HUDSON
INSTITUTE OF MEDICAL RESEARCH

Annual Report 2018

About us

Hudson Institute is a leading Australian medical research institute recognised internationally for discovery science and translational research into cancer, inflammation, reproductive health and children's health.

Our 475 scientists study human health and disease at a molecular and cellular level to discover how biological systems work and how disease and disability can be prevented or treated. Our close ties with clinicians and industry give us the ability to translate our discoveries into new preventative approaches, therapies and devices for patients.

We are a founding member of the Monash Health Translation Precinct with partners Monash Health and Monash University. Our integrated research teams include clinicians, nurses and clinical trial coordinators who both inform research programs based on patient need and advance these discoveries back to the clinic.

Working alongside clinicians in Melbourne hospitals for more than 50 years, Hudson Institute scientists pioneered IVF and stem cell discoveries and are now leading developments in paediatric cancer and the human microbiome. Our worldwide scientific and medical collaborations provide a foundation for transformative healthcare programs across the globe.

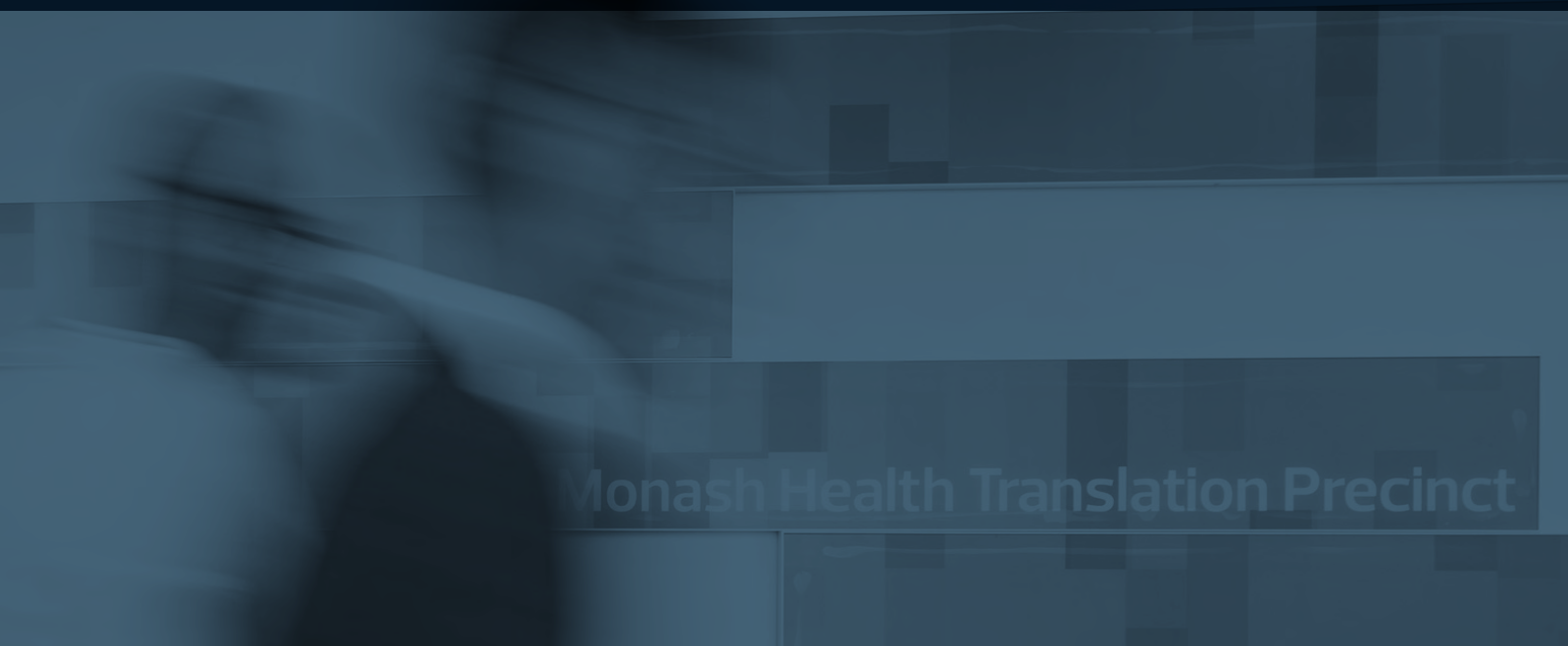
HUDSON INSTITUTE AT A GLANCE

296
STAFF

53
RESEARCH GROUPS

179
STUDENTS

300
RESEARCH PUBLICATIONS

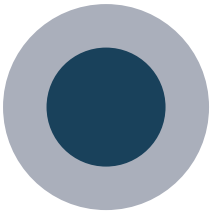


Our themes

Hudson Institute research is in four areas of medical need

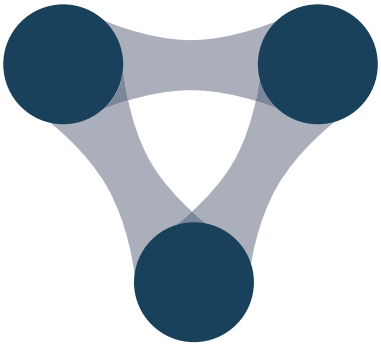
Cancer

Investigating the molecular and cellular mechanisms that lead to the development of cancer and how these insights may be used to better diagnose, detect and treat malignancies.



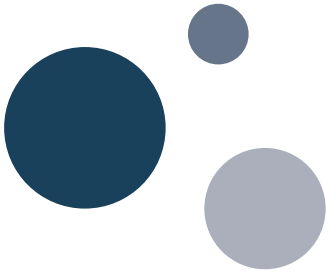
Inflammation

Exploring how our body responds to infection and tissue damage with inflammation, and using this knowledge to fight infectious diseases, cancer and autoimmune diseases.



Reproductive health and pregnancy

Addressing the challenges of infertility and complications during pregnancy, and progressing women's health.



Infant and child health

Protecting vulnerable newborns from complications during birth, in the critical early weeks of life and exploring better treatments for childhood diseases.

Director's report

Today we are fortunate that over the last century average lifespans have increased dramatically, thanks to medical research discoveries changing and improving human health.

However, this advancement has come with new challenges as we live longer with more complex health conditions. Inflammatory diseases and cancers are more common, human fertility is declining and although increasingly premature babies can be saved, many require lifelong medical care. The medical challenges to solve these complex health issues are considerable.

Tackling our biggest health challenges requires highly specialised researchers to push the boundaries of discovery and pioneer new treatments and cures. Our research workforce is precious and needs strong national and international support. As a leading medical research institute, we have the welcome duty of training brilliant young minds to reach their full potential. These emerging research leaders are the ones who will work to solve today's health problems and build tomorrow's industries.

In 2018, several of our outstanding mid and early career researchers received national recognition for their work. Four received highly competitive NHMRC Career Development Fellowships – congratulations to Dr Sam Forster, Dr Jaclyn Pearson, Associate Professor Rebecca Lim and Associate Professor Flora Wong. Additionally, Dr Cristina Giogha and Aidan Kashyap received esteemed Victoria Fellowships from the Victorian Government and Dr Erin McGillick and Dr Michelle Tate received prestigious national Tall Poppy Awards.

Our students are valued and vibrant members of the Institute and passionate contributors to the precinct. To enrich and inspire their research experience, this year we held the inaugural Hudson Institute student retreat at Phillip Island. The retreat provided the opportunity for students to discuss their research, develop further professional skills, and build networks with each other and with some of our senior researchers.

We continue to drive research innovation with our clinical research partner, Monash Health. Many of our research programs integrate clinicians, nurses and clinical trial coordinators so that our discoveries are informed by patient need and positioned for clinical development. Throughout this Annual Report, you will see the outcomes of this incredible partnership.

Key to ensuring that our discoveries reach people are partnerships with philanthropy and industry. I am immensely grateful to our diverse community of supporters, whose generous involvement makes our work possible. In particular, this year we welcomed to the Institute the Fowler Family (supporters of ovarian cancer research), the Ovarian Cancer Research Foundation, the Australian Lions Childhood Cancer Research Foundation and the Children's Cancer Foundation.

I thank our dedicated researchers, clinicians, students and our invaluable partners – all of whom bring passion and energy to improving the health of our community.

Professor Elizabeth Hartland
Director and CEO

Our precinct

Delivering cutting edge research to patients

Strength in collaboration

Hudson Institute's medical research programs span discovery and translational research and clinical trials. We progress scientific knowledge into new and innovative treatments and cures.

Translational research requires the combined skills of scientists and clinicians to take laboratory discoveries through to clinical application, harnessing both scientific and clinical expertise to produce new drugs, devices or treatments that will improve the lives of patients.

As a partner with Monash Health and Monash University, Hudson Institute researchers work directly with clinicians, enabling scientific breakthroughs to reach patients.

DISCOVERY RESEARCH

Exploring the biological mechanisms of disease.

TRANSLATIONAL RESEARCH

Developing research discoveries into new diagnostics and treatments.

CLINICAL TRIALS

Testing for effectiveness and safety of medical advances in patients.

HEALTH OUTCOMES

Improving the lives of patients by changing clinical practice and delivering better health outcomes.

Precinct partners

HUDSON INSTITUTE OF MEDICAL RESEARCH

MonashHealth

MONASH University

STRENGTH IN COLLABORATION

World-first trial of placental cell treatment helping premature babies

A world-first therapy using cells from the human placenta to repair the damaged lungs of premature babies is giving hope to families of the most vulnerable infants, like Flynn Minieri.

This year, a team of Hudson Institute, Monash Children's Hospital and Monash University researchers and clinicians completed a Phase I clinical trial of the innovative cell therapy, which could one day prevent preterm lung disease.

The results of the clinical trial, the culmination of more than 10 years' research, were published in the journal, *STEM CELLS Translational Medicine.*

Six preterm babies with the chronic lung disease bronchopulmonary dysplasia (BPD) were given one low dose of amniotic epithelial cells (hAECs) in the first-in-human safety trial.

The amnion cells are extracted from the amniotic sac, part of the human placenta that surrounds the baby during pregnancy. These cells are administered intravenously and work by attaching themselves to damaged lungs, kick-starting the baby's own repair process.

"This is the first step towards a therapy for vulnerable premature infants who currently have no other effective form of treatment," Dr Rebecca Lim, head of the Amnion Cell Biology research group and joint first author of the study, said.

"Our results show that this amnion cell therapy was well-tolerated and can be safely used in babies with lung disease."

BPD is the most common disease affecting premature babies. The smaller the baby, the greater the risk of them developing the disease and if BPD takes hold, there is no cure and it can cause multiple lifelong health impacts.

Dr Rebecca Lim, Professor Euan Wallace, Dr Atul Malhotra and baby in NICU ward of the Monash Children's Hospital

Giving infants a chance

Flynn Minieri (see photo on inside front cover) was born at Monash Children's at 25 weeks' gestation, weighing 990 grams and one of the first babies to receive the treatment.

Parents John and Kirsty Minieri wanted to take part in the trial because they recognised that there's a desperate need for babies with BPD, like Flynn, to receive better care.

"There is no doubt that when Flynn was in hospital, he benefited from treatments that were trialled on other babies, as well as the decisions of their brave parents deciding to take part in medical research," John and Kirsty said.

"We wanted to pass that hope on to other families."

Now in his third year, their 'little fighter' Flynn is a happy toddler and no longer needs oxygen support.

Next steps

A larger clinical trial involving 24 extremely premature babies at risk of developing BPD is now underway to determine the best dosage and frequency for the cell treatment.

"Our aim is to develop a treatment that could be rolled out in hospitals across the world to 'rebuild' the damaged lungs of premature babies in the days after birth, which could ultimately help increase survival rates and reduce complications," Dr Atul Malhotra from Monash Children's said.

Former Victorian Minister for Health, Jill Hennessy, said the world-first development is another example that Victoria is home to some of the best and brightest medical researchers.

"Developments like these have the power to change lives, save lives and give some of our most fragile infants a fighting chance," Ms Hennessy said.

Collaborators: Monash Children's Hospital, Monash University, Royal Women's Hospital

Funders: Fielding Foundation, Hugh Rogers Foundation, NHMRC

Dr Rebecca Lim

BPD facts

- BPD is the most common disease affecting premature babies.
- Almost one in 10 babies in Australia are born premature and up to 60 per cent of extremely premature babies will develop BPD.
- BPD occurs when immature newborn or premature lungs are exposed to ventilation causing damage to tiny developing lungs.
- BPD affects the alveoli, the tiny sacs in the lungs that enable the entry of oxygen into the bloodstream and the clearance of carbon dioxide from the body.
- Babies with BPD often suffer severe lifelong complications.
- There is currently no safe and effective treatment for BPD.

What are amnion epithelial cells?

An amniotic epithelial cell is a stem-like cell extracted from the lining of the inner membrane of the placenta. They have the ability to grow into any cell in the body, in a similar way to stem cells. Each placenta produces about 150-200 million amnion cells.

STRENGTH IN COLLABORATION

Could friendly bacteria be a cure for childhood IBD?

Being a young person is hard enough, but life can be extremely challenging for those children with inflammatory bowel disease (IBD) – often called the 'invisible illness'.

IBD is an incurable lifelong disease for one in 200 Australians, including more than 10,000 children, that causes inflammation anywhere from the mouth to the anus. It's often so severe that sufferers need to be hospitalised and may require surgery. Symptoms include frequent and severe diarrhoea, bleeding, abdominal pain, poor appetite, weight loss, tiredness, nausea, vomiting, fever, delayed growth and puberty.

Currently IBD is kept under control using drugs that suppress the immune system, but these become less effective over time and can have significant side effects, leaving patients with an increased risk of colorectal cancer and lymphoma.

In addition, the ongoing and chronic nature of IBD impacts a young patient's emotional, physical and social wellbeing. Having IBD can cause severe embarrassment and disruption to a young patient's education, employment and relationships, and the isolation and stress experienced can result in anxiety and depression.

Combining skills to find new treatments

Hudson Institute and Monash Children's Hospital researchers and clinicians are combining their expert skills to find new treatments to help young people with IBD.

The Childhood IBD Research Program involves three emerging research leaders from Monash Health Translation Precinct – Dr Sam Forster, Dr Jaclyn Pearson (Hudson Institute) and Dr Edward Giles (Monash Children's Hospital).

Changing the paradigm of IBD treatment

The team are combining their expertise in clinical disease, genomics and immunology to identify common protective and inflammation-causing gut bacteria in children diagnosed with IBD and to identify treatments that target those bacteria.

"Growing the bacteria from patient samples is not simple, but was pivotal to progress. With generous start-up support from the Gastroenterological Society of Australia and the Walter Cottman Equity Trust we have been able to overcome some of the initial technical challenges of working with complex bacterial samples. However, we need to do so much more," said Dr Sam Forster.

Already, the team have grown almost 2500 bacteria and identified around 20 of these bacteria that associate with bowel damage to proceed with more in-depth research.

"If we can understand how these key bacteria initiate the disease symptoms, this research has immense potential to change the paradigm of IBD treatment," said Dr Jaclyn Pearson.

The team envisage that the bacteria could be targeted directly with treatments including personalised probiotics, antibiotics and faecal transplants, or indirectly through diet or immunomodulators.

"Ultimately, through this work we will find new treatments that will reduce suffering, minimise hospital visits and reduce the need for surgery, optimising growth and psychosocial outcomes for young people," said Dr Edward Giles.

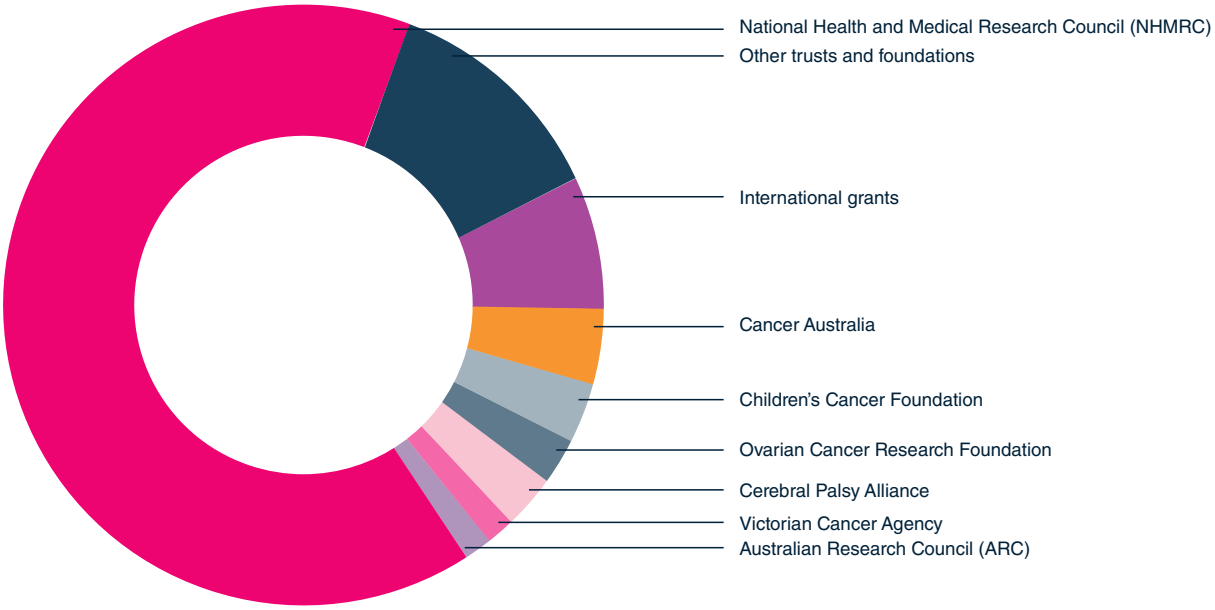
IBD facts

- IBD is the umbrella term for Crohn's Disease and ulcerative colitis – both are lifelong gastrointestinal disorders.
- IBD is an emerging global disease with Australia having one of the highest rates in the world.
- More than 80,000 Australians (one in 200) live with IBD, including an estimated 10,000 young people.
- IBD is increasing. More than 100,000 Australians are expected to have IBD by 2022.
- IBD is being diagnosed in more and more young patients.
- The total cost of caring for Australians with IBD is estimated at $3.1 billion each year, and that cost is expected to rise as the impact of the disease becomes more understood.

Dr Sam Forster, Dr Jaclyn Pearson and Dr Edward Giles

Research outputs

Grant funding received in 2018



Funding bodies ($)

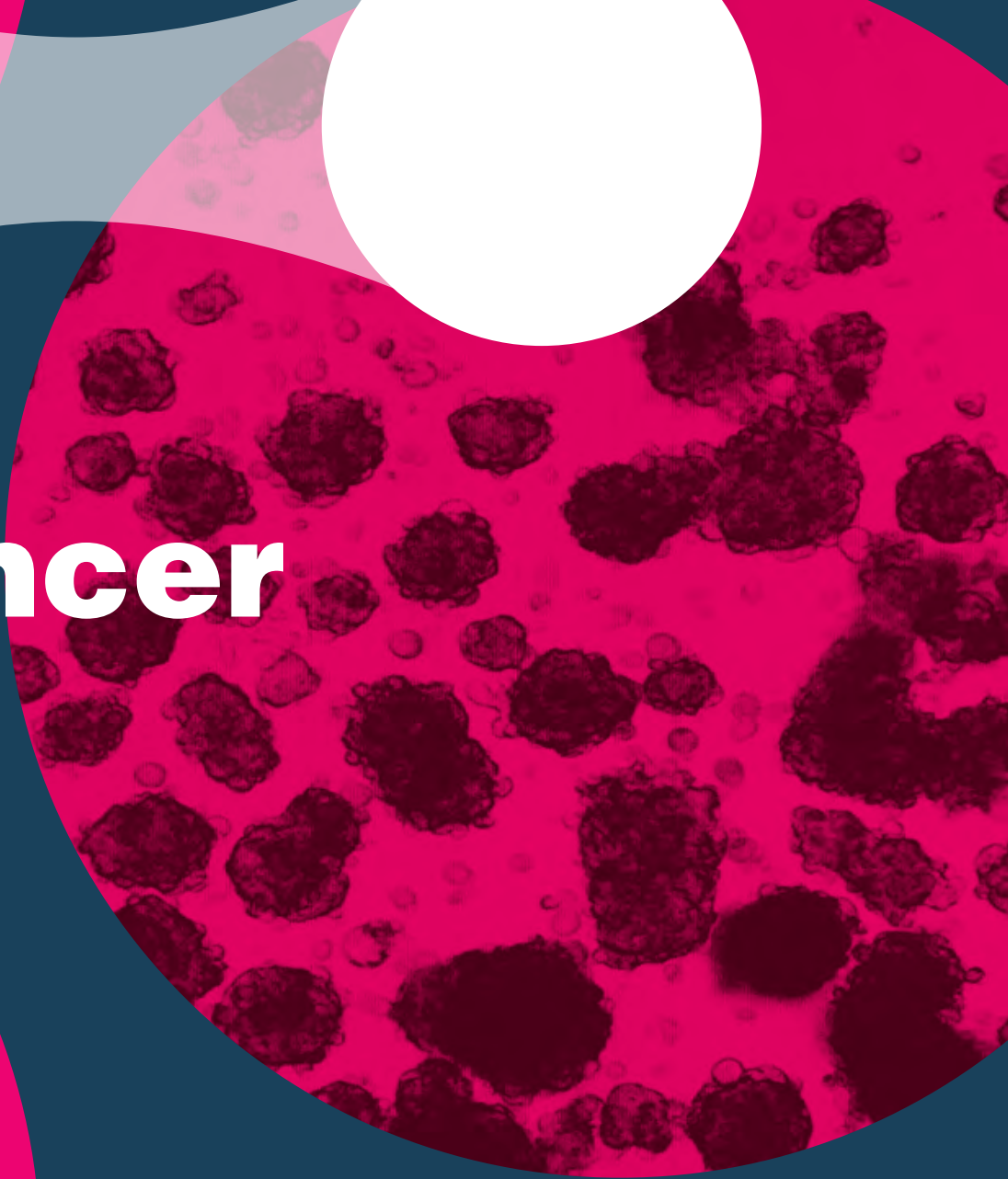
National Health and Medical Research Council (NHMRC)	14,682,315
Cancer Australia	964,144
Children's Cancer Foundation	712,114
Cerebral Palsy Alliance	644,668
Ovarian Cancer Research Foundation	571,949
Victorian Cancer Agency	357,250
Australian Research Council (ARC)	271,568
Other trusts and foundations	
Science and Industry Endowment Fund	285,180
National Heart Foundation	254,336
Robert Connor Dawes Foundation	228,315
CASS Foundation	182,000
Rebecca L Cooper Foundation	100,000
Cancer Council Victoria	100,000
LEW Carty Foundation	100,000
Other trusts and foundations	1,523,556
TOTAL	**2,773,387**
International grants	
Department of Defense (USA)	898,096
Lupus Research Alliance	448,943
Other international grants	192,023
TOTAL	**1,539,062**
TOTAL	**22,516,457**

Publications

In 2018, Hudson Institute's researchers published extensively in international peer-reviewed journals.

