current reference, we are considering the defence of marital coercion. It is an obscure, and often overlooked, criminal defence in s 328A of the Criminal Law Consolidation Act, providing a defence for a wife, who is charged with an offence other than murder or treason, if she can prove that the offence was committed in the presence of, and under the coercion of, her husband. Since 'no law can survive the reason on which it is founded', this is an opportune time to consider whether the defence is still relevant today, and options for reform.

Research Question/Focus

We are considering the defence in the context of domestic violence, and LGBTIQ movements, respectively. Whilst some argue that the defence of duress is sufficient, it is confined to threats to kill or cause serious harm. This does not reflect the human and social reality that husbands can apply other forms of pressure which may have just as much impact on their wives. We use Indigenous and migrant communities to illustrate that the defence may still afford legitimate protection to certain sectors of the community. Similarly, marital coercion is currently only applicable to a wife. This seems to ignore the existence of other power-imbalances, particularly in light of the recent legalisation of same-sex marriage.

Research Methodology/Approach

We began by reviewing existing commentary, legislation and case law. This also involved comparative research into jurisdictions like the United Kingdom and other Australian states. Subsequently, we will engage in consultation with interested parties, including defence lawyers, the DPP, women's groups and the LGBTIQ community. Our preliminary recommendation is that marital coercion, whilst seemingly outdated, cannot be abolished without corresponding reforms to broaden the scope of the duress defence. This will ensure that deserving defendants remain protected under our criminal law framework.

The Spatial and Temporal Interactions of Leopards and Mesopredators at Loskop Dam Nature Reserve, South Africa

Peters, Max, School of Animal and Veterinary Sciences, Faculty of Sciences

Abstract

Purpose/Rationale:

Large predator populations are experiencing significant declines throughout Africa, the ecological effects of which remain largely unknown. A large proportion of these species are apex predators – predators upon which no other animals prey. However, the ways in which these predators interact with small to intermediate sized predators – mesopredators – is not well understood.

Research Question/Focus:

This study aimed to quantify the distributional relationship and assess the temporal relationship between apex and mesopredators at Loskop Dam Nature Reserve, South Africa; a unique ecosystem where the leopard is the sole apex predator. The study also investigated the effect of selecting sampling sites based on predicted increased activity levels of a specific species.

Research Methodology/Approach:

Camera trapping data was collected using two sampling site selection methods – systematic grid array and leopard-targeted array. Differences between methodologies were analysed to determine potential bias. Data was also analysed to determine spatial and temporal interactions between leopards and 5 mesopredator species - serval, caracal, honey badger, black-backed jackal, and large spotted genet. It was found that leopards had no effect on the occurrence of caracal or black-backed jackal, however, honey badgers were shown to display spatial avoidance towards leopards. This information is extremely valuable to the wildlife management of this reserve and other sub-Saharan reserves, allowing for more specific and efficient species management plans.

Diagnostic definition of cerebral palsy in genetic association studies: a systematic literature review

Pham, Ryan, School of Public Health, Faculty of Health and Medical Sciences

Abstract

Purpose/Rationale:

Cerebral palsy (CP) is a heterogeneous group of non-progressive movement disorders. The broad nature of this definition potentially leads to the contamination of non-CP cases in genetic research. The purpose of this research is therefore to inform the need for one international consensus definition of this important childhood disorder for use in genetic, clinical, and epidemiological studies.

Research Question/Focus:

This systematic review was focused on determining how many of the CP genetic association studies provided sufficient detail for the ascertainment of CP cases and whether there were disparities in the diagnostic definition of CP across these studies.

Research Methodology/Approach:

A literature search was performed in PubMed, EMBASE, and BIOSIS to retrieve CP genetic association studies published from 1990 to 2016. The search strategy excluded (1) non-germline DNA studies, (2) studies that did not focus on CP as the main outcome, and (3) case reports and case series. The publications were separated based on their relative detail regarding CP case ascertainment. Studies providing enough detail were then compared by: (1) the objective criteria used to ascertain CP cases, and (2) evidence of compliance with the specified criteria. This search strategy yielded 918 potentially relevant articles. Full text screening resulted in a final set of 21 studies, 9 of which provided sufficient detail to compare the ascertainment of CP cases. Of these 9 studies, 3 used a definition provided by Bax et al. 2005, 3 studies used a definition by the Surveillance of Cerebral Palsy in Europe, and 3 studies used their own definition and classifications. The definition and diagnosis of CP is insufficiently reported and discrepant. The significance of these findings is that it can guide the reporting of future CP genetic association studies by the dissemination of these results to the Developmental Medicine and Child Neurology medical journal.

