

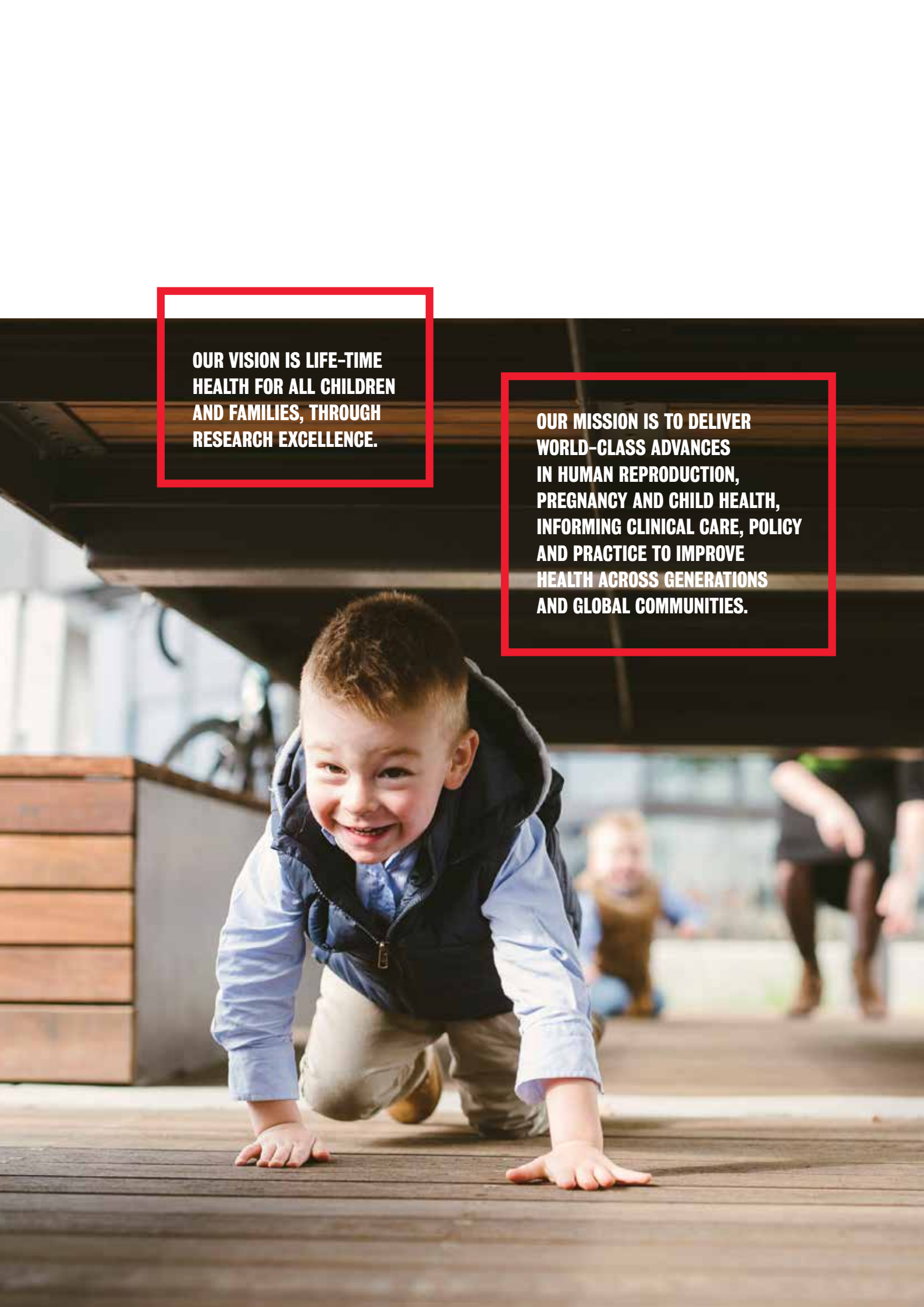


THE UNIVERSITY
of ADELAIDE



ANNUAL REPORT 2017

Robinson Research Institute



**OUR VISION IS LIFE-TIME
HEALTH FOR ALL CHILDREN
AND FAMILIES, THROUGH
RESEARCH EXCELLENCE.**

**OUR MISSION IS TO DELIVER
WORLD-CLASS ADVANCES
IN HUMAN REPRODUCTION,
PREGNANCY AND CHILD HEALTH,
INFORMING CLINICAL CARE, POLICY
AND PRACTICE TO IMPROVE
HEALTH ACROSS GENERATIONS
AND GLOBAL COMMUNITIES.**

WHO WE ARE

The Robinson Research Institute is a collective of internationally renowned researchers in human reproduction, pregnancy and child health at The University of Adelaide.

We focus on the early life events and determinants that build health and resilience in children and families over the life course and across generations, in Australia and around the world.

We seek to enable a healthy start through fertility choices and intentional conception, nurturing the baby during pregnancy and birth, strengthening the brain and body in early life, and advancing child and adolescent health to reduce and prevent disease.

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RRI SNAPSHOT



\$23.6M
COMPETITIVE
FUNDING



46
RESEARCH
LEADERS



400
MEMBERS



8
AWARDED NHMRC PROJECT
GRANTS + 1 CRE + 3 FELLOWSHIPS



6
NEW PATENTS FILED

OUR DISCOVERIES IMPACT ON



Fertility & Conception

- Assisted reproductive technologies
- Breast cancer
- Contraception
- Congenital abnormalities
- Embryo development
- Endocrine disorders
- Environmental reproductive toxins
- Endometriosis
- Female and male reproductive health
- Gamete development & quality
- Genome editing
- Immune disorders
- Implantation failure
- Infertility
- IVF
- Metabolic disease
- Miscarriage
- Mitochondrial disease
- Ovarian cancer
- Pelvic pain
- Polycystic ovary syndrome
- Preconception care and planning
- Puberty
- Reproductive cancers
- Sexually transmitted infection



4

RESEARCH THEMES



92

PHD STUDENTS



5

RRI EMBEDDED IN 5
SA HOSPITALS



10

RESEARCH
PRIORITIES



133

SYMPOSIUM + PLENARY
PRESENTATIONS (72 INTERNATIONAL)



23

HONOURS
STUDENTS



14

RRI EVENTS



562

PUBLICATIONS

Pregnancy & Birth

- Gestational diabetes
- Intrauterine growth restriction
- Labour induction
- Maternal overweight and obesity
- Maternal vaccinations
- Multiple pregnancies
- Neonatal medicine
- Obstetric medicine
- Placental development & dysfunction
- Postnatal depression
- Preeclampsia
- Pregnancy health & care
- Preterm birth
- Stillbirth
- Zika virus

Early Origins of Health

- Asthma & allergy
- Autism
- Autoimmune disorders
- Cancer
- Cardiovascular disease
- Diabetes, type 1 and type 2
- Disadvantage
- Epigenetics
- Neurodevelopment
- Obesity
- Transmission of health across generations
- Type 1 and type 2 diabetes

Child & Adolescent Health

- Blood transfusions
- Cerebral palsy
- Circadian rhythm disruptions
- Cystic fibrosis
- Educational achievement
- Epilepsy
- Influenza
- Intellectual disability
- Juvenile arthritis
- Meningococcal disease
- Mental health
- Organ transplantation
- Pertussis (whooping cough)
- Sleep disordered breathing
- Stem cells
- Vaccine safety

REFLECTIONS ON 2017

2017 was a productive and successful year for the Robinson Research Institute in our pursuit to improve the health and wellbeing of children and families in Australia, and around the world.

Collectively our members progressed understanding of the early life origins of health, advancing knowledge and developing solutions for important health conditions ranging from infertility and pregnancy disorders such as preterm birth, to debilitating childhood conditions including cerebral palsy and infectious diseases.

In 2017 The University of Adelaide undertook a review of its five Institutes. The RRI performed exceptionally well and funding has been extended for a further 5 years. The panel endorsed the direction the RRI is taking to secure sustainability into the future and we are confident we are well-placed in the changing research environment.

With wide consultation across our membership, we completed our five-year strategic plan, which focuses on strategies to

leverage current and future opportunities. Key to this will be partnerships and collaboration, community input, research translation, future leader training and ensuring our members have the facilities and support required to deliver excellence.

In mid-2017, most of our members moved into the new Adelaide Health and Medical Sciences Building, in the *Adelaide BioMed City*. We are now co-located with SAHMRI, the University of South Australia, the new Royal Adelaide Hospital and the future site for the Women's and Children's Hospitals. Being in this space affords us new collaborations and access to first-rate equipment and facilities that will make a real difference to our research productivity.

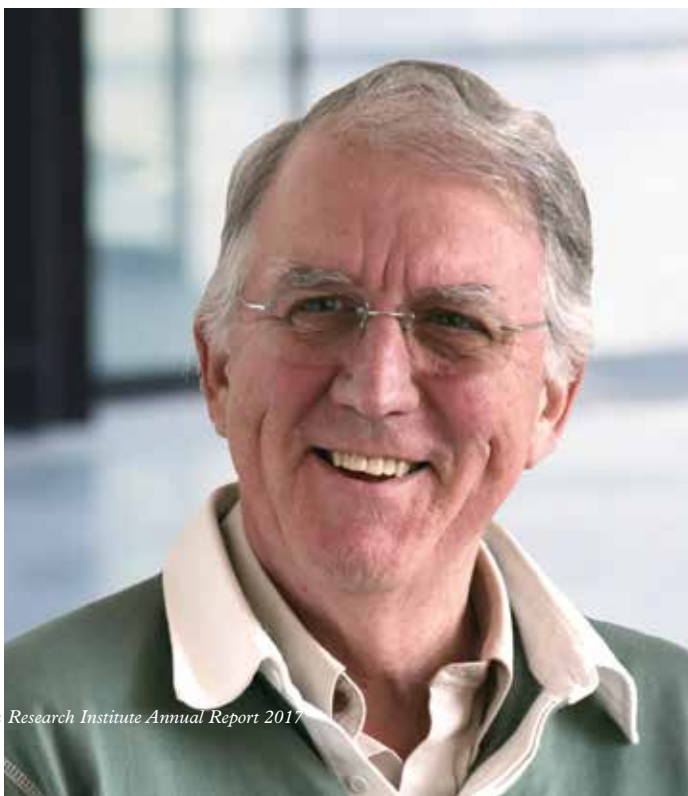
Our members produced an outstanding 562 publications in 2017, with many noteworthy

L to R:

Professor Jock Findlay AO
Chair of the Advisory Board

Professor Julie Owens
Acting Deputy Vice-
Chancellor, Research

Professor Sarah Robertson
Director



advances. Among them, we demonstrated that the 100-year-old underutilised fertility treatment of tubal flushing with iodised poppy seed oil is safe and reduces the need for IVF; we proved that administration of antenatal magnesium sulphate prior to preterm birth protects the fetus against cerebral palsy; we developed a new 3D printed lattice to facilitate efficient and cost-effective generation of regulatory T cells for immunotherapy; and we uncovered critical defence mechanisms against Zika Virus infection to inform design of effective vaccines.

We congratulate two members for major achievements in 2017; firstly, to Professor Jozef Gécz on his election as a *Fellow of the Australian Academy of Science* recognising his outstanding contribution to medical science through world-leading neurodevelopment research, and secondly, to Professor Helen Marshall for the remarkable success of *B Part of It*. A partnership with SA Health, this world-first Meningococcal B carriage study has recruited 34,500 students in years 10, 11 and 12 in South Australia, and evaluated the impact of free vaccinations against Meningococcal B on carriage rates in the whole population.

Continuing on from our collaboration focus in 2016, new research partnerships were established in 2017 with stakeholders from industry, not-for-profit organisations, government and the community, to develop new research areas and accelerate the

translation of research into practice. This was facilitated by internal funding programs and health consumer engagement training, intended to up-skill and support our members in broadening collaboration with non-traditional partners.

We continued to broaden support and resources for our early and mid-career researchers, understanding that developing early and mid-career capacity is critical to the future success of the Institute. In 2017 we further developed the Early and Mid-Career Researcher Council, which is providing valuable advice and guidance to the RRI's Executive Committee, ensuring that early and mid-career researcher views and issues of importance are addressed. Additionally, we introduced new initiatives to improve mentoring, grant development and the co-design of research with collaborators and stakeholders.

Despite the constrained research funding environment, RRI received strong NHMRC Project Grant outcomes. Most of the project grants funded had received support through one or more of RRI's research development initiatives and grant development funding. This demonstrates the value of these initiatives. Congratulations to our successful members highlighted later in this report.

As always, we are grateful to the University's continued encouragement, financial support and confidence in the Institute's research, and our ability to achieve our goals. We are

A partnership with SA Health, this world-first Meningococcal B carriage study has recruited 34,500 students in years 10, 11 and 12 in South Australia, and evaluated the impact of free vaccinations against Meningococcal B on carriage rates in the whole population.

well-supported by the Institute's professional staff, and thank them for their dedication and professionalism.

We continue to be inspired by our members' determination and commitment to research excellence, their willingness to adjust to changing environments and meet new challenges, and their ability to form successful collaborations and working partnerships with industry, the government and external bodies.

Thank you to the Advisory Board members, the Executive, EMCR Council and of course to our members for their hard work and perseverance as we collectively strive for the benefit of generations to come.



Research Priorities

WE SEEK TO PREVENT AND ALLEVIATE INFERTILITY



Infertility is common; 1 in 6 couples are diagnosed as clinically infertile, and demand on IVF services is growing, costing Australians more than \$360 million per year.

To address infertility the Robinson Research Institute is:

- Advancing knowledge of the physiological processes of gamete production, conception and early embryo development
- Defining how diet, infection and lifestyle choices alter fertility and the health of the baby
- Understanding how metabolic conditions such as obesity, diabetes and PCOS cause infertility and alter fetal growth, and developing interventions
- Improving the process of IVF to make it safer, less invasive and more cost-effective
- Developing new infertility treatments to expand options and to improve success
- Building tools to promote early planning for conception and parenthood to reduce the need for IVF

Translational Impact

Endometriosis Consensus Statement

Prof Neil Johnson and A/Prof Louise Hull were part of the World Endometriosis Society group that published the *Consensus Statement on the Classification of Endometriosis*.

The group produced a total of 28 consensus statements which covered women's priorities, aspects of classification, impact of low resources, as well as all the major classification systems for endometriosis. The group proposed a classification toolbox that could be used in cases of surgery to remove endometriosis.

Your Fertility

The RRI is a proud partner of *Your Fertility*; a national public education program that seeks to improve community understanding about modifiable factors that affect fertility, conception and a healthy birth.



In 2017 RRI, the Victorian Assisted Reproductive Treatment Authority and Flinders University further developed the *Your Fertility Potential webtool*, which provides tailored guidance to users based on input on personal factors including age, BMI, smoking and alcohol consumption, with the intent of improving conception success. New iterations will focus on behaviour change and how to best inform the community.

Emergency Contraception Guide

Prof Claire Roberts and Dr Luke Grzeskowiak partnered with Dr Helen Calabretto from SHINE SA to produce the *Emergency contraception – an evidence-based practice guide*.

This guide reviewed the three main methods of emergency contraception available in Australia, to assist pharmacists when dealing with clients. An evidence-based treatment algorithm was included to assist in decision-

making regarding emergency contraception use, with ulipristal acetate now likely to be the first-line option.

Light Study

The Livebirth rate In vitro fertilisation and Growth Hormone Treatment (Light) Study was a randomised placebo-controlled trial seeking to address the question of whether administration of human growth hormones in patients who have not responded well in previous IVF cycles, will improve the chance of pregnancy and livebirth in a subsequent cycle.

This study was completed in 2017 and did not demonstrate benefit of administering growth hormone. Prof Rob Norman and A/Prof Louise Hull's findings highlight the necessity of removing this practice in IVF clinics.

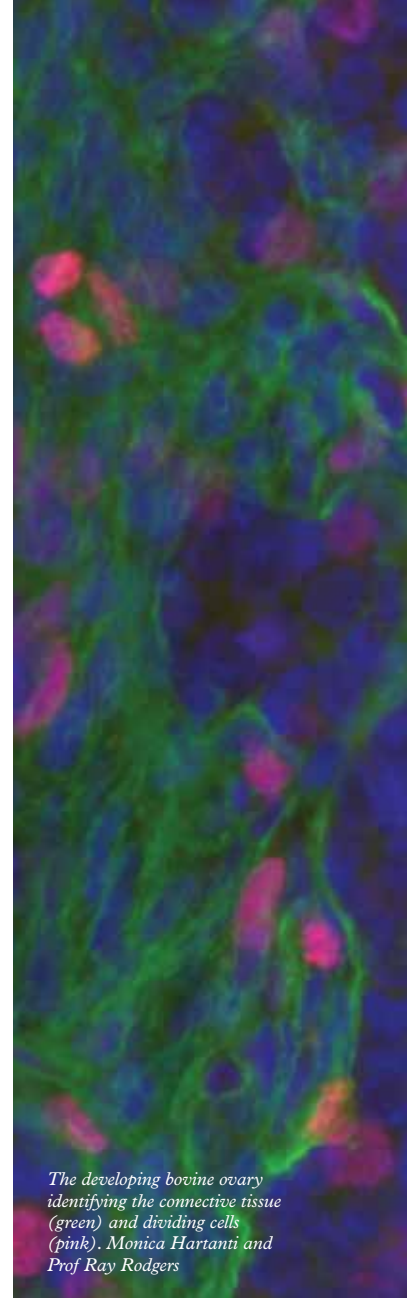
Endometriosis drug development

A/Prof Louise Hull is the principal investigator for a clinical trial assessing a new pharmaceutical drug for endometriosis in South Australia. This newly formulated GnRH antagonist (Elagolix) is for oral use, meaning it is easy to administer daily for long periods of time, compared to the injectable GnRH antagonists currently used.