Publication type	2016	2017	2018
Original research articles	234	273	206
Reviews	28	36	50
Editorials and commentaries	11	20	17
Books and book chapters	19	10	28

Cancer



Ovarian cancer researchers Dr Maree Bilandzic and Dr Andrew Stephens

CANCER

Early detection screening for ovarian cancer

The early detection of ovarian cancer in women who don't exhibit symptoms may be soon possible, simply through analysing a swab or blood sample.

Hudson Institute scientist Dr Andrew Stephens is preparing to trial the Active Ratio Test, which researchers believe could increase five-year survival rates from less than 30 to 90 per cent.

Around 300 at-risk women, who carry heritable mutations in the BRCA1 or BRCA2 genes that predispose them to having ovarian cancer, will participate in the trial.

Vague and misleading symptoms, combined with the need for invasive surgery for diagnosis, are what contribute to mostly advanced-stage diagnosis and poor survival rates.

Dr Stephens' research has found that ovarian cancers are very good at hiding from the immune system. His team identified a protein produced early on by the tumours that should sound an alarm to activate the immune system, but these molecules were not working properly in ovarian cancer tissues. A change in the molecule meant the immune system was switched off instead of on.

"Our 'Active Ratio Test' is based around that finding," Dr Stephens said. "It measures those changes to give an indication of the presence of a growing tumour. It's encouraging because we detect the largest amount of change at the earliest stage, when the cancer is still confined to the ovary."

"Ultimately, we want to get the test into a routine screening program as a regular health check for women," Dr Stephens said.

Collaborators: Biomedical and Health Innovation, RMIT University; Gynaecological Oncology, Monash Medical Centre

Funders: Ovarian Cancer Research Foundation (OCRF)

Ovarian cancer facts

- Ovarian cancer is the deadliest gynaecological disease, with a lower survival rate than both breast and cervical cancer. Only 30 per cent of women diagnosed with late stage ovarian cancer will survive beyond five years. However, if detected and treated earlier, survival rates increase to more than 90 per cent.
- Every year, more than 1600 Australian women are diagnosed with the disease and it claims the lives of more than 1000.
- It is known as the silent killer, as women with early stage ovarian cancer commonly do not present with any symptoms. This means the disease is often not detected until the advanced stages when it has spread beyond the ovaries.
- Ovarian cancer can affect any woman at any life stage.

CANCER

Hope for early stomach cancer diagnosis

A family of genes that could more accurately detect stomach cancer in its early stages and improve survival rates has been identified.

Stomach or gastric cancer is the third leading cause of cancer death worldwide. It is caused by the abnormal growth of cells in the lining, or mucosa, of the stomach. In 2015, there were 1150 deaths from stomach cancer in Australia.

Professor Brendan Jenkins and first author Dr Liang Yu analysed the genetic data from 900 patients with the aim of identifying a more accurate system to classify early stomach cancer and improve patient survival.

The study, published in the journal *Clinical Cancer Research*, identified a unique genetic pattern that measures key indicators of early stomach cancer, including tumour invasion depth, how the cancer cells behave, the degree of malignancy, and stage.

This level of detail provides clinicians with a more accurate prognosis compared to the current system used to classify the stage of these cancers.

Dr Liang Yu, a postdoctoral scientist, said the findings provide greater choice for clinicians and patients.

"A patient's prognosis largely depends on when their tumour is detected. Using these genes would greatly improve the classification of early stage tumours in terms of accuracy and sensitivity," Dr Yu said.

"We can use this signature to help doctors determine which patients with stomach cancer only require endoscopic treatment, a less invasive option to avoid radical surgery, and therefore significantly improve the patient's quality of life," Dr Yu said.

Collaborators: Duke-NUS Medical School; Kanazawa University; Shanghai Jiao Tong University; University of Adelaide; UNC-Chapel Hill

Funders: Cancer Council Victoria

Professor Brendan Jenkins and Dr Liang Yu

"A patient's prognosis largely depends on when their tumour is detected. Using these genes would greatly improve the classification of early stage tumours in terms of accuracy and sensitivity."

DR LIANG YU

Turbo-charging chemotherapy for lung cancer

A naturally occurring hormone could help make chemotherapy more effective, while at the same time protecting against its damaging side effects to the kidney, thanks to an innovative discovery by Hudson Institute researchers.

Most patients with lung cancer are treated with a chemotherapy drug called cisplatin, but less than a third of patients experience any benefit from this treatment and many will develop side effects from the drug, including kidney damage.

Dr Jason Cain and then PhD student Dr Kieren Marini, working in collaboration with Professor Neil Watkins (Garvan Institute), found that a protein called activin is a culprit in both chemotherapy resistance and chemotherapy-induced kidney damage.

"In chemotherapy-resistant tumours in mice, activin gets switched on in response to the damage caused by chemotherapy," said Dr Cain. "Cancer cells can then enlist activin to protect themselves. At the same time, when activin is switched on, it promotes kidney injury."

Casual chat leads to breakthrough

In the 1980s, Hudson Institute Distinguished Scientist Professor David de Krester discovered the naturally occurring protein follistatin and its ability to block the damaging inflammatory effects of activin in the body.

A chance conversation between the then colleagues, Prof Watkins and Prof de Kretser, led the team down a path of combining follistatin and platinum chemotherapy in preclinical trials. The team found that the addition of follistatin to platinum chemotherapy not only increased the odds of success of treatment with the drug from 10 to 70 per cent, it also reduced the chances of kidney damage.

Clinical trials

The study, published in the journal *Science Translational Medicine*, has laid the groundwork for clinical trials of the combination therapy in patients.

"Discoveries like this one – a combination therapy that actually reduces damage while improving effectiveness of chemotherapy – are exceedingly rare in cancer research," Dr Cain said.

"Many of us have heard about the devastating side effects of chemotherapy in cancer patients. This discovery has the potential to not only increase the effectiveness of platinum chemotherapy, but also give patients a better quality of life by preventing kidney damage."

Collaborators: Garvan Institute

Funders: Cancer Council NSW; Hudson Institute of Medical Research; NHMRC; Paranta Biosciences; Petre Foundation; St Vincent's Clinic Foundation; Victorian Cancer Agency; Victorian Government's Operational Infrastructure Support Program

"Discoveries like this one – a combination therapy that actually reduces damage while improving effectiveness of chemotherapy – are exceedingly rare in cancer research."

DR JASON CAIN

CANCER

L-R: Mr Jeremy Smith, Chairman, Children's Cancer Foundation; Professor Elizabeth Hartland; Associate Professor Ron Firestein; Ms Aileen Boyd-Squires, CEO, Children's Cancer Foundation; Dr Peter Downie, Head of the Children's Cancer Centre at Monash Children's Hospital; Mr Nigel Garrard, Board Member, Hudson Institute

Experts tackle children's cancer

More than 150 leading scientists and clinicians working in childhood cancer attended the annual International Childhood Cancer Research Symposium held in February.

The symposium is a key scientific event building vital links for sharing the latest frontline knowledge between research laboratories and paediatric oncology clinics to progress solutions for childhood cancer.

Scientific presentations at the annual symposium highlighted developments and discoveries in paediatric brain tumours, translational research advances and cancer precision medicine.

Renowned international speakers working in childhood cancer came from The Children's Hospital of Philadelphia (USA), The Hospital for Sick Children (Toronto, Canada), KK Women's and Children's Hospital (Singapore), Queensland Brain Institute, Royal Children's Hospital, Murdoch Children's Research Institute and Monash University.

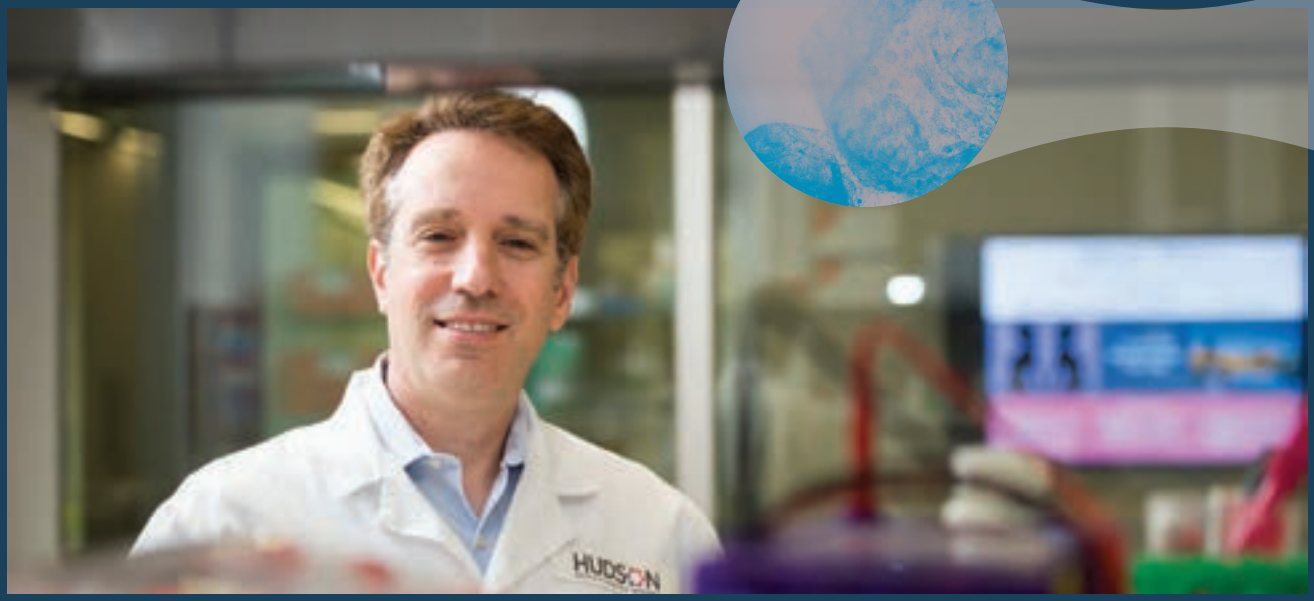
Childhood cancer precision medicine program launched

At the close of the symposium, the Hudson Monash Paediatric Precision Medicine Program was announced, funded with a generous $1.3 million grant from the Children's Cancer Foundation. The program focuses on improving outcomes for children with brain cancers and solid tumours.

In collaboration with Monash Children's Hospital, the Royal Children's Hospital and Monash University, the program has established a living biobank of paediatric solid tumours – including living organoid or lab-grown 'mini-tumours' – to trial and develop new, targeted treatments and improve survival rates for childhood cancer.

"Every child's tumour is genetically unique and responds to cancer treatment in a different way. Knowledge of the genetic variability of paediatric tumours is building at a fast pace and this program is translating this critical information into a pipeline of treatment," said Associate Professor Ron Firestein.

"Current treatment options including chemotherapy and radiation can have devastating long-term health effects for childhood cancer survivors. Our aim is to develop effective, targeted treatment options with fewer side effects for these young patients, which may improve long-term survival."



Associate Professor Ron Firestein

Setting the foundations

In 2018 the Hudson Monash Paediatric Precision Medicine Program made significant progress.

Leading cancer researchers, paediatric oncologists, bio-informaticians and pathologists from Australia and abroad were recruited to form the Children's Cancer Foundation Research Laboratory. Using their highly specialised skills, the team's initial work focused on harnessing multiple advances in science and technology to establish a living biobank of childhood brain tumours and solid cancers that will be used to accelerate new treatments for children with cancer.

"The biobank and drug-screening data are the vital foundations that will ultimately enable oncologists to tap into a vast pool of information, giving children with brain cancer the best chance of survival," said Associate Professor Ron Firestein.

Funding for multiple state-of-the-art technologies support the team's work, including a cutting-edge Whole Genome CRISPR Library for genetic screens and four drug libraries, providing more than 2000 individual compounds that are FDA approved or in late stage clinical trials.

Vital data

By December, the team had collected and cultured more than 90 tumour samples for the living biobank, mostly from Victoria (nearly doubling the target number). To achieve this, the team brought together multiple disperse scientific discoveries and new technologies into a highly specialised and streamlined pipeline.

"Our results are achieved by a strong focus on individualised and targeted solutions. Each tumour sample is vital for the biobank, but not all samples respond to standard culturing. Extremely high success rates have come from culturing samples using multiple methods," said A/Prof Firestein.

After culturing, each tumour sample is tested for sensitivity to more than 2000 drugs and drug combinations to produce the drug-screen data.

"Our hope is that this vital information will eventually be at oncologists' finger tips, enabling them to match the most effective drug to a child's tumour type."

Collaborative networks

The team also established data-sharing networks with paediatric cancer experts around the globe, enabling them to tap into vast real-time data pools and accelerate treatments. Their networks span four continents including 33 health services, universities and research centres.

In September, the team became the first Australian member of the US-based Children's Brain Tumour Tissue Consortium (CBTTC), working with multiple institutes from the US, Europe and China, including Weill Cornell Medicine and Stanford University. The CBTTC membership also gives the team access to the newly established Pediatric Brain Tumour Atlas – one of the most comprehensive collections of childhood brain tumour data that will allow the team to tap into a wealth of information and progress treatments.

CANCER

L-R: Dr Simon Chu, Professor Elizabeth Hartland, Dr Andrew Stephens, Ms Lucinda Nolan CEO, Ovarian Cancer Research Foundation

Inaugural symposium progresses understanding of ovarian cancer

The inaugural Ovarian Cancer Research Foundation (OCRF) Symposium held in November gathered ovarian cancer researchers and clinicians from across Australia to progress solutions to this devastating disease.

Held at Hudson Institute and hosted by OCRF, the symposium provided opportunities for more than 40 ovarian cancer scientists and clinicians to present research discoveries, network and forge new collaborations.

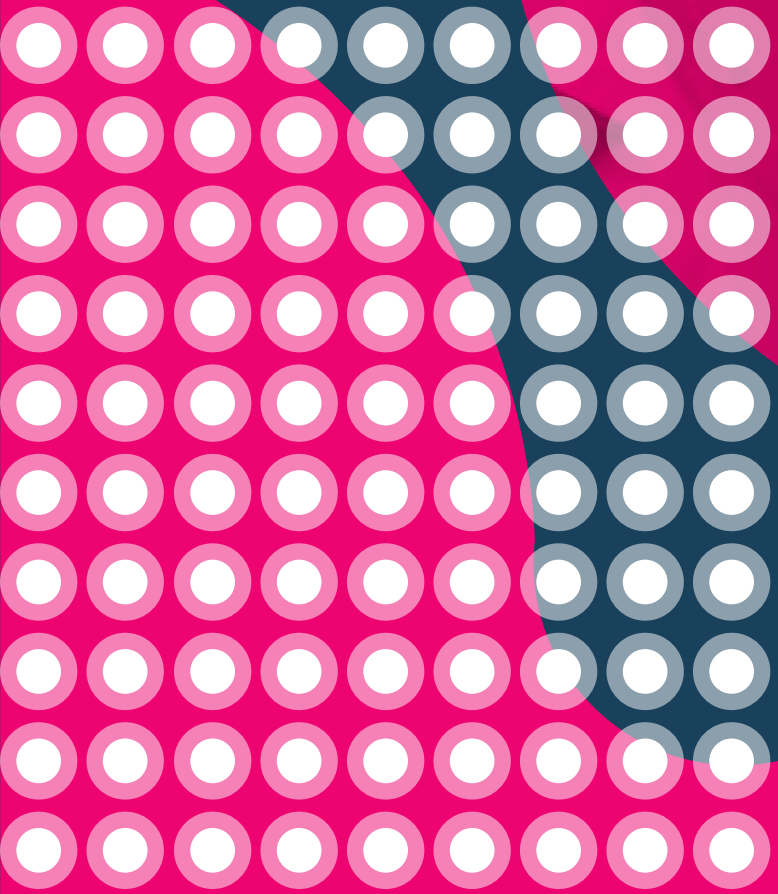
Hudson Institute Director, Professor Elizabeth Hartland, said scientific symposiums are vital for facilitating important knowledge and connections in medical research.

“Ultimately this leads to discoveries and better outcomes for the 1613 Australian women diagnosed with ovarian cancer each year,” said Prof Hartland.

Established in 2000, OCRF supports ovarian cancer research by funding scientific grants aimed at saving women’s lives through early detection and personalised treatment.

“We are very excited about establishing the inaugural Ovarian Cancer Research Symposium. We know the importance of collaboration and communication in progressing the understanding of this deadly disease and that research is the key to finding a cure,” said OCRF CEO, Lucinda Nolan.

Inflammation



Dr Samuel Forster

INFLAMMATION

Rethinking UTIs

New knowledge about bacteria in the bladder could fundamentally change how urinary tract infections (UTIs) are treated.

UTIs are painful infections that occur when bacteria enter the bladder, urethra or kidneys and multiply to cause infection.

A simple treatment of prescribed antibiotics usually kills the bacteria, but each year more than 70,000 Australians are hospitalised with kidney and urinary tract infections, which can lead to death, particularly in older people.

The rapid rise of antibiotic resistance in the bacteria that cause UTIs, such as *E. coli*, means we urgently need new and more effective ways of treating and managing UTIs.

The findings of a study by Dr Samuel Forster with collaborators at the Wellcome Sanger Institute (Cambridge, UK) and Loyola University Chicago (USA), published in *Nature Communications*, challenges more than 100 years of medical dogma, showing that bacteria in the female reproductive tract can inhabit the bladder without causing clinical infection.

"The female bladder has long been considered sterile, except in women with UTIs caused by invading bacteria," Research Group Head Dr Forster said. "Now we know that the bladder has its own resident bacterial populations."

"This raises the question – if antibiotics are used to kill the 'bad' bacteria in patients with UTIs, could this also upset the balance of healthy bacteria that may have a protective effect – much like in the gut?" he said.

Living library of bacteria

The team isolated and genome-sequenced 149 strains of bacteria found in urine samples from 77 healthy and symptomatic women, then grew them in the laboratory to create a 'living library' of bacteria.

When the team examined the genetic profiles of these bladder bacteria, they found that startlingly, up to two thirds of the species found in the bladder were also common to the reproductive tract.

"This 'crossover' suggests the female bladder is not sterile, and forms part of an interconnected bacterial community with the female reproductive tract," Dr Forster said.

Collaborators: Loyola University Chicago (USA); Wellcome Sanger Institute (Cambridge, UK)

Funders: CJ Martin Biomedical Fellowship; NHMRC

UTI facts

- UTIs are common – particularly in women, babies and older people.
- Around one in two women and one in 20 men will get a UTI in their lifetime.
- Standard antibiotic therapy fails in 25 to 35 per cent of people with acute UTIs.

INFLAMMATION

Cancer therapies trigger the innate immune system

Cancer occurs when cells develop dangerous mutations that allow them to inappropriately survive and proliferate.

Drugs targeting cell survival pathways have been developed to encourage cancer cell death. Our understanding of how these drugs eliminate cancer will be critical for their use in the clinic.