Keeping the Peace: Preserving Harmonious Relationships Between Eco-tourists and Villagers in Vietnam's Northern Mountainous Region

Platten, Spencer, School of Social Sciences, Faculty of Arts

Abstract

Purpose/Rationale:

Community-based eco-tourism (CBET) has recently been introduced into the Northern Mountainous Region of Vietnam. Site-visit research at two home-stays afforded an opportunity to investigate the impacts emanating from this social enterprise.

Research Methodology/Approach:

The villages of Da Bac and Sung, located in the province of Hoa Binh, have established several home-stay properties that provide accommodation options for the anticipated influx of 'eco-tourists'. Semi-structured interviews were conducted by the author between 7th and 9th of July 2017 with various stakeholders connected to these homestays acting as informants to the study. Topics discussed included community relations, profit re-distribution and traditional customs. The author also took a participant observation approach, taking notes as he experienced first-hand the social and environmental impacts of his involvement as an 'eco-tourist'. Research established that villagers have identified a small number of adverse impacts caused by eco-tourism which were verified by on-site observations and post-visit conversations conducted via email correspondence.

Research Question/Focus:

Two areas of concern inform the focus of this study. Firstly, the uneven distribution of the economic benefits accrued from eco-tourism which poses a threat to community solidarity and cohesion. Secondly, the cultural complexity of the region and the lack of information regarding traditional customs and practices offered to tourists prior to arrival. Accordingly, this research proposes that Action on Poverty Vietnam (APV), the assisting non-government organisation, introduces an electronic, interactive information guide that can provide incoming tourists with appropriate knowledge resources in an attempt to safeguard the current level of goodwill between service providers, community members and guests. Further, the research suggests that the home-stay owners be granted autonomous management and a larger share of the economic benefits with a portion of the profit allocated to community-wide service provisions.

Litigation Funds in Improving Access to Justice and Increasing Corporate Accountability

Porter, Tim, Adelaide Law School, Faculty of the Professions

Co-Presenters:

Boccaccio, Claudia, Adelaide Law School, Faculty of the Professions, Brunker, Mitchell, Adelaide Law School, Faculty of the Professions, Manning, Gerald, Adelaide Law School, Faculty of the Professions

Abstract

While the class action law suit has had a pivotal role in ensuring that large corporations are held accountable for breaking the law, it has some inherent limitations. There is a reluctance to join legal proceedings where there is so much uncertainty surrounding both the outcome of a matter, and the associated costs. These prohibitive costs can pose a serious obstacle to access to justice, preventing all but the wealthiest of Australians from seeking relief.

The growth of third-party funds, known as litigation funds, have helped to take away some of this uncertainty in this process, and allow people from all financial backgrounds to receive justice. These funds enter into agreements with individuals where they cover all of the costs associated with the law suit in exchange for a proportion of the funds recovered. They have recently been used to help shareholders of all backgrounds to pursue claims against big businesses, including AMP and the Commonwealth Bank of Australia.

The popularity of the litigation fund has skyrocketed, and even the Courts have recognised its importance. However, given the increasing reliance placed on these funds, it becomes important to recognise the legal and ethical issues arising from their use.

Our research has focused on some of the issues surrounding the growth of these funds. We examined the recent decision of Money Max, where the court made all members of a class action pay into a third-party fund. We also considered whether there should be a limit on how a litigation fund can take from a successful class action and whether they are creating a "culture of litigiousness" in Australia. This research required us to look to cases considering these third-party funds, as well as law reform commission reports and academic commentary in the area.

The aftermath of lack of trust in Ghana

Puellbeck, Julia, School of Economics, Faculty of the Professions

Abstract

The paper elaborates on the impact of lack of trust subject to the extent of corruption and the wider impact of both on economic development. Whereby trust is measured as peoples' perception on the trustworthiness of institutions, the governmental authorities and traditional institutions. The data indicates that trust has decreased whereas corruption has increased. Thus, the paper aims to test the hypothesis that lack of trust in society and the institutional environment encourage corrupt activities which create negative repercussions for economic growth. By means of a multinomial probit model by using a two least squares estimation the correlation between trust and corruption is elucidated. Essentially, indicating that higher levels of generalised trust demonstrate lower corruption rates, and thereby higher economic growth rates, consequently signalling the underlying roots of economic disparity within African countries. The intention of the paper is to clarify the disparity of economic development within Africa, and that trust reinforces the persistence of corruption which impedes economic development. Essentially, indicating that inherit cultural differences have influenced economic success within African countries, whereby elevating mutual and intercultural trust might positively influence a fair institutional infrastructure as well as economic competitiveness.