Results from the trial found that pain outcomes were improved by Elagolix, which now provides a new treatment option to women with endometriosis. This multinational, randomised controlled clinical trial was undertaken in partnership with the Pain and Anaesthesia Research Clinic and AbbVie.

Research advances in 2017

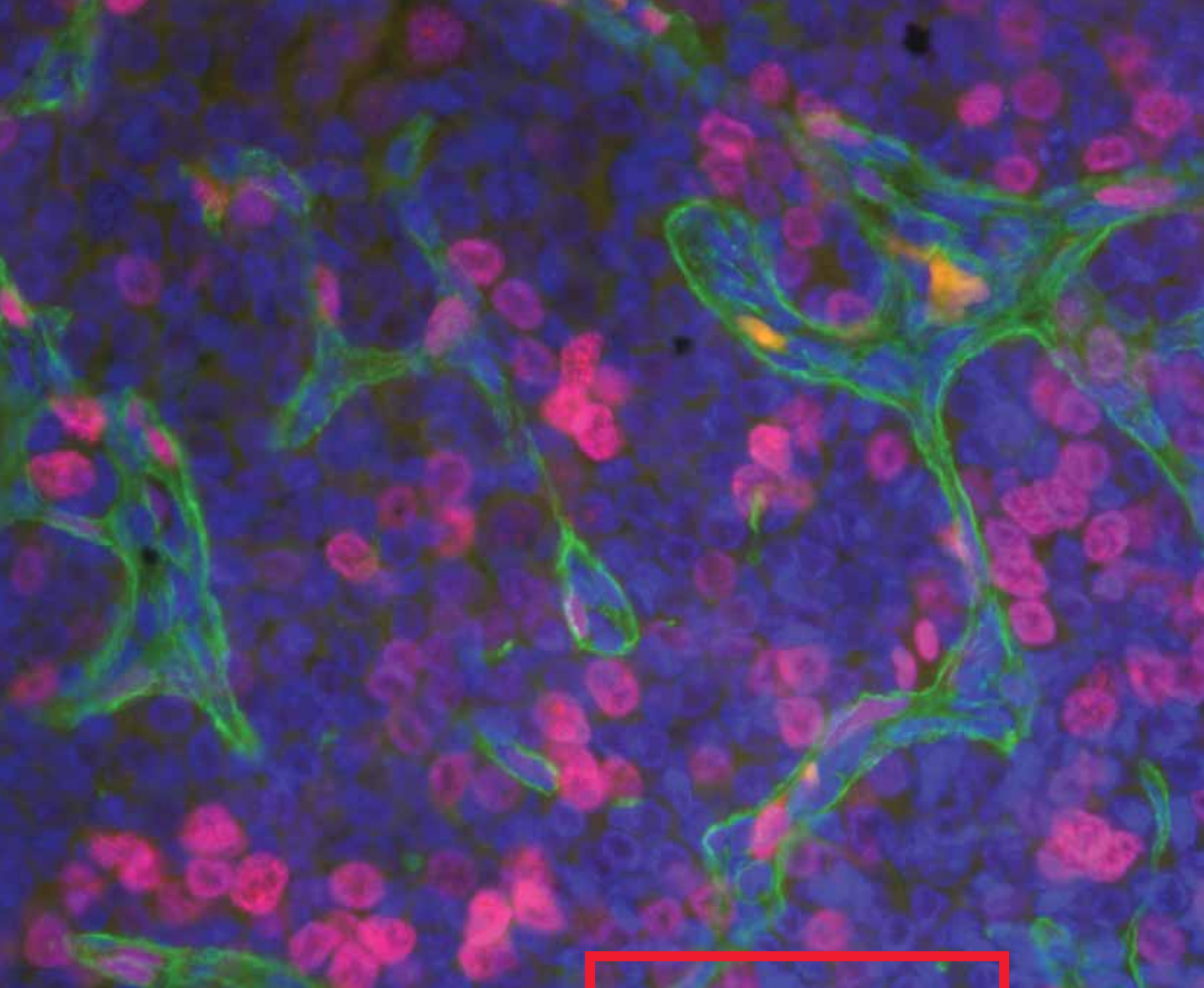
- We used time-lapse imaging to monitor mouse embryos conceived from older males or females and discovered distinct differences. Prof Rebecca Robker and Dr Macarena Gonzalez found that embryos created from older males experience developmental delays; they are now developing IVF strategies to improve development of these embryos.
- We demonstrated that the CD8 T cell response at conception can set the course of poor outcomes in gestation, such that a shift towards immunity as opposed to tolerance increases susceptibility to miscarriage in later gestation. Prof Sarah Robertson and Dr Lachlan Moldenhauer's research reinforces the importance of the correct immune response at conception.
- We developed a microRNA deficient mouse model of endometriosis and demonstrated that miRNA-155 and miR-RNA-223 were critical to normal endometriotic lesion development. The cellular and molecular pathways altered by these miRNAs were identified by PhD student Kavita Panir and are targets for therapeutic intervention.
- We have conceptualised assisted reproductive technologies as involving a hierarchy of risk of adverse outcomes for the children. Professors Michael Davies and Vivienne Moore seek to understand how and why risks increase as treatments become more invasive, with the aim of modifying treatments to ameliorate risks.
- We showed that the intensity of post-copulatory sexual selection determines the form of the spermatozoon and the structural organisation of the testis in numerous mammals. Prof Bill Breed's discovery highlights how evolution is influencing mammalian gamete and gonad structural organisation and function.
- We have shown that the addition of GM-CSF to oocyte maturation media can improve preimplantation embryo development in mice, pigs and cattle. Based on these findings A/Prof Mark Nottle has filed a patent and plans to extend this work to humans to overcome the need for hormonal stimulation in IVF.
- We examined a South Australian community cohort and found a low prevalence of polycystic ovary syndrome in young women (<25 years), suggesting under-diagnosis in this age group. Dr Jodie Avery's findings highlight the need for greater awareness of this condition among women and their care providers.
- We developed CAD-designed novel 3D-printed devices using the RMIT's micron-scale 2-photon lithographic printer. Prof Jeremy Thompson designed this during his four-month sabbatical at RMIT and the University of Melbourne. The devices are designed to incorporate various sensing modalities and seek to provide a platform for IVF automation.
- We identified the unique mechanism of action of the hormone progesterone in ovarian cells. This mechanism discovered by Prof Darryl Russell is important for understanding anovulatory infertility and includes novel targets for the development of new specific contraceptives.
- We commenced work on classes of birth defects and how they may be related to specific and potentially modifiable treatment practices. Prof Michael Davies seeks to understand how factors such as the mode of fertilisation, drug administration and utilising fresh or frozen embryos impacts the rate of birth defects.
- We demonstrated that tubal flushing with oil-soluble contrast medium increases live birth rates compared to water-soluble contrast medium in infertile women. This research by Prof Ben Mol received significant international media attention with women around the world now demanding this simple intervention.
- We instigated a collaboration with A/Prof Brant Gibson and Prof Andrew Greentree from RMIT to explore the application of a diamond as a 'vessel' for embryo development and cryopreservation. Prof Jeremy Thompson believes this could exploit the thermal conductance properties of a diamond and provide a receptacle to study electric and magnetic fields of embryos during their development.
- We undertook a systematic review of the best ovulation induction agents for women with WHO group II. Dr Rui Wang found that Letrozole and Clomiphene with Metformin were currently the most effective options available.
- We are developing a new line of tools that can assess when mammalian fertilisation takes place. Hannah McLennan and Dr



The developing bovine ovary identifying the connective tissue (green) and dividing cells (pink). Monica Hartanti and Prof Ray Rodgers

Roman Kostecki (Institute for Photonics and Sensing) are collaborating on this exciting project which is drawing commercial interest.

- We showed that the seminal plasma composition of men varies over time, with the pro-inflammatory cytokine interferon-gamma becoming transiently elevated in association with other inflammatory markers. This finding by Prof Sarah Robertson and Dr David Sharkey is important as seminal fluid interferon-gamma is often linked to unexplained infertility in couples.
- We analysed 17 PCOS-related genes in fetal ovaries and discovered 5 genes which show the same pattern of high expression early in gestation with a steady decrease towards birth. Prof Ray Rodgers and Monica Hartanti's findings suggest women are pre-disposed to developing PCOS during their mother's pregnancy.



- We demonstrated that relaxin is a component of seminal plasma that contributes to the female immune adaptation for pregnancy. Working with Prof Richard Ivell and A/ Prof Ravinder Anand-Ivell, Prof Sarah Robertson and Dr Danielle Glynn found that this hormone, better known for its role in female reproduction, may also help mediate the male contribution to conception and embryo implantation.
- We joined forces with Quantitative Pty Ltd and clinical IVF programs in SA and WA, to further characterise specific features of human embryos. This collaboration led by Dr Hannah Brown uses Grey-Level Co-occurrence Matrices, combined with artificial learning algorithms to identify which embryos have high probability of surviving to term.

“WE USED TIME-LAPSE IMAGING TO MONITOR MOUSE EMBRYOS THAT WERE CONCEIVED FROM OLDER MALES OR FEMALES AND DISCOVERED DISTINCT DIFFERENCES.”

Prof Rebecca Robker
Head, Ovarian Cell Biology

OPTIMISING GROWTH OF THE FETUS IN THE WOMB

Australian babies weigh on average 3.4kg at birth. However, over 6% of infants weigh less than 2.5kg and 12% weigh more than 4kg. Both lighter and heavier infants are at greater risk of health complications including disability, adult onset diseases and early death.

To understand how and why some babies are born too small or too large, and to optimise birth weight, the Robinson Research Institute is:

- Investigating how birth weight is influenced by the interaction between genetic factors and the environment
- Developing effective interventions to ensure babies are born at a healthy weight
- Educating the community about the risk factors associated with unhealthy birth weight, including diet, alcohol, drug usage, smoking, mental health issues, diabetes, BMI and disadvantage
- Understanding why Aboriginal women are at increased risk of delivering an unhealthy birth weight infant, and working with these women to improve outcomes for both mothers and babies

Translational Impact

Prediction to Prevent Pregnancy Complications

Approximately 25% of women in their first on-going pregnancy in Australia are affected by one or more of the four major complications: preeclampsia, preterm birth, intrauterine growth restriction and gestational diabetes. Health issues for the resulting babies range from childhood obesity, mild learning and behavioural problems, to severe disabilities such as cerebral palsy, intellectual disability, blindness or even death.

Prof Claire Roberts is seeking to prevent the onset of these complications and has developed the world's first pregnancy screening test that can predict a women's risk of developing each of these complications – and she has validated these algorithms. Claire has garnered the support of a commercial partner and hopes this screening test will be implemented in antenatal clinics in the next few years.



Research advances in 2017

- We reported the first characterisation of pulsatile growth hormone in female mice and found that maternal growth hormone increases through pregnancy in mice as in humans. This finding by Dr Kathy Gatford provides further evidence that maternal growth hormone is important in the maternal adaptation to pregnancy and in promoting fetal growth.
- We analysed 387 DNA methylation profiles from placental tissues and identified 62 CpG sites that accurately predicted the gestational age of the placenta at sampling from 8-42 weeks gestation. Prof Claire Roberts and team found that accelerated placental aging was characteristic of early-onset preeclampsia (<34 weeks gestation) but not late-onset preeclampsia (>34 weeks gestation), providing insight into the molecular differences in the placenta from early-onset preeclampsia compared to those from uncomplicated pregnancy.
- We provided novel insights into bovine placental development and comprehensive baseline reference data. Prof Stefan Hiendleder and colleagues' findings are important as placental function impacts growth and development with lifelong consequences for performance and health.
- We discovered that a non-coding micro RNA called MiR-223 is a driver of healthy fetal growth. Dr John Schjenken and Prof Sarah Robertson showed that deficiency in this micro RNA causes fetal growth restriction and fetal death when mice receive a second hit inflammation challenge.
- We found that use of Doppler to measure middle cerebral artery peak systolic velocity in the fetus that has undergone one intrauterine transfusion (IUT) for anemia secondary to red cell alloimmunisation, is non-inferior to timing based on expected decrease in fetal hematocrit or fetal hemoglobin level. Prof Jodie Dodd has shown that measurement does not compromise infant hemoglobin at birth.

Research Priorities

PREVENTING EARLY LABOUR AND IMPROVING OUTCOMES FOR BABIES BORN PREMATURELY

1 in 10 babies are born preterm at less than 37 weeks gestation. This carries immediate and life-long risks to the infant's health and survival as the brain and organs are not fully developed.

To improve outcomes for babies born preterm and to ultimately predict and prevent early labour, the Robinson Research Institute is:

- Investigating how factors such as infection, stress and immune responses interact in some women to trigger early labour and birth
- Developing predictive tests to identify which women are at increased risk for preterm labour
- Identifying and evaluating preventative drugs and treatments for mothers assessed to be at risk
- Developing treatments to improve short and long-term health outcomes for babies born preterm

Translational Impact

Pregnancy Care Guidelines

The *Pregnancy Care Guidelines* have been developed to provide a reliable and standard reference for health professionals providing antenatal care. They summarise the available evidence on many aspects of antenatal care and have been designed to improve

the experience and outcomes of pregnancy care for Australian women and their families.

A/Prof Philippa Middleton is an expert advisor and member of the guideline development committee. These guidelines were endorsed by NHMRC in October 2017.

Research advances in 2017

- Working with colleagues at The University of Western Australia, we demonstrated that a novel probiotic microbial treatment OM85 can train the immune response in pregnant mice to protect against inflammation-induced preterm labour and fetal growth restriction. This study led by Prof Sarah Robertson suggests that broad-spectrum protection of pregnancy against infection-associated inflammatory stress, without compromising capacity for efficient pathogen eradication, represents an achievable therapeutic goal.
- We were invited to produce a “State of the Art” review in *Pediatrics* to address the issue in clinical practice of determining the oxygen requirements



in the preterm newborn. A/Prof Michael Stark and Dr Chad Andersen challenged the accepted understanding of how to tackle this problem by proposing an alternative way forward to improve the care of this high-risk patient population.

- We worked with colleagues in The Netherlands to develop knowledge on the relationship between inter-pregnancy intervals and the chance of preterm birth. Prof Ben Mol and colleagues showed that in women with a previous preterm birth, the chance of a repeat was greater if there was a short or a long interval before the next pregnancy.
- We completed a comprehensive evaluation of approaches to target Toll-like receptors (TLRs) in the development of novel drugs for preterm birth. Since TLRs are at the top of the inflammatory cascade through which many triggers of preterm birth converge, Prof Sarah Robertson proposes that novel small molecule and peptide compounds that inhibit TLRs are strong candidates for new pharmacological therapies to suppress or delay onset of labour.

**“THE PREGNANCY CARE GUIDELINES
HAVE BEEN DEVELOPED TO PROVIDE A
RELIABLE AND STANDARD REFERENCE
FOR HEALTH PROFESSIONALS
PROVIDING ANTENATAL CARE.”**

A/Prof Philippa Middleton
Head, Health of Women and Babies + SAHMRI

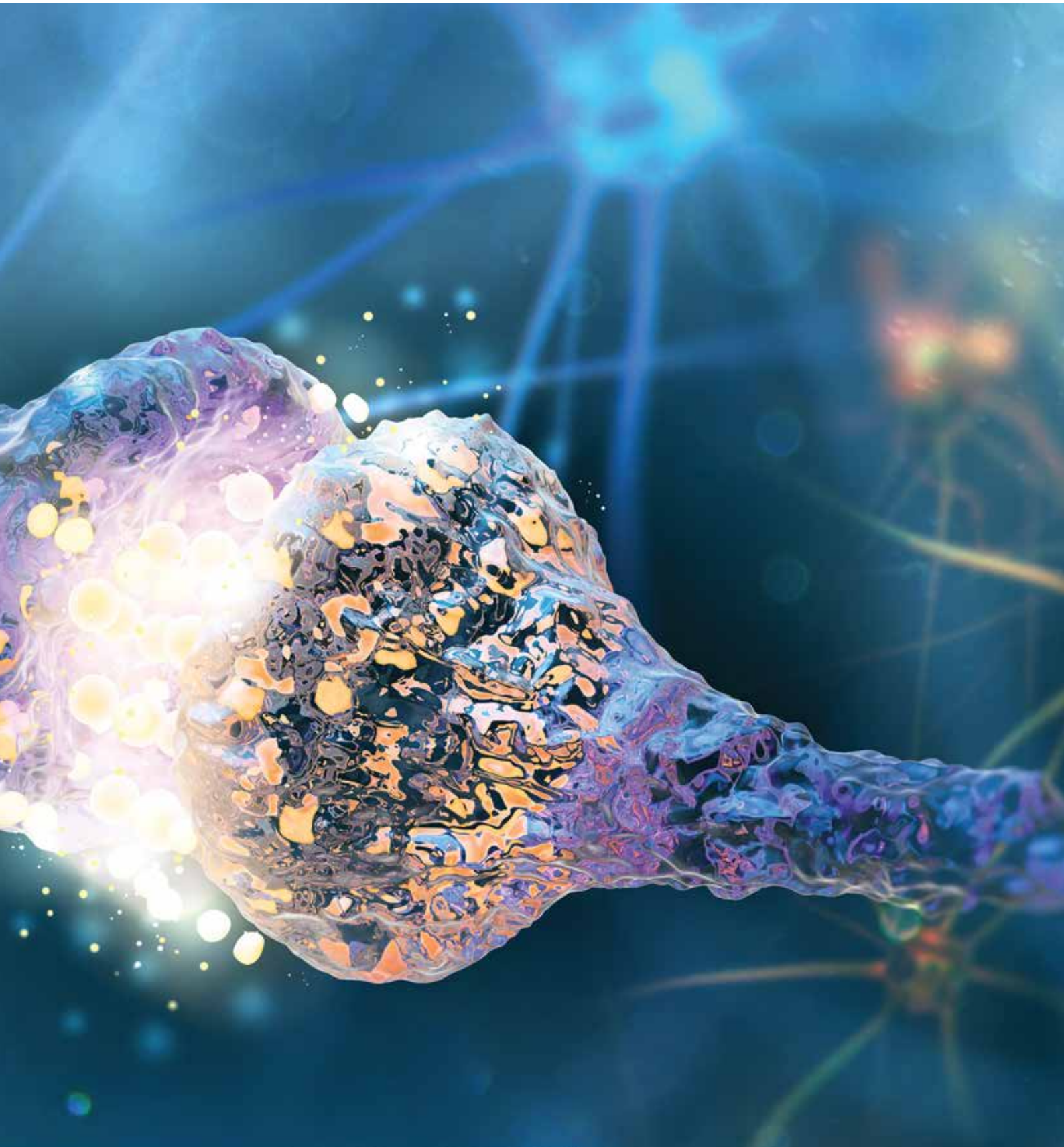
MAXIMISING BRAIN DEVELOPMENTAL POTENTIAL

Children born preterm often experience problems in neurodevelopment, which impacts their ability to contribute to society, and their physical and psychological health.