A collaborative study led by Hudson Institute's Dr Kate Lawlor and published in *Cell Reports* has shown that some anti-cancer drugs that trigger the death of cancer cells also cause a potent immune response that may additionally prevent their growth. These cancer treatments may therefore be more powerful than once thought, and deliver a 'double-hit' to cancer cells, potentially stopping cancer progression in some patients.

"Until now, scientists have believed that drugs targeting the BCL-2 protein family kill cancer cells in only one way. Our work shows that these chemotherapy drugs may not only kill the cells during cancer treatment, but may also activate the body's own immune system to prevent further tumour and blood cancer growth," Dr Lawlor said.

Dr Lawlor said this new knowledge opens up the potential for improved cancer treatments that take advantage of the body's own immune response. This finding could also advance other treatments where cells exist in 'stressful' environments, such as bacterial and viral infections, arthritis and type 2 diabetes.

In future work, Dr Lawlor's team hope to test the effectiveness of this drug combination in cancer patient cells, and determine the diseases where we need to limit or enhance this form of cell death.

Collaborators: Australian National University; National Institute of Biological Sciences, China; Walter and Eliza Hall Institute

Funders: NHMRC

"Until now, scientists have believed that drugs targeting the BCL-2 protein family kill cancer cells in only one way. Our work shows that these chemotherapy drugs may not only kill the cells during cancer treatment, but may also activate the body's own immune system to prevent further tumour and blood cancer growth."

DR KATE LAWLOR

Hidden gene may hold TB secret

Knowledge of how a gene 'communicates' could hold the innovative key to improving resistance to a disease that kills millions of people globally each year.

Professor Paul Hertzog and Dr Nicky de Weerd were part of a vital study published in Nature Communications that found a genetic variation in the IFNAR1 gene is associated with a protective effect to tuberculosis (TB). Their work is part of a larger program led by Prof Hertzog on the roles of type 1 interferons in inflammatory diseases and cancer.

"Understanding the way the IFNAR protein works could help scientists reduce vulnerability to the disease, combat drug resistance and aid in the development of targeted therapeutics," said Prof Hertzog.

Australians are now largely protected from TB due to our high standards of healthcare and historical record of vaccinating against TB, but the disease continues to pose a significant global public health challenge. In 2016, more than 10 million people worldwide contracted TB and 1.7 million died from it, making it one of the top 10 causes of death worldwide.

Some of Australia's nearest neighbours (including Indonesia, India and the Philippines) have some of the highest rates of TB infection in the world. Understanding how the immune system fights TB infection may lead to new treatments for this age-old disease.

Collaborators: Centenary Institute, University of Sydney; Guangdong Medical University; Sichuan University; Shenzhen University School of Medicine; Sun Yet-sen University

Funders: NHMRC

Professor Paul Hertzog and Dr Nicky de Weerd

"Understanding the way the IFNAR protein works could help scientists reduce vulnerability to the disease, combat drug resistance and aid in the development of targeted therapeutics."

PROF PAUL HERTZOG

INFLAMMATION

Inaugural oration honours Professor Elizabeth Hartland

Hudson Institute Director, Professor Elizabeth Hartland, has been honoured for her outstanding leadership and mentorship of young researchers in the field of immunology and infectious diseases.

The inaugural Hartland Oration was presented at the annual Lorne Infection and Immunity Conference held in Victoria in February 2018.

The oration will be presented each year by the best early career researcher from the Victorian Infection and Immunity Network (VIIN), which brings together researchers in immunology, microbiology and related disciplines from across Victoria. Hosted by Hudson Institute, the network includes 1200 members and 15 institutional supporters, whose common goal is solving problems in infectious diseases and immunology through research collaboration.

The oration recognises Prof Hartland's contributions in co-founding the Lorne Infection and Immunity Conference alongside Professor Paul Hertzog in 2011, and her role as a supportive mentor for early career researchers and students in the field.

"I am very proud of the momentum and support that we have created for infection and immunity research over the last several years," Prof Hartland said.

"Our inclusive policy means that every researcher, from junior to senior level, with an interest in infection and immunity can enjoy interactions with their peers at several VIIN events, thereby building their own networks."

As VIIN Co-Convenor (2009-2017), Professor Hartland had key roles in co-convening the Lorne Infection and Immunity Conferences (2011-2017), the VIIN Industry Alliance (2012-2014) and the VIIN Young Investigator Symposia (2009-2016).

Professor Elizabeth Hartland and 2018 Hartland Orator, Dr Angela Pizzolla

Reproductive health

Dr Jemma Evans

REPRODUCTIVE HEALTH

How diet affects fertility

A simple change in diet could be the key to improving fertility and a healthy pregnancy in some women.

A study by Dr Jemma Evans, published in the journal *Human Reproduction*, found that women with obesity, who are more prone to infertility and pregnancy complications, had elevated levels of toxic proteins known as advanced glycation end products (AGEs).

Dr Evans and her team discovered that AGEs trigger inflammation in the womb, making it more difficult for an embryo to implant and potentially reducing the likelihood of a pregnancy occurring.

"This is the first time anyone has demonstrated in laboratory studies that specific toxic factors in the womb can compromise fertility," Dr Evans said.

"These toxic 'by-products' alter the cells in the lining of the womb," Dr Evans said. "In addition, AGEs interfere with placental development, which could contribute to pregnancy complications."

Dr Evans has started a clinical trial to test whether a simple eight-week dietary intervention – known to improve health in diseases such as diabetes – could reduce these toxic factors in the womb and help more women fall pregnant and achieve healthier pregnancies.

"If successful, the treatment may become a more holistic way to improve fertility and potentially avoid the need for costly measures such as IVF," Dr Evans said.

Collaborators: Department of Diabetes, Central Clinical School, Monash University

Funders: Fielding Foundation Fellowship; Monash IVF; Society for Reproductive Investigation Bridge Grant

Advanced glycation end products (AGEs) facts

- AGEs are harmful compounds that are produced when proteins or fats combine in the bloodstream after consumption of sugary, highly processed or browned foods.
- Foods that have been exposed to high temperatures, as in grilling, frying or toasting, tend to be very high in these compounds.
- When AGES accumulate in high levels, they increase the risk of developing many different diseases.

REPRODUCTIVE HEALTH

Small protein could solve big fertility puzzle

Women with unexplained infertility could achieve a healthy pregnancy thanks to Dr Tracey Edgell's discovery of a protein impacting the uterine environment.

Dr Edgell's research focus is on identifying the optimum endometrial environment for an embryo to implant, helping women achieve healthy pregnancies.

In a study published in the journal *Cytokine*, Dr Edgell identified a number of proteins elevated in the womb with unexplained infertility, including a protein called CSF3, which has a range of effects in different women.

In fertile women, CSF3 promotes the growth of cells in the lining of the womb so that an embryo can implant more easily. However, at higher concentrations detected in some women with unexplained infertility, this positive effect was lost.

Currently, CSF3 is occasionally used in IVF as a complementary treatment either prior to embryo transfer to promote development of a pregnancy, or in the early stages of pregnancy of women with a history of recurrent miscarriage.

"However, our study revealed that for women with elevated levels of CSF3 who were trying to fall pregnant, raising these CSF3 levels even further could stop a pregnancy occurring," Dr Edgell said.

Dr Edgell aims to develop a treatment to 'rebalance' naturally high CSF3 levels in women with infertility. This would enable an embryo to implant and provide a better chance of pregnancy occurring naturally.

"Our ultimate goal is to target CSF3 in a treatment for women with unexplained fertility so they can become pregnant without the need for costly, invasive and stressful IVF procedures," Dr Edgell said.

Collaborators: Monash Health; Monash IVF; Monash University

Funders: Fielding Foundation; Monash IVF Research and Education Fund; NHMRC

Fertility facts

- An estimated 121 million couples experience infertility worldwide, with around half seeking medical assistance.
- Victoria's IVF success rate is about 28 per cent.
- The costs of IVF to the Australian healthcare system are substantial. In 2015, the taxpayer contributed $254M to infertility treatment – a 50 per cent increase from 2007.

Dr Tracey Edgell

Dad's health at conception could impact children

Women trying to fall pregnant are encouraged to avoid smoking and drinking alcohol, but new research is bringing the lifestyle and health of men wanting to become fathers into the spotlight.

A study by Associate Professor Patrick Western with first author, Dr Jessica Stringer, published in the journal *BMC Biology,* has identified a new pathway of non-genetic inheritance by which a father's health prior to conception may affect the health of his children.

A/Prof Western said the research substantially extends the understanding of how fathers pass on epigenetic information that may affect the health of their children.

The discovery means a father's lifestyle choices – including diet, alcohol, drugs, smoking and medications – could be linked to the development of his children.

The epigenome provides a layer of complexity on top of one's DNA. It's like a set of instructions that determine whether a gene can be 'switched' on and off, or a 'road-map' that defines cell types in the body.

A/Prof Western and Dr Stringer uncovered how an epigenetic modifying complex, called PRC2, regulates non-genetic information transmitted from a father to his offspring via sperm.

"For the first time, we demonstrated that altered function of PRC2 in mouse sperm, before eggs are fertilised, caused epigenetic effects on development and gene expression that could be 'inherited' by the father's offspring," Dr Stringer explained.

"We can now look at how specific drugs, diets or environmental factors affect PRC2 function as well as the sperm epigenome to help provide up-to-date information to men wanting to become fathers," A/Prof Western said.

Collaborators: Monash University; University of Adelaide; University of Melbourne

Funders: NHMRC

Associate Professor Patrick Western and Dr Jessica Stringer

Epigenetics facts

- Epigenetics refers to heritable marks in the DNA that determine whether a gene can be 'switched' on and off, changing how cells read genes, without causing changes in the underlying DNA sequence.
- The epigenome provides a layer of complexity on top of our DNA. It's like a set of instructions or 'road-map' that defines cell types in the body.
- Epigenetic control of genes is part of what allows a tiny cluster of identical cells in the womb to grow into a fully formed baby. By regulating different sets of genes that can be switched on and off, some cells become heart cells while others become brain cells.
- Importantly, epigenetic pathways can be disrupted by exposure to lifestyle factors, like diet, drugs and chemicals, providing a means by which health state in a parent can affect his or her future children.

REPRODUCTIVE HEALTH

Inaugural Salamonsen Lecture and CRH Reproductive Health Symposium

The contributions of reproductive health expert Professor Lois Salamonsen were recognised as part of the newly established Salamonsen Lecture held at the inaugural Centre for Reproductive Health Symposium in October.

The events brought together Australian and international leaders in reproductive biology to share cutting edge research in preeclampsia, pregnancy and infertility affecting women and men.

Prof Salamonsen, former Head of Hudson Institute's Centre for Reproductive Health, has made outstanding contributions to the field of endometrial biology over the past 30 years. She is a Fellow of the Australian Academy of Sciences.

Prof Salamonsen's innovative research has advanced knowledge of menstruation and gynaecological conditions central to female fertility. She has shown how the embryo and the womb cooperate to support a healthy pregnancy. Her work on embryo-maternal cross talk continues to deliver new concepts to improve IVF success rates.

The Salamonsen Lecture was delivered by Professor Yoel Sadovksy, Executive Director of the Magee-Women's Research Institute, USA, a world-renowned leader in the field of placental biology.

The Symposium included national speakers Associate Professor Louise Hull, Dr Peter Stanton, Professor Sarah Robertson, Professor Mark Hedger and Dr Stacey Ellery.

L-R: Dr Jemma Evans, Professor Guiying Nie, Professor Lois Salamonsen, Professor Yoel Sadovsky

Children's health

CHILDREN'S HEALTH

Helping newborns breathe

Could keeping a newborn baby connected to the breathing support of their mother at birth ensure a smoother and safer entry into the world?

A new clinical trial is putting innovative Hudson Institute research into practice and will provide evidence to help clinicians decide the best time to cut the umbilical cord.

Around 1000 newborn babies born after 32 weeks will be part of the clinical trial at Monash Health and the Royal Women's Hospital.

The Baby Directed Umbilical Cord Clamping (Baby DUCC) clinical trial is based on a feasibility study published in the journal *Resuscitation*, led by researchers from Hudson Institute, Monash University and the Royal Women's Hospital.

The study found newborns who need assistance with breathing after birth can be safely helped by medical staff while remaining connected to their mothers via the umbilical cord, providing optimum outcomes. These newborns had more stable oxygen levels and heart rates, as well as avoiding a potentially dangerous drop in heart rate – often seen when a baby's cord is clamped immediately after birth.

The trial will use a baby's vital signs as the deciding factor on when to cut the umbilical cord rather than relying on a set time said lead author, Hudson Institute and Monash University PhD student, Dr Douglas Blank.

"The technique takes advantage of a powerful, safe and free resource available to newborns worldwide – their mother and placenta," Dr Blank said.

"This study may change the way clinicians help all newborns to breathe after birth, with no need for new equipment, just a change in timing. If successful, this technique could be used in virtually any setting."

A larger trial is underway to determine whether this technique can also be used to reduce death and brain damage resulting from birth asphyxia.

Collaborators: Monash University; Royal Women's Hospital; The University of Melbourne

Funders: Monash Graduate Education: the Monash Graduate Scholarship, Monash International Postgraduate Research Scholarship; NHMRC

Translation to breathing facts

- More than five per cent of newborns born worldwide need help breathing immediately after birth.
- Worldwide, more than 800,000 newborns die annually because they do not breathe well after birth.
- The majority of newborns that die are born in developing countries but are born at full-term and are otherwise completely healthy.
- Birth asphyxia is a result of a newborn being deprived of oxygen for long enough during the birth process to cause physical harm, usually to the brain.
- Babies with mild or moderate birth asphyxia may recover fully. Babies who have long periods of asphyxia may develop permanent injury, which could affect their brain, heart, lungs, kidneys or other organs.

CHILDREN'S HEALTH

Boys, girls and intersex conditions

It's the 'I' in 'LGBTIQ' – each year, one in 5000 babies are born intersex, also called disorders of sex development.

A baby who is born intersex means they have certain sex characteristics, including genetic, hormonal or physical features, which are not typically male or female.

Hudson Institute-led research is shining a light on the fundamental processes that cause embryos to develop as male, which may help to improve diagnosis and treatment for people born intersex.

Scientists have already established that the protein SOX9 is a crucial regulator of male sex development, directing the testes to form within a developing embryo. Yet how SOX9 did this remained a mystery, until now.

Research led by Professor Vincent Harley and PhD student Aleisha Symon, published in *Nucleic Acids Research*, has solved the puzzle by showing that SOX9 works with two other proteins to turn hundreds of genes on or off to form testes.

This research will help to identify the genes involved in male sex determination and examine the role of these genes in sex development disorders that have a genetic basis.

"SOX9 'turns on' male genes, like a switch turning on a light bulb, to determine the sex of an embryo. Before we made this discovery, we did not understand which light bulbs these were, or how many SOX9 need to switch on to be male," Prof Harley said.

"This research provides the first insights into how SOX9 controls testes formation through its unique control of genes, and will help to improve our understanding of the genetic pathways that are activated when embryos develop as male or intersex."

PhD student Aleisha Symon and Professor Vincent Harley

Disorders of sex development facts

- Around one per cent of babies are born each year with a disorder of sex development, or intersex, where their genetic, hormonal or physical sex characteristics (genitals, gonads and chromosome patterns) are not typically male or female.

Collaborators: The University of Montpellier (France) in collaboration with laboratories in Argentina and France

Funders: NHMRC Program and Fellowship grants to Prof Harley; Monash PhD stipend to Aleisha Symon

‘Sleep hormone’ skin patch could protect at-risk newborns

A simple melatonin skin patch treatment containing a naturally occurring ‘sleep hormone’ could help protect newborn babies from brain damage caused by oxygen deprivation at birth.

Melatonin is a hormone that is produced naturally by the body in the pineal gland. It is known to induce sleep and is sometimes taken to counter jet lag. It is also a powerful antioxidant.

Published in the *Journal of Pineal Research*, a study by PhD student Dr James Aridas and Associate Professor Suzanne Miller is paving the way for melatonin to be used as a treatment for babies starved of oxygen at birth.

In the study, the research team applied melatonin skin patches within 24 hours after birth in a preclinical model of birth asphyxia.

“We found that melatonin protects the brain against an acute lack of oxygen, by reducing harmful free radicals and inflammation, which in turn protects neuronal development and results in better neonatal outcomes,” Dr Aridas explained.

Neonatologist and researcher Dr Atul Malhotra is investigating how this knowledge could be used to help newborns in low-resource birth settings in rural India.

“We hope that a simple, safe and effective melatonin skin patch could be the key to improving the lives of millions of babies around the world who are born starved of oxygen, from world-class neonatal intensive care units to rural India,” Dr Aridas said.

Collaborators: Department of Obstetrics and Gynaecology, Monash University; Monash Children’s Hospital; Murdoch Children’s Research Institute

Funders: ARC; NHMRC; Bill and Melinda Gates Foundation

Associate Professor Suzanne Miller

Dr James Aridas

Birth asphyxia facts

- Each year worldwide, up to four million babies suffer a difficult birth resulting in birth asphyxia.
- Of these infants, a quarter will die and a quarter will survive, but are likely to have permanent disabilities.
- There is currently no effective form of treatment to protect the brain in most babies born with birth asphyxia.

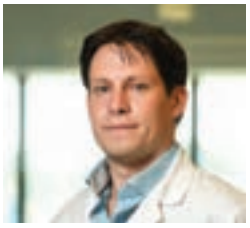
Research excellence

NHMRC Career Development Fellowships

Associate Professor Rebecca Lim
Industry Level 2

Dr Jaclyn Pearson
RD Wright Biomedical Level 1

Associate Professor Flora Wong
Next Generation Clinical Researchers Program



Dr Sam Forster
RD Wright Biomedical Level 1

NHMRC Early Career Fellowship

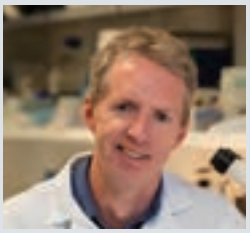
Dr Vanessa Stojanovska

NHMRC Research Fellowships

In 2018 four of our senior researchers were awarded NHRMC Research Fellowships – a recognition of their outstanding achievements and the importance of their research.

Professor Stuart Hooper
Senior Principal Research Fellowship

Professor Vincent Harley
Senior Research Fellowship



Professor Brendan Jenkins
Senior Research Fellowship

Associate Professor Ron Firestein
Senior Research Fellowship

Emerging researchers shine

We celebrate our early to mid career researchers who were recognised for their outstanding work and contributions to medical research.

veski Victoria Fellowships

veski Fellows shape Victoria's economy by driving new ideas and products in our industries and enhance the state's reputation as a global centre for innovation and discoveries.

In 2018, two young Institute researchers, Dr Cristina Giogha and Aidan Kashyap, received highly esteemed Victoria Fellowships funded by the Victorian Government and delivered through veski. They will visit New York and the Netherlands to explore leading-edge techniques and devices that will progress their research, and bring that knowledge back to Victoria.

L-R: Dr Cristina Giogha, Victorian Lead Scientist Dr Amanda Caples, Aidan Kashyap

Tall Poppy Science Awards

Dr Michelle Tate and Dr Erin McGillick were two of 11 Victorian early career researchers who received prestigious Tall Poppy Awards – an acknowledgment of their outstanding science achievements and excellence in engaging the community in science and innovation.

Dr Michelle Tate and Dr Erin McGillick

Ferring Innovation Grants

Dr Tracey Edgell and Dr Fiona Cousins were two of only eight international researchers to receive Ferring Innovation Grants focused on exploratory, discovery and preclinical research into novel drug targets. Those selected from a record number of applications are considered to be at the cutting edge of innovation in their fields.

Dr Tracey Edgell

Dr Fiona Cousins

Student impact

179
STUDENTS
138 PHD
2 MASTERS
39 HONOURS

25
STUDENTS WITH MEDICAL TRAINING

74
STUDENT FIRST AUTHOR PUBLICATIONS

We mentor, train and inspire the next generation of pioneering researchers by providing postgraduate and Honours students with the skills and tools they need to succeed.

We are committed to mentoring tomorrow's research leaders and ensuring Victoria's future discoveries – for patients and for our economy.

2018 HISS Committee

More than 179 Honours, Masters and PhD students work alongside our senior researchers and their teams, contributing to projects at the Institute and publishing their own work in prestigious scientific journals.

Our learning environment fosters excellence and innovation to help students develop the confidence and tools to succeed. Through one-on-one supervision and mentorship by our international scientific leaders, our students have access to state-of-the-art resources and technology platforms and development opportunities including workshops, seminars and national and international conference opportunities.

Student Retreat

The Hudson Institute Student Society (HISS) provides an incredible support network and study-life balance for all Institute students. Run by and for students, HISS hosts on- and off-site social events and student symposia.

In 2018, HISS held the inaugural Hudson Institute Student Retreat at Phillip Island in September. Held over two days, more than 70 students joined in, to present their research to an audience of peers and senior Institute researchers and to learn, collaborate and network across the Institute.