The relationship between diabetes mellitus and cognitive function in community-dwelling men

Qing Huynh, Lian, School of Medicine, Faculty of Health and Medical Sciences

Abstract

Purpose/Rationale:

Diabetes increases the risk for dementia, however studies show inconsistent associations between diabetes and cognition. Thus, the purpose of this study is to provide more robust evidence for whether diabetes is independently associated with cognition.

Research Question/Focus:

To examine the effect of diabetes onset, duration and control on cognition in a longitudinally-followed cohort of community-dwelling men.

Research Methodology/Approach:

Men aged 35-80yr at enrolment (n=1194) and followed-up over 5-years (n=860) were drawn from the Florey Adelaide Male Ageing Study. Diabetes was defined by self-reported doctor diagnosis, fasting blood glucose (FBG) ≥ 7.0 mmol/L, HbA1c $\geq 6.5\%$ or medication use. Cognition was assessed using Trail Making Test A (TMT-A; visuospatial) and B (TMT-B; executive function) and Fuld Object Memory Evaluation (FOME; working memory). Data were analysed by multiple-adjusted linear regression.

Results:

12.9% at baseline and 19.2% at 5-year follow-up had diabetes. At baseline, compared to men without diabetes, those with diabetes had poorer performance on the TMT-B ($p=0.003$), but no difference on TMT-A or FOME. At baseline, in the men with diabetes, there were no independent associations between FBG or HbA1c at the time of testing with performance on cognitive tests. At 5-year follow-up, compared to men without diabetes, those with pre-existing ($p=0.007$) but not those with incident diabetes ($p>0.05$) showed a deterioration on TMT-B from baseline. Performance on the FOME deteriorated in those with incident ($p=0.03$) and pre-existing ($p=0.016$) diabetes. TMT-A did not change significantly in any of the groups.

Conclusion:

Diabetes adversely affects cognitive function in middle-aged and older men, primarily impacting executive function and working memory. The magnitude of this effect is determined by the duration of diabetes. While indices of control at the time of testing have no effect on performance, the impacts of prior diabetes control including glucose variability, hypoglycaemia, and medication use needs to be determined in future studies.

Remote Aboriginal Community Well-Being and South Australia's Driving and Licensing Offences

Raaj, Appurya, School of Social Sciences, Faculty of Arts

Abstract

The purpose of the research was to investigate the operation of South Australian driving and licensing penalty and enforcement systems to assess the impact such systems have on the well-being of Aboriginal communities in the APY Lands. The catalyst for the research was the disproportionately high number of outstanding fines for driving and licensing related penalties in the APY Lands.

The research question concerned how the penalty and fines enforcement systems for driving and licensing offences impacted the well-being of Aboriginal communities. This required a three-part approach:

The first part is an examination of the existing penalty and fines enforcement systems, this includes the deconstruction of the legislative structures of driving and licensing offences and penalties.

The second part of the report required the analysis of the systems of offence, penalties and enforcement in the APY Lands, specifically focusing on the system results in the disproportionately high number of fines. This analysis involved examining the practical issues with the current systems and of concepts underpinning the systems. The conclusions drawn include the recognition of a fundamental incongruence between the 'white fella' norms that inform Australian law and Aboriginal norms and values.

The third and final part of the report focused on the impact on the well-being of Aboriginal communities. The findings demonstrate that the current systems exacerbate the existing transport disadvantage on the APY Lands, aggravating the poverty and lack of economic development as well as contributing to the continued criminalisation of Aboriginal people in South Australia.

The research methodology involved the analysis of empirical data on traffic offences on the APY Lands provided by On the Right Track Remote. Due to the lack of empirical data specific to the APY Lands, the research methodology required travel to the APY Lands to consult and gather first-hand, anecdotal evidence from service providers.