Other children are born with genetic conditions that impair normal intellectual or physical function, some of which manifest years after birth.

To further our limited understanding of genetic and environmental drivers of neurodevelopment, the Robinson Research Institute is:

- Investigating the physiology that is responsible for changes in neurodevelopment for preterm babies, and determining whether changes are due to being born early, or growth restriction during pregnancy
 - Understanding how exposure to adverse environments during pregnancy and in early life affect brain development
 - Developing interventions to counter neurodevelopmental changes through improving the strength of neuron connections in the brain and improving environmental learning settings for children
 - Gaining a better understanding of how socioeconomic disadvantage affects cognitive and motor abilities
 - Identifying genetic causes of neuro-developmental disease and developing effective interventions
- Research advances in 2017**
- We have started to identify patterns of physical activity that are associated with higher levels of brain plasticity and better cognitive function. Once this work is completed, Prof Michael Ridding hopes to provide physical activity guidelines to optimise brain health and function.
 - We undertook a systematic review of the evidence concerning cognitive outcomes in children conceived via ART, and identified that there are certain treatment components, such as ICSI, that appear to be detrimental to cognitive function. The review by Dr Alice Rumbold was widely publicised by the European Society for Human Reproduction and Embryology.
 - We effectively modeled several genes using cell-based investigations, mouse models and a range of genetic tools. A/Prof Cheryl Shoubridge's team has reported seizure and behavioral deficits in the brains of mice carrying mutations causing intellectual disability and seizures. Ongoing pre-clinical trials treating these mice with a steroid hormone acting on the brain, is uncovering the molecular drivers to improve these deficits.
 - We have identified the developmental cause of a common but unusual type of genetic epilepsy which only affects females. This research by Prof Paul Thomas and collaborators has been accepted for publication in *Neuron*, one of the highest ranking neuroscience journals.
 - We identified multiple novel genes and mutations causing neurodevelopmental disorders. Prof Jozef Gécz's research is building the understanding of why and how some children live with neurodevelopmental disorders and in the future will enable the development of targeted interventions.



PREVENTING AND REVERSING CHILDHOOD OBESITY

Approximately 56% of women, 70% of men and 23% of children are overweight or obese.

Children born to overweight or obese parents are at increased risk of obesity throughout life.



“WE DEMONSTRATED THAT LOW-IMPACT EXERCISE IN OBESE MALES IMPROVED THE METABOLIC HEALTH OF FEMALE OFFSPRING”

Prof Michelle Lane
Head, Gamete and Embryo Biology + Repromed

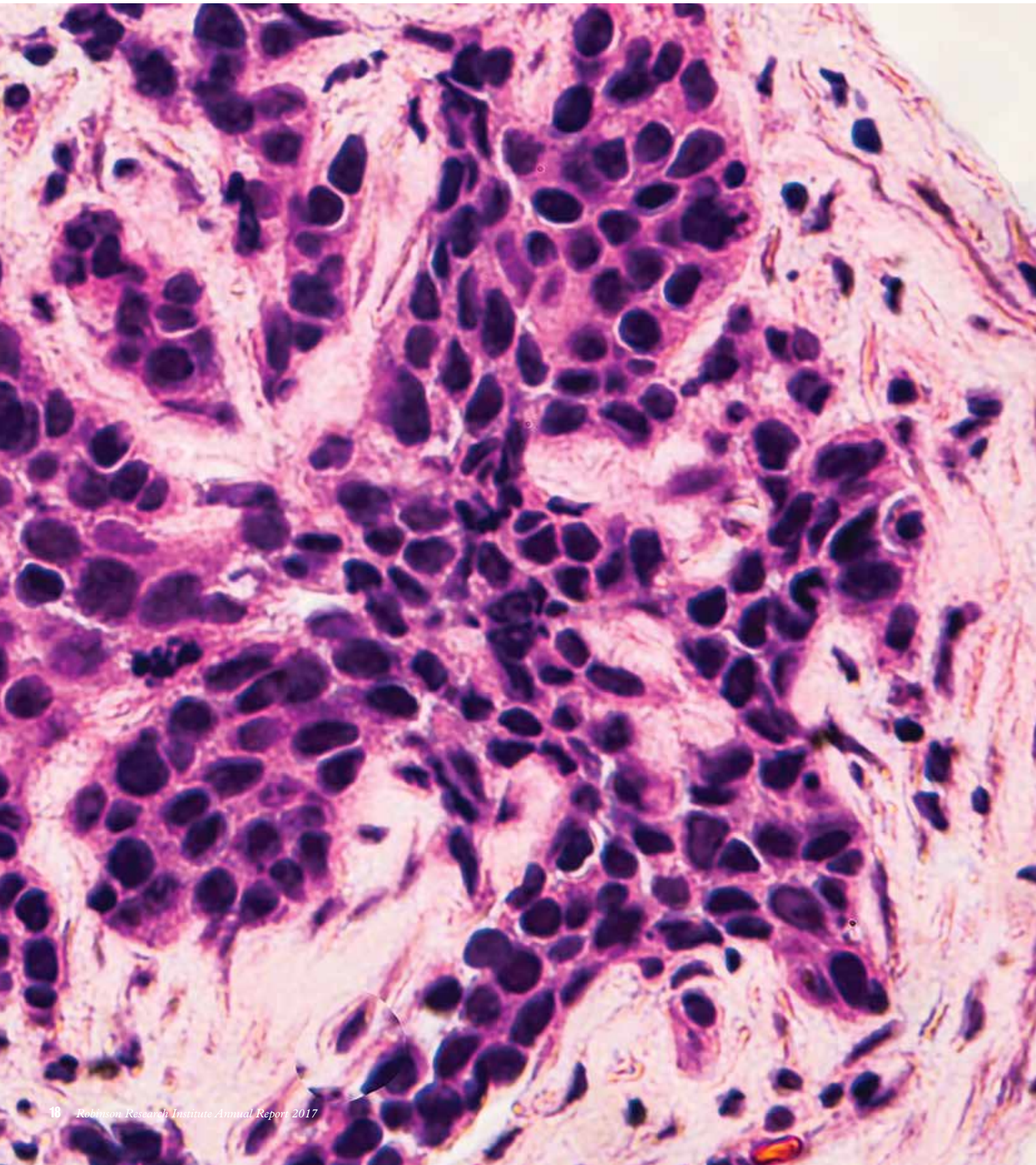
To reduce the incidence of obesity and tackle its intergenerational transmission, the Robinson Research Institute is:

- Developing interventions for pregnant women who are overweight or obese to improve pregnancy health and the health of the baby
- Identifying key dietary, metabolic and other factors in obese mothers that are related to poor health in children
- Uncovering why maternal and paternal obesity can both lead to increased risk of poor metabolic health and obesity in children
- Developing tools to match women to the most appropriate and cost-effective form of intervention to limit gestational weight gain, especially in disadvantaged and Aboriginal women
- Developing guidelines and tools for improving clinical care of pregnant women who are overweight or obese



Research advances in 2017

- We showed that moderate preterm birth after maternal betamethasone treatment did not impair adult glucose metabolism. Dr Kathy Gatford's findings suggest that not all antenatal glucocorticoids adversely program metabolic health and that moderate preterm birth likely doesn't increase the risk of poor adult metabolic health.
- We undertook an assessment of the adolescent health guidelines, and Dr Zohra Lassi identified a lack of robust and comprehensive information supporting optimal nutrition and healthy behaviors for adolescents, including pregnant female adolescents. Globally, this age group faces high rates of morbidity and mortality, thus remains a priority for further research and evidence-based policy initiatives.
- We demonstrated that low-impact exercise in obese males improved the metabolic health of female offspring. This research in a mice model by Drs Tod Fullston and Nicole McPherson and Prof Michelle Lane highlights the importance of exercise in preventing transmission of chronic disease
- We studied the effect of time-restricted feeding in 16 overweight men at risk of developing type 2 diabetes. A/Prof Leonie Heilbronn demonstrated an improvement in their glycaemia responses, reducing the likelihood of diabetes development.
- We investigated the impact of simulated shift work exposure during pregnancy on maternal, fetal and progeny health. Prof David Kennaway, and Drs Tamara Varcoe and Kathy Gatford found that exposing pregnant ewes to simulated shift work perturbs glucose tolerance and increases insulin secretion at early gestation. While this did not affect pregnancy outcomes or fetal growth, offspring had reduced nocturnal melatonin secretion at weaning. The offspring are being studied to determine the impact of the prenatal shift work simulation on their metabolic health into adulthood.
- We undertook a review on the most common vices of men of reproductive age and the damage they pose to fertility and offspring health. Prof Michelle Lane, Dr Tod Fullston and collaborators highlighted the negative effects of alcohol consumption, overweight/obesity and tobacco smoking on the health of the offspring and how small lifestyle changes can act as a circuit breaker for the transmission of obesity and metabolic disorders.



DISCOVERING CAUSES AND CURES FOR REPRODUCTIVE CANCERS

Breast and prostate cancers are among the most prevalent forms of cancer with around 1 in 9 Australian women and men diagnosed each year; and this is increasing.

To understand and prevent reproductive cancers the Robinson Research Institute is:

- Identifying the common features of reproductive organs that are likely to contribute to cancer susceptibility
- Understanding the role of sex hormone responsive tissues and how their frequent changes compromise the immune system, leading to cancer development
- Uncovering how diet, lifestyle and environmental factors encourage (or discourage) reproductive cancer development
- Developing new treatment options to prevent cancer-related disability and death

Translational Impact


INFORMD Alliance

Almost 8% of women aged between 40-74 years have extremely high breast density which can make it difficult for doctors to detect breast cancer on a screening mammogram. Breast density is a highly contentious issue and until recently there was no information about breast density on any Australian government website, and no policies or position statements around reporting it.

Together with leading breast cancer researchers from 5 different institutions across Australia, A/Prof Wendy Ingman founded the INFORMD Alliance (INformation FORum on Mammographic Density), with the goal of raising awareness around breast density and calling for the development of guidelines so that density can be routinely reported to women having mammograms.

Research advances in 2017

- We demonstrated that the cytoskeletal protein, keratin 5 is associated with chemotherapy resistance and progression in serous ovarian cancer. Dr Carmela Ricciardelli and team believe that developing strategies to target keratin 5 may prevent recurrence and chemotherapy resistance in serous ovarian cancer patients.
- We discovered that chronic low-level inflammation can drive increased breast density and the associated increased risk of cancer in a mouse model. This discovery by A/Prof Wendy Ingman opens the door for new approaches to reduce breast cancer risk with the use of anti-inflammatory drugs targeted to women with high breast density.
- We showed that environment and lifestyle stressors influence ovarian somatic cell function and in turn impact on oocyte and embryo health. Prof Darryl Russell found that these stress response mechanisms are important in the initiation and progression of cancers of reproductive organs.
- We developed a novel ex vivo explant assay to assess drug response using cryopreserved ovarian cancer tissue. The ex vivo tissue explant assay maintained viable tumor cells in an intact tumor microenvironment similar to the in vivo situation over the 120-hour culture period. Dr Carmela Ricciardelli and Prof Martin Oehler's assay is a robust and cost-effective model to assess chemosensitivity and therapeutics in ovarian cancer.
- We collaborated with Prof Stuart Pitson and identified CIB2 as a novel endogenous suppressor of SK1 signalling. Prof Martin Oehler and team demonstrated the therapeutic potential of SK1 in ovarian cancer.



“WE IDENTIFIED THAT THE PROTEIN MARKER PKCZETA MEASURED IN NEONATAL BLOOD T CELLS IS A USEFUL MARKER FOR PREDICTING ALLERGY DEVELOPMENT IN CHILDHOOD.”

Prof Antonio Ferrante
Head, Developmental and Genetic Immunology

Research Priorities

INVESTIGATING EARLY LIFE ORIGINS OF ALLERGIES AND DEVELOPING INTERVENTIONS

Allergies affect hundreds of millions of children worldwide and there is no cure. Asthma, rhinitis, eczema, dermatitis, food allergies and anaphylaxis are on the increase – now 20% of Australians suffer from one or more allergic conditions.



To progress allergy and immunity research the Robinson Research Institute is:

- Identifying environmental factors and events that occur during pregnancy that increase susceptibility to allergy in childhood
- Identifying the genetic and epigenetic changes that occur in the placenta that program immune function in early childhood and increase susceptibility to allergy
- Identifying biomarkers that predict the risk of allergy in childhood
- Developing effective interventions for allergy prevention either during pregnancy or after birth
- Uncovering the causes of food allergies and developing interventions to prevent and treat these allergies

Translational Impact

Hot Topics in Allergy

The RRI partnered with Healthy Development Adelaide to host a public forum on the topic *Hot Topics in Allergy*, to inform the community on recent advances in the area of allergy research, and actions to reduce the likelihood of allergy development in children.

Researchers from the RRI, SA Pathology and SAHMRI presented at this event in the University's new Adelaide Health and Medical Sciences Building.

Research advances in 2017

- We identified that the protein marker PKCzeta measured in neonatal blood T cells is a useful marker for predicting allergy development in childhood. Prof

Antonio Ferrante has shown that this protein prevents T cells developing an allergy-inducing subset, and that expression is epigenetically controlled.

- We discovered that administering maternal methyl-donor supplements to mothers of growth-restricted sheep late in pregnancy led to offspring losing the protection against allergy that is usually seen after intrauterine growth restriction. Dr Kathy Gatford stresses that early pregnancy supplements are vital and effective at reducing risks of neural tube defects in the baby, but highlights that the absence of recommendations on folic acid later in pregnancy might increase the risk of allergy development in children.



TACKLING LIFE-THREATENING INFECTIOUS DISEASES

Protecting children and adolescents from serious infectious diseases is a national priority to secure the future health of the nation.

To eliminate life-threatening conditions in children the Robinson Research Institute is:

- Improving the effectiveness of vaccine programs for pregnant women to increase protection for both women and their babies against serious infections
- Combatting life-threatening meningococcal and pneumococcal disease by optimising infectious disease prevention
- Testing new and current vaccines for babies, children, adolescents and pregnant women to ensure they are safe and effective
- Uncovering how and why some health conditions, such as pregnancy, obesity and immune compromise, impact on vaccine effectiveness
- Educating the community on the importance of vaccinations and incorporating community views and values into immunisation policy

Translational Impact

Pertussis vaccine recommendations

Mark McMillan reviewed and synthesised the literature on the use of the pertussis vaccine in pregnancy and found that administering this vaccine in pregnancy is safe.

This review is now referenced by the Australian Technical Advisory Group on Immunisation as evidence of the safety and efficacy of administration during pregnancy.

Human Papillomavirus Working Party

Prof Helen Marshall chaired the Australian Technical Advisory Group on Immunisation Human Papillomavirus Working Party to review the evidence for a change to the Human Papillomavirus vaccination program for school students.

Based on the wide body of evidence, the group recommended reducing the number of vaccinations for children aged 9-14 years from three doses to two doses, as two doses provides the same level of protection.

B Part of It study

In South Australia the highest number of meningococcal disease notifications occur in adolescents, with the majority of these infections due to the B strain. In 2017, the *B Part of it* study recruited 34,500 South Australian students in years 10, 11 and 12 to take part in a study measuring the effectiveness of the Meningococcal B vaccine in reducing carriage of neisseria meningitides in adolescents.

Led by Prof Helen Marshall in partnership with SA Health, this study will yield results likely to impact immunisation policy in Australia and around the world. If a herd immunity benefit is shown, this will build the case to introduce Meningococcal B to the Pharmaceutical Benefit Scheme and provide free coverage for Australian infants.

SA Vaccinology Update

In partnership with SA Health, the Women's and Children's Hospital and SAHMRI, the RRI hosted the 5th annual *SA Vaccinology Update*, with Prof Helen Marshall leading the event.

This event provides health care professionals with the latest research discoveries, policy changes, clinical trials and vaccinology and immunology information, to ensure the best service, advice and care is provided to patients, with nurses able to claim CPD Points.

