Four Early Career Researchers from the Faculty of Medicine, Nursing and Health Sciences were recently recognised for their contribution to research at Flinders University. The Vice Chancellor Awards for Early Career Researchers were presented to Dr Ivanka Prichard, Dr Andrew Rowland, Dr Bradley Simpson and Dr Lauren Thurgood. Each of these researchers has published widely, secured funding and significantly advanced research projects within the Faculty in the five years since completing their PhD.

**Dr Prichard** (Cancer Prevention) focuses on addressing lifestyle factors associated with chronic disease. Her research examines a range of issues, including attitudes towards food and eating behaviour, the influence of family and peers on diet, pathways to increase physical activity and the effectiveness of different interventions to reduce sun exposure among young people.

By developing a greater understanding of what drives these health behaviours, Dr Prichard is informing the development of age appropriate health promotion strategies that could help reduce the incidence of cancer and other chronic diseases.

**Dr Rowland** (Clinical Pharmacology) is focused on improving the utilisation of cancer drugs. While there have been a number of advances in the treatment of cancer in recent years, many anticancer drugs are still hindered by sub-optimal responses and frequent severe toxicity. Dr Rowland is developing an analytical approach that is capable of quantifying the concentration of anticancer drugs in human plasma and using a computer based approach to simulate the absorption, distribution, metabolism and elimination of drugs. Both projects have the potential to predict the optimal drug dosage for cancer patients, to improve treatment outcomes and minimise toxicity and the financial burden of these costly drugs to the community.

**Dr Simpson** (Flinders Centre for Innovation in Cancer) is exploring the pharmacological potential of native plants used in the traditional medicine systems of Aboriginal communities in South Australia and on Cape York Peninsula.

Dr Simpson is undertaking pharmacological screening of medicinal plants to determine their chemical make-up and biological effects. Together with the Northern Kaanju traditional owners, Dr Simpson has co-discovered novel plant-derived compounds with potent anti-inflammatory properties for the treatment of psoriasis. His ongoing research is also exploring potential treatments for cancer, infectious diseases and lifestyle diseases.

**Dr Thurgood** (Haematology) is investigating cellular differences in chronic lymphocytic leukaemia (CLL), the most common form of adult leukaemia in western countries.

CLL patients show varying clinical outcomes, some patients rarely require treatment, whilst others have aggressive disease and respond poorly to current treatment options. By identifying differences at a cellular level between patients that respond well to treatment, and those that relapse, Dr Thurgood hopes to develop targeted therapies which may prolong the life expectancy of patients with a poor prognosis.
1st January saw the commencement of our new School of Health Sciences. The Faculty of Medicine, Nursing and Health Sciences now has three schools including the existing School of Medicine and School of Nursing and Midwifery. I thank all members of our Faculty staff for your cooperation and many positive contributions during this period of change.

I also thank our Faculty’s researchers and professional staff who have been involved in the preparation of applications for the annual National Health and Medical Research Council’s Project Grant Round. This is the major annual external research funding round for many of our researchers. This year the University has submitted sixty-five applications for consideration for funding.

Congratulations to the four Early Career Researchers from our Faculty recently recognised by the Vice Chancellor for their significant contributions to research at Flinders University. This is well deserved acknowledgement of your achievements in your careers to date, and we wish you well for your future research endeavours here at Flinders University.

Finally, I congratulate Professor John Coveney on his appointment as Dean of our new School of Health Sciences and Professor Ross McKinnon and Dr Jennifer Tieman on their appointments as the new Associate Deans (Research) of the School of Medicine and School of Health Sciences respectively. Further details about the new research structures across our Faculty will be presented in the next edition of Research Pulse.

Professor Michael Kidd AM
Executive Dean
Faculty of Medicine, Nursing and Health Sciences
Flinders University

Improving mental health care for older people in rural regions

There is significant unmet need for mental health care for people aged over 65, with serious consequences for their mental and physical health. Older people in rural communities are particularly disadvantaged in terms of availability and access to mental health care services.