The prevalence and impact of pancreatic enzyme deficiency in type 2 diabetes

Riceman, Michael, School of Medicine, Faculty of Health and Medical Sciences

Abstract

Rationale:

Type 2 diabetes (T2D) is common, affecting approximately 1.2 million Australians. Diabetes management requires minimising blood glucose levels, with an important target being glucose levels directly after a meal (postprandial glycaemia). A major determinant of postprandial glycaemia is the hormone "GLP-1". GLP-1 is secreted from the gut in response to a meal and lowers postprandial glycaemia through a variety of mechanisms. Importantly, GLP-1 is only released in response to nutrients that have first been digested by enzymes released by the pancreas. As such, a deficiency in pancreatic enzymes, termed pancreatic exocrine insufficiency (PEI), reduces GLP-1 secretion, thus increasing postprandial glycaemia. Recent literature has demonstrated an increased prevalence of PEI in T2D, as determined by measuring the enzyme faecal elastase-1 (FE-1). In these patients, pancreatic enzyme replacement therapy (PERT) may represent a novel therapy to improve blood glucose control.

Research Questions:

1. What is the prevalence of low FE-1 in T2D?
2. In patients with T2D and low FE-1:
 - a. Are there symptoms of PEI?
 - b. What is the effect of PERT on postprandial glycaemia?

Research Methodology:

T2D patients were recruited from the community, submitted a stool sample for FE-1 measurement and completed a PEI symptom questionnaire. Those with low FE-1 ($\leq 200\mu\text{g/g}$) were invited to participate in a randomised, double-blinded, crossover study to examine the effect of PERT vs placebo on postprandial glycaemia.

Results:

Of 109 patients with T2D, 10 (9.2%) had low FE-1. There was no difference in body mass index, presence of nausea, abdominal discomfort or greasy stools in patients with and without low FE-1. In patients with low FE-1, PERT had no significant effect on postprandial glycaemia.

Conclusion:

Low FE-1 is uncommon in community-based patients with T2D and appears to have minimal clinical relevance. In particular, PERT does not reduce postprandial glycaemia in these patients.

Do the existing defences of duress and necessity properly recognise the common event of domestic violence victims committing crimes such as social security fraud or theft or prostitution at the behest of their abusive partner?

Slimming, Rebecca, Adelaide Law School, Faculty of the Professions

Co-Presenters: Jay, Olivia, Adelaide Law School, Faculty of the Professions, Slimming, Rebecca, Adelaide Law School, Faculty of the Professions

Abstract

Purpose/Rationale:

Criminal defences have historically been criticised for their inability to assist victims of Domestic Violence (DV). In particular, the common law defences of duress and necessity are significantly restricted for such offenders. DV has long been recognised as an acute social problem, characterised not only by physical violence but also a high degree of coercive control. This is reflected through the common occurrence of victims committing crimes such as social security fraud, theft and prostitution at the behest of their abusive partners.

Research Question/Focus

The South Australian law of duress currently requires that the accused committed the offence under a threat of death or grievous bodily harm; that the threat was imminent; and that the accused did not have reasonable opportunity to escape. These requirements are incompatible with the challenges faced by victims of DV. Similarly, necessity is also unavailable to DV victims, requiring the offender to reasonably believe imminent peril will result if a crime is not carried out. The current laws fail to recognise the inevitability of violence towards DV victims. Our research concludes that although the impacts of domestic violence and coercion are currently recognised in sentencing, new legislation - with a focus on defences available to victims of domestic violence - should be drafted by the South Australian Law Reform Institute for parliamentary consideration. These models are evident in other jurisdictions, which have increased flexibility in their legal systems, to potentially assist domestic violence victims.

Research Methodology/Approach

This paper will explain the effects domestic violence has on the victims and their reasons for offending. It considers the limited protection they have and highlights potential law reform suggestions by comparing the approaches of each defence and possible sentencing solutions from domestic and international jurisdictions. The floodgate argument will be considered and consultation with the wider public will inform topical research and debate.

Application of detrital zircon U-Pb geochronology: A study of the Mesoproterozoic Bullita Group, Birrindudu Basin, Northern Australia

Subarkah, Darwinaji, School of Physical Sciences, Faculty of Sciences

Abstract

Purpose: Establish importance of detrital zircon geochronology

Detrital zircons are grains of silicate minerals derived from a pre-existing rock through weathering and erosion which were then transported into depositional systems to form sedimentary successions. Geochronology of this mineral is an effective and essential tool used in earth science research. Although they make up only a minor portion of sedimentary rocks, detrital zircons are chemically robust and are relatively common. They also contain high concentrations of key trace elements. By analyzing their inherent radioactive U-Pb system we can extract a range of information: from high precision radiometric dating to reconstructing provenance regions.