Research advances in 2017

- We provided the first data globally on the duration of effectiveness of a new meningococcal B vaccine (MenB-fHBP). Prof Helen Marshall's data showed persistence of the immune response to 4 years for the majority of children vaccinated.

Research Priorities

POPULATION INTERVENTIONS TO SECURE A BETTER START FOR ALL CHILDREN

For children to fulfill their health and development potential, early intervention is vital to ensure their optimal capabilities can be achieved; this includes physical, mental, social and emotional health, cognitive ability and academic achievement.

To enable the best start in life and improve future human capability, the Robinson Research Institute is:

- Uncovering how to best support child health and development, particularly among disadvantaged populations, through trials, data linkage and observational studies
- Developing pragmatic, preventative interventions across the multiple systems that support development, including health, child care, welfare, and child protection systems

Translational Impact

Child Protection in South Australia report

The South Australian Government's Early Intervention Research Directorate is an important initiative that considers evidence-based knowledge in the planning and evaluation of services for early intervention and prevention of child abuse and neglect.

The BetterStart group led by Prof John Lynch developed the *Child Protection in South*

Australia report, and found that contact with the child protection system is common; one in four children in SA will have contact with the child protection system by age 10. This research is being referenced to communicate the gravity of the issue to the media and the wider community.

eMums plus intervention

In collaboration with the Child and Family Health Service, Professors Michael Sawyer, John Lynch and team conducted a pilot trial of the *eMums plus* intervention.

This online platform is designed to support mothers with postnatal depression and parenting issues. The pilot found that mothers engage well with an online nurse-moderated platform and were recruited into interventions earlier compared to traditional face to face services.

Social and Emotional Development report

A/Prof Philippa Middleton and Emily Shepherd were contributors to the *NHMRC Report on the Evidence: Promoting social and emotional development and wellbeing of infants in pregnancy and the first year of life*.



This report sought to:

- Summarise the findings of a comprehensive evaluation of 51 systematic reviews
- Provide a Working Committee's assessment and interpretation of the evidence in the Australian context through its application of the Grading of Recommendations Assessment, Development and Evaluation approach
- Provide information for governments and other policy makers, researchers and service providers
- Facilitate the development of evidence-based policy in Australia

CaFHS collaboration

A research-service collaboration between the SA Child and Family Health Service (CaFHS) and the BetterStart research group has evolved, using population-based evidence to design and deliver services aligned to need, while working towards embedding evaluation into service delivery.

The *Five by Five* report delivered by Prof John Lynch's team has formed a basis for development of new models of care. Additionally, the *Vulnerability in South Australian Children* report by CaFHS has directly informed design of a three-tiered service model.

Child and Adolescent Mental Health and Educational Outcomes

The Department of Education and Training engaged The University of Western Australia to conduct an analysis of the educational outcomes of children and adolescents with mental disorders using data from the Young Minds Matter survey, NAPLAN and parental information.

Prof Michael Sawyer contributed to the report which found that students with mental disorders (ADHD, depression or anxiety) have poorer NAPLAN results in all domains and year levels as well as higher rates of absence from school. The effect of mental disorders on academic performance was found to compound with socio-economic disadvantage.

Domestic violence research dissemination

Dr Rhiannon Pilkington presented to an audience of over 200 child protection practitioners, policy makers and researchers at the *Child protection and domestic violence: Meeting the challenges of collaboration* symposium hosted by the Australian National Research Organisation for Women's Safety and the SA Department for Child Protection.

Dr Pilkington explained there is currently no population-wide data on the experience and incidence of domestic and family violence, and the SA Police data may provide a useful resource.

Research Priorities

PIONEERING INTERVENTIONS TO IMPROVE THE HEALTH OF CHILDREN

Many serious physical and mental disorders affecting adults originate in childhood. To prevent the development of disease and/or disability, interventions need to be administered in early life, be safe and targeted.

To tackle childhood genetic, neuro-developmental, metabolic and immunological conditions, the Robinson Research Institute is:

- Investigating the causes of childhood conditions through discovery research, large-scale clinical trials and cohort studies
- Developing effective treatments and interventions to prevent disorders progressing from early life to adulthood

Translational Impact

International Cerebral Palsy Genetic Consortium

The RRI's Cerebral Palsy research group, led by E/Prof Alastair MacLennan and Prof Jozef Gécz, initiated the first international cerebral palsy genomic consortium.

Leading international cerebral palsy researchers from the USA, Canada, Sweden, China and Australia visited Adelaide in

March to participate in a workshop which led to collaborative research projects and the establishment of an international register and genomic database at The University of Adelaide for genetic variations in cerebral palsy.

Carina Biotech

Carina Biotech is a newly established start-up company developing cellular immunotherapies, particularly for the treatment of childhood cancers.

This company was spun out of the \$63 million CRC for Cell Therapy Manufacturing, which was jointly established with the University of South Australia, with Prof Simon Barry leading the T cell therapy program.

Initial work will focus on developing technologies involving Chimeric Antigen Receptor T-cells (CAR T-cells), which have shown unprecedented results in clinical trials against leukaemia.

Research advances in 2017

- We are the first to show how a newly described complement receptor, CR1g, works as a control point in inflammation. This research by Prof Antonio Ferrante suggests that inflammatory mediators and drugs such as steroid and anti-TNF biologics may act through this receptor to guide macrophages to protect against diseases such as type 1 diabetes.
- We established the first Australasian cystic fibrosis rat colony to test the effectiveness of corrective gene therapy on lung health. A/Prof David Parsons and Drs Martin Donnelley and Chantelle McIntyre hope that airway gene therapy can be administered to infants born with cystic fibrosis to prevent disease development. For people living with cystic fibrosis, it has the potential to halt lung disease in its tracks.





- We demonstrated that vascular changes in children with sleep disordered breathing (SDB) are consistent with the early development of vascular disease. Dr Anna Kontos found that children with SDB and high brachial artery blood flow velocity had altered autonomic function and increased sympathetic nerve fibres density on arteries.
- We showed that newborn screening for primary immunodeficiency disease is likely to reduce morbidity and mortality of affected children. Dr Jovanka King advanced screening by testing for immunoglobulin deficiencies to the T cell arm, with success achieved using blood spots to assess RNA.
- We know that metabolic reprogramming accompanies cell activation, with a shift from oxidative phosphorylation to glycolysis underpinning many cellular functions. Research by A/Prof Charles Hii has demonstrated a physical link between cell signalling and glucose metabolism, and he has established that MEKK3 interacts with GAPDH in human T cells. This implies that the observed kinase-energy metabolism cross-talk is a fundamental regulatory pathway that underpins T cell functions.
- We are identifying increasing numbers of novel genetic variants in families with a cerebral palsy child and to-date, one in three cases have a likely causative genetic variant. This research by E/Prof Alastair MacLennan and his team provides a breakthrough in understanding cerebral palsy causation, facilitating counselling and targeted interventions in the future.
- We have selectively inhibited the TNFR-p38 signalling pathway and its associated pathogenesis by developing short peptide biologics of TNFR1 that inhibit inflammation. Prof Antonio Ferrante believes the peptide inhibitors could hold promise for treating chronic inflammatory disease.

FUNDING HIGHLIGHTS



NHMRC

Centres for Research Excellence commencing in 2017

Prof Jozef Gécz and team (led by Dr Tony Roscioli) awarded \$2.5 million
Dr Tony Roscioli (Garvan Institute) together with Prof Jozef Gécz (CIB) and colleagues awarded a CRE for *Transforming the Diagnosis and management of Severe Neurocognitive Disorders Through Genomics*

Partnership Projects commencing in 2017

\$1.05 million to Prof Helen Marshall
Reducing vaccine preventable diseases in children: Using national active hospital based surveillance to evaluate and improve immunisation program performance

Project Grants commencing in 2017

\$1.5 million to Prof Rebecca Robker
Re-energising the preimplantation embryo to extend lifetime health

\$1 million to Prof Simon Barry
Identification of the conformation dependent targets of autoimmune disease linked variation in human regulatory T cells

\$791,369 to A/Prof Chris Wilkinson
STan intrapartum fetal monitoring (cardiotocographic plus electrocardiographic) compared with cardiotocographic (CTG) monitoring alone: an Australian randomised controlled trial

\$523,988 to Prof Paul Thomas
Identifying the pathological mechanism of PCDH19-Girls Clustering Epilepsy

NHMRC – ARC Linkage Grants commencing in 2017

\$480,000 to Prof Sarah Robertson
Adelaide Flow Cytometry Facility

Centre for Research Excellence awarded in 2017

Prof Maria Makrides, A/Prof Philippa Middleton and team awarded \$2.5 million
Prof Maria Makrides (SAHMRI) awarded a CRE for *Targeted nutrition to improve maternal and child health outcomes*

Project Grants awarded in 2017

\$1.46 million to Prof Sarah Robertson
The male partner contribution to pregnancy immune tolerance deficit in women

\$1.1 million to Prof Ben Mol
Prediction and prevention of spontaneous preterm birth: An individual participant data meta-analysis comprising of prognostic and therapeutic data

\$987,047 to A/Prof Leonie Heilbronn
Intermittent fasting versus daily energy restriction for improved human health

\$714,792 to Prof Michael Davies
Identifying strategies to improve perinatal outcomes after assisted reproduction

\$690,821 to Prof Sarah Robertson
Preclinical development of TLR signaling inhibitors for prevention of preterm labour and fetal inflammatory injury

\$562,194 to Prof Michael Davies
Why is there an increased risk of severe adverse perinatal outcomes after the use of clomiphene citrate for infertility treatment?

\$536,978 to Prof Ray Rodgers
Antioxidant enzymes counter reactive oxygen species from steroidogenic cytochrome P450 enzymes in the ovary to limit aneuploidy of embryos

\$287,316 to Prof Jodie Dodd
The effects of dietary and lifestyle interventions among pregnant women who are overweight or obese on longer-term maternal and early childhood outcomes: an individual participant data meta-analysis

ARC

Prof Frank Grutzner awarded \$380,000 for his project *Non-coding RNAs in mammalian reproduction* (commenced in 2017)

Prof Jozef Gécz awarded \$234,000 for his project: *TREX-mediated nuclear mRNA export in neuronal differentiation and function* (commenced in 2017)

Bill and Melinda Gates Foundation

Prof Darryl Russell awarded \$135,135 for *New safer contraceptives that block ovulation*



Glockwise from top left:

Ricky Matias with the FACs Aria Flow Cytometer
Dr Jimmy Breen, Management of large genomic datasets



Cerebral Palsy Alliance Research Foundation

Prof Jozef Gécz awarded \$230,462 for *Multi-omics investigations of cerebral palsy causation in discordant monozygotic twins and singletons*

Commercial Motor Vehicle Fund

E/Prof Alastair MacLennan awarded \$90,000 for *Infrastructure for international genomic database*

Channel 7 Children’s Research Foundation

RRI members were awarded five project grants in 2017 totaling more than \$370,000. This includes \$74,276 to Dr Alison Care for *The utility of resveratrol for improving fetal growth in complicated pregnancies*

Diabetes Australia

A/Prof Leonie Heilbronn awarded \$60,000 for *Time restricted feeding, glycaemic control and the adipose tissue transcriptome*

Fay Fuller Foundation

A/Prof David Parsons awarded \$670,000 to *Establish the first Australasian CF rat colony to test corrective gene therapy*

Ferring Pharmaceuticals

Prof Sarah Robertson awarded \$206,000 for *Novel drug candidates for boosting Treg cells in pregnancy*

Guerbet Group

Prof Ben Mol awarded \$131,420 for *Effectiveness and safety of tubal flushing in infertility: long-term follow-up and secondary analysis*

Meat and Livestock Australia

Prof Jeremy Thompson awarded \$246,000 for *Quantitative image assessment of embryos to predict pregnancy in embryo transfer programs*

Medical Research Future Fund

Prof Bill Hague awarded \$1.19 million for *“TURRIFIC”: a Trial of URsodeoxycholic acid vs Rifampicin in severe early-onset Intrahepatic Cholestasis of pregnancy*

Northern Area Health Network

A/Prof Michael Stark awarded \$120,000 for *The impact of iron treatment for iron deficiency and iron anaemia in pregnancy on maternal and neonatal physiology*

Ovarian Research Cancer Foundation

Prof Martin Oehler awarded \$88,239 to fund biospecimen collection

SA Government

Prof John Lynch awarded \$565,000 for *Data analytics to support child protections*

Stolen Generations Community Reparations Fund

Prof Vivienne Moore and colleagues awarded \$75,000 for *Preserving and making accessible Ngarrindjeri photographs, documents and stories: a healing process*

Tenix Foundation and Cerebral Palsy Alliance

E/Prof Alastair MacLennan awarded \$900,000 for *Australian Collaborative Cerebral Palsy Research Group infrastructure grant*

The Hospital Research Foundation

A/Prof Wendy Ingman awarded \$125,000 for *Breaking immune tolerance in triple negative breast cancer*

University of Adelaide

Dr Jimmy Breen awarded \$1.8 million Infrastructure Investment Plan funding for *Management of large genomic datasets*

Women’s and Children’s Hospital Foundation

RRI members were awarded seven project grants in 2017 totaling \$525,000. This included \$75,000 to Dr Merryn Netting for *BabyEATS Study (Baby’s Eating and Allergen Timing Study): Parental uptake of infant feeding guidelines for prevention of allergy*

World Health Organisation

Dr Zohra Lassi awarded \$249,968 for *Systematic reviews for the WHO guidelines on health policy and system support to optimize community health worker programmes*

FELLOWSHIPS AND AWARDS



ARC

Commencing in 2017

Future Fellowship
Prof Frank Grutzner

NHMRC

Commencing in 2017

Research Fellowship
Prof Rebecca Robker

Early Career Fellowship
Dr Carolyn Berryman and
Dr Brenton Hordacre

Awarded in 2017

Early Career Fellowships
Dr Zohra Lassi, Dr Kisha Sivanathan and
Dr Clare Whitehead

Other Fellowships (awarded 2017)

Cerebral Palsy Alliance Fellow
Dr Mark Corbett

Endeavour Executive Fellowship
Dr Murthy Mittinty

Lloyd Cox Fund
Professorial Research Fellowships
Professors Michael Davies, Claire Roberts
and Ray Rodgers

Career Development Fellowships
Drs Jodie Avery and Renae Fernandez

University of Adelaide
Beacon Fellowship Dr Zohra Lassi
Barbara Kidman Fellowship Dr Clare Hume

**Women's and Children's
Hospital Foundation**
MS McLeod Fellowship Dr Anna Kontos
Population Health Scholarship
Mark McMillan

Awards and Prizes

Australian Federal Government

Jago Van Dam awarded a Research Training
Program Scholarship

Australian and New Zealand Obesity Society

Dr Amy Hutchison received the ECR Award
for Best Clinical Presentation

Australian and New Zealand Society for Cell and Developmental Biology

Chandran Pfitzner received a Poster Prize

Australian of the Year

Dr Nigel Farrow was a SA Finalist for
Australian of the Year

Clarivate

Prof John Lynch is in the Top 1% of Cited
Scientists in their Field Internationally



Dr Jodie Avery and Dr Renae Fernandez, recipients of the Lloyd Cox Career Development Fellowship

CSIRO OnPrime

Prof Simon Barry selected as a State Winner to enter the CSIRO Accelerate Program

ESHRE

Prof Rob Norman AO was Elected as a Life Member to the European Society for Human Reproduction and Embryology

Healthy Development Adelaide

Zohra Lassi, Kavita Panir and Jago Van Damn received HDA Travel Grants

Humand Genetics Society of Australasia

Dr Mark Corbett received a Travel Award to attend the HGSA Annual Scientific Meeting

NHMRC

Prof Helen Marshall's research was chosen as one of the Top 10 Best Research Projects funded by NHMRC

PSANZ

Dr Petra Verburg received the Best Oral Presentation for Epidemiology and a Travel Award

Jago Van Dam received an ECR Travel Award

SA Science Excellence Awards

Prof John Lynch's team were finalists for Excellence in Research Collaboration

SAHMRI

A/Prof Philippa Middleton received the Inaugural Mid-Career Researcher Award

Society for Maternal Fetal Medicine

Prof Jodie Dodd received the Award for Research Excellence

Society for Reproduction and Fertility

Holly Groome awarded a Travel Grant to travel to ASI

Society for Reproductive Biology

Dr Kylie Dunning received the ECR Collaborative Research Travel Award and Holly Groome received the ECR Poster Prize

Society for the Study of Reproduction

Macarena Gonzalez received the Lalor Foundation Merit Award, the Reproduction, Fertility and Development Journal Travel Award, and the Larry Ewing Memorial Trainee Travel Award

Dr Alison Care received the International Best Abstract Trainee Travel Award

#SuperstarsofSTEM

Drs Hannah Brown and Pallave Dasari selected as Inaugural Superstars of STEM

The Conversation

Dr Hannah Brown selected as one of the Top 50 Thinkers for 2017

The University of Adelaide

A/Prof Mark Nottle received the E-Challenge Award for Medical Innovation

Dr Kathy Gatford received the Head of School of Medicine Award

Dr John Schjenken funded by the Donald Cheek Fund for research collaboration with North Carolina State University

Dr Zohra Lassi received the Llewellyn & Margaret Davey Bequest Travel Award

Siew Wong received a Dean's Commendation for Doctoral Thesis Excellence

Amy Garrett received the Best Oral Presentation and the Best PG Student Poster Award at the Annual Florey Postgraduate Awards

Megan Bater received the Florey Medical Research Foundation Prize and the Adelaide Medical School Prize

Women's and Children's Health Network

Prof Simon Barry and A/Prof David Parson's team received Channel 7 Translational Research Awards

Prof John Lynch and team received a Service Excellence Award

World Congress of Reproductive Biology

Nicole Bastian awarded a Travel Grant to attend WCRB in Japan



AUSTRALIAN ACADEMY OF SCIENCE

Prof Jozef Gécz elected as a Fellow of the Australian Academy of Science for his groundbreaking discoveries in the field of intellectual and physical disability.