"The retreat set a high standard with many outstanding student presentations highlighting the strength of work at the Institute. The social events reinforced the potential for new collaborations and, both staff and students benefited from the opportunity to build their research networks. I'm looking forward to the second Hudson Institute student retreat in 2020," said HISS President, Poornima Wijayaratne.

Graduates of 2018

Congratulations to our 27 PhD and 39 Honours students who graduated

Doctor of Philosophy

Dr Nicole Alers
Neonatal neurodevelopment after antioxidant with melatonin during late pregnancy in an ovine model of intrauterine growth restriction
Prof Graham Jenkin, A/Prof Suzanne Miller, Prof Euan Wallace

Dr Majid Gharama Alhomrani
How human amnion epithelial cells alter hepatic stellate cells and macrophages to resolve hepatic fibrosis
Prof William Sievert, A/Prof Rebecca Lim

Dr James Aridas
Protecting the newborn brain following asphyxia at birth
A/Prof Suzanne Miller, Prof Graham Jenkin, Dr Tamara Yawno

Dr Jesse Jay Balic
Investigation into the metabolic role of STAT3 in gastric cancer
Prof Brendan Jenkins, Dr Daniel Gough

Dr Nadia Bellofiore
Discovery and characterisation of the first menstruating rodent: The spiny mouse for use as an in vivo model of reproductive biology
Dr Jemma Evans, A/Prof Peter Temple-Smith, Dr Fiona Cousins

Dr William Archer Berry
Advancing personalised medicine for pancreatic cancer patients
Prof Brendan Jenkins, Dr Daniel Croagh

Dr Laura Bienvenu
Cardiomyocyte mineralocorticoid receptor signalling plays a critical role in ischemia-reperfusion injury and recovery of cardiac function
Dr Morag Young

Dr Emma Croser
Innate immunity of mice to Hendra virus infection
Prof Paul Hertzog, Dr Deborah Middleton

Dr Christopher Daly
Mesenchymal precursor cells, pentosan polysulfate and lumbar disc regeneration
A/Prof Tony Goldschlager, Prof Graham Jenkin, Prof Peter Ghosh

Dr Kimberley Natalie D'Costa
Effect of Helicobacter pylori interactions with host epithelial cells on inflammation and disease
Prof Richard Ferrero, Dr Le Son Tran

Dr Harriet Christel Fitzgerald
Analysis of the proliferative phase uterine microenvironment and its potential contribution to idiopathic infertility in women
Prof Lois Salamonsen, Dr Tracey Edgell

Dr Seungmin (Jimmy) Ham
The effect of metformin on signalling pathways involving LKB1/AMPK in breast cancer
Prof Peter Temple-Smith, Dr Craig Harrison, Prof Euan Wallace, A/Prof Graeme Southwick

Dr Jibriil Patrick Ibrahim
The implications of pulmonary oxytocin delivery on respiratory function
Dr Rob Bischof, Prof Michelle McIntosh

Dr Tan Hung (Dilys) Leung
Investigation of the pathophysiology of granulosa cell tumours of the ovary
Prof Peter Fuller, Dr Simon Chu

Dr Jingang Li
Cord blood stem cells to reduce preterm brain injury
A/Prof Suzanne Miller, Prof Graham Jenkin, A/Prof Flora Wong, Dr Tamara Yawno

Dr Hannah Pui Yun Loke
The role of SRY in normal and diseased male dopamine pathways
Dr Joohyung Lee, Prof Vincent Harley

Dr Raffaella Lucciola
Identifying transcriptional networks in purified endometrial mesenchymal stem cells (MSC)
Prof Caroline Gargett, Prof Jan Brosens

Dr Jared Peter Mamrot
Early development biology of the spiny mouse (Acomys cahirinus)
Dr Hayley Dickinson, Prof David Gardner, Dr Mulyoto Pangestu

Dr Zoe Rebecca Marks
Investigation of Type 1 interferon and immune signalling in breast and ovarian cancers
Prof Paul Hertzog, Dr Nollaig Bourke

Dr Charlotte Nejad
Characterisation of a new type of microRNA inhibitor to target cancer cells
Dr Michael Gantier, Dr Jonathan Ferrand

Dr Madison Claire Paton
Cord blood stem cells: preventing cerebral palsy
A/Prof Suzanne Miller, Prof Graham Jenkin, Dr Beth Allison, A/Prof Michael Fahey, Dr Courtney McDonald

Dr Rahana Abdul Rahman
New adjuvant therapy for preterm pre-eclampsia
Prof Euan Wallace, A/Prof Rebecca Lim

Dr Bennet Seow
The comparative effects of endogenous, synthetic and selective glucocorticoids during lung development
A/Prof Timothy Cole, Dr Annie McDougall, A/Prof Megan Wallace

Dr Elizabeth Sigston
Emergence and margins in head and neck cancer: a new understanding
Prof Bryan Williams, Prof Julian Smith

Dr Xin (Claire) Sun
The epigenetic control of mitochondrial DNA copy number in tumorigenesis and differentiation
Prof Justin St John, Dr Matthew McKenzie

Dr Knarik Tamanyan
Insights into the risk factors and mechanisms for the adverse sequelae of sleep disordered breathing in children
Prof Rosemary Horne, Dr Lisa Water, Dr Sara Biggs

Dr Moya Vandeleur
The impact of sleep disturbance on daytime functioning, mood and quality of life in children and adolescents with cystic fibrosis
Prof Rosemary Horne, Dr David Armstrong, Dr Gillian Nixon, A/Prof Philip Robinson

Bachelor of Biomedical Science (Honours)

Mr Dasun Fernando
Miss Lisianne George
Ms Emma Green
Miss Monica Kanki
Ms Anika-Raam Kaur
Miss Laura Le Mercier
Mr James Li
Mr Alen Pasalic
Ms Mikayla Maree Ruzic
Miss Manizha Shekibi
Miss Madeleine Smith
Miss Esther Tseng
Miss Holly Ung
Miss Madeleine Wemyss
Mr Raphael Yip

Bachelor of Science (Honours)

Mr Harrison James Burgin
Ms Rainbow Chan
Ms Ziying Chen
Mr Leo Judge Cooper
Ms Jacinta Renae Dela Cruz
Ms Cimona Daphne Fernandes
Miss Stephanie Gordon
Mr Nikshay Kartigan
Mr Samuel James Kaye
Ms Lena Hoang My Le
Ms An Nisaa Jasmine Mohd Roslee
Ms Elizabeth Murray
Mr Fraser Nott
Mr Declan Jeffery Saville
Ms Marielle Stratikopoulos
Ms Ekimei Sun
Ms Hasara Tennakoon
Miss Alice Zagato

Bachelor of Medical Science (Honours)

Miss Gemma Louise D'Adamo
Miss Zlatikha Djuliannisaa
Ms Sarah Klink
Ms Eva Matthews Staindl
Ms Sophie Suke
Mr Jed Wen Jie Tan

Our supporters

Thank you to our many generous and thoughtful donors who supported the continuation and expansion of medical research to meet some of our greatest health challenges.

Among the life-changing research programs that benefited from this funding are

The Children's Cancer Foundation

- Continued its support of the Hudson Monash Paediatric Precision Medicine Program (HMPPMP). More on page 19.
- Established the Children's Cancer Foundation Research Laboratory.
- Promoted the HMPPMP through a video shown to 650 guests at the Children's Cancer Foundation Million Dollar Lunch.
- Established an annual PhD scholarship in paediatric precision medicine.
- Sponsored the international Childhood Cancer Research Symposium as the exclusive major supporter. More on page 18.

Ovarian Cancer Research Foundation

- Continued to support work on a screening tool that could lead to an early ovarian cancer detection test and the discovery of new drugs to better treat the disease. More on page 15.
- Expanded research into the role of a genetic mutation found in the majority of granulosa cell tumours, human granulosa cell tumours and serous epithelial ovarian cancer with a class of drugs in preclinical models.
- Maintained the Ovarian Cancer Tissue Bank that stores more than 2200 samples.
- Established and held the inaugural Ovarian Cancer Research Foundation Symposium. More on page 20.

Australian Lions Childhood Cancer Research Foundation, via the Children's Cancer Foundation, funded research into new therapeutic options for Medulloblastoma and Diffuse Intrinsic Pontine Glioma.

The Fielding Foundation Fellowship was awarded to women's health researcher Dr Jemma Evans, and the Fielding Foundation Innovation Award to ovarian cancer researcher Dr Maree Bilandzic. More on page 43.

The Ron Evans AM Cancer Research Fellowship, supported by the Evans Family Foundation, was awarded to bowel cancer researcher Dr Afsar Ahmed. More on page 44.

The Dr Sue Fowler PhD Scholarship in Ovarian Cancer was established by the Piers K Fowler Trust. The inaugural recipient is Ms Nazanin Karimnia.

Gandel Philanthropy supported the Gandel Genomics Centre and Gandel genomics health research program to develop genomics technologies from basic research through to diagnostics and precision medicine.

Funding from the Robert Connor Dawes Foundation supported research into paediatric brain cancer.

Brain cancer research also received significant funding from a private benefactor.

The Isabella and Marcus Foundation supported the international Childhood Cancer Research Symposium.

To increase awareness of the ground-breaking research that can be achieved through donations and bequests, we hosted tours for many of our benefactors including Australian Lions Childhood Research Foundation Board, Piers K Fowler Trust, Children's Cancer Foundation, AFL Media, Fielding Foundation, Ovarian Cancer Research Foundation and Witchery.

Kay Blandthorn
Head of Philanthropy and Fundraising

L-R: Dr Tracey Edgell, Mr Peter Fielding, Professor Elizabeth Hartland, Dr Jemma Evans, Dr Maree Bilandzic, Mr Andrew McCallum, Hudson Institute Foundation board member.

Investing in the future

The Fielding Foundation supports Hudson Institute's brightest scientific minds and most promising research discoveries and, in doing so, makes an invaluable investment in the future of medical research and healthcare in Australia.

In 2014, two highly successful initiatives were established at Hudson Institute through the generous $1 million donation made by the Fielding Foundation and its chair, Melbourne businessman and philanthropist Mr Peter Fielding.

The Fielding Foundation Fellowship supports an outstanding early to mid career researcher each year to establish their own independent research, setting young scientists on the path to success at a crucial time in their scientific careers.

In 2018, the Fielding Foundation Fellowship was awarded to Dr Jemma Evans, a leader in the field of endometrial biology, who has made significant progress on women's reproductive health. Her dual focus is endometriosis and fertility. Through a clinical trial Dr Evans is helping women with metabolic disorders who have difficulty conceiving to achieve a healthy pregnancy. In addition, she is developing a non-invasive early detection test for endometriosis.

The Fielding Innovation Award supports an early to mid career researcher each year to produce major advancements in the commercialisation of their research, ensuring discoveries reach patients as treatments.

The 2018 Fielding Innovation Award was awarded to Dr Maree Bilandzic, a senior postdoctoral scientist, who is trialling a new and exciting approach to target ovarian cancer cells. This innovative research has the potential to stop the growth and spread of tumours at initial diagnosis or relapse.

Institute visit

In May, Mr Fielding visited the Institute to meet with past Fellowship and Innovation Award recipients to hear about their significant progress in moving laboratory discoveries to patients. This includes a major clinical trial to treat lung disease in preterm babies and significant progress on a project to develop new drugs for autoimmune diseases.

"We are grateful to Mr Peter Fielding for his foresight and commitment to high quality medical research and supporting the exciting potential of our leaders and emerging scientists," Hudson Institute Director, Professor Elizabeth Hartland, said.

"This type of investment is critical to the future of Australian medical research and innovation. It not only fosters the careers of the Institute's emerging scientists, but this funding also plays a critical role in taking promising research from the laboratory to patients."

Dr Afsar Ahmed

Ron Evans' gift to bowel cancer research

When former AFL great Ron Evans AM passed away from bowel cancer in 2007, his family wanted to leave a positive and enduring legacy.

In the years following his passing, they dedicated their time to raising funds for medical research to find a cure for bowel cancer, a disease that claims the lives of 5375 Australians every year – the second largest cause of cancer deaths.

Ron's wife, Andrea Evans, said philanthropy was important to Ron and he would be extremely proud to know about the work being done in his name.

"When you lose someone, they will always be with you. It was such a shock losing Ron, and I sometimes think what would have happened if different treatments existed when he got cancer," said Mrs Evans.

"Our family funds medical research to make a difference to somebody who is living with bowel cancer, to hopefully change their life and the life of their family. This is why we help.

"Finding a cure would be a wonderful legacy for Ron."

Closer to new treatment options

In 2018, the Ron Evans Fellowship was again awarded to Dr Afsar Ahmed, whose research focuses on the link between cells in the immune system and inflammatory bowel diseases and bowel cancer.

Recent research has indicated a strong link between immune cells and bowel cancer, which begins with an uncontrolled growth of cells in the walls of the bowel.

Dr Ahmed is investigating the role that immune cells play, ultimately to progress treatments for inflammatory bowel diseases and bowel cancer.

"We know that immune cells are a major regulator of inflammatory diseases and different cancers, but don't understand how they work in bowel cancer," said Dr Ahmed.

"We are targeting an immune cell gene, integrin-linked kinase, which we suspect plays an important role in regulating immune cells in these diseases."

This knowledge could be used to develop new treatments for bowel cancer and inflammatory bowel diseases including Crohn's disease and colitis."

2018 supporters

We are grateful for the gifts received from individuals, trusts, foundations and organisations during the year.

We also acknowledge the support of the Victorian State Government through the Operational Infrastructure Support Program and the Australian Government through its funding bodies including the NHRMC. These valuable contributions assist our scientists to undertake and progress life-changing research.

Funding bodies

Australian Academy of Science

Australian Communities Foundation

Australian Lions Childhood Cancer Research Foundation

Australian Nuclear Science and Technology Organisation

Australian Physiological Society

Australian Research Council

Australian Society for Medical Research

Avner Pancreatic Cancer Foundation

Bethlehem Griffiths Research Foundation

Cancer Australia

Cancer Council Victoria

Carrie's Beanies 4 Brain Cancer Foundation

Cerebral Palsy Alliance

Children's Cancer Foundation

Collier Charitable Fund

Cure Brain Cancer Foundation

Department of Defense (USA)

Department of Health – Australian Government

Department of Health and Human Services – Victorian Government

Department of Innovation, Industry and Science – Australian Government

Deutsche Forschungsgemeinschaft German Research Foundation

Equity Trustees

European Society of Human Reproduction & Embryology

Evans Family Foundation

Ferring Research Institute

Fielding Family Foundation

Gandel Philanthropy

Gastroenterological Society of Australia

Granulosa Cell Tumour Research Foundation

Harold & Cora Brennen Benevolent Trust

Harold Mitchell Foundation

Inner Wheel Australia

International Society for Cell and Gene Therapy

International Society for Extracellular Vesicles

International Society of Hypertension

Isabella and Marcus Paediatric Brainstem Tumour Fund

Japan Society for the Promotion of Science

Jerome Lejeune Foundation

LEW Carty Charitable Fund

Lord Mayor's Charitable Foundation

Lupus Research Alliance

Medical Research Future Fund – Australian Government

Melbourne IVF Pty Ltd

Monash Children's Cancer Centre

Monash IVF Group

Monash University

MS Research Australia

National Health and Medical Research Council

Ovarian Cancer Research Foundation

Peninsula and Southeast Oncology

Perinatal Society of Australia and New Zealand

Piers K Fowler Trust

Rebecca L Cooper Medical Research Foundation

Red Nose

Robert Connor Dawes Foundation

Science and Industry Endowment Fund

Scinogy Pty Ltd

The Andrea Joy Logan Trust Fund

The CASS Foundation

The Endocrine Society of Australia

The Fertility Society of Australia

The Financial Markets Foundation for Children

The Heart Foundation

The High Blood Pressure Research Council of Australia

The Ian Potter Foundation

The Kids' Cancer Project

The Scottish Cot Death Trust

The Victorian Assisted Reproductive Treatment Authority

The Winston Foundation

veski

Victorian Cancer Agency

Walter Thomas Cottman Charitable Trust

Wilrene Pty Ltd

Youanmi Foundation

Major donors

Professor Michael Adamson

Professor Warwick Anderson AM

Professor Henry Burger AO

Professor Arthur Clark

Mrs Joan Donaldson

Mrs Patricia Donges

Dr Robert Edgar

Mrs Andrea Evans

Mr Peter Fielding

Mr John Fowler

Professor John Funder AC

Mr Richard Harbig

Professor Mark Hedger

Mrs Kathleen Johnston AM

Mr James Johnston

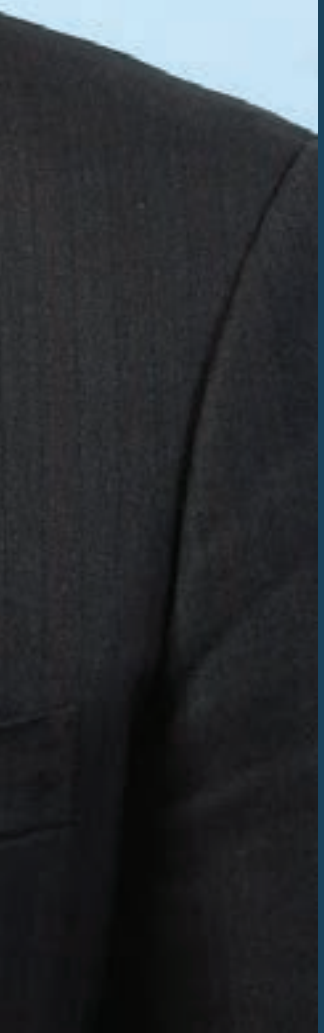
Mrs Christina Kirkland

Ms Ann Lorden

Mr Lance Matheson

Ms Julie Muir

Mrs Jean Thomas



Board chair's report

The 2018 year was remarkable for both the Institute and for advances in human health.

To reach the 'patient-ready stage' scientific discoveries require highly specialised skills, clinical and scientific collaboration, leading edge technology, innovative thinking – and a large dose of patience.

During the year we were fortunate to work with dedicated partners who share our bold ambitions for scientific advances to help patients. The Children's Cancer Foundation has invested considerable support funding in our Institute's talented scientists to give children with cancer access to the world's best diagnoses and treatments. Similarly, the Ovarian Cancer Foundation has partnered with us to seek better long-term outlooks for women with ovarian cancer through early detection.

The essential contribution that our generous philanthropic partners and donors have made is outlined throughout this Annual Report.

Under the leadership of Director and CEO, Professor Elizabeth Hartland, and her leadership team, the strategic direction of Hudson Institute has been thoroughly reviewed and four principal areas for particular focus have been identified: cancer, inflammation, reproductive health and children's health. The aspiration is for Hudson Institute to be a leader in these areas in Australia and, progressively, internationally.

Changes in strategic direction require the reallocation of resources to provide the means to deliver our aspirational goals. The required changes were largely put in place over the past year.

Another major change reflects the requirements of today's complex technological era in a specialist clinical research environment. Good governance and compliance underpin scientific discovery. To ensure Hudson Institute meets the required standards, Joseph Pereira joined the Executive team in the position of Senior Operations Manager. His immediate goals were to streamline business systems and scientific and statutory compliances. These are critical for the Institute to grow in a sustainable and ethical way.

The Institute's partnerships with State and Federal Government remain fundamental to our success. The longstanding Federal Government NHMRC grants and the Victorian State Government's Operational Infrastructure Scheme have now been augmented by the MRFF, a potential new major source of Federal funding for medical research.

Commercialisation of research provides unique opportunities for growth and prudent investment. Significant progress and partnerships with industry were made across many of our research areas during 2018.

I am grateful to all Board members for their commitment to the Institute's progress. Two Board members retired during the year: Professor Erwin Loh, who represented Monash Health, and Maria Trinci, who chaired the Audit and Risk Committee. Both retired as a consequence of personal career changes and I thank them for their valuable contribution. As a consequence, Andrew Stripp from Monash Health and Christopher Dodd joined the Board.

On behalf of the Board, I am very impressed by Hudson Institute's achievements in 2018. The Board looks forward to sharing in and contributing to the next steps of our journey and we thank all scientists and staff who make that possible.

Dr Bob Edgar
Chair

Board of directors

The directors of Hudson Institute of Medical Research Board, 31 December 2018

BOARD CHAIR

Dr Robert (Bob) Edgar

BEcon (Hons), PhD (Ohio State), FAICD

Appointed: April 2009

Dr Edgar has extensive experience in financial services, including 25 years at ANZ Bank where he retired as Deputy Chief Executive Officer in 2009. He is also a director on the boards of Djerriwarrh Securities, Linfox Armaguard Pty Ltd and Transurban Ltd.

Professor Christina Mitchell

MBBS, PhD, FRACP

Appointed: September 2011

Prof Mitchell is the Academic Vice-President and Dean of the Faculty of Medicine, Nursing and Health Sciences at Monash University. Prof Mitchell is a physician-scientist, specialising in clinical haematology. In 2011, she was the first woman appointed Dean of Medicine among the group of eight universities in Australia. In 2015, Prof Mitchell was inducted into the Victorian Honour Roll of Women for her leadership as the Dean and also received the Lemberg Medal, which is awarded annually to a distinguished Australian biochemist. In 2015, Prof Mitchell became a member of the Australian Academy of Health and Medical Sciences.