While the provision of integrated services is advocated in Australian national and state policies, the methods for initiating and maintaining collaborative process for integration are unclear. A research project, led by Professors Jeffrey Fuller and Eimear Muir-Cochrane, together with Associate Professor Sharon Lawn, Professor Richard Reed, Ms Ann Nosworthy, Ms Ruth McPhail, Mr Philip Galley, Dr Adam Gerace, Dr Julie Henderson, Professor Malcolm Battersby, Mrs Debra O’Kane, Dr Candice Oster and Ms Suzanne Dawson, will address this lack of clarity.

Medicare Locals have been established to coordinate the delivery of primary health care that will address local health care needs and fill service gaps. The aim of this health services research is to validate and test a model for Medicare Locals to plan and manage the development of integrated primary mental health care for older people in a rural network. The research will use participatory evaluation feedback and problem solving processes. One rural region in South Australia is being used as the case study to examine the interaction between mental health services, primary health care, aged care and other community services as they seek to meet the mental health care needs of older people.

An evidence-based theoretical model for managing integrated primary mental health care services has been developed and will be tested in this case study. Service Network Analysis will be undertaken to provide information about the structure and function of links between services, and barriers and enablers to effective linkages. The research will collect data on the perceptions and experiences of key stakeholders, consumers and their carers of successful and unsuccessful pathways to older persons’ mental health care.

The role of macro and micro level policy will also be examined in supporting the development of local integrated care.

Findings from the project will be presented to the key stakeholders progressively over the project to facilitate improved service coordination. The broader outcome will be a network-planning model that could be used in other regional locations to improve integrated care between primary, sub-acute and community care providers.

This project has partnered with Southern Adelaide-Fleurieu-Kangaroo Island Medicare Local; Southern Fleurieu and Kangaroo Island Positive Ageing Task Force and Country Health SA Local Health Network Mental Health Services and is funded by the Australian Primary Health Care Research Institute.

pam.smith@flinders.edu.au

Ms Suzanne Dawson, Professor Jeffrey Fuller and Professor Eimear Muir-Cochrane
Motivation for breastfeeding mothers

New research has found that breastfeeding mothers may change how they feed their babies in response to a motivational interviewing intervention.

The PhD research by General Practitioner, Dr Megan Elliott-Rudder, was co-supervised by Professor Ellen McIntyre and Professor Louis Pilotto.

The cluster-randomised controlled trial found that offering more support for ongoing breastfeeding, through trained general practices nurses who used a motivational interviewing approach, led more mothers to follow the Australian dietary guidelines on breastfeeding.

It found a significant increase in rates of exclusive breastfeeding and full breastfeeding at four months, compared to the control group, with 330 mothers attending one of fifteen general practices. Results were adjusted for mothers’ employment plans during their baby’s first year of life, which was the only demographic, birthing or planning variable that was unequally distributed between groups.

These findings offer hope that primary care facilities can influence the decline in breastfeeding that occurs between two and six months postnatal, which in turn may reduce avoidable hospital admissions and illnesses among babies.

The study published in *Acta Paediatrica* gives high level evidence for this novel application of motivational interviewing. It adds to the body of evidence on the importance of health professional training in breastfeeding management and support. Dr Elliott-Rudder says that motivational interviewing enables a collaborative, patient-centred conversation with mothers. “The model was attractive to practice nurses because there was no way they wanted to beat mothers around the head. They were quite keen however to have something they could offer mothers wherever they were at.”


ellen.mcintyre@flinders.edu.au

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Cytochromes P450: a very old friend with potential importance in heart disease

Ischaemic heart disease (IHD) can take many forms including angina, myocardial infarction (MI) and sudden cardiac death, and represents a major and increasing public health burden.

IHD has risen from being the fourth leading cause of disability-adjusted life years (DALYs), a measure of disease burden, in 1990 to become the leading cause of DALYs in 2010. In the United States, IHD is responsible for about one out of every six deaths, and it has been estimated that every 25 seconds an American will suffer an acute IHD-related event.