For three decades, Prof Gécz and his research team have discovered or contributed to the discovery of more than 150 genes that either directly cause or are linked to neurodevelopmental disorders in patients with intellectual disability, autism, epilepsy and cerebral palsy.

Visit science.org.au/fellowship/fellow to watch Prof Gécz's election video.

FINANCIALS 2017



NHMRC \$7,137,377

International Competitive \$6,900,288

Government & Public Sector \$4,906,765

Industry \$2,656,263

ARC \$1,482,115

Not-for-Profit Organisations \$411,061

Non Commonwealth Competitive \$107,335

COLLABORATION

HOSPITALS

Members are embedded within the 5 SA public hospitals.



ACADEMIC

Collaborating with researchers at hundreds of institutions across 30+ countries.



CLINICIANS

Many RRI members are clinicians, and we collaborate with fertility clinics, hospitals and other primary health organisations.



INDUSTRY

Research translation is facilitated through industry and pharmaceutical company collaborations and our MRCF membership.



To ensure our research is relevant and our findings are translated into improved care, our members collaborate extensively with researchers, industry and stakeholders, - locally and across the globe.



HEALTH CONSUMERS

Collaborating with health consumers ensures our research is relevant and provides access to unique perspectives and solutions.



PEAK BODIES

We advocate for early life research by working with peak bodies including AAMRI, ARACY, AAS, AAHMS and relevant scientific societies.



NOT-FOR-PROFITS

We partner with not-for-profit organisations to support evidence-based impact.



GOVERNMENT

Our members collaborate with local, state and federal Government on projects to improve the health of the community.

SOME OF OUR COLLABORATORS

South Australian Health & Medical Research Institute (SAHMRI)

The RRI and SAHMRI are partnering on collaborative research programs, joint research appointments and shared core facilities.

Our partnership seeks to advance a progressive research agenda in South Australia in order to provide an optimal environment for world-class research, and to attract, support and train the very best researchers in the areas of healthy mothers, babies and children, and early origins of health and disease.

The Victorian Assisted Reproductive Treatment Authority (VARTA)

VARTA provides independent information and support for individuals, couples, and health professionals on fertility, infertility, assisted reproductive treatment, and lifelong health for children.

VARTA and the RRI together with Andrology Australia and the Jean Hailes Foundation make up the Your Fertility Coalition which is funded through the Commonwealth Department of Health. Accessed through the *Your Fertility* website, VARTA and the RRI have developed the *Your Fertility webtool* which enables users to gauge fertility health based on factors including age, weight, smoking and alcohol consumption.

Healthy Development Adelaide (HDA)

HDA promotes, facilitates and enables multidisciplinary research that advances the understanding of healthy development. HDA events enable networking and collaboration between researchers, industry, government and the general public, and offers research support for the next generation of researchers.

Established in 2004 as an initiative of the University of Adelaide, HDA plays a key role in South Australia, linking research, service delivery and policy development, and is currently led by Institute Research Leaders Professor Claire Roberts and Professor Michael Sawyer, with the RRI being a founding partner and continuing major supporter.

SHINE SA

SHINE SA is a leading not-for-profit provider of primary care services and education for sexual and relationship wellbeing. SHINE SA's service and education delivery model works to provide sexual health education, early intervention, health promotion, clinical services and therapeutic counselling.

Approximately 4,500 abortion procedures occur every year in South Australia. To reduce the necessity of this invasive procedure, RRI members are collaborating with SHINE SA to increase awareness and uptake of emergency contraception, and together have improved clinical practice guidelines for the provision of emergency contraception by community pharmacists.

INSTITUTE ENGAGEMENT

Community Events

The RRI hosts public events to engage the local community, disseminate research findings and identify collaborative opportunities.

Research Tuesdays (May)

Hosted by The University of Adelaide, RRI Research Leader Prof Jozef Gécz presented the May edition of Research Tuesdays on the topic: *Childhood neurodevelopmental disabilities*.

Cure 4 Cystic Fibrosis (May)

Co-hosted by Cure4CysticFibrosis and the RRI, this networking event brought together cystic fibrosis researchers, donors, supporters and families affected by cystic fibrosis. A/ Prof David Parsons provided an update on research advances and Cure4CysticFibrosis unveiled their new branding and direction.

Good Sleep Matters (July)

The RRI co-hosted its fourth public forum with Healthy Development Adelaide on the topic *Good Sleep Matters*. It was the first public forum held in the AHMS building and featured presentations by Prof David Kennaway (RRI), Dr Tamara Varcoe (RRI), Dr Mark Kohler (UniSA) and Dr Kate Bartel (Flinders University).

Making Babies in the 21st Century (October)

The RRI hosted the 5th *Annual Making Babies in the 21st Century* public forum, commencing with a tour of the state-of-the-art birthing simulator and featured presentations by Louise Johnson (VARTA), Prof Rob Norman (Fertility SA), Dr Deirdre Zander-Fox (Repromed), Dr Renae Fernandez (RRI) and Dr John Schjenken (RRI).

Hot Topics in Allergy (November)

Together with Healthy Development Adelaide, the RRI hosted the public forum *Hot Topics in Allergy*, with presentations by Prof Michael Gold (RRI), Dr Pravin Hissaria (SA Pathology), Prof Simon Barry (RRI) and Dr Merryn Netting (RRI).

Research Events

Involvement in research events provides members the opportunity to network with peers, share research discoveries and recent advances, and build existing and new collaborations to address important health issues.

The International Cerebral Palsy Genetics Consortium (March)

E/Prof Alastair MacLennan, Prof Jozef Gécz and collaborators established the International Cerebral Palsy Genomics Consortium. This consortium seeks to foster collaboration between key active cerebral palsy genomics groups around the world, and to establish the world's first genomics database of cerebral palsy. The first meeting of the group occurred in March with members traveling to Adelaide from China, Canada, USA, Sweden, Turkey, Spain and other Australian universities.

WCH Co-hosted Grand Rounds (June, September & November)

For the second year in a row the RRI co-hosted three Women's and Children's Hospital's Grand Rounds seminars: Prof Claire Roberts, RRI – *Pregnancy complications, prevention is better than cure*; Prof Stephen Tong, University of Melbourne – *Repurposing drugs to fast track the translation of new treatments to tackle major pregnancy complications*; and Prof Peter Davis, Royal Women's Hospital – *Organised scepticism in the delivery room*.

New Frontiers for a Healthy Start to Life (May)

The RRI hosted the fourth *New Frontiers* thinktank conference, which brought together researchers under the banner *Securing health in future generations through pre-conception care*, and provided a unique opportunity to initiate interactions and to think BIG, prospectively and proactively.

Core Facilities Showcase (July)

RRI and SAHMRI co-hosted the *Core Facilities Showcase*, featuring 19 Adelaide-based biomedical facilities that support research. This event provided the opportunity for members to speak with

Robinson
Research Ins
Healthy children for lif

Core Facilities leaders, to understand service offerings and to discuss collaborative projects, with 200 researchers attending from across the University, RRI and SAHMRI.

INSPIRE Series (August)

The RRI hosted the annual INSPIRE Lunch with the Institute's Emeritus Faculty, showcasing the new AHMS building. In a change to the format, this event focused on the future strategy of the Institute and sought input from the Emeritus Faculty on our future direction.

SA Vaccinology Update (September)

The RRI teamed up with SA Health, the Women's and Children's Hospital and SAHMRI to host the fourth SA Vaccinology Update. This full day event for immunisation providers, doctors and researchers featured presentations that showcased the latest developments in immunisation research, policy and programs.

RRI Symposium (November)

The Institute's largest internal event brings members together for a day of collaboration and networking. Members have the opportunity to learn about the research being undertaken across the Institute, with the 2017 program highlighting Epigenetics and BIG Data, Promoting family health and wellbeing, and Ethical challenges for the RRI. Award recipients from the day were: Melanie Smith – 2017 Jeffrey Robinson Honours Scholarship, Holly Groome – Best Student e-presentation, Dr Chantelle



McIntyre – Best ECR e-presentation, Publication of the year – Dr Rui Wang, Prof Rob Norman and Prof Neil Johnson and 2017 Director’s Award – Sarah Eley.

Sponsorships

To support members in their career growth and to build collaborations, the RRI sponsored the following events in 2017:

ASMR

Sponsorship of the ASMR Annual Scientific Meeting supports the Institute’s early career researchers and students in career development. The Institute sponsored the *Robinson Research Institute prize for the best presentation in the field of reproduction, pregnancy or child health*, which was awarded to RRI member Jago Van Dam.

Adelaide Immunology Retreat

RRI sponsored the 2017 Adelaide Immunology Retreat, which featured keynote presentations from local and national immunologists and oral presentations from immunology students. Holly Groome received the *Robinson Research Institute Award for best presentation in the field of Reproductive, Developmental or Paediatric Immunology*.

SRB

For the 12th year in a row the RRI sponsored the Society for Reproductive Biology at its annual joint meeting with the Endocrine Society of Australia. The Institute sponsored



the *Robinson Research Institute Award for Excellence in Reproductive Biology*, which was awarded to Dr Mark Green.

Connectome Project

RRI sponsored the launch of *Connectome Project Adelaide*, a symposium series designed to connect leading neuroscientists and the next generation of world-class researchers. This new initiative has been established by two of RRI’s members, Matilda Jackson and Tessa Mattiske.

EpiCSA

RRI sponsored the Epigenetics Consortium of South Australia’s second annual meeting, which is organised by EMCRs within the RRI. Dr John Schjenken received the *Robinson Research Institute Award for Best Epigenetic Oral Presentation in Reproduction*, and Melanie Smith was awarded the *Robinson Research Institute Award for Best Epigenetic Poster Talk in Reproduction*.

Clockwise from top left:

Cure4CF A/Prof David Parsons
Making babies (l to r) Dr John Schjenken, Dr Renae Fernandez, Dr Deirdre Zander Fox, Amanda Blair, Louise Johnson, Prof Rob Norman
International Cerebral Palsy Genomic Consortium delegates



RESEARCH GROUPS

Our senior researchers lead a diverse range of research groups across the Institute's four themes.

OUR RESEARCH LEADERS

FERTILITY AND CONCEPTION THEME

Prof Bill Breed

Comparative Reproductive Biology of Mammals

Comparative morphology of gametes and their interaction at fertilisation in Australian mammals

Group Members:

Senior Lecturer: Eleanor Peirce

Lecturer: Natasha Speight

External Collaborators: Chris Dickman (University of Sydney), Stefan Lupold (University of Zurich), Richard Oko (Queens University) and Kevin Rowe (Museum Victoria)



Prof Frank Grutzner

Comparative Genome Biology

Comparing genetic and epigenetic mechanisms in mammalian species to improve our understanding of how human diseases originate

Group Members:

Visiting Research Fellow: Dan Kortschak

ARC Research Associate: Tasman Daish

PhD Candidates: Eunice Lee, David Stevens and Tahlia Perry

Honours Student: Natasha Bradley

Research Assistant: Ellen Gillet

Visiting Student: Henrike Franske

Affiliated Research Fellow: Peggy Rismiller

RRI Collaborators: Stefan Hiendleder, Martin Oehler, Carmela Ricciardelli and Darryl Russell

External Collaborators: Peter Donnelly (Oxford University), Briony Forbes (Flinders University), Henrik Kaessman (University of Lausanne), James Turner (Medical Research Council), Wesley Warren (University of Washington), Guojie Zhang (University of Copenhagen)



A/Prof Leonie Heilbronn

Obesity and Metabolism

Does when we eat matter more than what we eat to prevent type 2 diabetes?

Group Members:

Postdoctoral Fellow: Amy Hutchison

PhD Candidates: Rajesh Chaudhary, Bo Liu, Prashant Regmi and Lijun Zhao

RRI Collaborators: Rob Norman and Rebecca Robker

External Collaborators: Siobhan Banks, Alison Coates (University of South Australia), Michelle Keske (Menzies Institute), Natalie Luscombe-Marsh, Manny Noakes (CSIRO), Satchin Panda (SALK), Dorit Samocha-Bonet (Garvin Institute), Tim Sargeant (SAHMRI), Charmaine Tam (University of Sydney) and Gary Wittert (University of Adelaide)



A/Prof Louise Hull

Endometriosis

Developing diagnostic and therapeutic tools to treat pelvic pain and infertility caused by endometriosis

Group Members:

Gynaecologist: Susan Evans

Research Fellow: Vicki Nisenblat

PhD Candidate: Kavita Panir

RRI Collaborators: Hannah Brown, Robert Norman, Sarah Robertson, John Schjenken and David Sharkey

External Collaborators: Neil Johnson, Cindy Farquar (University of Auckland) and Guiying Nie (Hudson Institute)



A/Prof Wendy Ingman

Breast Biology and Cancer

Exploring how the immune system in the breast affects cancer and mastitis susceptibility

Group Members:

Postdoctoral Scientist: Danielle Glynn

Postdoctoral Researcher: Pallave Dasari

Research Nurse: Michelle Warnes

Research Officer: Leigh Hodson

PhD Candidates: Sarah Bernhardt, Amita Ghadge, Siti Noor Din and Joe Wrin

Masters Student: Vahid Atashgaran

Honours Student: Maddison Archer

RRI Collaborators: Simon Barry, Mark Hutchinson and Sarah Robertson

External Collaborators: Lisa Amir (LaTrobe University), Kara Britt (Peter MacCallum Institute), Andreas Evdokiou (University of Adelaide), Fiona Pixley (University of Western Australia), Tim Price, David Walsh (Queen Elizabeth Hospital) and Rik Thompson (University of Queensland)



Prof Michelle Lane

Gamete and Embryo Biology

Understanding the impact of environment insults to gametes on developmental trajectory of the embryo, and disease development in offspring

Group Members:

Research Fellows: Tod Fullston and Nicole McPherson

PhD Candidates: Alexander Penn and Helana Shehadeh

Research Assistant: Lauren Sandeman

Honours Students: Bridget Arman and Lauren Villarosa

RRI Collaborators: Julie Owens, Rebecca Robker and Sarah Robertson

External Collaborators: John Aitken (Newcastle University), Rob McLachlan (PHMRI), Moira O'Bryan (Monash University) and Gary Wittert (University of Adelaide)



Prof Rob Norman AO

Reproductive and Endocrine Medicine

Optimising outcomes in fertility treatments and preconception care

Group Members:

Senior Research Associate: Jodie Avery

PhD Candidate: Rui Wang

RRI Collaborators: Leonie Heilbronn, Louise Hull, Neil Johnson, Ben Mol, Rebecca Robker and Ray Rodgers

External Collaborators: Georgina Chambers (University of New South Wales), Bart Fauser (University of Utrecht), David Handelsman (ANZAC Institute), Rodger Hart (University of Western Australia), Qiao Jie (Beijing University), Louise Johnson (VARTA), Joop Lavern (Rotterdam University), Lisa Moran and Helana Teede (Monash University), Lois Salamonsen (Hudson Institute) and Chen Zhi-Jiang (Shanghai University)



A/Prof Mark Nottle

Reproductive Biotechnology

Innovative approaches to regenerative medicine and human IVF

Group Members:

Research Fellow: Ivan Vassilev

Honours Students: Anmol Saini and Staci Jennings

Research Assistants: Jess Zemetis and Stephen McIlfratrick

RRI Collaborators: Hannah Brown, Jeremy Thompson, Michelle Lane, Stefan Hiendleder and Toby Coates

External Collaborators: Peter Cowan (St Vincents Hospital), Emmanuele Cozzie (University of Padua), Wayne Hawthorne, Philip O'Connell (Westmead Millennium Institute), Andrew Lew (WEHI), John Paul Souliou (Universite de Nantes) and Simon Robson (Harvard Medical School)



Prof Martin Oehler, Dr Carmela Ricciardelli

Reproductive Cancers

Identification of novel biomarkers and therapeutic targets for ovarian cancer

Group Members:

Senior Scientist: Anne MacPherson

Postdoctoral Researcher: Noor Lokman

Honours Students: Rachel Ho, Tannith Noye and Zoe Price

Research Assistant: Anita Oehler

RRI Collaborators: Frank Grutzner, Ray Rodgers and Darryl Russell

External Collaborators: Taran Andrei (University of Tubingen), Peter Hoffman (University of Adelaide), Stuart Pitson, Wang Shudong (University of Adelaide) and Andrew Ruszkiewicz (SA Pathology)



Prof Sarah Robertson

Reproductive Immunology

Understanding how the immune system enables healthy conception and pregnancy, and is a key factor in infertility and disorders of pregnancy

Group Members:

Senior Postdoctoral Researchers: Lachlan Moldenhauer and David Sharkey

Postdoctoral Researchers: Kerri Diener, PeckYin (Loretta) Chin and John Schjenken

Research Fellow: Alison Care

PhD Candidates: Hon Yeung Chan, Ella Green, Kavita Panir, Hanan Wahid and Bihong Zhang

Honours Students: Nibir Chowdhury and Holly Groome

Research Officer: Camilla Dorian

RRI Collaborators: Simon Barry, Louise Hull, Mark Hutchinson, Wendy Ingman, Rebecca Robker and Jeremy Thompson