Ms Maria Trinci

BA/BComm, CA

Appointed: March 2015

Ms Trinci is a partner within KPMG, specialising in financial services for nearly 20 years. During the year Maria was the Head of Capital Markets and the Head of Digital for the Audit, Assurance and Risk Consulting Practice.

Ms Trinci has now relocated to London as a Seconded Partner in the Banking Practice. She has stood down from her not-for-profit roles within Hudson Institute and Cancer Council as a consequence of the move.

Special responsibilities: Chair, Finance and Audit Committee; Investment Committee member

Professor Warwick Anderson AM

BS (Hons) UNE, PhD (Adelaide), DUniv (Adelaide), FAHA (Int), FRCPA (Hon), FAAHMS, DH (Newcastle)

Appointed: July 2015

Prof Anderson is Secretary-General of the International Human Frontier Science Program Organization. He was previously CEO of the NHMRC and a member of numerous international medical research bodies. Prof Anderson is an Emeritus Professor at Monash University and has held academic and research positions at Monash University, The Baker Heart and Diabetes Institute, The University of Sydney and Harvard Medical School.

Mr Nigel Garrard

BEcomm, AICD, CA FAMI

Appointed: March 2016

Mr Garrard has been the Managing Director and CEO of Orora Limited since 2013 when it was listed on the Australian Securities Exchange. Mr Garrard has held a number of senior executive positions including Managing Director of SPC Ardmona, Amcor Australasia and Coca-Cola Amatil's food and service division. He is a former Chair of the Australian Government's National Food Industry Strategy Ltd and has been a director of a number of industry and not-for-profit organisations.

Special responsibilities: Chair, Hudson Foundation; Investment Committee member

Mr Andrew Leyden

BComm

Appointed: March 2016

Mr Leyden is Head of Lazard Corporate Advisory in Australia and has worked in the investment banking industry for over 25 years.

Special responsibilities: Chair, Investment Committee; Hudson Foundation member

Ms Zita Peach

BSc, FAICD, FAMI

Appointed: May 2016

Ms Peach is a non-executive director on ASX listed, government and not-for-profit boards. She has also worked in senior leadership roles as Executive Vice-President and Managing Director of Fresenius Kabi, Vice-President of Business Development at CSL Limited and Commercial Director at Merck Sharp Dohme. Ms Peach has extensive experience in commercialising technologies, licensing, mergers and acquisitions. She is a graduate of the Australian Institute of Company Directors and a Fellow of the Australian Marketing Institute. She is a non-executive director of Starpharma Holdings Limited, AirXpanders Inc, Monash IVF Group Limited, Visioneering Technologies Inc, Pacific Smiles Group Ltd and Mt Stirling Alpine Resorts Management Board.

Special responsibilities: Chair, Intellectual Property and Commercialisation Committee

Mr David Hanna

BEc, BA (Asian Studies), GAICD

Appointed: March 2017

Mr Hanna joined Monash University in 2012 as Director, Business Strategy. For 15 years prior to this, David held a variety of senior management positions in the Victorian Government in economic development policy, international policy and operations and innovation policy. Mr Hanna also serves on boards in the screen, manufacturing and insurance industries, as well as for community legal and arts organisations.

Professor Kim Cornish

BS (Hons), PhD (London)

Appointed: September 2017

Prof Cornish is Director of the Monash Institute of Cognitive and Clinical Neurosciences and the Head of School of Psychological Sciences. Prior to joining Monash University in 2009, she was a Canada Research Chair (Tier 1) at McGill University (Montréal, Canada). In 2017, Prof Cornish was elected Fellow of the Academy of the Social Sciences in Australia. Over her 25-year career, Prof Cornish has received over $9 million in competitive grant and fellowship funding for her work in delineating cognitive profiles and trajectories in typically developing children and in neurodevelopmental disorders. Prof Cornish is the co-inventor of TALI Train™ – a novel, interactive technology platform for detecting and training attention deficits in early childhood.

COMPANY SECRETARY

Mr Rob Merriel

Appointed: May 2014

BA, Grad Dip (Psych), Grad Dip (Accounting), CPA

Mr Merriel is a Certified Practising Accountant with more than 35 years' experience working in medical research (Baker IDI and Hudson Institute), healthcare (Melbourne Health and Monash Health) and commercial organisations (Pacific Dunlop and Deloitte Consulting). The current Chief Financial Officer and Chief Commercialisation Officer of Hudson Institute, Mr Merriel was a Director of MHRP Pty Ltd (2015-2018) and was previously the director and company secretary of several biotechnology-focused companies, including BioGrid Australia, Biocomm, the Australian Technology Fund and Evivar.

Board committees

Finance and Audit Committee

This committee assists the board in internal control and compliance, accounting and financial reporting and risk management processes of Hudson Institute.

Members: Ms Maria Trinci (Chair 2015-2018), Mr David Hanna, Ms Carmel Mortell and Secretary Mr Rob Merriel. Hudson Institute's CEO, Professor Elizabeth Hartland, and Financial Accountant, Mr Alan Lahiff, also attend meetings of this board committee.

Investment Committee

This committee advises the board and director on the effectiveness of investment policies, and approves the engagement of investment managers and investment transactions.

Members: Mr Andrew Leyden (Chair since November 2016), Mr Nigel Garrard, Ms Maria Trinci and Secretary Mr Rob Merriel. Hudson Institute's Financial Accountant attends meetings of this board committee.

Intellectual Property and Commercialisation Committee

This committee advises the board and director on statutory requirements for corporate governance and commercialisation of Hudson Institute's intellectual property and related issues.

Members: Mrs Zita Peach (Chair since August 2016), Mr Grant Fisher, Dr Michael Pannacio, Dr Andrew Gearing, Dr Rob Klupacs and Secretary Mr Rob Merriel. Hudson Institute's CEO, Prof Hartland, Business Development Manager Carmela Monger and Business Development Coordinator Kate Mackin attend meetings of this board committee.

Operational overview

Since joining the Institute in June, there has been considerable progress in many areas of operations, all of which are vital to our ongoing scientific achievements.

Ongoing investment and support of our technology platforms supports our excellence. Our cell therapies platform in particular has enabled numerous clinical trials, accelerating translational outcomes for patients.

The laboratory and technical services team have done an excellent job of ensuring researchers obtain maximum value for each research dollar. Their efforts are fundamental to the operation of the Institute and they are a vital cog in the research engine.

The need for good governance and compliance is critical within a complex and specialised clinical research environment. Regular review and improvements in business operating systems have ensured probity and excellent accountability.

Our collaborative ventures between the Monash Health Translation Precinct partners enable researchers from Monash University School of Clinical Sciences and Monash Health to integrate teaching, research and clinical activities and initiatives. This has resulted in the consolidation of shared research platforms, research infrastructure and facilities, including planning and construction of a new precinct biobank.

I look forward to bringing my experience in basic and clinical research, commercial therapeutic development, scientific service provision, and operational and executive management to support the Directors and Hudson Institute Board and create a vibrant and supportive environment for our researchers to flourish in.

Joseph Pereira
Senior Operations Manager

Business development and commercialisation

Translation into real-world community impact requires collaboration between our researchers, clinicians and industry, to realise the potential of their discoveries.

Business development supports our researchers' engagement and work with industry, including filing patent applications around significant new discoveries and securing funding through industry-academic partnerships, grants and venture capital.

In 2018, our researchers were successful in gaining competitive grant funding leveraging industry-academic links, including NHMRC Development Grants, a Cooperative Research Centre Project (CRC-P) funded in collaboration with the Melbourne cancer immunotherapy start-up Cartherics and others on stem cell therapies, and two of only eight Ferring Research Institute Innovation Grants awarded worldwide, to progress new therapies for endometriosis and infertility treatments.

In addition, a range of significant partnerships with industry were developed, including the ongoing joint collaboration with Roche and Monash University for autoimmune disease, and commercial partnerships with Invion to progress a cancer treatment and Scinogy to develop cell therapies processing technology.

Rob Merriel
Chief Commercialisation Officer

BUSINESS DEVELOPMENT AND COMMERCIALISATION

Research alliance with Invion Limited

In March, Hudson Institute entered into a research and development agreement with cancer therapy developer Invion Limited, which will see the two organisations working together to advance Invion's cancer treatment based on Photosoft technology.

Invion is developing a new cancer therapy that aims to effectively treat cancer with fewer side effects, particularly cancer types that have already become resistant to chemotherapies.

Hudson Institute is providing the research facilities and expertise required to undertake Invion-sponsored research projects. The collaboration will initially focus on the treatment of ovarian cancer, with a view to expanding into other forms of cancer.

Light-based therapy

Invion is developing Photosoft as a next generation, or further developed technology, for Photodynamic therapy (PDT), which is currently used to treat skin cancers and sun spots.

PDT uses light to kill cancer cells and other abnormal tissues. It works by exposing non-toxic photosensitising agents to specific light wavelengths. The agents produce a form of oxygen (cytotoxic-reactive oxygen) that can destroy cancer cells without damaging the surrounding tissue.

The technology appears to shut down malignant tumours while stimulating the immune system, unlike current treatments such as radio therapy and chemotherapy that suppress the immune system.

Dr Andrew Stephens

Ovarian cancer expertise

Dr Andrew Stephens, Head of the Ovarian Cancer Biomarkers Research Group, was appointed to Invion's advisory board. As an Ovarian Cancer Research Foundation (OCRF) Research Fellow, Dr Stephens is regarded as one of Australia's foremost experts in the field of ovarian cancer research. He will provide key scientific assessment of Invion's cancer treatment technology, Photosoft.

"Early data from Photosoft is encouraging and I look forward to working with Invion to build a strong scientific and medical basis for its future development. With carefully developed studies and positive results, this technology could drive a new way of targeting several cancers, including ovarian cancer," said Dr Stephens.

Promising results

Initial laboratory studies have been promising and it is expected the research will move into pre-clinical trials in 2019.

"We have shown that the improved formulation of Photosoft is 15 times more effective at killing ovarian cancer cells than first-generation technology. That means we can control how rapidly cancer cells are killed, or increase the proportion of cells that are killed over the same effective treatment time," Dr Stephens explained.

Hudson Institute Director and CEO, Professor Elizabeth Hartland, said, "Early data is very encouraging, new technologies such as Photosoft represent a real opportunity to improve the lives of cancer patients around the world."

Melbourne innovation set to revolutionise cell therapy industry

A world-leading innovation is rapidly changing the way cell therapies are manufactured to treat diseases including stroke and cerebral palsy, thanks to a Hudson Institute industry partnership.

New cell processing technology, ROTEA, developed by Melbourne start-up Scinogy in conjunction with Hudson Institute, is taking these cell therapy treatments out of the lab and into hospitals.

According to Scinogy CEO, David James, the technology is a game changer for the cell therapies industry, which could significantly reduce the costs and labour associated with manufacturing cells for clinical use.

Until now, the manufacturing of cell therapies required an expensive, purpose-built 'clean room' to create a controlled environment. The ROTEA has now compressed this technology down to a small self-contained machine that sits on any laboratory or clinic bench.

Associate Professor Rebecca Lim, Head of the Amnion Cell Biology Research Group, has been working closely with Scinogy on the ROTEA technology, which has the potential to reduce costs of cell therapies by as much as 90 per cent and could enable her research to reach many more patients.

"Cell therapies have huge potential to treat many human diseases, from cancer to stroke. By reducing the cost, labour and manufacturing we enable more patients to benefit from cell therapies much sooner," A/Prof Lim said.

ROTEA was born out of a partnership between industry and academia, and Scinogy has now based itself on-site at the Monash Health Translation Precinct (MHTP).

"As a start-up, this was a natural progression. This is a dynamic precinct where research, industry and academia cohabitate, collaborate and foster innovation within the wider biomedical hub of Melbourne," Mr James said.

What are cell therapies?

Cell therapies are an emerging medical treatment that use living cells to treat a broad range of diseases. They aim to replace diseased or dysfunctional cells with healthy, functioning ones or by creating an environment where the tissue can heal itself. Examples include whole blood transfusions, cancer immunotherapies and stem cell therapies.

The oldest form of stem cell therapy is bone marrow transplantation, where blood stem cells are given to patients to treat cancer.

About Scinogy

Scinogy is a Melbourne-based engineering company dedicated to revolutionising the global cell therapy industry by making clinical results a commercial reality. Scinogy's focus is on developing manufacturing systems that deliver high-quality, affordable therapies.

Stephen Willson, COO Scinogy and Dr Rebecca Lim with the cell-processing technology, ROTEA

Organisation structure

BOARD OF DIRECTORS

COMMITTEES

Career Development Committee
Culture and Engagement Committee
Early Career Researcher Committee
Education and Training Committee
Equity and Diversity Committee
Ethics Committee
Hudson Institute Student Society
OHSE Committee
Research Committee
Seminar Committee

BOARD SUBCOMMITTEES

Finance and Audit Committee
Investment Committee
Intellectual Property and Commercialisation Committee

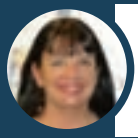
Director
Professor Elizabeth Hartland

EXECUTIVE

Associate Director
Professor Paul Hertzog

Chief Financial Officer
Chief Commercialisation Officer
Company Secretary
Mr Rob Merriel

Senior Operations Manager
Dr Joseph Pereira



Head of Philanthropy and Fundraising
Ms Kay Blandthorn

Executive Officer
Ms Ann Scott

SCIENTIFIC SUPPORT GROUP

CENTRE HEADS

Centre for Cancer Research
Associate Professor
Ron Firestein

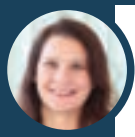
Centre for Endocrinology and Metabolism
Professor Peter Fuller

Centre for Innate Immunity and Infectious Diseases
Professor Paul Hertzog

Centre for Reproductive Health
Professor Kate Loveland

The Ritchie Centre
Professor Stuart Hooper

TECHNOLOGY PLATFORMS AND CAPABILITIES



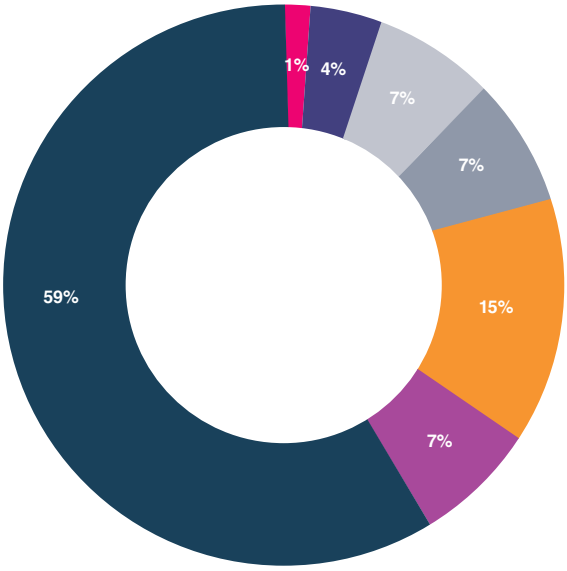
MHTP Platform Strategic Initiatives Manager
Ms Vivien Vasic

PLATFORMS

Cell Therapies
Flow Cytometry
Functional Genomics
Histology
Mass Spectrometry
Medical Genomics
Micro Imaging

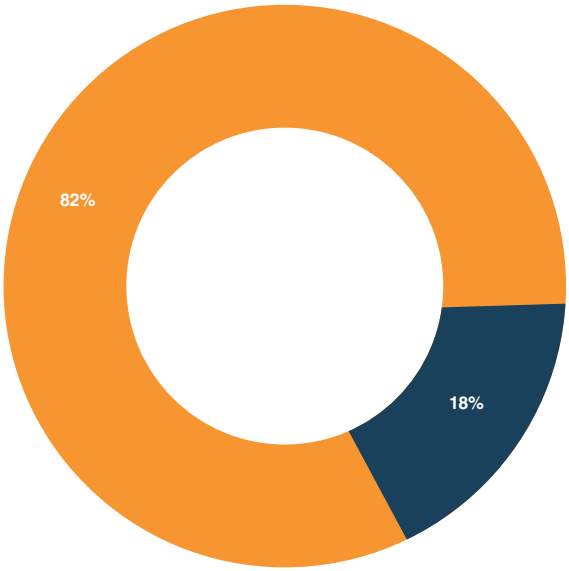
Financial snapshot

Revenue



Revenue	2018 ($)	2017 ($)	2016 ($)
Australian Government	27,875,344	22,899,072	22,389,405
Victorian Government	3,336,283	3,089,225	2,672,867
Philanthropic grants	6,957,795	7,476,138	8,225,532
Commercial research	3,547,176	3,649,352	2,819,941
Infrastructure Monash University	3,198,626	2,474,291	3,131,004
Other income	2,122,605	2,493,126	1,610,163
Investment income	625,873	672,316	1,625,164
Total	**47,663,700**	**42,753,519**	**42,474,077**

Expenditure



Expenditure	2018 ($)	2017 ($)	2016 ($)
Scientific and laboratory	38,950,957	36,222,463	36,445,356
Administration expenses	8,806,847	6,922,922	6,708,460
Total	**47,757,804**	**43,145,385**	**43,153,816**