Despite the established clinical impact of various cardiovascular risk factors and the continuous enhancement of risk prediction models, a substantial proportion of IHD-related events remain unexplained. This has prompted the search for new biochemical, vascular and genetic markers to improve risk prediction.

The cytochromes P450 (P450s) are an enzyme superfamily that is primarily involved in the breakdown (metabolism) of compounds that are produced by our body, and those that we are exposed to, including almost 75% of drugs. While many P450s are involved in drug metabolism, these enzymes have existed for >3.5 billion years, suggesting that their primary function is the metabolism and detoxification of compounds produced by our bodies, and those that we are exposed to, including almost 75% of drugs.

An increasing body of evidence has convincingly demonstrated that P450s are found in many organs and tissues, including the cardiovascular system and kidney. Over the past 20 years a growing number of studies have investigated the potential role of P450s in regulating normal cardiovascular function (homeostasis) and IHD. As several P450s play a role in cardiovascular homeostasis and drug metabolism, these enzymes may affect the onset and progression of IHD as well as the therapeutic response of several cardiovascular drugs.

Flinders University academics Dr Andrew Rowland and Professor Arduino Mangoni have recently reviewed the evidence for the role of P450s in IHD and provided an expert opinion on the topic (http://www.ncbi.nlm.nih.gov/pubmed/24274646), highlighting the current concepts in this field, knowledge gaps and scope for future research.

andrew.rowland@flinders.edu.au; arduino.mangoni@flinders.edu.au
Celebrating success in the Faculty

Research Pulse welcomes information regarding grants, awards and honours for publication in future editions. Faculty of Medicine, Nursing and Health Sciences’ researchers are shown here in bold.

National Health Performance Authority
David Ben-Tovim, Richard Woodman: Advice on calculation methodology for the measurement of unexpected hospital mortality, $471,977.

DEEWR Office for Learning and Teaching
Eimear Muir-Cochrane, David Gillham, Deb O’Kane, Pat Barkway, Daryle Rigney, Wendy Edmondson: Reshaping curricula: integrating culturally diverse/mental health online content to prepare work ready health professionals, $219,000.

Flinders University - Deputy Vice Chancellor (Research) Near Miss
Ida Llewellyn-Smith, Andrew Allen: Changes in central presympathetic circuits that control heart function in chronic heart failure, $25,000.

The Clive & Vera Ramaciotti Foundation
Andrew Rowland: Improving outcomes for oncology patients receiving treatment with protein (tyrosine) kinase inhibitors through dose optimisation, $74,500.

Alzheimer’s Australia SA
Sam Davis: A literature review of training resources for primary care practitioners, $62,670.

The Motor Neurone Disease Research Institute of Australia Rosalind Nicholson Research Grant
Mary-Louise Rogers: A biomarker to track progression of motor neuron disease in humans and MND mice, $100,000.

Apex Foundation Trust for Autism

RAH Research Foundation Allied Health Award
Laleh Younasis (MSc), Willem Van Steenbrugge, Sebastian Doeltgen, Amy Rodriguez: Implementing Aphasia Language and Functional Therapy (the LIFT program) in the sub-acute Inpatient Rehabilitation Setting, $30,000.

Heart Foundation Focus Grants
Kevin McNamara, James Dunbar: Absolute risk screening in pharmacy, $149,000.

Heart Foundation Postdoctoral Fellowships
Kevin McNamara, James Dunbar (supervisor): Management of acute coronary syndrome for patients with multimorbidity, $150,000.

Heart Foundation Health Professional Scholarships
Pupalan Iyngkaran, Northern Territory Heart Failure Initiative (NTHFTI), $120,000 (over 3 years).

Flinders Medical Centre - Clinicians Special Purpose Fund
Scott Morris, Anthony Carlisle: Neonatal core body temperature investigation, $85,000.