Research question/aim of project: Determine intra-basin correlation as well as environment of Bullita Group.

In this project we use this powerful technique to study the Mesoproterozoic Bullita Group. The group is a part of the Birrindudu Basin, which alongside the Tomkinson Province and the McArthur Basin makes up the informally and confusingly named greater McArthur Basin. The purpose of this project is to establish the lithological equivalents as well as the tectonic setting of this regionally extensive Proterozoic 'super basin' system.

Methodology/Approach:

Maximum depositional ages of formations in the Bullita Group were constrained and compared with other similar units throughout the greater McArthur Basin to demonstrate correlation. Temporal variation in provenance was explored by contrasting the age distribution with the magmatic history of possible source regions in the area. Lastly, the tectonic setting of the basin was interpreted by plotting the distribution of ages against the difference between crystallization age and depositional age. The Bullita Group is expected to correlate with the Nathan Group and the Mount Rigg Group in the McArthur Basin, and was possibly deposited on a rifting margin. Ultimately, detrital zircon geochronology applied alongside other geochemistry studies can provide a comprehensive understanding of how sedimentary systems form and evolve over time.

Modafinil and Mirtazapine for Management of Amphetamine Withdrawal

Sweet, Caitlin, School of Medicine, Faculty of Health and Medical Sciences

Abstract

Purpose/Rationale: Amphetamine dependence is important public health issue in Australia and there is currently no pharmacotherapy for its management. Withdrawal has been identified as a promising treatment target. Modafinil and mirtazapine are used off-label by Drug and Alcohol Services South Australia (DASSA) to manage the sleep-wake cycle disturbance characteristic of amphetamine withdrawal. With increasing use of crystal form methamphetamine, the landscape of amphetamine use is changing, and it is important to assess the effectiveness of these medications compared with 'treatment as usual' in a contemporary setting.

Research Focus: To investigate the impact of (1) modafinil and mirtazapine on treatment completion rates, and (2) modafinil and mirtazapine on sleep quality, sleep-wake cycle disturbance and symptom severity, both compared with treatment as usual.

Methods: A retrospective case-note review of 2016 DASSA inpatient withdrawal episodes with amphetamine or methamphetamine as the principal drug of concern was performed. Data collected included demographics, routine objective and subjective scoring, and clinical observations. Logistic regression was used for analysis of binary outcomes.

Results: Post exclusions, 253 episodes were included in the final data set. Modafinil was associated with a significantly higher likelihood of treatment completion than treatment as usual (odds ratio 3.60, 95% CI 1.50,8.65, P=0.005). Mirtazapine was associated with decreased treatment completion (odds ratio 0.52, 95% CI 0.27,0.99, P=0.046). Mirtazapine patients had significantly higher rates of anxiety than treatment as usual. No difference was identified between modafinil or mirtazapine and treatment as usual in sleep quality, sleep-wake cycle disturbance or symptom severity.

Conclusions: Modafinil for amphetamine withdrawal shows promise as a pharmacological target. The negative relationship between mirtazapine and treatment completion warrants further investigation. Exploration of measurement tools to improve assessment of amphetamine withdrawal symptoms is a crucial step in approaching this research in the future.

Improving Maritime Radar Models with the Burr Distribution

Tran, Charlie, School of Electrical and Electronic Engineering, Faculty of Engineering, Computer and Mathematical Sciences

Abstract

Rationale

Maritime search and rescue missions are a challenging endeavour, but innovations in radar modelling can increase the success of these missions by improving the accuracy of radar system simulations. One such innovation involves finding models that match the statistical characteristics of real radar data obtained by radar systems observing signal returns, also known as backscatter. There have been many popular models for radar backscatter in maritime environments that approximate the distribution of the real data, such as the Pareto distribution, a power-law statistical distribution. However, it is of interest to find tighter fitting models to improve the performance of radar systems.

Research Focus

Towards the research aims, the Burr distribution was considered as a likely candidate to achieve a tighter fit to the real data. Hence, the research focus was to determine whether the Burr distribution could provide an improved fit to the real data, compared to other popular models, and to analyse the degree of improvement.