External Collaborators: David Olson (University of Alberta), Jelmer Prins (University of Groningen), Kenner Rice (NIH Washington) and Sylvain Chemtob (University of Montreal)



Prof Rebecca Robker

Ovarian Cell Biology

Discovering the biological mechanisms that drive ovulation and early embryo development

Group Members:

Postdoctoral Researcher: Sonja Frolich

PhD Candidates: Macarena Bermudez Gonzalez, Yasmyn Gordon, David Kennedy and Siew Wong

Honours Student: Catherine Dimasi

RRI Collaborators: Leonie Heilbronn, Michelle Lane, Robert Norman, Darryl Russell, Cheryl Shoubridge and Michael Stark

External Collaborators: Michael Barry, Ryan Rose (Fertility SA), John Carroll, Damian Dowling (Monash University), Mark Febbraio (Garvan Institute), Jon Hennebold (Oregon National Primate Institute), Jie Qiao (Peking University) and Teresa Woodruff (Northwestern University)



Prof Ray Rodgers

Ovarian Developmental Biology

Understanding how the ovary produces oocytes and hormones, what can go wrong and why

Group Members:

Postdoctoral Researcher: Katja Hummitzsch

PhD Candidates: Nicole Bastian, Katrina Copping, Monica Hartanti and Menghe Liu

Research Assistant: Wendy Bonner

RRI Collaborators: Michelle Lane, Sarah Robertson and Darryl Russell

External Collaborators: Richard Anderson (University of Edinburgh), Ross Bathgate, John Wade (Howard Florey Institute), Hugh Harris (University of Adelaide), Helen Irving-Rodgers (Griffith University), Phil Knight (University of Reading), Lisa Martin, Dagmar Wilhelm (Monash University), Viv Perry (University of Nottingham) and William Rainey (University of Michigan)



Prof Jeremy Thompson

Early Development

Understanding the impact of metabolic disruption to gametes, embryos and the reproductive tract

Group Members:

Postdoctoral Researchers: Hannah Brown and Kylie Dunning

PhD Candidates: Megan Lim, Hanna McLennan and Avishkar Saini

Manager IVF Solutions: Marie Anastasi

Honours Students: Tahlee Blade Stevenson, Doan Thao Dinh, Sophie Kedzior and Kate Neadley

Research Assistants: Tiffany Cheow and Annie Whitty

Technical Officer: Anwar Fatoi

Visiting Students: Sandra Soto Heras, Clara Smonteiro and Gabi Vetleal

RRI Collaborators: Michael Davies, Louise Hull, Michelle Lane, Mark Nottle, Sarah Robertson, Rebecca Robker and Darryl Russell

External Collaborators: Andrew Abell, Hayley McGrice, Yvonne Stokes (University of Adelaide), Michael Barry, Rob Norman, Ryan Rose (Fertility SA), Jose Burantini (Universidade Estadual Paul), Pablo Certica (Uni Buenos Aires), Michel DeVos, Johan Smitz (Vrije Universiteit Brussel), David Gardner, Mark Green (University of Melbourne), Brant Gibson, Andrew Greentree, Antony Orth (RMIT), Rob Gilchrist (University of New South Wales), Ewa Goldys, Nicole Packer (Macquarie University), Jen Kelly, Alan Tilbrook (SARDI), David Mottershead (Mottasis Review), Simon Walton (Australian Reproductive Technologies) and Deidre Zander-Fox (Repromed)



Prof Darryl Russell

Ovarian and Reproductive Cancer Cell Biology

Defining the molecular mechanisms of hormone control of ovarian folliculogenesis

Group Members:

Research Fellow: Alaknanda Alaknanda

PhD Candidates: Doan Thao Dinh and Adrian Kaczmarek

RRI Collaborators: Simon Barry, Frank Grutzner, Michelle Lane, Carmela Ricciardelli, Claire Roberts, Sarah Robertson, Rebecca Robker, Ray Rodgers and Jeremy Thompson

External Collaborators - Juan Carlos Rodriguez-Maneque (Genyo), Robert Gilchrist (University of New South Wales) and John Sandy (Rush University)



Prof Paul Thomas

Neural Development

Generation and analysis of mouse models for epilepsy and intellectual disability

Group Members:

Postdoctoral Research Fellow: Stefka Tasheva

PhD Candidates: Ruby Moffat, Daniel Pederick, Chandran Pfitzner, Louise Robertson and Ella Thomson

Honours Student: Connor Larson

Research Assistant: Sandie Piltz and Melissa White

RRI Collaborator: Jozef Gécz

External Collaborator: Robin Lovell-Badge (Francis Crick Institute)



PREGNANCY AND BIRTH THEME

Prof Jodie Dodd

Lifelong Health Research

Start early, stay healthy, stop obesity

Group Members:

Clinical Researchers: Chad Andersen and Andrew McPhee

Senior Statistician: Lisa Yelland

Statistician: Jennie Louise

Senior Trial Coordinator: Andrea Deussen

Research Coordinator: Angela Newman

Research Dietitian: Shanshan Han

PhD Candidates: Cecelia O'Brien, Casey Nottage and Amanda Poprzeczny

Research Assistants: Lauren Cates, Ashlee Jacobsen, Lavern Kannieappan, Erin Keen and Caroline Sheppard

Data Manager: Sasha Zhang

Elective Research Students: Rebekah Clark and Louise Fraser

RRI Collaborators: Jenny Couper, Lynne Giles, Vivienne Moore, Julie Owens and Jeffrey Robinson

External Collaborators: Annick Bogaerts (Limberg Catholic University), Emma Carlsen, Nina Geiker & Kristina Renault (University of Copenhagen), Roland Devlieger (University Hospital Keuken), Jan Dickinson (King Edward Memorial Hospital), Adrienne Gordon (University of Sydney), Rosalie Grivell (Flinders University), Catherine Hoyo (North Carolina State University), Mark Kilby (Birmingham Women's Hospital), John Kingdom, Greg Ryan & Rory Windrim (Mt Sinai Hospital), Berthold Koletzko (Ludwig-Maximilians University), Debbie Lawlor (Bristol University), Ritta Luoto (UKK Institute), Fionnula McAuliffe (University College Dublin), Dorte Moller Jensen (Odense University Hospital), Susan Phelan (California Polytechnic State University), Lucilla Poston (King's College London), Phil Robinson (Women's and Children's Hospital), Richard Saffery (Murdoch Research Institute), Wendy Scheil (SA Pregnancy Outcomes Unit), Mette Tanvig & Christina Vinter (University of Southern Denmark), Shakila Thangaratnam (QMUL), Liliana Voto (Juan A Fernandez Hospital)



Prof Bill Hague

Obstetric Medicine

Improving outcomes for pregnant women with medical complications

Group Members:

Research Coordinator: Suzette Coat

Postdoctoral Research Assistant: Mansi Singh

PhD Candidate: Jago Van Dam

Research Assistant: Jessica Marathe

RRI Collaborators: Jenny Couper, Jodie Dodd, Ben Mol, Julie Owens and Julia Pitcher

External Collaborators: Hanneke de Vries (Free University Hospital), Michael Fenech (CSIRO), Anand Hardikar (University of Sydney), Laura Magee (University of British Columbia), Marc Rodger, Mark Walker, Shi-Wu Wen (University of Ottawa), Janet Rowan (Auckland Hospital), David Simmons (University of Western Sydney) and Catherine Williamson (King's College London)



Prof Stefan Hiendleder

Epigenetics and Genetics

Understanding epigenetic and genetic mechanisms and programming in prenatal development

Group Members:

Postdoctoral Researcher: Dana Thomsen

PhD Candidates: Amanda Camp, Hanh Nguyen and Entesar Shuaib

RRI Collaborators: Kathy Gatford, Karen Kind, Mark Nottle, Julie Owens and Claire Roberts

External Collaborators: Mike Goodard, Ruidong Xiang (University of Melbourne), Axel Janke (Goethe University), Sergio Ledda (University Sassari), Tim Smith (USDA) and John Williams (Davies Research Centre)



E/Prof Alastair MacLennan AO, Prof Jozef Gécz

Cerebral Palsy

Uncovering the genetic causes of cerebral palsy and understanding the epigenetic interaction with genetic susceptibility

Group Members:

Postdoctoral Fellow: Mark Corbett

Senior Scientist: James Breen

Postdoctoral Researcher: Clare Van Eyk

Bioinformatician: Chenglong Yu

Data Manager: Jesia Berry

PhD Candidate: Sayaka Kayumi

Research Officers: Ashiqul Alam, Kelly Harper and Dani Webber

Research Assistants: Mahalia Frank and Hannah McDonald

Summer Student: Ryan Pham

RRI Collaborator: Ben Mol

External Collaborators: Matthew Bainbridge, Richard Gibbs (Baylor College), Jeff Craig (Murdoch Children's Research Institute), Daniel Geschwind (UCLA) and Richard Kruer (University of Arizona)



A/Prof Philippa Middleton

Health of Women and Babies

Improving the care of women and babies through evidence-based clinical practice and policy

Group Members: Pat Ashwood and Emily Shepherd

External Collaborators: Caroline Crowther



Prof Ben Mol

Evidence Based Women's Health Care

Evaluation of the effectiveness of health care for women and implementation of best practice

Group Members

Research Fellow: Sean O'Leary and Clarabelle Pham

Research Coordinator: Suzette Coat

PhD Candidates: Moustafa Abdelhafez Gadalla, Engida Derbie and Rui Wang

Honours Student: Maleesa Pathirana

Intern: Lindsey Smits

Visiting Fellow: Shuo Huang

RRI Collaborators: Michael Davies, Gus Dekker, Jodie Dodd, Bill Hague, Louise Hull, Michelle Lane, John Lynch, Helen Marshall, Vivienne Moore, Rob Norman, Martin Oehler, Julie Owens, Claire Roberts, Sarah Robertson, Michael Stark and Jeremy Thompson

External Collaborators: Siladitya Bhattacharya (University of Aberdeen), Arri Coomarasamy (University of Birmingham), Caroline Crowther (University of Auckland), Tony Duan (Shanghai Tongji University), Bill Grobham (Northwestern University), Justus Hofmeyr (University of Witwatersrand), Rodolfo Pacagnella (University of Campinas), Shakila Thangaratinam (Blizard Institute), Homan Tuong (Vietnam National University) and Xiaoke Wu (Heilongjiang University)



Prof Claire Roberts, Prof Gus Dekker

Placental Development

Implementing screening tests for women in early pregnancy to alleviate major complications of pregnancy

Group Members:

Research Fellow: Tina Bianco-Miotto

Endeavour Fellow: Siew Siew Lee

Postdoctoral Researchers: Prabha Andraweera, Jessica Grieger, Luke Grzeskowiak, Tanja Jankovic-Karasoulos, Shalem Leemaqz, Dale McAnich and Jessica Phillips

Research Midwife: Samantha Pahl

PhD Candidates: Amy Garrett, Julia Dalton, Benjamin Mayne, Catherine McCormack, Michelle Plummer, Qianhui Wan, Rebecca Wilson and Nahal Habibi

Visiting PhD Candidate: Petra Verburg

Research Assistant: Dylan McCullough

Honours Students: Brooke Loughhead and Melanie Smith

Technical Officer: Caitlin McCullough

RRI Collaborators: Kathy Gatford, John Lynch, Helen Marshall, Ben Mol, Sarah Robertson, Michael Sawyer and Michael Stark

External Collaborators: Lisa Amir (La Trobe University), Vicki Clifton (Mater Research Institute), Rosalie Grivell (Flinders University), Louise Kenny (University College Cork), Lesley McCowan (University of Auckland) and Alicia Smith (Emory University)



EARLY ORIGINS OF HEALTH THEME

Prof Michael Davies, Prof Vivienne Moore

Life Course and Intergenerational Health

Uncovering how inequalities in the health of women and their children arise through social and biological pathways, and identifying opportunities for change

Group Members:

Academic: Megan Warin

Research Fellow: Jodie Avery

Senior Postdoctoral Fellow: Wendy Mark

Postdoctoral Fellow: Zohra Lassi

Senior Postdoctoral Researchers:
Melissa Whitrow and Tanya Zivkovic

Postdoctoral Researcher: Renae Fernandez

Statistician: Chris Davies

Teaching and Research Academic:
Lynne Giles

Coordinator CIS Facility: Stephanie Champion

PhD Candidates: Ash Borqvist, Lucy Farrell, Anna Roesler and Rachele Warner

RRI Collaborators: Rob Norman, Ray Rodgers, Alice Rumbold and Darryl Russell

External Collaborators: Kurt Barnhart (University of Pennsylvania), Bianca Destavola (London School of Hygiene and Tropical Medicine), Dmitry Kissin (Centers for Disease Control and Prevention), Jennifer Marino (University of Melbourne), Lisa Moran and Helena Teede (Monash University) and Stanley Ulijaszek (University of Oxford)



Prof David Kennaway

Circadian Physiology

Understanding how circadian rhythms regulate metabolism, reproduction and fetal programming of disease

Group Members:

Research Fellow: Tamara Varcoe

Research Officers: Hong Liu and Mark Salkeld

RRI Collaborators: Michael Davies and Kathy Gatford

External Collaborators: Tim Kuchel (SAHMRI) and Glenn McConnell (Victoria University)



Prof Lyle Palmer

Genetic Epidemiology

Investigating the epidemiology and genetic epidemiology of the origins of health and disease

Group Members:

Principal Scientist: Gustavo Carneiro

Statistical Analyst: Kelly Hall

PhD Candidate: Luke Oakden-Rainer

Masters Student: Mel Rogers

RRI Collaborator: John Lynch

External Collaborators: John Hopper (University of Melbourne) and Andrew Bradley (University of Queensland)



Dr Kathy Gatford

Early Origins of Health and Disease

Understanding how early life exposures increase risk of adult disease and developing interventions to improve long-term health

Group Members:

PhD Candidates: Pat Grant, Hong Liu, Dane Horton and Amy Wooldridge

RRI Collaborators: Jodie Dodd, David Kennaway, Karen Kind, Julie Owens, Julia Pitcher, Claire Roberts and Jeffrey Robinson

External Collaborators: Robert Bischof, Jane Black (Monash University), Vicki Clifton (Mater Medical Research Institute), Glenn McConnell (Victoria University), Margaret Morris (University of New South Wales), Tim Moss (Hudson Institute), Beverley Muhlhauser (University of Adelaide), Caroline Relton (Newcastle University) and Rebecca Simmons (University of Pennsylvania)



Prof Michael Ridding, Dr Julia Pitcher

Neuromotor Plasticity and Development

Investigating how early life events affect the development of the human brain and its ability to learn and remember, and to recover from injury or illness

Group Members:

Paediatric Neurologist: Nicholas Smith
Research Fellows: Carolyn Berryman and Mitchell Goldsworthy

Postdoctoral Researchers: Brenton Hordacre and Luke Schneider

Research Officers: Joanne Collins and Bahar Moezzi

PhD Candidates: Amy Garrett and Jago Van Dam

Research Assistant: Lynton Graetz

Visiting Scientist: Zhimai Lyu

RRI Collaborators: Jodie Dodd, Bill Hague and Michael Stark

External Collaborators: Femke Buisman-Pijlman (University of Adelaide), Angela Clow (University of Westminster), Paul Fitzgerald (Monash University), Lorimer Moseley (University of South Australia), John Rothwell (University College London), Michelle Short (Flinders University) and Ulf Ziemann (University of Tübingen)



Dr Alice Rumbold
Equity and Healthy Futures

Improving the lifelong health of women and children by reducing inequality in disadvantaged families

Group Members:

Senior Research Associates: Jodie Avery and Arusyak Sevoyan

Postdoctoral Research Fellow: Zohra Lassi

Visiting PhD Candidate: Christieli de Menezes Oliveria

PhD Candidate: Jessica Dawson

Administrative Assistant: Courtney Hammond



A/Prof Michael Stark
Neonatal Medicine

Ensuring life-long health for newborns born preterm

Group Members:

Clinical Researchers: Chad Andersen and Andrew McPhee

Consultant Neonatologist: Amy Keir

PhD Candidate: Tara Crawford

Masters Student: Megan Bater

RRI Collaborators: Jodie Dodd, Ben Mol and Claire Roberts

External Collaborator: Hareesh Kirpalani (Children’s Hospital of Philadelphia)



CHILD AND ADOLESCENT HEALTH THEME

Prof Simon Barry
Molecular Immunology

Understanding the molecular basis for immune tolerance

Group Members:

Postdoctoral Research Fellows: Cheryl Brown and Timothy Sadlon

Postdoctoral Researchers: Veronika Bandara and Chris Hope

Research Assistant: Batjargal Gundsambuu

PhD Candidates: Kristen Malatesta, Ying Ying Wong and Soon Wei Wong

Honours Student: Nicole Craig

RRI Collaborators: Jenny Couper, Wendy Ingman, Sarah Robertson and Darryl Russell

External Collaborators: Marc Beyer, Joachim Schultze (LIMES), Dan Campbell, Thomas Duhon (Benorya), Greg Goodall (Centre for Cancer Biology), Chris Goodnow, Shane Grey, John Sprent (Garvan Institute), Randall Grose (SAHMRI), Kazu Kikuchi (Victor Chang Institute), Giovanna Lombardi, Tim Tree (King’s College London), Kelli MacDonald (QIMR), Raymond Steptoe (Diamantia Institute) and Kathryn Wood (Oxford University)



Senior Scientists: Jodie Nitschke and Danielle Penko

Clinical Researchers: Rob Carroll, Shilpa Jesudason and Chen Au Peh

Technical Officer: Julie Johnston

PhD Candidates: Ernesto Hurtado Perez, Francis Kette, Bron Lett, Sebastian Stead and Kisha Sivanathan