2018 Publications

Book Chapters

1. Berry W, Croagh D (2018) Utility of endoscopic ultrasound-guided fine-needle aspiration for preclinical evaluation of therapies in cancer. In *Inflammation and Cancer: Methods and Protocols*. Jenkins BJ, ed. New York, NY: Humana Press. Vol 1725, pp 31-40.
2. Brownbill P, Sebire N, McGillick EV, Ellery S, Murthi P (2018) Ex vivo dual perfusion of the human placenta: Disease simulation, therapeutic pharmacokinetics and analysis of off-target effects. In *Preeclampsia: Methods and Protocols*, 1st Edn. Murthi P, Vaillancourt C, eds. New York, NY: Humana Press. pp 173-189.
3. Chollangi T, Clabault H, Thibeault A, Yong HE, Narula S, Menkhorst E, Sanderson JT, Vaillancourt C, Murthi P (2018) An electrical impedance-based assay to examine functions of various placental cell types in vitro. In *Preeclampsia: Methods and Protocols*, 1st Edn. Murthi P, Vaillancourt C, eds. New York, NY: Humana Press. pp 267-276.
4. de Kretser DM, Stanton P, O'Donnell L (2018) Structure/Cells overview. In *Encyclopedia of Reproduction*, 2nd Edn. Skinner MK, ed. United States: Academic Press. Vol 1, pp 10-16.
5. Findlay JK, Dunning KR, Gilchrist RB, Hutt KJ, Russell KL, Walters KA (2018) Follicle selection in mammalian ovaries. In *The Ovary*, 3rd Edn. Leung P, Adashi E, eds. London: Academic Press. pp 3-21.
6. Fuller PJ, Young MJ (2018) Aldosterone, action and function. In *Encyclopedia of Endocrine Diseases*, 2nd Edn. Huhtaniemi I, Martini L, eds. United States: Academic Press. Vol 3, pp 540-545.
7. Funder JW (2018) Aldosterone resistance. In *Oxford Desk Reference: Endocrinology*. Turner HE, Eastell R, Grossman A, eds. United Kingdom: Oxford University Press. pp 448-449.
8. Funder JW (2018) Mineralocorticoid Receptor Antagonists. In *Encyclopedia of Endocrine Diseases*, 2nd Edn. Huhtaniemi I, Martini L, eds. United States: Academic Press. Vol 3, pp 581-585.
9. Funder JW (2018) Mineralocorticoids and Mineralocorticoid Excess Syndromes: Pathophysiology. In *Encyclopedia of Endocrine Diseases*, 2nd Edn. Huhtaniemi I, Martini L, eds. United States: Academic Press. Vol 3, pp 581-585.
10. Horne RSC (2018) Autonomic cardiorespiratory physiology and arousal of the fetus and infant. In *SIDS - Sudden Infant and Early Childhood Death: the past the present and the future*. Byard R, Duncan J, eds. Adelaide: University of Adelaide Press. pp 449-490.
11. Jarde T, Kerr G, Akhtar R, Abud HE (2018) Modelling intestinal carcinogenesis using in vitro organoid cultures. In *Inflammation and Cancer: Methods and Protocols*. Jenkins BJ, ed. New York, NY: Humana Press. Vol 1725, pp 41-52.
12. Jenkins BJ, Deswaerte V (2018) Immuno-detection of immature and bioactive forms of the inflammatory cytokine IL-18. In *Inflammation and Cancer: Methods and Protocols*. Jenkins BJ, ed. New York, NY: Humana Press. Vol 1725, pp 229-235.
13. Kennedy CL, Hartland EL (2018) Citrobacter rodentium infection model for the analysis of bacterial pathogenesis and mucosal immunology. In *Inflammation and Cancer: Methods and Protocols*. Jenkins BJ, ed. New York, NY: Humana Press. Vol 1725, pp 77-89.
14. Leaw B, Gurusinghe S, Lim R, Wallace EM (2018) Real-time blood pressure recording using radiotelemetry in a rat model of preeclampsia. In *Preeclampsia: Methods and Protocols*, 1st Edn. Murthi P, Vaillancourt C, eds. New York, NY: Humana Press. pp 325-334.
15. Leung DTH, Chu S (2018) Measurement of oxidative stress: mitochondrial function using the seahorse system. In *Preeclampsia: Methods and Protocols*, 1st Edn. Murthi P, Vaillancourt C, eds. New York, NY: Humana Press. Vol 1710, pp 285-293.
16. Loveland KL (2018) Activins in male reproduction. In *Encyclopedia of Reproduction*, 2nd Edn. Jegou B, Skinner M, eds. United States: Academic Press. Vol I, Male Reproduction, pp 208-214.
17. Lyons VG, Payne NL, McCoy CE (2018) Optimization techniques for miRNA expression in low frequency immune cell populations. In *Inflammation and Cancer: Methods and Protocols*. Jenkins BJ, ed. New York, NY: Humana Press. Vol 1725, pp 237-256.
18. Mansell A, Tate MD (2018) In vivo infection model of severe influenza A virus. In *Inflammation and Cancer: Methods and Protocols*. Jenkins BJ, ed. New York, NY: Humana Press. Vol 1725, pp 91-99.
19. Ng A, Barker N (2018) Role of Igr5-expressing stem cells in epithelial renewal and cancer in the reproductive tract. In *Cell Biology of the Ovary: Stem Cells, Development, Cancer, and Clinical Aspects*, 1st Edn. Katabuchi H, Ohba T, Motohara T, eds. Singapore: Springer Singapore. pp 45-59.
20. O' Donnell L, Stanton PG (2018) Spermiation. In *Encyclopedia of Reproduction*, 2nd Edn. Jegou B, Skinner M, eds. United States: Academic Press. Vol I, Male Reproduction, pp 145-151.
21. Pepin G, Gantier MP (2018) Assessing the cGAS-cGAMP-STING activity of cancer cells. In *Inflammation and Cancer: Methods and Protocols*. Jenkins BJ, ed. New York, NY: Humana Press. Vol 1725, pp 257-266.
22. Quinn T, Greaves R, Badoer E, Walker D (2018) DHEA in prenatal and postnatal life: implications for brain and behavior. In *Vitam Horm*, 1st Edn. Litwack G, ed. California, USA: Academic Press. Vol 108, pp 145-174.
23. Ruwanpura SM, Rosli S, Tate MD (2018) Lung Diseases. In *Inflammasomes: Clinical and Therapeutic Implications*. Cordero MD, Alcocer-Gómez E, eds. Cham, Switzerland: Springer. Vol 108, pp 61-84.
24. Saad M, Ruwanpura SM (2018) Tissue processing for stereological analyses of lung structure in chronic obstructive pulmonary disease. In *Inflammation and Cancer: Methods and Protocols*. Jenkins BJ, ed. New York, NY: Humana Press. Vol 1725, pp 155-162.
25. Salamonsen L, Evans J (2018) Menstruatrion and Endometrial Repair. In *Encyclopedia of Reproduction*, 2nd Edn. Spencer T, Flaws J, eds. United States: Academic Press. Vol II, Female Reproduction, pp 320-325.
26. Tran LS, Ferrero RL (2018) Isolation of mouse primary gastric epithelial cells to investigate the mechanisms of helicobacter pylori associated disease. In *Inflammation and Cancer: Methods and Protocols*. Jenkins BJ, ed. New York, NY: Humana press. Vol 1725, pp 119-126.
27. Yong HE, Murthi P, Brennecke SP, Moses EK (2018) Genetic approaches in preeclampsia. In *Preeclampsia: Methods and Protocols*, 1st Edn. Murthi P, Vaillancourt C, eds. New York, NY: Humana Press. pp 53-72.

Journal Articles

1. Alamgeer M, Watkins DN, Banakh I, Kumar B, Gough DJ, Markman B, Ganju V (2018) A phase IIa study of HA-irinotecan, formulation of hyaluronic acid and irinotecan targeting CD44 in extensive-stage small cell lung cancer. Invest New Drugs 36:288-298.
2. Aleksova J, Kurniawan S, Elder GJ (2018) The trabecular bone score is associated with bone mineral density, markers of bone turnover and prevalent fracture in patients with end stage kidney disease. Osteoporos Int 29:1447-1455.
3. Aleksova J, Kurniawan S, Vucak-Dzumhur M, Kerr P, Ebeling PR, Milat F, Elder GJ (2018) Aortic vascular calcification is inversely associated with the trabecular bone score in patients receiving dialysis. Bone 113:118-123.
4. Aleksova J, Wong P, McLachlan R, Choy KW, Ebeling PR, Milat F, Elder GJ (2018) Sex hormone-binding globulin is a biomarker associated with nonvertebral fracture in men on dialysis therapy. Kidney Int 94:372-380.
5. Allison BJ, Nguyen V, Yiallourou SR, Nitsos I, Black MJ, Polglase GR (2018) The effect of sex and prematurity on the cardiovascular baroreflex response in sheep. Exp Physiol 103:9-18.
6. Antoniotti GS, Coughlan M, Salamonsen LA, Evans J (2018) Obesity associated advanced glycation end products within the human uterine cavity adversely impact endometrial function and embryo implantation competence. Hum Reprod 33:654-665.
7. Aridas JDS, Yawno T, Sutherland AE, Nitsos I, Ditchfield M, Wong FY, Hunt RW, Fahey MC, Malhotra A, Wallace EM, Jenkin G, Miller SL (2018) Systemic and transdermal melatonin administration prevents neuropathology in response to perinatal asphyxia in newborn lambs. J Pineal Res 64:e12479.

8. Asai Y, Eslami A, van Ginkel CD, Akhabir L, Wan M, Yin D, Ellis G, Ben-Shoshan M, Marenholz I, Martino D, Ferreira MA, Allen K, Mazer B, de Groot H, de Jong NW, Gerth van Wijk R, Dubois AEJ, Grosche S, Ashley S, Ruschendorf F, Kalb B, Beyer K, Nothen MM, Lee YA, Chin R, Cheuk S, Hoffman J, Jorgensen E, Witte JS, Melles RB, Hong X, Wang X, Hui J, Musk AWB, Hunter M, James AL, Koppelman GH, Sandford AJ, Clarke AE, Daley D (2018) A Canadian genome-wide association study and meta-analysis confirm HLA as a risk factor for peanut allergy independent of asthma. J Allergy Clin Immunol 141:1513-1516.

9. Barseghyan H, Symon A, Zadikyan M, Almalvez M, Segura EE, Eskin A, Bramble MS, Arboleda VA, Baxter R, Nelson SF, Delot EC, Harley V, Vilain E (2018) Identification of novel candidate genes for 46,XY disorders of sex development (DSD) using a C57BL/6J-Y (POS) mouse model. Biol Sex Differ 9:8.

10. Bellofiore N, Rana S, Dickinson H, Temple-Smith P, Evans J (2018) Characterization of human-like menstruation in the spiny mouse: comparative studies with the human and induced mouse model. Hum Reprod 33:1715-1726.

11. Bhakta S, Crocker LM, Chen Y, Hazen M, Schutten MM, Li D, Kuijl C, Ohri R, Zhong F, Poon KA, Go MAT, Cheng E, Piskol R, Firestein R, Fourie-O'Donohue A, Kozak KR, Raab H, Hongo JA, Sampath D, Dennis MS, Scheller RH, Polakis P, Junutula JR (2018) An anti-GDNF family receptor alpha 1 (GFRA1) antibody-drug conjugate for the treatment of hormone receptor-positive breast cancer. Mol Cancer Ther 17:638-649.

12. Binder-Heschl C, Crossley K, Te Pas A, Polglase G, Blank D, Zahra V, Moxham A, Rodgers K, Hooper S (2018) Haemodynamic effects of prenatal caffeine on the cardiovascular transition in ventilated preterm lambs. PLoS One 13:e0200572.

13. Bitto NJ, Baker PJ, Dowling JK, Wray-McCann G, De Paoli A, Tran LS, Leung PL, Stacey KJ, Mansell A, Masters SL, Ferrero RL (2018) Membrane vesicles from Pseudomonas aeruginosa activate the non-canonical inflammasome through caspase-5 in human monocytes. Immunol Cell Biol 96:1120-1130.

14. Blank DA, Badurdeen S, Omar FKC, Jacobs SE, Thio M, Dawson JA, Kane SC, Dennis AT, Polglase GR, Hooper SB, Davis PG (2018) Baby-directed umbilical cord clamping: A feasibility study. Resuscitation 131:1-7.

15. Blank DA, Gaertner VD, Kamlin COF, Nyland K, Eckard NO, Dawson JA, Kane SC, Polglase GR, Hooper SB, Davis PG (2018) Respiratory changes in term infants immediately after birth. Resuscitation 130:105-110.

16. Blank DA, Kamlin COF, Rogerson SR, Fox LM, Lorenz L, Kane SC, Polglase GR, Hooper SB, Davis PG (2018) Lung ultrasound immediately after birth to describe normal neonatal transition: an observational study. Arch Dis Child Fetal Neonatal Ed 103:F157-F162.

17. Blank DA, Polglase GR, Kluckow M, Gill AW, Crossley KJ, Moxham A, Rodgers K, Zahra V, Inocencio I, Stenning F, LaRosa DA, Davis PG, Hooper SB (2018) Haemodynamic effects of umbilical cord milking in premature sheep during the neonatal transition. Arch Dis Child Fetal Neonatal Ed 103:F539-F546.

18. Bonham MP, Leung GKW, Davis R, Sletten TL, Murgia C, Young MJ, Eikelis N, Lambert EA, Huggins CE (2018) Does modifying the timing of meal intake improve cardiovascular risk factors? Protocol of an Australian pilot intervention in night shift workers with abdominal obesity. BMJ Open 8:e020396.

19. Bowles J, Feng CW, Ineson J, Miles K, Spiller CM, Harley VR, Sinclair AH, Koopman P (2018) Retinoic acid antagonizes testis development in mice. Cell Rep 24:1330-1341.

20. Boyce KJ, De Souza DP, Dayalan S, Pasricha S, Tull D, McConville MJ, Andrianopoulos A (2018) Talaromyces marneffei simA encodes a fungal cytochrome P450 essential for survival in macrophages. mSphere 3:00056-00018.

21. Brew N, Nakamura S, Hale N, Azhan A, Davies GI, Nitsos I, Miller SL, Walker DW, Wong FY (2018) Dobutamine treatment reduces inflammation in the preterm fetal sheep brain exposed to acute hypoxia. Pediatr Res 84:442-450.

22. Brewster J, Garama D, Lamare M, Carne A (2018) Carotenoid composition of a New Zealand (Evechinus chloroticus) and an Australian (Heliocidaris erythrogramma) sea urchin in relation to gonad colour Aquac Res 49:2751-2762.

23. Casaca A, Hauswirth GM, Bildsoe H, Mallo M, McGlinn E (2018) Regulatory landscape of the Hox transcriptome. Int J Dev Biol 62:693-704.

24. Chan E, Luwor R, Burns C, Kannourakis G, Findlay JK, Ahmed N (2018) Momelotinib decreased cancer stem cell associated tumor burden and prolonged disease-free remission period in a mouse model of human ovarian cancer. Oncotarget 9:16599-16618.

25. Cheng H, Ge X, Zhuo S, Gao Y, Zhu B, Zhang J, Shang W, Xu D, Ge W, Shi L (2018) β-Elemene synergizes with gefitinib to inhibit stem-like phenotypes and progression of lung cancer via down-regulating EZH2. Front Pharmacol 9:1413.

26. Chin LY, Walsh TA, Van Haltren K, Hayden L, Davies-Tuck M, Malhotra A (2018) Elective replacement of intravenous cannula in neonates-a randomised trial. Eur J Pediatr 177:1719-1726.

27. Ching NS, Kotsanas D, Easton ML, Francis MJ, Korman TM, Buttery JP (2018) Respiratory virus detection and co-infection in children and adults in a large Australian hospital in 2009-2015. J Paediatr Child Health 54:1321-1328.

28. Choudhary N, Tan K, Malhotra A (2018) Inpatient outcomes of preterm infants receiving omega-3 enriched lipid emulsion (SMOFlipid): an observational study. Eur J Pediatr 177:723-731.

29. Christiansz JA, Lappin CR, Weichard AJ, Nixon GM, Davey MJ, Horne RSC, Biggs SN (2018) Slow wave activity and executive dysfunction in children with sleep disordered breathing. Sleep Breath 22:517-525.

30. Cohen E, Whatley C, Wong FY, Wallace EM, Mockler JC, Odoi A, Hollis S, Horne RSC, Yiallourou SR (2018) Effects of foetal growth restriction and preterm birth on cardiac morphology and function during infancy. Acta Paediatr 107:450-455.

31. Cohen E, Wong FY, Wallace EM, Mockler JC, Odoi A, Hollis S, Horne RSC, Yiallourou SR (2018) EEG power spectrum maturation in preterm fetal growth restricted infants. Brain Res 1678:180-186.

32. Cousins FL, O DF, Gargett CE (2018) Endometrial stem/progenitor cells and their role in the pathogenesis of endometriosis. Best Pract Res Clin Obstet Gynaecol 50:27-38.

33. Crawshaw JR, Kitchen MJ, Binder-Heschl C, Thio M, Wallace MJ, Kerr LT, Roehr CC, Lee KL, Buckley GA, Davis PG, Flemmer A, Te Pas AB, Hooper SB (2018) Laryngeal closure impedes non-invasive ventilation at birth. Arch Dis Child Fetal Neonatal Ed 103:F112-F119.

34. Croft B, Ohnesorg T, Hewitt J, Bowles J, Quinn A, Tan J, Corbin V, Pelosi E, van den Bergen J, Sreenivasan R, Knarston I, Robevska G, Vu DC, Hutson J, Harley V, Ayers K, Koopman P, Sinclair A (2018) Human sex reversal is caused by duplication or deletion of core enhancers upstream of SOX9. Nat Commun 9:5319.

35. Croton LCP, Morgan KS, Paganin DM, Kerr LT, Wallace MJ, Crossley KJ, Miller SL, Yagi N, Uesugi K, Hooper SB, Kitchen MJ (2018) In situ phase contrast X-ray brain CT. Sci Rep 8:11412.

36. Crozier TM, Galt P, Wilson SJ, Wallace EM (2018) Rapid response team calls to obstetric patients in a busy quaternary maternity hospital. Aust N Z J Obstet Gynaecol 58:47-53.

37. Daemen A, Liu B, Song K, Kwong M, Gao M, Hong R, Nannini M, Peterson D, Liederer BM, de la Cruz C, Sangaraju D, Jaochico A, Zhao X, Sandoval W, Hunsaker T, Firestein R, Latham S, Sampath D, Evangelista M, Hatzivassiliou G (2018) Pan-cancer metabolic signature predicts co-dependency on glutaminase and de novo glutathione synthesis linked to a high-mesenchymal cell state. Cell Metab 28:383-399 e9.

38. Dagar V, Hutchison W, Muscat A, Krishnan A, Hoke D, Buckle A, Siswara P, Amor DJ, Mann J, Pinner J, Colley A, Wilson M, Sachdev R, McGillivray G, Edwards M, Kirk E, Collins F, Jones K, Taylor J, Hayes I, Thompson E, Barnett C, Haan E, Freckmann ML, Turner A, White S, Kamien B, Ma A, Mackenzie F, Baynam G, Kiraly-Borri C, Field M, Dudding-Byth T, Algar EM (2018) Genetic variation affecting DNA methylation and the human imprinting disorder, Beckwith-Wiedemann syndrome. Clin Epigenetics 10:114.

39. Daly CD, Ghosh P, Zannettino ACW, Badal T, Shimmon R, Jenkin G, Oehme D, Jain K, Sher I, Vais A, Cohen C, Chandra RV, Goldschlager T (2018) Mesenchymal progenitor cells primed with pentosan polysulfate promote lumbar intervertebral disc regeneration in an ovine model of microdiscectomy. Spine J 18:491-506.

40. Daly CD, Lim KZ, Ghosh P, Goldschlager T (2018) Perioperative care for lumbar microdiscectomy: a survey of Australasian neurosurgeons. J Spine Surg 4:1-8.

41. Darzi S, Deane JA, Nold CA, Edwards SE, Gough DJ, Mukherjee S, Gurung S, Tan KS, Vashi AV, Werkmeister JA, Gargett CE (2018) Endometrial mesenchymal stem/stromal cells modulate the macrophage response to implanted polyamide/gelatin composite mesh in immunocompromised and immunocompetent mice. Sci Rep 8:6554.

42. Davies-Tuck ML, Wallace EM, Davey MA, Veitch V, Oats J (2018) Planned private homebirth in Victoria 2000-2015: a retrospective cohort study of Victorian perinatal data. BMC Pregnancy Childbirth 18:357.

43. D'Costa K, Chonwerawong M, Tran LS, Ferrero RL (2018) Mouse models of Helicobacter infection and gastric pathologies. J Vis Exp 140:e56985.

44. Dekker J, Hooper SB, Martherus T, Cramer SJE, van Geloven N, Te Pas AB (2018) Repetitive versus standard tactile stimulation of preterm infants at birth - A randomized controlled trial. Resuscitation 127:37-43.

45. Deswaerte V, Nguyen PM, West A, Browning AF, Yu L, Ruwanpura S, Balic J, Livis T, Girard C, Preaudet A, Oshima H, Fung KY, Tye H, Najdovska M, Ernst M, Oshima M, Gabay C, Putoczki TL, Jenkins BJ (2018) Inflammasome adaptor ASC suppresses apoptosis of gastric cancer cells by an IL-18 mediated inflammation-independent mechanism. Cancer Res 78:1293-1307.

46. Dhillon SK, Lear CA, Galinsky R, Wassink G, Davidson JO, Juul S, Robertson NJ, Gunn AJ, Bennet L (2018) The fetus at the tipping point: modifying the outcome of fetal asphyxia. J Physiol 596:5571-5592.

47. Donoghue JF, Kerr LT, Alexander NW, Greenall SA, Longano AB, Gottardo NG, Wang R, Tabar V, Adams TE, Mischel PS, Johns TG (2018) Activation of ERBB4 in glioblastoma can contribute to increased tumorigenicity and influence therapeutic response. Cancers (Basel) 10:243.

48. Edgell TA, Evans J, Lazzaro L, Boyes K, Sridhar M, Catt S, Rombauts LJF, Vollenhoven BJ, Salamonsen LA (2018) Assessment of potential biomarkers of pre-receptive and receptive endometrium in uterine fluid and a functional evaluation of the potential role of CSF3 in fertility. Cytokine 111:222-229.

49. Endersby R, Whitehouse J, Hii H, Greenall SA, Johns TG, Gottardo NG (2018) A pre-clinical assessment of the Pan-ERBB inhibitor dacomitinib in pediatric and adult brain tumors. Neoplasia 20:432-442.

50. Evans MA, Lim R, Kim HA, Chu HX, Gardiner-Mann CV, Taylor KWE, Chan CT, Brait VH, Lee S, Dinh QN, Vinh A, Phan TG, Srikanth VK, Ma H, Arumugam TV, Fann DY, Poh L, Hunt CPJ, Pouton CW, Haynes JM, Selemidis S, Kwan W, Teo L, Bourne JA, Neumann S, Young S, Gowing EK, Drummond GR, Clarkson AN, Wallace EM, Sobey CG, Broughton BRS (2018) Acute or delayed systemic administration of human amnion epithelial cells improves outcomes in experimental stroke. Stroke 49:700-709.

51. Faridi P, Li C, Ramarathinam SH, Vivian JP, Illing PT, Mifsud NA, Ayala R, Song J, Gearing LJ, Hertzog PJ, Ternette N, Rossjohn J, Croft NP, Purcell AW (2018) A subset of HLA-I peptides are not genomically templated: evidence for cis- and trans-spliced peptide ligands. Sci Immunol 3:eaar3947.

52. Fernando S, Wallace EM, Vollenhoven B, Lolatgis N, Hope N, Wong M, Lawrence M, Lawrence A, Russell C, Leong K, Thomas P, Rombauts L (2018) Melatonin in assisted reproductive technology: a pilot double-blind randomized placebo-controlled clinical trial. Front Endocrinol (Lausanne) 9:545.

53. Ferrand J, Croft NP, Pepin G, Diener KR, Wu D, Mangan NE, Pedersen J, Behlke MA, Hayball JD, Purcell AW, Ferrero R, Gantier MP (2018) The use of CRISPR/Cas9 gene editing to confirm congenic contaminations in host-pathogen interaction studies. Front Cell Infect Microbiol 8:87.

54. Fijak M, Pilatz A, Hedger MP, Nicolas N, Bhushan S, Michel V, Tung KSK, Schuppe HC, Meinhardt A (2018) Infectious, inflammatory and 'autoimmune' male factor infertility: how do rodent models inform clinical practice? Hum Reprod Update 24:416-441.