Australia Day Honours
Member (AM) in the General Division of The Order Of Australia
Susan Charlton: For significant service to the community of South Australia through a range of philanthropic and charitable organisations, and to physiotherapy.
Graeme Young: For significant service to medicine through a range of research, clinical and academic roles, particularly in the area of gastrointestinal health.

NHMRC Postgraduate Scholarships
Geetha Gopalsamy: Effect of type 2 resistant starch (RS2) on zinc retention in zinc depleted growing rats and the potential utilisation of RS2 by infant fecal inocula, $78,412.

Mr Kevin McNamara

Dr Pupalan Iyngkaran
Recent research has uncovered differences in personality that might make some health professionals more suited to working in rural and remote areas than others. The Remote and Rural Allied Health Motivation and Personality (RRAHMP) study looked for connections between personality and work location. It was fuelled by the difficulties that remote areas have in attracting and retaining allied health professionals.

Led by Flinders University Northern Territory Medical Program academic Narelle Campbell, and supported by Diane Eley from University of Queensland and Lindy McAllister from University of Sydney, the research collected personality profiles from over 560 allied health professionals. A study on this topic with this number of Australian allied health professionals has never been done before. The study used the Temperament and Character Inventory, a well-researched personality tool.

The findings provide support for what appears as common sense. Allied health professionals who work in remote areas showed a tendency to be higher in a trait called Novelty seeking – being curious and open to new experiences. Higher levels of novelty seeking make the idea of exploring a career in the bush more appealing. Potentially it could help the allied health professional retain their enthusiasm and energy despite the challenges of service provision to isolated areas.

Many new graduate allied health professionals seek work in remote places, however the study suggested this carries risk. The youngest group in the study (under 30 years) showed higher Harm Avoidance levels, meaning they were more anxious and worried than older professionals. The challenges in remote work such as lack of on-site same profession support, isolation from friends and family and travelling large distances to deliver services in a cross cultural context could potentially erode their confidence further. Providing a new graduate with extensive orientation and counselling while they get established, and ongoing support to build their confidence, could alleviate some of their concerns.

“This research is particularly important to Flinders because of the remoteness of the North-South Corridor that we occupy from Adelaide up to Darwin. We have also invested in a large range of allied health professional courses. Personality traits can mature with age, experience and reflection so ensuring that our students learn about, and in, the remote context will provide them with the best opportunity for graduating remote-ready.”

narelle.campbell@flinders.edu.au

Access to the original research can be found at http://onlinelibrary.wiley.com/doi/10.1111/ajr.12047/abstract

Supporting children and young people

Associate Professor Alison Hutton, from the School of Nursing and Midwifery, recently presented the keynote address at the Are Risk Event held in Sweden. She presented harm minimisation strategies that have been used over the years to reduce alcohol related harm and violence and create safe supportive environments for young people at Adelaide ‘Schoolies’ festivals.

Following this, Associate Professor Hutton will travel to Baltimore in the USA to commence an Endeavour Executive Fellowship at Johns Hopkins School of Nursing. The main aim of this fellowship is to observe how ‘service learning’ is taught to nursing students. Service learning is a method of teaching that combines classroom teaching with meaningful community service and relies on critical thinking, community engagement and personal responsibility.

Associate Professor Hutton wishes to bring this philosophy of teaching back to the School of Nursing and Midwifery to enhance the work of nursing students, through providing service to others and attaining a positive change to the wider community.

alison.hutton@flinders.edu.au

Associate Professor Alison Hutton

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Flinders University recognises outstanding research published by higher degree students each year. The Flinders University Best Research Student Paper Award is valued at $1000 and is awarded to students who have made a significant original contribution to their field of study by publishing in a high quality, peer reviewed, scientific journal.

The recipients of the 2013 Flinders University Best Research Student Paper Award are Ms Lucinda Bell and Dr Carolyn Petersons.