Masters Students: Kyung Kang and Juewan Kim

RRI Collaborator: Mark Nottle

External Collaborators - Shane Grey (Garvan Institute of Medical Research) and Claudine Bonder (University of South Australia)

Prof Jennifer Couper
Diabetes

Preventing type 1 diabetes and its complications

Group Members:

Clinical Partner: Alexia Pena

Clinical Researcher: Pyria Augustine

Research Manager: Rebecca Thomson

Research Coordinator: Megan Penno

Clinical Research Recruitment

Coordinator: Kelly McGorm

Research Nurses: Sarah Beresford and Meredith Krieg

Research Officer: Roger Gent

PhD Candidate: Jessica Phillips

Masters Student: Myff Geyer

RRI Collaborators: Simon Barry, Jodie Dodd and Lynne Giles

External Collaborators: Peter Colman (Royal Hospital Melbourne), Maria Craig, Kim Donaghue (University of Sydney), Liz Davies, Tim Jones (Telethon Kid’s Institute), David Dunger (University of Cambridge), Jo Forbes (University of Queensland)



Prof Toby Coates
Transplantation

Generation of novel beta cell replacement therapy to treat type 1 diabetes

Group Members:

Principal Medical Scientist: Christopher Drogemuller

Senior Medical Scientist: Svjetlana Kireta

Senior Postdoctoral Researchers: Darling Rojas-Canales and Plinio Hurtado



Prof Antonio Ferrante

Developmental and Genetic Immunology

Cellular signalling pathways in childhood allergy and inflammatory disorders

Group Members:

Principal Scientist: Charles Hii

Senior Scientists: Nick Gorgani and Alex Quach

Pathologist: Tatijana Banovic

Paediatric Immunologist: Jovanka King

Postdoctoral Researcher: Usma Munawarra

PhD Candidates: Marwah Basin Khalah, Khalida Perveen, David Shields and Annabelle Small

Research Assistants: Any Bao and Trishni Putty

Honours Student: Nikki Lansdown

Placements: Nicola Clarke, Wesley Ho, David Liddel, Melody Morgan and Stefan Sancin

RRI Collaborators: Simon Barry, Jennifer Couper, Jozef Gécz, Michael Gold, Declan Kennedy, Anna Kontos, Andrew McPhee and Patrick Quinn

External Collaborators: Catherine Abbott (Flinders University), Paul Anderson, Howard Morris (University of South Australia), Sharon Choo (Royal Children's Hospital), Lennart Hammarstrom (Karolinska Institute), Peter Hofmann, Susanna Proudman (University of Adelaide), Suresh Mahalingam (Griffith University), Susan Prescott (University of Western Australia) and Harald Renz (Phillips University)



Prof Jozef Gécz

Neurogenetics

Investigating the genetics and biology of human neurodevelopmental disabilities

Group Members:

Postdoctoral Fellows: Sarah Heron, Atma Ivancevic and Lachlan Jolly

Postdoctoral Researchers: Mark Corbett and Chenglong Yu

Research Officers: Duyen Pham, Raman Sharma and Claire Van Eyk

PhD Candidates: Deepti Domingo, Thuong Ha, Claire Homan, Sayaka Kayumi, Kristy Kolc and Debrah Renders

Research Assistants: Alison Gardner, Brett Johnson, Hannah McDonald, Marie Shaw, Renee Carroll, Renee Schulz and Dani Webber

RRI Collaborators: Alastair MacLennan, Cheryl Shoubridge and Paul Thomas

External Collaborators: Sam Berkovic, Ingrid Scheffer (University of Melbourne), Evan Eichler (Washington University), Dan Geschwind (UCLA), Vera Kelscheuer (Max Planck Institute) and Miles Wilkinson (USCD)



Prof Michael Gold

Allergy and Vaccine Safety

Michael leads two research groups in the areas of allergy and vaccine safety

Group Members:

Head of Discipline: Nigel Stocks

Senior Researcher: Annette Braunack-Mayer

Postdoctoral Research Fellow: Merryn Netting

Affiliate Senior Lecturer: Karen Best

Research Coordinator: Gabriella Lincoln

Research Officer: Alexis Wheeler

Research Nurses: Christine Health and Mary Walker

PhD Candidate: Katherine Duszynski

RRI Collaborators: John Lynch and Helen Marshall

External Collaborators: Katie Allen and Mimi Tang (Murdoch Children's Research Institute), Madhava Balakrishna (World Health Organisation), Maria Makrides (SAHMRI), Priscilla Nyambayo (Medicines Control Authority of Zimbabwe), Nicole Pratt (University of South Australia) and Susan Prescott (Telethon Kid's Institute)



Prof Jon Jureidini

Critical and Ethical Mental Health

Promoting safe, effective and ethical research and practice in mental health

Group Members:

Postdoctoral Fellow: Melissa Raven

Psychiatric Epidemiologist: Anne Tonkin

PhD Candidate: Patricia O'Rourke

Research Assistant: Riley Emmerson

External Collaborators: Elia Abi-Jaoude (University of Toronto), Peter Doshi (University of Maryland), David Healy, Joanna Le Noury (Bangor University), Quinn Grundy, Barbara Mintzes (University of Sydney), John Nardo (Emory University), Catalin Tufanaru (University of Adelaide) and Martin Whitely (Murdoch University)



Prof Declan Kennedy

Sleep Disorders

Understanding the morbidity of sleep disorders and their effect on child development

Group Members:

Director, Pulmonary Medicine: James Martin

Head, School of Psychology and Social Policy: Kurt Lushington

Medical Scientist: Anna Kontos

Sleep Lab Manager: Yvonne Pamula

Honours Student: Charmaine O'Reilly

RRI Collaborators: Suzette Coat, Jennifer Couper and Antonio Ferrante

External Collaborators: Mathias Baumert, Scott Willoughby (University of Adelaide), Roger Gent, Melissa La Forgia (Women's and Children's Hospital), Quenten Schwarz (University of South Australia)



Prof John Lynch

Better Start

Providing children with the best start in life

Group Members:

Associate Professor: Lisa Smithers

Research Fellow: Clare Hume

Senior Lecturer: Catherine Chittleborough

Postdoctoral Researchers: Angela Gialamas, Dandara Haag, Catia Malvaso, Rhiannon Pilkington, Alyssa Sawyer and Helena Schuch

Statistician: Murthy Mittinty

Research Associates: Janet Grant, Alicia Montgomerie and Alexandra Procter

RRI Collaborators: Gus Dekker, Nicki Hodyl, Ben Mol, Claire Roberts and Michael Sawyer

External Collaborators: Aluisio Barros (University Pelotas), Tony Blakely (University Otago), Deborah Cobb-Clark, Stelfi Schurer (University of Sydney), George Davey Smith, Neil Davies (University of Bristol), Pernille Due (Danish National Public Health Institute), Kathleen Falster, Louisa Jorm (University of New South Wales), Belinda Gabbe (Monash University), Steve Guthridge, Sven Silburn (Menzies Institute), Rosemary Korda (Australian National University), Catherine Law (Institute of Child Health), Anna Pearce (University of Glasgow)



Prof Helen Marshall

Vaccines and Infectious Diseases

Optimising protection for babies, children, adolescents and pregnant women against serious infectious diseases through improved immunisation strategies

Group Members:

Clinical Researchers: Sue Evans and Suja Mathew

Research Manager: Michelle Clarke

Research Nurses: Louise Goodchild, Christine Heath, Lesley Macauley and Mark Walker

Research Coordinators: Su-san Lee, Kathryn Riley and Philippa Rokkas

PhD Candidates: Mark McMillan, Jane Tuckerman and Bing Wang

Masters Student: Marianne Yanni

Honours Students: Hassen Mohammed and Brianna Morello

Administrative Assistant: Cherie Madex

RRI Collaborators: Simon Barry, Gus Dekker, Jodie Dodd, Lynn Giles, Michael Gold, John Lynch, Andy McPhee, Ben Mol and Claire Roberts

External Collaborators: Ross Andrews (Menzies Research), Ray Borrow, Shamez Lantanti (Public Health England), Margie Danchin (Murdoch Children's Research Centre), Adam Finn (University of Bristol), Ann Koehler (SA Health), Stephen Lambert (Queensland Children's Medical Research Institute), Andrew Lawrence (SA Pathology), David Lynn, Steve Wesselingh (SAHMRI), Kristine Macartney, Nicholas Wood (University of Sydney), Martin Maiden, Jenny McLennan, Andy Pollard, Matthew Snape (University of Oxford), Peter Richmond (University of Western Australia)



A/Prof David Parsons

Cystic Fibrosis

Development and testing of genetic therapies for treating and preventing cystic fibrosis lung disease

Group Members:

Research Fellow: Martin Donnelley

Postdoctoral Researchers: Patricia Cmielewski, Juliette Delhove, Nigel Farrow, Chantelle McIntyre and Nathan Rout-Pitt

PhD Candidates: Ryan Green, Ali McCarron, Harsha Padmanabhan and Thomas Goddard

Honours Student: Chantelle Carpentieri

Administrative Assistant: Bernadette Boog

RRI Collaborators: Simon Barry, Mark Nottle and Paul Thomas

External Collaborators: Ivan Bertonecello, Jonathan McQualter (Melbourne University), Ric Boucher (University of North Carolina), Paul Cooke, Karen Siu (4Dx Company), Andreas Fouras, Marcus Kitchen, Kaye Morgan (Monash University), Albert Juhasz, Ivan Lee, Euan Smith (University of South Australia), Tim Kuchel (SAHMRI), Maria Limberis (University of Pennsylvania), Rob Tarran (University of North Carolina), Kentaro Uesugi (JSDTI), Naoto Yagi (JASRI) and Roger Yazbek (Flinders University)



Prof Michael Sawyer

Child and Adolescent Mental Health

Developing and evaluating population-level interventions for the health and wellbeing of mothers and children

Group Members:

Postdoctoral Researcher: Alyssa Sawyer

Senior Project Officer: Jennifer Clark

Research Assistants: Amy Kaim and Christy Reece

RRI Collaborators: John Lynch, Ben Mol and Claire Roberts

External Collaborators: Harriet Hiscock (University of Melbourne) and David Lawrence (University of Western Australia)



A/Prof Cheryl Shoubridge

Intellectual Disability Research

Defining molecular and cellular pathways for intellectual disability and seizures, and developing effective interventions

Group Members:

Postdoctoral Researchers: Matilda Jackson and Kristie Lee

PhD Candidates: Karagh Loring and Tessa Mattiske

Research Assistants: Laura Redpath and Aneta Zysk

RRI Collaborators: Jozef Géczy, Claire Roberts and Rebecca Robker

External Collaborators: Gaele Friocourt (INSERM), Robert Harvey (School of Pharmacy London), Nigel Jones (University of Melbourne) and Jeffrey Noebels (Baylor)



INVESTING IN OUR MEMBERS

The RRI invests in people through facilities, funding programs, scholarships and training.

CORE FACILITIES



Adelaide Research Assay Facility (ARAF)

Professor David Kennaway

The Adelaide Research Assay Facility provides specialised, high-throughput and high-

sensitivity assays of physiologically important analytes for academic researchers and commercial customers Australia-wide.

ARAF provide services and consultation for specialised measurements of analytes in human or animal biological fluids or cell culture / tissue extracts. These cover broad research areas including, but not limited to, endocrinology, neuroscience, physiology, immunology, pathology and cancer.



Bioinformatics Facility

Dr Jimmy Breen

Bioinformatics enhances the Institute's capability in next-generation sequencing and systems biology approaches to basic

science and clinical research, investigating human and animal reproduction and development. Strategies to design and analyse transcriptome, deep-sequencing, genome and proteome data sets are powerful tools to investigating systems and processes in biology and disease.

Bioinformatics methods allow researchers to follow a complementary path in their research that promotes exploratory analysis and hypothesis generation, as well as focused analysis of previously identified targets of interest.



Biostatistics Facility

Dr Emma Knight

The Biostatistics Facility is a collaborative research service that provides expertise in research design and statistical

analysis. Statisticians advise researchers on appropriate study design and conduct, undertake statistical analysis and report on research findings.

The aim of this facility is to improve the quality of peer reviewed publications and NHMRC, ARC and other competitive grant funding applications.



Cohort and Intergenerational Studies Facility (CIS)

Professor Claire Roberts

The Cohort and Intergenerational Studies Facility underpins the

strategic utilisation of unique Adelaide generated longitudinal studies - both cohorts and randomised controlled trials - established before or at birth, or in childhood. CIS and its resources enhance collaborations, support novel interrogations of accrued data and enable data sharing between studies.

CIS aims to align, maintain and enhance cohorts, databases and related resources, stimulate research that addresses prioritised complex challenges in reproductive and paediatric health, and increase participation in national and international consortia.



Gene Silencing and Expression Facility (GSEx)

Jason Gummow

The Gene Silencing and Expression Facility provides gene manipulation services to

Australian researchers in a fully equipped PC2 laboratory. The facility offers custom production of lentiviral, AAV, Adenovirus and retroviral vectors, and stock viruses for purchase by the microlitre.

In addition, customers can access CRISPR, telomerase reverse transcriptase (hTERT), non-viral vector and other cell and molecular biology services. These viruses have been used to infect immortal cell lines and primary cell cultures.



SA Genome Editing Facility (SAGE)

Professor Paul Thomas

The SA Genome Editing Facility uses cutting edge genome editing technology to generate mutant mice

for a wide range of applications. Utilising new CRISPR/Cas9 technology, the facility offers a number of services including generation of custom knock out, point mutation, conditional and tagged alleles.

SAGE's services are highly accessible, offering a significantly reduced cost and fast turnaround compared to traditional ES cell methods - providing researchers an edge when applying for grants and publishing in high impact journals.

2017 Funding programs

Designed for Success

A new initiative for 2017, the *Designed for Success* program seeks to improve the scientific quality and significance of grant applications to improve chances of application success. This program provides facilitated development of research projects over an extended period of time, with structured project development in set stages and significant external review.

The program was piloted with three research teams in 2017, with review of the program and success rates set for 2018.

Engaging Opportunities

Engaging Opportunities funding supports the development of new relationships with key stakeholders to jointly address research priorities; sharing identification and ownership of the problem being addressed, and the path to understanding and progressing a solution.

Collaboration with groups such as health consumers, clinicians, business, industry, government and not-for-profits will lead to more robust and relevant research projects, quicker development of solutions, and more effective translation of discoveries. This program resulted in the development of four partnerships with new stakeholders.

Investment for Success

This program increases competitiveness for the NHMRC funding by developing highly competitive (but as yet unfunded) project grant applications, into more competitive applications for resubmission.

Support serves to enable proof-of-concept studies, experiments or analysis, to ensure rapid publication of a pivotal paper or increase scientific quality, significance and innovation.

In 2017, five projects were funded, with four participants going on to achieve NHMRC project grant funding.

Innovation Seed Funding

This pilot program supports early and mid-career researchers to collaborate across research groups and themes and to explore novel research questions. Its goal is to harness and progress new ideas towards competitive, fundable research that addresses significant knowledge gaps.

Six collaborative projects were supported in 2017, bringing together 24 members and external collaborators.

Exchange Program

The Exchange Program seeks to build collaborations with international researchers - to expand the international profile of the Institute - with the aim of increasing research capacity and facilitating access to international funding, databases and expertise.

This program funds Institute members to spend time with collaborators overseas, as well as funding international collaborators to spend time with the Institute in Adelaide.

Visiting Speakers

The Visiting Speakers Program supports external research leaders to visit the Institute, and encourages collaboration between institutions, providing insight and new perspectives on our research priorities.

Visitors present a seminar to members and meet with relevant researchers to discuss research progress and ideas.

Mentoring Program

This program seeks to strengthen networks, build relationships and develop career pathways and track records, providing mutual benefit for both the mentee and mentor.

In 2017 the Early Mid-Career Researcher Council ran the program for early and mid-career researchers seeking a mentor. A workshop was added to the program to ensure mentees maximised their involvement and were prepared when meeting their mentors, and to provide the opportunity to understand the needs of mentees. In 2017, 16 EMCRs were matched with a senior researcher by the EMCR Council.

High Impact Paper Funding

Publishing in high impact journals is a leading factor in research success and career development. This program provides financial support to enable the publication of research findings in prestigious journals that attract an international, interdisciplinary audience.

In 2017 four members received funding for their high impact publications.



Travel Grants

Supporting researchers to travel so they can present and share their research findings at national and international conferences and meetings is essential for career development and building a strong track record. Attendance at key conferences enables important networking with peers, and the opportunity to develop future collaborations.



25

travel grants awarded



19

conferences with RRI representation

Louise Robertson attended the CRISPR-Cas Revolution Conference in New York.



Clockwise from top:

Dr Kerrilyn Diener &
Dr Martin Donnelley
Melanie Smith
Bridget Arman



2017 Fellowships and Scholarships

Career Development Fellowship

This fellowship funds the salary of ‘Emerging Star’ early career researchers for one year, supporting their career development to enable competitiveness for an NHMRC Career Development Fellowship or similar. In 2017 the fellowship was jointly awarded to:

- Dr Kerrilyn Diener – *Understanding how the immune response to infections during pregnancy can impact on reproductive outcomes and offspring health*
- Dr Martin Donnelley – *Demonstrating the effectiveness of cystic fibrosis gene therapy using novel X-ray imaging tools*

Jeffrey Robinson Honours Scholarship

Each year the Institute awards the *Jeffrey Robinson Honours Scholarship* to a top performing student, who commences honours under the supervision of a RRI Member.