55. Fitzgerald HC, Evans J, Johnson N, Infusini G, Webb A, Rombauts L, Vollenhoven B, Salamonsen L, Edgell T (2018) Idiopathic infertility in women is associated with distinct changes in proliferative phase uterine fluid proteins Biol Reprod 98:752-764.

56. FitzGerald LM, Jung CH, Wong EM, Joo JE, Gould JA, Vasic V, Bassett JK, O'Callaghan N, Nottle T, Pedersen J, Giles GG, Southey MC (2018) Obtaining high quality transcriptome data from formalin-fixed, paraffin-embedded diagnostic prostate tumor specimens. Lab Invest 98:537-550.

57. Flores TJ, Nguyen VB, Widdop RE, Sutherland MR, Polglase GR, Abud HE, Black MJ (2018) Morphology and function of the lamb ileum following preterm birth. Front Pediatr 6:8.

58. Fowke TM, Galinsky R, Davidson JO, Wassink G, Karunasinghe RN, Prasad JD, Bennet L, Gunn AJ, Dean JM (2018) Loss of interneurons and disruption of perineuronal nets in the cerebral cortex following hypoxia-ischaemia in near-term fetal sheep. Sci Rep 8:17686.

59. Funder JW (2018) Primary aldosteronism and cardiovascular risk, before and after treatment. Lancet Diabetes Endocrinol 6:5-7.

60. Galinsky R, Dhillon SK, Lear CA, Yamaguchi K, Wassink G, Gunn AJ, Bennet L (2018) Magnesium sulfate and sex differences in cardiovascular and neural adaptations during normoxia and asphyxia in preterm fetal sheep. Am J Physiol Regul Integr Comp Physiol 315:R205-R217.

61. Gao Q, Xiang SD, Wilson K, Madondo M, Stephens AN, Plebanski M (2018) Sperm protein 17 expression by murine epithelial ovarian cancer cells and its impact on tumor progression. Cancers (Basel) 10: E276.

62. Gerard C, Brown KA (2018) Obesity and breast cancer - Role of estrogens and the molecular underpinnings of aromatase regulation in breast adipose tissue. Mol Cell Endocrinol 466:15-30.

63. Gibson DA, Collins F, Cousins FL, Esnal Zufiaurre A, Saunders PTK (2018) The impact of 27-hydroxycholesterol on endometrial cancer proliferation. Endocr Relat Cancer 25:381-391.

64. Goldfinch CD, Korman T, Kotsanas D, Burgner DP, Tan K (2018) C-reactive protein and immature-to-total neutrophil ratio have no utility in guiding lumbar puncture in suspected neonatal sepsis. J Paediatr Child Health 54:848-854.

65. Greenall SA, Donoghue J, Johns TG, Adams TE (2018) Differential sensitivity of human hepatocellular carcinoma xenografts to an IGF-II neutralizing antibody may involve activated STAT3. Transl Oncol 11:971-978.

66. Gunasinghe SD, Shiota T, Stubenrauch CJ, Schulze KE, Webb CT, Fulcher AJ, Dunstan RA, Hay ID, Naderer T, Whelan DR, Bell TDM, Elgass KD, Strugnell RA, Lithgow T (2018) The WD40 protein bamb mediates coupling of BAM complexes into assembly precincts in the bacterial outer membrane. Cell Rep 23:2782-2794.

67. Gurung S, Deane JA, Darzi S, Werkmeister JA, Gargett CE (2018) In vivo survival of human endometrial mesenchymal stem cells transplanted under the kidney capsule of immunocompromised mice. Stem Cells Dev 27:35-43.

68. Gurung S, Williams S, Deane JA, Werkmeister JA, Gargett CE (2018) The transcriptome of human endometrial mesenchymal stem cells under TGFbetaR inhibition reveals improved potential for cell-based therapies. Front Cell Dev Biol 6:164.

69. Hammarberg K, Kirkman M, Stern C, McLachlan RI, Clarke G, Agresta F, Gook D, Rombauts L, Vollenhoven B, Fisher JRW (2018) Survey of reproductive experiences and outcomes of cancer survivors who stored reproductive material before treatment. Hum Reprod 32:2423-2430.

70. Hart RJ, Doherty DA, Keelan JA, Minaee NS, Thorstensen EB, Dickinson JE, Pennell CE, Newnham JP, McLachlan R, Norman RJ, Handelsman DJ (2018) The impact of antenatal Bisphenol A exposure on male reproductive function at 20-22 years of age. Reprod Biomed Online 36:340-347.

71. Hart RJ, Frederiksen H, Doherty DA, Keelan JA, Skakkebaek NE, Minaee NS, McLachlan R, Newnham JP, Dickinson JE, Pennell CE, Norman RJ, Main KM (2018) The possible impact of antenatal exposure to ubiquitous phthalates upon male reproductive function at 20 years of age. Front Endocrinol 9:288.

72. Hashimura H, Shen J, Fuller PJ, Chee NYN, Doery JCG, Chong W, Choy KW, Gwini SM, Yang J (2018) Saline suppression test parameters may predict bilateral subtypes of primary aldosteronism. Clin Endocrinol (Oxf) 89:308-313.

73. Herson MR, Hamilton K, White J, Alexander D, Poniatowski S, O'Connor AJ, Werkmeister JA (2018) Interaction of preservation methods and radiation sterilization in human skin processing, with particular insight on the

impact of the final water content and collagen disruption. Part I: process validation, water activity and collagen changes in tissues cryopreserved or processed using 50, 85 or 98% glycerol solutions. Cell Tissue Bank 19:215-227.

74. Hill DG, Yu L, Gao H, Balic JJ, West A, Oshima H, McLeod L, Oshima M, Gallimore A, D'Costa K, Bhathal PS, Sievert W, Ferrero RL, Jenkins BJ, Jones GW (2018) Hyperactive gp130/STAT3-driven gastric tumourigenesis promotes submucosal tertiary lymphoid structure development. Int J Cancer 143:167-178.

75. Hobson SR, Gurusinghe S, Lim R, Alers NO, Miller SL, Kingdom JC, Wallace EM (2018) Melatonin improves endothelial function in vitro and prolongs pregnancy in women with early-onset preeclampsia. J Pineal Res 65:e12508.

76. Hooper SB, Kitchen MJ, Polglase GR, Roehr CC, Te Pas AB (2018) The physiology of neonatal resuscitation. Curr Opin Pediatr 30:187-191.

77. Hooper SB, te Pas AB, Polglase GR, Wyckoff M (2018) Animal models in neonatal resuscitation research: what can they teach us? Semin Fetal Neonatal Med 23:300-305.

78. Horne R, Shandler G, Tamanyan K, Weichard AJ, Odoi A, Biggs S, Davey M, Nixon G, Walter L (2018) The impact of sleep disordered breathing on cardiovascular health in overweight children. Sleep Medicine 41:58-68.

79. Horne RSC (2018) Cardiovascular autonomic dysfunction in sudden infant death syndrome. Clin Auton Res 28:535-543.

80. Horne RSC, Roy B, Walter LM, Biggs SN, Tamanyan K, Weichard A, Nixon GM, Davey MJ, Ditchfield M, Harper RM, Kumar R (2018) Regional brain tissue changes and associations with disease severity in children with sleep disordered breathing. Sleep 41:zsx203.

81. Horne RSC, Sun S, Yiallourou SR, Fyfe KL, Odoi A, Wong FY (2018) Comparison of the longitudinal effects of persistent periodic breathing and apnoea on cerebral oxygenation in term and preterm-born infants. J Physiol 596:6021-6031.

82. Hu F, Zhang W, Shi L, Liu X, Jia J, Xu L, Zhu H, Li Y, Xu D, Lu L, Qiu X, Liu W, Qiao J, Wang Y, Li Z (2018) Impaired CD27+IgD+ B cells with altered gene signature in rheumatoid arthritis. Front Immunol 9:626.

83. Hu J, Merriner DJ, O'Connor AE, Houston BJ, Furic L, Hedger MP, O'Bryan MK (2018) Epididymal cysteine-rich secretory proteins are required for epididymal sperm maturation and optimal sperm function. Mol Hum Reprod 24:111-122.

84. Huberts TJP, Foglia EE, Narayen IC, van Vonderen JJ, Hooper SB, Te Pas AB (2018) The breathing effort of very preterm infants at birth. J Pediatr 194:54-59.

85. Hutchinson DS, Brew N, Vu T, Merlin J, Hale N, Walker DW, Wong FY (2018) Effects of hypoxia-ischemia and inotropes on expression of cardiac adrenoceptors in the preterm fetal sheep. J Appl Physiol 125:1368-1377.

86. Ioannidis JPA, Kim BYS, Trounson A (2018) How to design preclinical studies in nanomedicine and cell therapy to maximize the prospects of clinical translation. Nat Biomed Eng 2:797-809.

87. Jansz N, Keniry A, Trussart M, Bildsoe H, Beck T, Tonks ID, Mould AW, Hickey P, Breslin K, Iminitoff M, Ritchie ME, McGlinn E, Kay GF, Murphy JM, Blewitt ME (2018) Smchd1 regulates long-range chromatin interactions on the inactive X chromosome and at Hox clusters. Nat Struct Mol Biol 25:766-777.

88. Kashyap A, DeKoninck P, Crossley K, Thio M, Polglase G, Russo FM, Deprest J, Hooper S, Hodges R (2018) Antenatal medical therapies to improve lung development in congenital diaphragmatic hernia. Am J Perinatol 35:823-836.

89. Katsura Y, Kondo HX, Ryan J, Harley V, Satta Y (2018) The evolutionary process of mammalian sex determination genes focusing on marsupial SRYs. BMC Evol Biol 18:3.

90. Khanabdali R, Shakouri-Motlagh A, Wilkinson S, Murthi P, Georgiou HM, Brennecke SP, Kalionis B (2018) Low-dose aspirin treatment enhances the adhesion of preeclamptic decidual mesenchymal stem/stromal cells and reduces their production of pro-inflammatory cytokines. J Mol Med (Berl) 96:1215-1225.

91. Kling JC, Jordan MA, Pitt LA, Meiners J, Thanh-Tran T, Tran LS, Nguyen TTK, Mittal D, Villani R, Steptoe RJ, Khosrotehrani K, Berzins SP, Baxter AG, Godfrey D, Blumenthal A (2018) Temporal regulation of natural killer T cell interferon gamma responses by β-catenin-dependent and -independent WNT signaling. Front Immunol 9:483.

92. Knetsch CW, Kumar N, Forster SC, Connor TR, Browne HP, Harmanus C, Sanders IM, Harris SR, Turner L, Morris T, Perry M, Miyajima F, Roberts P, Pirmohamed M, Songer JG, Weese JS, Indra A, Corver J, Rupnik M, Wren BW, Riley TV, Kuijper EJ, Lawley TD (2018) Zoonotic transfer of Clostridium difficile harboring antimicrobial resistance between farm animals and humans. J Clin Microbiol 56:e01384-17.

93. Krause M, Rak-Raszewska A, Naillat F, Saarela U, Schmidt C, Ronkainen VP, Bart G, Yla-Herttuala S, Vainio SJ (2018) Exosomes as secondary inductive signals involved in kidney organogenesis. J Extracell Vesicles 7:1422675.

94. Kumar A, Sturrock S, Wallace EM, Nestel D, Lucey D, Stoyles S, Morgan J, Neil P, Schlipalius M, Dekoninck P (2018) Evaluation of learning from practical obstetric multi-professional training and its impact on patient outcomes in Australia using Kirkpatrick's framework: a mixed methods study. BMJ Open 8:e017451.

95. Lalzad A, Wong F, Singh N, Coombs P, Brockley C, Brennan S, Ditchfield M, Rao P, Watkins A, Saxton V, Schneider M (2018) Knowledge of safety, training, and practice of neonatal cranial ultrasound: a survey of operators. J Ultrasound Med 37:1411-1421.

96. Lang T, Lee JPW, Elgass K, Pinar AA, Tate MD, Aitken EH, Fan H, Creed SJ, Deen NS, Traore DAK, Mueller I, Stanisic D, Baiwog FS, Skene C, Wilce MCJ, Mansell A, Morand EF, Harris J (2018) Macrophage migration inhibitory factor is required for NLRP3 inflammasome activation. Nat Commun 9:2223.

97. Lao JC, Pang MA, Malhotra A, Tan K, Beker F, Konig K, Collins C, Theda C, Kamlin O, Yeomans E, Elsayed K, Noble E, Walsh G, Argus B, Twitchell E, Berger JP, Veldman A, Nold-Petry C, Nold M (2018) Characterising the maturation of T cell polarisation in preterm and term infants and in the neonatal chronic lung disease bronchopulmonary dysplasia 22nd Annual Congress of the Perinatal Society of Australia and New Zealand (PSANZ) 54:30.

98. Lappas M, McCracken S, McKelvey K, Lim R, James J, Roberts CT, Fournier T, Alfaidy N, Powell KL, Borg AJ, Morris JM, Leaw B, Singh H, Ebeling PR, Wallace EM, Parry LJ, Dimitriadis E, Murthi P (2018) Formyl peptide receptor-2 is decreased in fetal growth restriction and contributes to placental dysfunction. Mol Hum Reprod 24:94-109.

99. Larmour LI, Cousins FL, Teague JA, Deane JA, Jobling TW, Gargett CE (2018) A patient derived xenograft model of cervical cancer and cervical dysplasia. PLoS One 13:e0206539.

100. Law N, Ruane LE, Low K, Hamza K, Bardin PG (2018) Dysfunctional breathing is more frequent in chronic obstructive pulmonary disease than in asthma and in health. Respir Physiol Neurobiol 247:20-23.

101. Li J, Yawno T, Sutherland AE, Gurung S, Paton M, McDonald C, Tiwari A, Pham Y, Castillo-Melendez M, Jenkin G, Miller SL (2018) Preterm umbilical cord blood derived mesenchymal stem/stromal cells protect preterm white matter brain development against hypoxia-ischemia. Exp Neurol 308:120-131.

102. Lim CH, Sun Q, Ratti K, Lee SH, Zheng Y, Takeo M, Lee W, Rabbani P, Plikus MV, Cain JE, Wang DH, Watkins DN, Millar S, Taketo MM, Myung P, Cotsarelis G, Ito M (2018) Hedgehog stimulates hair follicle neogenesis by creating inductive dermis during murine skin wound healing. Nat Commun 9:4903.

103. Lim R, Malhotra A, Mockler J, Wallace E (2018) Allogeneic amniotic epithelial cells for established bronchopulmonary dysplasia in premature, low birthweight infants: A first-in-human safety trial. Cytotherapy 20:S21.

104. Lim R, Malhotra A, Tan J, Chan ST, Lau S, Zhu D, Mockler JC, Wallace EM (2018) First-in-human administration of allogeneic amnion cells in premature infants with bronchopulmonary dysplasia: a safety study. *Stem Cells Transl Med* 7:628-635.

105. Lim SC, Tajika M, Shimura M, Carey KT, Stroud DA, Murayama K, Ohtake A, McKenzie M (2018) Loss of the mitochondrial fatty acid beta-oxidation protein medium-chain acyl-coenzyme A dehydrogenase disrupts oxidative phosphorylation protein complex stability and function. Sci Rep 8:153.

106. Lio A, Aurilia C, Zahra V, Moss TJ, LaRosa DA, Hooper SB, Gill AW, Kluckow M, Nitsos I, Vento G, Polglase GR (2018) Ventilation prior to umbilical cord clamping improves cardiovascular stability and oxygenation in preterm lambs after exposure to intrauterine inflammation. Front Pediatr 6:286.

107. Low LY, Harrison PF, Gould J, Powell DR, Choo JM, Forster SC, Chapman R, Gearing LJ, Cheung JK, Hertzog P, Rood JI (2018) Concurrent host-pathogen transcriptional responses in a Clostridium perfringens murine myonecrosis infection. MBio 9:e00473-00418.

108. Lu J, Shu R, Zhu Y (2018) Dysregulation and dislocation of SFPQ disturbed DNA organization in Alzheimer's disease and frontotemporal dementia. J Alzheimers Dis 61:1311-1321.

109. Lubout CMA, Derks TGJ, Meiners L, Erwich JJ, Bergman KA, Lunsing RJ, Schwarz G, Veldman A, van Spronsen FJ (2018) Molybdenum cofactor deficiency type A: prenatal monitoring using MRI. Eur J Paediatr Neurol 22:536-540.

110. Lv Q, Yang B, Ning C, Xie B, Nie G, Chen X, Chen Q (2018) Hypoxia is involved in the reduction of HtrA3 in patients with endometrial hyperplasia and cancer. Biochem Biophys Res Commun 503:2918-2923.

111. Malhotra A, Castillo-Melendez M, Allison BJ, Sutherland AE, Nitsos I, Pham Y, Alves de Alencar Rocha A, Fahey MC, Polglase GR, Jenkin G, Miller SL (2018) Neuropathology as a consequence of neonatal ventilation in premature growth restricted lambs. Am J Physiol Regul Integr Comp Physiol 315:R1183-R1194.

112. Mansilla M, Wang Y, Hyett J, da Silva Costa F, Nie G (2018) Serum podocalyxin for early detection of preeclampsia at 11–13 weeks of gestation. Placenta 71:13-15.

113. Marini KD, Croucher DR, McCloy RA, Vaghjiani V, Gonzalez-Rajal A, Hastings JF, Chin V, Szczepny A, Kostyrko K, Marquez C, Jayasekara WSN, Alamgeer M, Boolell V, Han JZR, Waugh T, Lee HC, Oakes SR, Kumar B, Harrison CA, Hedger MP, Lorensuhewa N, Kita B, Barrow R, Robinson BW, de Kretser DM, Wu J, Ganju V, Sweet-Cordero EA, Burgess A, Martelotto LG, Rossello FJ, Cain JE, Watkins DN (2018) Inhibition of activin signaling in lung adenocarcinoma increases the therapeutic index of platinum chemotherapy. Sci Transl Med 10:eaat3504.

114. Marsman C, Lafouresse F, Liao Y, Baldwin TM, Mielke LA, Hu Y, Mack M, Hertzog PJ, de Graaf CA, Shi W, Groom JR (2018) Plasmacytoid dendritic cell heterogeneity is defined by CXCL10 expression following TLR7 stimulation. Immunol Cell Biol 96:1083-1094.

115. Martinez-Chacon G, Brown KA, Docanto MM, Kumar H, Salminen S, Saarinen N, Makela S (2018) IL-10 suppresses TNF-alpha-induced expression of human aromatase gene in mammary adipose tissue. FASEB J 32:3361-3370.

116. McDonald CA, Fahey MC, Jenkin G, Miller SL (2018) Umbilical cord blood cells for treatment of cerebral palsy; timing and treatment options. Pediatr Res 83:333-344.

117. McDonald CA, Penny TR, Paton MCB, Sutherland AE, Nekkanti L, Yawno T, Castillo-Melendez M, Fahey MC, Jones NM, Jenkin G, Miller SL (2018) Effects of umbilical cord blood cells, and subtypes, to reduce neuroinflammation following perinatal hypoxic-ischemic brain injury. J Neuroinflammation 15:47.

118. McDougall ARA (2018) Uncovering the mechanisms underlying congenital lung malformations. Can we improve treatments? Am J Respir Crit Care Med 197:1246-1247.

119. McDougall ARA, Fosang AJ, Faggian J, Wallace MJ, Crossley KJ, Cole TJ, Hooper SB (2018) Glucocorticoids influence versican and chondroitin sulphate proteoglycan levels in the fetal sheep lung. Respir Res 19:155.

120. McLean G, Hough C, Sehgal A, Ditchfield M, Polglase GR, Miller SL (2018) Three-dimensional ultrasound cranial imaging and early neurodevelopment in preterm growth-restricted infants. J Paediatr Child Health 54:420-425.

121. Melehan KL, Hoyos CM, Hamilton GS, Wong KK, Yee BJ, McLachlan RI, O'Meagher S, Celermajer D, Ng MK, Grunstein RR, Liu PY (2018) Randomised trial of CPAP and vardenafil on erectile and arterial function in men with obstructive sleep apnea and erectile dysfunction. J Clin Endocrinol Metab 103:1601-1611.

122. Menkhorst E, Griffiths M, Van Sinderen M, Rainczuk K, Dimitriadis E (2018) Galectin7 is elevated in endometrioid (type I) endometrial cancer and promotes cell migration. Oncol Lett 16:4721-4728.

123. Micati DJ, Hime GR, McLaughlin EA, Abud HE, Loveland KL (2018) Differential expression profiles of conserved snail transcription factors in the mouse testis. Andrology 6:362-373.

124. Miyamoto Y, Whiley PAF, Goh HY, Wong C, Higgins G, Tachibana T, McMenamin P, Mayne L, Loveland KL (2018) The STK35 locus contributes to normal gametogenesis and encodes a lncRNA responsive to oxidative stress. Biol Open 7:bio032631.