Ms Lucinda Bell is a Nutrition and Dietetics PhD student undertaking research into the dietary patterns of Australian toddlers and their associations with socio-demographic characteristics and adiposity. She is being supervised by Associate Professor Anthea Magarey and Dr Rebecca Golley.

Ms Bell’s research, published in the European Journal of Clinical Nutrition, identified two dietary patterns at 14 and 24 months of age, representing core (rich in fruits, vegetables and grains) and non-core (low-fibre, fatty and sugary foods and beverages) intake.

Poorer-quality dietary patterns were seen in children of younger mothers and those breastfed for shorter durations at both ages, and at 14 months in children with smoking mothers and those introduced to solids early.

Conversely, higher-quality dietary patterns were associated with highly educated mothers and longer breastfeeding duration (at 14 months) and later solid introduction (at 24 months).

Interestingly, patterns were not associated with children’s adiposity. Despite this, it is of concern that dietary patterns characterised by non-nutritious foods were identified at this young age. These findings support the need to intervene early with parents to promote healthy eating and can inform future investigations on the effects of early diet on long-term health.

Dr Carolyn Petersons received the 2013 Flinders University Best Research Student Paper Award for her study published in Diabetes Care, a leading journal of the American Diabetes Association.

Her research focussed on low-dose glucocorticoids which are prescribed long-term to approximately one percent of the population, most commonly for inflammatory rheumatologic disease.

The metabolic effects of low-dose glucocorticoids and optimal management of glucocorticoid-induced diabetes are poorly characterised. This study, undertaken at the Southern Adelaide Diabetes and Endocrine Services, used gold standard metabolic techniques to investigate the acute and chronic effects of low-dose prednisolone on carbohydrate metabolism in subjects with inflammatory rheumatologic disease.

The study found that a one-week course of prednisolone increased basal endogenous glucose production, and reduced insulin sensitivity and secretion, while long-term low-dose prednisolone administration reduced insulin sensitivity.

This research has important clinical implications. Vigilant screening for diabetes should occur in patients taking low-dose glucocorticoids. Alternative treatment options should be considered, particularly in patients at high risk of diabetes. Finally, therapy for glucocorticoid-induced diabetes should target insulin sensitivity.

The study was funded by the Diabetes Australia Research Trust and Foundation Daw Park. Dr Petersons was the recipient of an Australian Postgraduate Award and a Flinders Centre for Clinical Change and Health Care Research Top-up Scholarship, and her supervisor, Dr Burt, was supported by a South Australian Health Practitioner Fellowship.

lucy.bell@flinders.edu.au; carolynpetersons@yahoo.com.au
Briony Forbes was appointed as Associate Professor of Medical Biochemistry at Flinders University in August 2013. She comes to Flinders from the School of Molecular and Biomedical Science at the University of Adelaide where she was head of the The Laboratory of Protein Signalling.

Her research interests are in the insulin-like growth factor (IGF) system in development and disease. IGFs play a major role in cancer, aging, neuronal disease, diabetes and cardiovascular disease.

Using her expertise in protein structure and function she has been developing inhibitors of IGF action for the treatment of cancer. As there is evolutionary and functional overlap between the IGF and insulin hormones and signaling pathways more recently the focus has broadened to understanding mechanisms of metabolism control and the development of novel insulins for the treatment of diabetes.

The laboratory also has a keen interest in exploring the links between metabolism and cancer and hence the new lab at Flinders is called Proteins in Metabolism and Cancer.

The Forbes laboratory research is supported by an ARC Linkage grant entitled New insulins for improved management of diabetes and Briony recently received an NHMRC project grant entitled Novel insulin mimetics $542,562 (2014-2016).

briony.forbes@flinders.edu.au

Promoting physical activity to children

Public health institutions have increasingly addressed what is called a children’s obesity ‘epidemic’, most notably through large-scale initiatives promoting physical activity. Professor John Coveney and Dr Stephanie Alexander (Université de Montréal) examined these public health efforts in Canada and Australia by analysing the main public health websites targeting child physical activity and obesity in both countries.