Research Approach

The distribution structure of the real radar data was processed to develop a distribution graph that was the standard of comparison for the models. Mathematical derivations of the Burr distribution resulted in a simulated model that could be analysed, and compared to the real data. The other models were also simulated using a similar methodology and the results were compared to the Burr distribution and real data.

Conclusion

It was found that the Burr model provided a better approximation compared to the other models. Therefore, implementing the Burr distribution in radar systems can result in increased performance. Areas of further research include developing detection algorithms using the Burr model as a basis and to test the performance of these algorithms.

Postmodern thought and individual experience: An interpretative phenomenological analysis

Van Antwerpen, Natasha, School of Psychology, Faculty of Health and Medical Sciences

Abstract

Rationale

The influence of culture upon the psychology of the individual has long been an area of consideration within academia, however, changes to the philosophical underpinnings of the culture have not always been considered in their impact upon individuals; among them, the shift from modernism to postmodernism. As postmodernism, prominent within the late 1900s, advocated a radical change in views on morality, values, beliefs, and the self, studying its influence upon individuals is both pertinent in its influence, and in understanding the phenomenological processes by which individuals develop and maintain their values and beliefs.

Research Question

The present study was centred around the influence of postmodern thought and ideas in shaping or influencing individuals' perceptions of themselves, their values, and their beliefs. Preliminary findings suggest that, while postmodern thought in general is largely considered extreme, participants found it useful as a tool to question and develop their own beliefs and values, which were frequently centred within their experience and what 'felt' true to them.

Research Methodology

The study at present consists of seven participants with experience in higher education, in courses and degrees with some postmodern component. Eligibility was determined by a prior knowledge or exposure to postmodern ideas, hence recruitment was directed towards university students and graduates. Data were gathered using semi-structured interviews and analysed with Interpretative Phenomenological Analysis (IPA); a qualitative method intended to understand the psychological functioning and essence of an individual's experience both separate and in relation to their cultural surrounding. IPA is grounded in phenomenology and utilises small sample sizes to explore or provide greater depth to the area of investigation.

The role of biological nitrogen fixation on legume plants associated with bacteria

Yun, Jihye, School of Agriculture, Food and Wine, Faculty of Sciences

Co-Presenter: Zhan, Xiaojun, School of Agriculture food and wine, Faculty of Science

Abstract

Purpose/Rationale

Nitrogen is essential for plant life due to its central role in photosynthesis without enough nitrogen in the soil plants become nitrogen deficient resulting in poor growth. Soil nitrogen levels can be improved by the use of inorganic fertilisers or biological nitrogen fixation. Biological nitrogen fixation can be achieved naturally by planting legumes with specific bacteria, Rhizobia (1). Rhizobia are able to take N₂ from the atmosphere and fix N₂ in soil by producing nodules in the plant roots, nitrogen is then available to be used by other plants. Fixation of nitrogen in the soil by Rhizobia stops if sufficient inorganic nitrogen has been supplied or if the plants unhealthy (1). Using Rhizobia inoculated legumes reduces cost by purchasing reduced amount of inorganic nitrogen fertilisers, and reducing damage to the environment.

Research Question/Focus

As legumes and their Rhizobium have a large genetic diversity (2), it is essential for research performed involving which legumes are the most effective at fixing nitrogen. Chickpeas and lucerne are both legumes which can be used with Rhizobia to fix nitrogen both in agriculture and viticulture. In addition these crops can help to maintain the structural integrity of the soil in the off-season and reduces erosion of the soil (2). Also, they can be used for livestock grazing. The aim of this experiment is to evaluate whether Rhizobia inoculation on legumes has effect on plant growth into two species; Mesorhizobium ciceri strain CC1192 for Chickpea (PBA HatTrick) and one with Ensifer meliloti strain RR1128 for lucerne (SARDI-Grazer, certified number V35069).

Research Methodology/Approach

This experiment was conducted with five replicates in each treatment in a control environment in the Plant Accelerator. To observe the growth rate, shoot height was measured every week over four weeks. Biomass, presence of nodules and nitrogen content were measured at the conclusion of the experiment.

References

1. Singer, M, and Munns, D 1991, Soils, an introduction. 4th ed. New York: Macmillan, pp.210-215, 234, 257-259.
2. Hardarson, G and Atkins, C 2003, 'Optimising biological N₂ fixation by legumes in farming systems', Plant and Soil, vol.252, no.1, pp.41-54.