This scholarship is named after E/Prof Jeffrey Robinson CBE, for whom the Institute is named. E/Prof Robinson was instrumental in developing the University’s outstanding reputation for excellence in research in obstetrics, gynaecology, reproductive medicine and biology.

In 2017, the Institute awarded the *Jeffrey Robinson Honours Scholarship* to Melanie Smith to work on the project *Characterising microRNA expression in human placenta and maternal plasma across early gestation* under the supervision of Dr Jimmy Breen, Prof Claire Roberts and Dr Tina Bianco-Miotto.

Repromed Reproductive Health Scholarship

The Institute partnered with Repromed in 2016 to establish the *Repromed Reproductive Health Scholarship*. This scholarship is awarded to a top student completing their honours year under the supervision of a RRI Member.

Repromed are a South Australian fertility treatment company offering a complete range of fertility treatments and options.

The 2017 recipient for this scholarship was Bridget Arman who completed her project *Perturbed metabolism affects epigenetic marks in the preimplantation embryo via the lysine demethylase family to impair embryo development and viability* under the supervision of Prof Michelle Lane, Dr Nicole McPherson and Dr Deirdre Zander-Fox.

Training and Workshops

Co-creation Workshop

The Institute held its first Co-creation Workshop on the topic: *Immunisation, Reproduction and Pregnancy*. This event brought together researchers across the Institute, state and country, along with stakeholders and clinicians to discuss priority areas of research. It sought to collectively identify areas of opportunity, strength and gaps, and to form new collaborative research teams.

Due to the success of the day, further topics have been identified for workshops in 2018.



Engaging Health Consumers Training

The Institute and SAHMRI partnered to engage Anne McKenzie AM (Head, Consumer and Community Health Research Network) to run full day workshops on how to engage health consumers.

This workshop involved 4 health consumers and was arranged in consultation with the Health Consumers Alliance SA and the WCHN Consumer and Community Engagement Program.

Health Consumer Drop-in Session

In early February, the RRI held an informal 'drop-in session' where members spoke with health consumers about their grant proposals. This session was held in collaboration with the Health Consumers Alliance (HCA) and provided invaluable external perspectives, with many members re-shaping areas of their grant proposals in response to feedback received.

TWITTER AND MEDIA INTRODUCTION

The Institute teamed up with the University's Marketing and Media departments to run a 2-hour introductory session on Twitter and Media for our members. Presenters included:

Ben Osborne - Using Twitter to enhance your research profile

Dr Bastien Llamas - My Twitter experience - why I decided to use it, how I use it and what I do with it as a researcher

David Ellis - Understanding the media - why we need each other and how to make it work.

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Dr Megan Penno



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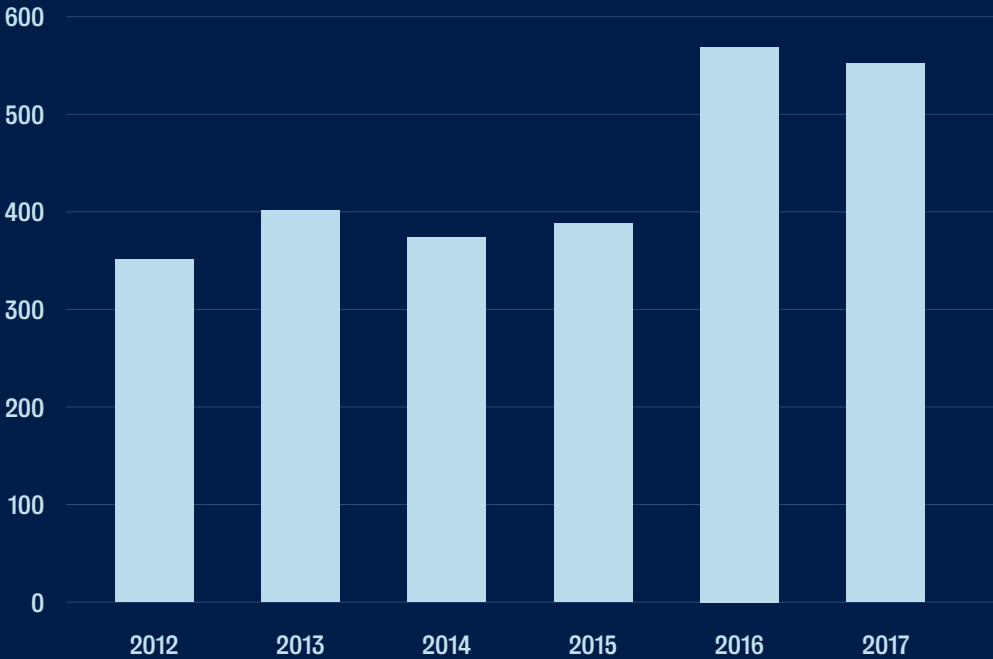
Members

Abdelhafez Gadalla, Moustafa	Brown, Cheryl	Derbie, Engida	Goodchild, Louise	Ernesto	Leemaqz, Shalem
Alaknanda, Alaknanda	Brown, Hannah	Deussen, Andrea	Gordon, Yasmyn	Hutchison, Amy	Lett, Bron
Alam, Ashiqul	Camp, Amanda	Diener, Kerri	Gorgani, Nick	Ingman, Wendy	Liddel, David
Alvin Zhao, Chengzhi	Care, Alison	Dimasi, Catherine	Graetz, Lynton	Ivancevic, Atma	Lim, Megan
Anastasi, Marie	Carneiro, Gustavo	Dinh, Doan Thao	Grant, Pat	Jackson, Matilda	Lincoln, Gabriella
Andraweera, Prabha	Carpentieri, Chantelle	Dodd, Jodie	Grant, Janet	Jacobssen, Ashlee	Liu, Bo
Archer, Maddison	Carroll, Renee	Domingo, Deepti	Green, Ella	Jankovic-Karasoulos, Tanja	Liu, Hong
Arman, Bridget	Carroll, Rob	Donnelley, Martin	Green, Ryan	Jennings, Staci	Liu, Menghe
Ashwood, Pat	Cates, Lauren	Dorian, Camilla	Grey, Shane	Jesudason, Shilpa	Lokman, Noor
Atashgaran, Vahid	Champion, Stephanie	Drogemuller, Christopher	Grieger, Jessica	Johnson, Brett	Loring, Karagh
Augustine, Pyria	Chan, Hon Yeung	Dunning, Kylie	Groome, Holly	Johnston, Julie	Loughhead, Brooke
Avery, Jodie	Chaudhary, Rajesh	Duszynski, Katherine	Grutzner, Frank	Jolly, Lachlan	Louise, Jennie
Bandara, Veronika	Cheow, Tiffany	Evans, Sue	Grzeskowiak, Luke	Jureidini, Jon	Lushington, Kurt
Banovic, Tatijana	Chin, Peck Yin	Evans, Susan	Gundsambuu, Batjargal	Kaczmarek, Adrian	Lynch, John
Bao, Andy	Chittleborough, Catherine	Farrell, Lucy	Ha, Thuong	Kaim, Amy	Lyu, Zhimai
Barry, Simon	Chowdhury, Nibir	Farrow, Nigel	Haag, Dandara	Kang, Kyung	Ma, Xiaoma
Basin Khalah, Marwah	Clark, Rebekah	Fatohi, Anwar	Hague, William	Kannieappan, Lavern	Macauley, Lesley
Bastian, Nicole	Clark, Jennifer	Fernandez, Renae	Hall, Kelly	Kayumi, Sayaka	MacLennan, Alastair
Bater, Megan	Clarke, Nicola	Ferrante, Antonio	Hammond, Courtney	Kedzior, Sophie	Macpherson, Anne
Beresford, Sarah	Clarke, Michelle	Frank, Mahalia	Han, Shanshan	Keen, Erin	Madex, Cherie
Bermudez Gonzalez, Macarena	Cmielewski, Patricia	Franske, Henrike	Harper, Kelly	Keir, Amy	Malatesta, Kristen
Bernhardt, Sarah	Coat, Suzette	Fraser, Louise	Hartanti, Monica	Kennaway, David	Malvaso, Catia
Berry, Jesia	Coates, Toby	Frolich, Sonja	Heath, Christine	Kennedy, David	Marathe, Jessica
Berryman, Carolyn	Collins, Joanne	Fullston, Tod	Heilbronn, Leonie	Kennedy, Declan	March, Wendy
Best, Karen	Copping, Katrina	Gao, Yuhuang	Heron, Sarah	Kette, Francis	Marshall, Helen
Bianco-Miotto, Tina	Corbett, Mark	Gardner, Alison	Hiendleder, Stefan	Kim, Juewan	Martin, James
Blade Stevenson, Tahlee	Couper, Jennifer	Garrett, Amy	Hii, Charles	King, Jovanka	Mathew, Suja
Bonder, Claudine	Craig, Nicole	Gatford, Kathryn	Ho, Rachel	Kireta, Svjetlana	Mattiske, Tessa
Bonner, Wendy	Crawford, Tara	Gécz, Jozef	Ho, Wesley En You	Kolc, Kristy	Mayne, Benjamin
Boog, Bernadette	Daish, Tasman	Gent, Roger	Hodson, Leigh	Kontos, Anna	McAninch, Dale
Borqvist, Ash	Dalton, Julia	Geyer, Myf	Homan, Claire	Kortschak, Dan	McCarron, Ali
Bradley, Natasha	Dasari, Pallave	Ghadge, Amita	Hope, Chris	Krieg, Meredith	McCormack, Catherine
Braunack-Mayer, Annette	Davies, Michael	Gialamas, Angela	Hordacre, Brenton	Lane, Michelle	McCullough, Dylan
Breed, William	Davies, Chris	Giles, Lynne	Horton, Dane	Lansdown, Nikki	McCullough, Caitlin
Breen, James	Dawson, Jessica	Gillet, Ellen	Huang, Shuo	Larson, Connor	Mcdonald, Hannah
	de Menezes Oliveira, Christieli	Glynn, Danielle	Hull, Louise	Lassi, Zohra	McGorm, Kelly
	Dekker, Gus	Goddard, Thomas	Hume, Clare	Lee, Siew Siew	McIlfratrick, Stephen
	Delhove, Juliette	Gold, Michael	Hummitzsch, Katja	Lee, Eunice	McIntyre, Chantelle
		Goldsworthy, Mitchell	Hurtado, Plinio	Lee, Kristie	McLennan, Hanna
			Hurtado Perez,	Lee, Su-san	McMillan, Mark

McPhee, Andrew	Parsons, David	Robker, Rebecca	Smonteiro, Clara	Yelland, Lisa	Calabretto, Helen
McPherson, Nicole	Pathirana, Maleesa Melanie	Rodgers, Raymond	Soto Heras, Sandra	Yu, Chenglong	Clifton, Vicki
Middleton, Philippa	Pederick, Daniel	Roesler, Anna	Speight, Natasha	Zemetis, Jess	Gilchrist, Robert
Mittinty, Murthy	Peh, Chen	Rogers, Mel	Stark, Michael	Zhang, Sasha	Hammerbert, Karin
Moezzi, Bahar	Peirce, Eleanor	Rojas-Canales, Darling	Stevens, David	Zhang, Bihong	Johnson, Neil
Moffat, Ruby	Pena, Alexia	Rokkas, Philippa	Stocks, Nigel	Zhao, Lijun	Khurana, Sanjeev
Mohammed, Hassen	Penko, Daniella	Rout-Pitt, Nathan	Tasheva, Stefka	Zivkovic, Tanya	Makrides, Maria
Mol, Ben	Penn, Alexander	Rowe, Kevin	Thomas, Paul	Zysk, Aneta	McColl, Shaun
Moldenhauer, Lachlan	Penno, Megan	Rumbold, Alice	Thompson, Jeremy		Moran, Lisa
Montgomerie, Alicia	Perry, Tahlia	Russell, Darryl	Thomsen, Dana	Clinical Partners	Mottershead, David
Moore, Vivienne	Perveen, Khalida	Sadlon, Timothy	Thomson, Ella	Andersen, Chad	Omari, Taher
Morello, Brianna	Pfitzner, Chandran	Saini, Anmol	Thomson, Rebecca	Boros, Christina	Sales, Kurt
Morgan, Melody	Pham, Clarabelle	Saini, Avishkar	Tonkin, Anne	Duggan, Paul	Tufanaru, Catalin
Munawara, Usma	Pham, Duyen	Salkeld, Mark	Tuckerman, Jane	Froessler, Bernd	Whitehead, Clare
Neadley, Kate	Pham, Ryan	Sancin, Stefan	Van Dam, Jago	Grivell, Rosalie	Wilkinson, Dominic
Netting, Merryn	Phan, Thi To Uyen	Sandeman, Lauren	Van Eyk, Clare	Haslam, Ross	Xafis, Vicki
Newman, Angela	Phillips, Jessica	Sawyer, Michael	Varcoe, Tamara	McPhee, Andrew	Zander-Fox, Deirdre
Nguyen, Hanh	Pilkington, Rhiannon	Sawyer, Alyssa	Vassilev, Ivan	Pena, Alexia	Zhou, Jo
Nisenblat, Vicki	Piltz, Sandie	Schjenken, John	Verburb, Petra	Smith, Nicholas	
Nitschke, Jodie	Pitcher, Julia	Schneider, Luke	Vetleal, Gabi	Symonds, Ian	Emeritus Faculty
Noor Din, Siti	Plummer, Michelle	Schuch, Helena	Wahid, Hanan	Teague, Warwick	Breed, Bill
Norman, Rob	Poprzecny, Amanda	Schulz, Renee	Walker, Mary	Wilkinson, Chris	Hopwood, John
Nottage, Casey	Price, Zoe	Sevoyan, Arusyak	Wan, Qianhui		MacLennan, Alastair
Nottle, Mark	Procter, Alexandra	Sharkey, David	Wang, Jing	Core Facilities Leaders	Matthews, Colin
Noye, Tannith Marie	Putty, Trishni	Sharma, Raman	Wang, Bing	Barry, Simon	Mulley, John
O'Brien, Cecelia	Quach, Alex	Shaw, Marie	Wang, Rui	Breen, Jimmy	Norman, Rob
O'Leary, Sean	Raven, Melissa	Shehadeh, Helana	Warin, Megan	Champion, Stephanie	O'Loughlin, John
O'Reily, Charmaine	Redpath, Laura	Shepherd, Emily	Warner, Rachelle	Gummow, Jason	Payne, Dianna
O'Rourke, Patricia	Reece, Christy	Sheppard, Caroline	Warnes, Michelle	Kennaway, David	Petrucco, Ossie
Oakden-Rainer, Luke	Regmi, Prashant	Shields, David	Webber, Dani	Knight, Emma	Robertson, Don
Oehler, Anita	Renders, Debrah	Shoenaker, Danielle	White, Melissa	Roberts, Claire	Robinson, Jeffrey
Oehler, Martin	Ricciardelli, Carmela	Shoubridge, Cheryl	Whitrow, Melissa	Russell, Darryl	Seamark, Bob
Owens, Julie	Ridding, Michael	Shuaib, Entesar	Whitty, Annie	Salkeld, Mark	Setchell, Brian
Padmanabhan, Harsha	Riley, Kathryn	Singh, Mansi	Wilson, Rebecca	Thomas, Paul	Sutherland, Grant
Pahl, Samantha	Rismiller, Peggy	Sivanathan, Kisha	Wong, Siew	White, Melissa	
Palmer, Lyle	Roberts, Claire	Small, Annabelle	Wong, Soon Wei		Professional Staff
Pamula, Yvonne	Robertson, Sarah	Smith, Melanie	Wong, Ying Ying	Affiliate Members	Goddard, Marcus
Panir, Kavita	Robertson, Louise	Smith, Nicholas	Wooldridge, Amy	Anson, Donald	DeCean, Rachel
	Robinson, Jeffrey	Smithers, Lisa	Wrin, Joe	Barry, Michael	Eley, Sarah
		Smits, Lindsey	Xinqi, Alan Shi	Buisman-Pijlman, Femke	Kenny, Ashleigh
			Yanni, Marianne		Xu, Khloe

REPRESENTATIVE PUBLICATIONS 2017

RRI Publications 2012-2017



The following 50 publications (of a total of 562 peer-reviewed primary papers, reviews and book chapters) illustrate the scope and impact of the RRI's research output in 2017.

The full list of publications can be found at adelaide.edu.au/robinson-research-institute/research/publications

1. Adikusuma F, Williams N, Grutzner F, Hughes J & Thomas P. (2017). Targeted deletion of an entire chromosome Using CRISPR/Cas9. *Molecular Therapy*, 25(8), 1736-1738.
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11. Darvishi S, Gharabaghi A, Boulay C, Ridding M, Abbott D & Baumert M. (2017). Proprioceptive feedback facilitates motor imagery-related operant learning of sensorimotor β -band modulation. *Frontiers in Neuroscience*, 11:60.
12. Dass Singh M, Fenech M, Hague W, Owens J, Thomas P, Hor M & Theodora A. (2017). Infant birth outcomes are associated with DNA damage biomarkers as measured by the cytokinesis block micronucleus cytome assay: the DADHI study. *Mutagenesis*, 32(3), 355-370.
13. Davies M, Rumbold A, Marino J, Willson K, Giles L, Whitrow M, Scheil W, Moran L, Thompson J, Lane M & Moore V. (2017). Maternal factors and the risk of birth defects after IVF and ICSI: A whole of population cohort study. *British Journal of Obstetrics and Gynaecology*, 124(10), 1537-1544.
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