They found that in both the Canadian and Australian documents numerous risks were emerging related to children’s obesity. For instance, not only was being overweight or obese deemed a health risk, but simply engaging in less physical activity than is prescribed by the public health institutions warranted the label ‘at risk’. A particular version of the child’s healthy body (i.e., slender, muscles, not fat) was also emphasised as one of the main incentives for children to engage in physical activity, and the departure from norms of what a child’s healthy body ought to look like (i.e., muscle, slim) was constructed as a further indicator of risk and potential disease.

Professor Coveney and Dr Alexander also found a strong association between seeking pleasure and being physically active. In the public health documents, physical activity was assumed to be ‘fun’ for all children and thus ‘fun’ was used as a way to motivate and urge children to be physically active. Omitted from this discussion is the importance of ‘fun’ for children’s social and emotional health and that both active and inactive leisure are relevant for children’s overall well-being.

The findings, published in Health Sociology Review, call for research and practice within public health to reflect on its role in advancing the existing societal and cultural values and beliefs (i.e., productivity and utilitarianism) over others (i.e., pleasure, social and emotional health), particularly in the context of the promotion of children’s health and well-being.

John Coveney
head.fppphc@flinders.edu.au

Briony Forbes
Associate Professor Briony Forbes
The research team in Palliative and Supportive Services, lead by Professor David Currow, has been studying breathlessness for more than a decade. Breathlessness is a highly frightening symptom, and many people across the community have breathlessness at rest or on minimal exertion despite maximal treatment of their underlying disease for many years.

The research team includes a range of disciplines from across the campus: palliative and supportive care, respiratory medicine and clinical pharmacology. The team has been exploring systematically the benefits and harms of regular, low dose opioids such as morphine which augment the body’s own natural opioid-like chemicals which are secreted when a person is breathlessness.

These new research projects funded by the National Health and Medical Research Council are looking at:

- whether opioid receptors in the peripheral nervous system help in any way to modulate the sensation of breathlessness; and
- how best to adjust the dose of regular, low dose, sustained release oral morphine in people who have shown benefit from the medication.

These very practical questions are likely to influence the care of literally millions of people around the world, given the prevalence of breathlessness in diseases such as emphysema (chronic obstructive pulmonary disease), chronic heart failure and advancing cancer.

david.currow@flinders.edu.au

Over the last decade there has been considerable interest in short sequences of RNA called microRNAs which are involved in gene regulation and produced by all animal cells.

Following experimental predictions that some viruses also make microRNAs, researchers at Flinders University have examined whether these molecules are detectable in blood and urine of transplant patients with the BK virus infection.

Professor Jonathan Gleadle, Dr Jordan Li, Dr Michael Michael and Mrs Kym McNicholas, in collaboration with colleagues from the Royal Adelaide Hospital and SA Pathology, have successfully detected for the first time BK virus encoded microRNAs in the blood of transplant patients with BK virus infection. The level of these microRNAs is strongly linked with actual kidney disease produced by the viral infection.

The findings of this study have been accepted for publication in the American Journal of Transplantation, the highest ranked transplantation journal in 2013 and second in surgery. This study was undertaken with support from a Flinders University Faculty of Medicine, Nursing and Health Sciences seeding grant.

Dr Li said this study will be expanding to prospectively evaluate whether testing for these molecules can be developed into an improved test for the infection.

This discovery also opens the exciting possibility of using microRNAs to detect other viruses such as cytomegalovirus and human papilloma viruses that are re-activated in transplant patients when their immune system is suppressed.

jordan.li@health.sa.gov.au

Research Pulse is an initiative of the Faculty of Medicine, Nursing & Health Sciences at Flinders University. Comments and suggestions for future articles are welcome. Also available online: www.flinders.edu.au/mnhs/publications.cfm

Contact: health.research@flinders.edu.au  │  Editorial Team: Mrs Denise Caretti, Ms Pat Barkway & Dr Karen Lower

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