125. Mrocki MM, Nguyen VB, Lombardo P, Sutherland MR, Bensley JG, Nitsos I, Allison BJ, Harding R, De Matteo R, Schneider M, Polglase GR, Black MJ (2018) Moderate preterm birth impacts right ventricular structure and function and pulmonary artery blood flow in adult sheep. J Physiol 596:5965-5975.

126. Muscat A, Wong NC, Drummond KJ, Algar E, Khasraw M, Verhaak R, Field K, Rosenthal MA, Ashley DM (2018) The evolutionary pattern of mutations in glioblastoma reveals therapy-mediated selection. Oncotarget 9:7844-7858.

127. Nasiri N, Mukherjee S, Panneerselvan A, Nisbet DR, Tricoli A (2018) Optimally hierarchical nanostructured hydroxyapatite coatings for superior prosthesis biointegration. ACS Appl Mater Interfaces 10:24840-24849.

128. Nde C, Gimeno GC, Docanto M, Knower KC, Young MJ, Buehn J, Sayed E, Clyne CD (2018) Timeless is a novel estrogen receptor co-activator involved in multiple signalling pathways in MCF-7 cells. J Mol Biol 430:1531-1543.

129. Nejad C, Pepin G, Behlke MA, Gantier MP (2018) Modified polyadenylation-based RT-qPCR increases selectivity of amplification of 3'-microRNA isoforms. Front Genet 9:11.

130. Nejad C, Pillman KA, Siddle KJ, Pepin G, Anko ML, McCoy CE, Beilharz T, Quintana-Murci L, Goodall GJ, Bracken CP, Gantier MP (2018) miR-222 isoforms are differentially regulated by type-I interferon. RNA 24:332-341.

131. Nejad C, Stunden HJ, Gantier MP (2018) A guide to miRNAs in inflammation and innate immune responses. FEBS J 285:3695-3716.

132. Nguyen HH, Wong P, Strauss BJ, Ebeling PR, Milat F, Vincent A (2018) A cross-sectional and longitudinal analysis of trabecular bone score in adults with turner syndrome. J Clin Endocrinol Metab 103:3792-3800.

133. Nguyen QN, Zerafa N, Liew S, Morgan F, Strasser A, Scott C, Findlay J, Hickey M, Hutt K (2018) Loss of PUMA protects the ovarian reserve during DNA-damaging chemotherapy and preserves fertility. Cell Death Dis 9:618.

134. Nguyen TP, Yong HE, Chollangi T, Brennecke SP, Fisher SJ, Wallace EM, Ebeling PR, Murthi P (2018) Altered downstream target gene expression of the placental Vitamin D receptor in human idiopathic fetal growth restriction. Cell Cycle 17:182-190.

135. Odobasic D, Jia Y, Kao W, Fan H, Wei X, Gu R, Ngo D, Richard Kitching A, Holdsworth SR, Morand EF, Yang YH (2018) Formyl peptide receptor activation inhibits the expansion of effector T cells and synovial fibroblasts and attenuates joint injury in models of rheumatoid arthritis. Int Immunopharmacol 61:140-149.

136. Olesen IA, Joensen UN, Petersen JH, Almstrup K, Rajpert-De Meyts E, Carlsen E, McLachlan R, Juul A, Jorgensen N (2018) Decrease in semen quality and Leydig cell function in infertile men: a longitudinal study. Hum Reprod 33:1963-1974.

137. Ong YR, Cousins FL, Yang X, Mushafi A, Breault DT, Gargett CE, Deane JA (2018) Bone marrow stem cells do not contribute to endometrial cell lineages in chimeric mouse models. Stem Cells 36:91-102.

138. O'Reilly LA, Putoczki TL, Mielke LA, Low JT, Lin A, Preaudet A, Herold MJ, Yaprianto K, Tai L, Kueh A, Pacini G, Ferrero RL, Gugasyan R, Hu Y, Christie M, Wilcox S, Grumont R, Griffin MDW, O'Connor L, Smyth GK, Ernst M, Waring P, Gerondakis S, Strasser A (2018) Loss of NF-kappaB1 causes gastric cancer with aberrant inflammation and expression of immune checkpoint regulators in a STAT-1-dependent manner. Immunity 48:570-583 e578.

139. Paton MCB, Allison BJ, Li J, Fahey MC, Sutherland AE, Nitsos I, Bischof RJ, Dean JM, Moss TJM, Polglase GR, Jenkin G, McDonald CA, Miller SL (2018) Human umbilical cord blood therapy protects cerebral white matter from systemic LPS exposure in preterm fetal sheep. Dev Neurosci 40:258-270.

140. Phan TG, Ma H, Lim R, Sobey CG, Wallace EM (2018) Phase 1 trial of amnion cell therapy for ischemic stroke. Front Neurol 9:198.

141. Polglase GR, Blank DA, Barton SK, Miller SL, Stojanovska V, Kluckow M, Gill AW, LaRosa D, Te Pas AB, Hooper SB (2018) Physiologically based cord clamping stabilises cardiac output and reduces cerebrovascular injury in asphyxiated near-term lambs. Arch Dis Child Fetal Neonatal Ed 103:F530-F538.

142. Prokopuk L, Hogg K, Western PS (2018) Pharmacological inhibition of EZH2 disrupts the female germline epigenome. Clin Epigenetics 10:33.

143. Prokopuk L, Stringer JM, White CR, Vossen R, White SJ, Cohen ASA, Gibson WT, Western PS (2018) Loss of maternal EED results in postnatal overgrowth. Clin Epigenetics 10:95.

144. Raab M, Sanhaji M, Matthess Y, Horlin A, Lorenz I, Dotsch C, Habbe N, Waidmann O, Kurunci-Csacsko E, Firestein R, Becker S, Strebhardt K (2018) PLK1 has tumor-suppressive potential in APC-truncated colon cancer cells. Nat Commun 9:1106.

145. Richardson AM, Lewis DP, Kita B, Ludlow H, Groome NP, Hedger MP, de Kretser DM, Lidbury BA (2018) Weighting of orthostatic intolerance time measurements with standing difficulty score stratifies ME/CFS symptom severity and analyte detection. J Transl Med 16:97.

146. Rossi GP, Funder JW (2018) Adrenal vein sampling is the preferred method to select patients with primary aldosteronism for adrenalectomy: pro side of the argument. Hypertension 71:5-9.

147. Saeidi S, Shapouri F, de Iongh RU, Casagranda F, Sutherland JM, Western PS, McLaughlin EA, Familari M, Hime GR (2018) Esrp1 is a marker of mouse fetal germ cells and differentially expressed during spermatogenesis. PLoS One 13:e0190925.

148. Sandaradura SA, Bournazos A, Mallawaarachchi A, Cummings BB, Waddell LB, Jones KJ, Troedson C, Sudarsanam A, Nash BM, Peters GB, Algar EM, MacArthur DG, North KN, Brammah S, Charlton A, Laing NG, Wilson MJ, Davis MR, Cooper ST (2018) Nemaline myopathy and distal arthrogryposis associated with an autosomal recessive TNNT3 splice variant. Hum Mutat 39:383-388.

149. Sandow JJ, Rainczuk A, Infusini G, Makanji M, Bilandzic M, Wilson AL, Fairweather N, Stanton PG, Garama D, Gough D, Jobling TW, Webb AI, Stephens AN (2018) Discovery and validation of novel protein biomarkers in ovarian cancer patient urine. Proteomics Clin Appl 12:e1700135.

150. Schuelein R, Spencer H, Dagley LF, Li PF, Luo L, Stow JL, Abraham G, Naderer T, Gomez-Valero L, Buchrieser C, Sugimoto C, Yamagishi J, Webb AI, Pasricha S, Hartland EL (2018) Targeting of RNA polymerase II by a nuclear Legionella pneumophila Dot/Icm effector SnpL. Cell Microbiol 20:e12852.

151. Sehgal A, Allison BJ, Gwini SM, Menahem S, Miller SL, Polglase GR (2018) Vascular aging and cardiac maladaptation in growth-restricted preterm infants. J Perinatol 38:92-97.

152. Skinner S, Crossley K, Amberg B, Kashyap A, Hooper S, Deprest JA, Hodges R, DeKoninck P (2018) The effects of partial amniotic carbon dioxide insufflation in an ovine model. Prenat Diagn 38:994-1003.

153. Soh HJ, Rowe K, Davey MJ, Horne RSC, Nixon GM (2018) The OSA-5: development and validation of a brief questionnaire screening tool for obstructive sleep apnea in children. Int J Pediatr Otorhinolaryngol 113:62-66.

154. Sreenivasan R, Ludbrook L, Fisher B, Declosmenil F, Knower KC, Croft B, Bird D, Ryan J, Bashamboo A, Sinclair AH, Koopman P, McElreavey K, Poulat F, Harley V (2018) Mutant NR5A1/SF-1 in patients with disorders of sex development shows defective activation of the SOX9 TESCO enhancer. Hum Mutat 39:1861-1874.

155. Srirattana K, St. John JC (2018) Additional mitochondrial DNA influences the interactions between the nuclear and mitochondrial genomes in a bovine embryo model of nuclear transfer. Sci Rep 8:7246.

156. St John JC, Tsai TS (2018) The association of mitochondrial DNA haplotypes and phenotypic traits in pigs. BMC Genet 19:41.

157. Stark JC, Wallace EM, Lim R, Leaw B (2018) Characterization and isolation of mouse primary microglia by density gradient centrifugation. J Vis Exp 132:e57065.

158. Stavely R, Fraser S, Sharma S, Rahman AA, Stojanovska V, Sakkal S, Apostolopoulos V, Bertrand P, Nurgali K (2018) The onset and progression of chronic colitis parallels increased mucosal serotonin release via enterochromaffin cell hyperplasia and downregulation of the serotonin reuptake transporter. Inflamm Bowel Dis 24:1021-1034.

159. Stifter SA, Matthews AY, Mangan NE, Fung KY, Drew A, Tate MD, Soares da Costa TP, Hampsey D, Mayall J, Hansbro PM, Garcia Minambres A, Eid SG, Mak J, Scoble J, Lovrecz G, de Weerd NA, Hertzog PJ (2018) Defining the distinct, intrinsic properties of the novel type I interferon, IFNβ. *J Biol Chem* 293:3168-3179.

160. Stojanovska V, Atik A, Nitsos I, Skiold B, Barton S, Zahra V, Rodgers K, Hooper S, Galinsky R, Polglase AL (2018) Effects of intrauterine inflammation on cortical gray matter of near-term lambs. Front Pediatr 6:145.

161. Stringer JM, Forster SC, Qu Z, Prokopuk L, O'Bryan MK, Gardner DK, White SJ, Adelson D, Western PS (2018) Reduced PRC2 function alters male germline epigenetic programming and paternal inheritance. BMC Biol 16:104.

162. Suliman BA, Al-Yahya S (2018) Promyelocytic leukemia zinc finger triggers ATP-binding cassette subfamily E member 1-mediated growth inhibition in breast cancer cells. Oncol Lett 16:4143-4150.

163. Sun X, Johnson J, St. John JC (2018) Global DNA methylation synergistically regulates the nuclear and mitochondrial genomes in glioblastoma cells. Nucleic Acids Research 46:5977-5995.

164. Sun X, St John JC (2018) Modulation of mitochondrial DNA copy number in a model of glioblastoma induces changes to DNA methylation and gene expression of the nuclear genome in tumours. Epigenetics Chromatin 11:53.

165. Sun X, Vaghjiani V, Jayasekara WSN, Cain JE, St John JC (2018) The degree of mitochondrial DNA methylation in tumor models of glioblastoma and osteosarcoma. Clin Epigenetics 10:157.

166. Szczepny A, Carey K, McKenzie L, Jayasekara WSN, Rossello F, Gonzalez-Rajal A, McCaw AS, Popovski D, Wang D, Sadler AJ, Mahar A, Russell PA, Wright G, McCloy RA, Garama DJ, Gough DJ, Baylin SB, Burgess A, Cain JE, Watkins DN (2018) The tumor suppressor Hic1 maintains chromosomal stability independent of Tp53. Oncogene 37:1939-1948.

167. Tafreshi M, Guan J, Gorrell RJ, Chew N, Xin Y, Deswaerte V, Rohde M, Daly RJ, Peek RM, Jr., Jenkins BJ, Davies EM, Kwok T (2018) Helicobacter pylori type IV secretion system and its adhesin subunit, cagL, mediate potent inflammatory responses in primary human endothelial cells. Front Cell Infect Microbiol 8:22.

168. Tamanyan K, Walter LM, Weichard A, Davey MJ, Nixon GM, Biggs SN, Horne RS (2018) Age effects on cerebral oxygenation and behavior in children with sleep disordered breathing. Am J Respir Crit Care Med 197:1468-1477.

169. Tan C, Lavender I, Naismith A, Nguyen Q, Ptasznik R, Nandurkar D, Wong J, Kumar B, Fuller PJ, Coombs PR, Mond M (2018) Evaluation of a dedicated ultrasound fine needle aspiration service for thyroid nodules. Sonography 5:3-11.

170. Tan JL, Lau SN, Leaw B, Nguyen HPT, Salamonsen LA, Saad MI, Chan ST, Zhu D, Krause M, Kim C, Sievert W, Wallace EM, Lim R (2018) Amnion epithelial cell-derived exosomes restrict lung injury and enhance endogenous lung repair. Stem Cells Transl Med 7:180-196.

171. Thomas-White K, Forster SC, Kumar N, Van Kuiken M, Putonti C, Stares MD, Hilt EE, Price TK, Wolfe AJ, Lawley TD (2018) Culturing of female bladder bacteria reveals an interconnected urogenital microbiota. Nat Commun 9:1557.

172. Thong EP, Catford S, Fletcher J, Wong P, Fuller PJ, Teede H, Milat F (2018) Recurrent vertebral fractures in a young adult: a closer look at bone health in type 1 diabetes mellitus. Endocrinol Diabetes Metab Case Rep 2018:18-0010.

173. Thong EP, Wong P, Dev A, Ebeling PR, Teede HJ, Milat F (2018) Increased prevalence of fracture and hypoglycaemia in young adults with concomitant type 1 diabetes mellitus and coeliac disease. Clin Endocrinol (Oxf) 88:37-43.

174. Tian R, Li X, Gao Y, Li Y, Yang P, Wang K (2018) Identification and validation of the role of matrix metalloproteinase-1 in cervical cancer. Int J Oncol 52:1198-1208.

175. Tiwari A, Wong CS, Nekkanti LP, Deane JA, McDonald C, Li J, Pham Y, Sutherland AE, Jenkin G, Kirkland MA (2018) Controlling the effective oxygen tension experienced by cells using a dynamic culture technique for hematopoietic ex vivo expansion. Curr Protoc Stem Cell Biol 44:2A.11.1-2A.11.13.

176. Tolcos M, McDougall A, Shields A, Chung Y, O'Dowd R, Turnley A, Wallace M, Rees S (2018) Intrauterine growth restriction affects cerebellar granule cells in the developing guinea pig brain. Dev Neurosci 40:162-174.

177. Tran LS, Tran D, De Paoli A, D'Costa K, Creed SJ, Ng GZ, Le L, Sutton P, Silke J, Nachbur U, Ferrero RL (2018) NOD1 is required for Helicobacter pylori induction of IL-33 responses in gastric epithelial cells. Cell Microbiol 20:e12826.

178. Trinh A, Wong P, Fahey MC, Ebeling PR, Fuller PJ, Milat F (2018) Trabecular bone score in adults with cerebral palsy. Bone 117:1-5.

179. Tsai TS, St John JC (2018) The effects of mitochondrial DNA supplementation at the time of fertilization on the gene expression profiles of porcine preimplantation embryos. Mol Reprod Dev 85:490-504.

180. Tsai TS, Tyagi S, St. John JC (2018) The molecular characterisation of mitochondrial DNA deficient oocytes using a pig model. *Hum Reprod* 33:942-953.

181. Tsuji-Hosokawa A, Kashimada K, Kato T, Ogawa Y, Nomura R, Takasawa K, Lavery R, Coschiera A, Schlessinger D, Harley VR, Takada S, Morio T (2018) Peptidyl arginine deiminase 2 (Padi2) is expressed in Sertoli cells in a specific manner and regulated by SOX9 during testicular development. *Sci Rep* 8:13263.

182. Turner L, Bitto NJ, Steer DL, Lo C, D'Costa K, Ramm G, Shambrook M, Hill AF, Ferrero RL, Kaparakis-Liaskos M (2018) *Helicobacter pylori* outer membrane vesicle size determines their mechanisms of host cell entry and protein content. *Front Immunol* 9:1466.

183. van der Veeken L, Russo FM, van der Merwe J, Basurto D, Sharma D, Nguyen T, Eastwood MP, Khoshgoo N, Toelen J, Allegaert K, Dekoninck P, Hooper SB, Keijzer R, DE Coppi P, Deprest J (2018) Antenatal management of congenital diaphragmatic hernia today and tomorrow. *Minerva Pediatr* 70:270-280.

184. Vandeleur M, Walter LM, Armstrong DS, Robinson P, Nixon GM, Horne RSC (2018) Quality of life and mood in children with cystic fibrosis: associations with sleep quality. *J Cyst Fibros*. 17:811-820.

185. Walker RG, McCoy JC, Czepnik M, Mills MJ, Hagg A, Walton KL, Cotton TR, Hyvonen M, Lee RT, Gregorevic P, Harrison CA, Thompson TB (2018) Molecular characterization of latent GDF8 reveals mechanisms of activation. *Proc Natl Acad Sci USA* 115:E866-E875.

186. Walter LM, Ahmed B, Odoi A, Cooney H, Horne RSC, Wong FY (2018) Bradycardias are associated with more severe effects on cerebral oxygenation in very preterm infants than in late preterm infants. *Early Hum Dev* 127:33-41.

187. Walter LM, Tamanyan K, Limawan AP, Biggs SN, Weichard AJ, Davey MJ, Nixon GM, Horne RSC (2018) Overweight and obese children with sleep disordered breathing have elevated arterial stiffness. *Sleep Med* 48:187-193.

188. Walter LM, Tamanyan K, Nisbet LC, Davey MJ, Nixon GM, Horne RSC (2018) Obesity and anthropometric determinants of autonomic control in children with sleep-disordered breathing-which measurements matter? *Int J Obes (Lond)* 42:1195-1201.

189. Wang Y, Li Y, Hyett J, da Silva Costa F, Nie G (2018) HtrA3 isoform-specific ELISAs for early detection of preeclampsia. *SLAS Discov* 23:1092-1099.

190. Whitby S, Salamonsen LA, Evans J (2018) The endometrial polarity paradox: differential regulation of polarity within secretory phase human endometrium. *Endocrinology* 159:506-518.

191. Wijayarathna R, de Kretser D, Sreenivasan R, Ludlow H, Middendorff R, Meinhardt A, Loveland KL, Hedger MP (2018) Comparative analysis of activins A and B in the adult mouse epididymis and vas deferens. *Reproduction* 155:15-23.

192. Wijayarathna R, de Kretser DM, Meinhardt A, Middendorff R, Ludlow H, Groome NP, Loveland KA, Hedger MP (2018) Activin over-expression in the testis of mice lacking the inhibin alpha-subunit gene is associated with androgen deficiency and regression of the male reproductive tract. *Mol Cell Endocrinol* 470:188-198.

193. Wilson AL, Moffitt LR, Duffield N, Rainczuk A, Jobling TW, Plebanski M, Stephens AN (2018) Autoantibodies against HSF1 and CCDC155 as biomarkers of early-stage, high-grade serous ovarian cancer. *Cancer Epidemiol Biomarkers Prev* 27:183-192.

194. Winship A, Menkhorst E, Van Sinderen M, Dimitriadis E (2018) Interleukin 11 blockade during mid to late gestation does not affect maternal blood pressure, pregnancy viability or subsequent fertility in mice. *Reprod Biomed Online* 36:250-258.

195. Winship A, Ton A, Van Sinderen M, Menkhorst E, Rainczuk K, Griffiths M, Cuman C, Dimitriadis E (2018) Mouse double minute homologue 2 (MDM2) downregulation by miR-661 impairs human endometrial epithelial cell adhesive capacity. *Reprod Fertil Dev* 30:477-486.

196. Wong A, Cheung B, Nejad C, Gantier M, Graudins A (2018) Hepatotoxicity after paracetamol overdose in a patient with cystic fibrosis despite early acetylcysteine and utility of microRNA to predict hepatotoxicity. *Clin Toxicol (Phila)* 56:904-906.

197. Wooldridge AL, Bischof RJ, Liu H, Heinemann GK, Hunter DS, Giles LC, Simmons RA, Lien YC, Lu W, Rabinowitz JD, Kind KL, Owens JA, Clifton VL, Gatford KL (2018) Late-gestation maternal dietary methyl donor and cofactor supplementation in sheep partially reverses protection against allergic sensitization by IUGR. *Am J Physiol Regul Integr Comp Physiol* 314:R22-R33.

198. Xiang SD, Wilson KL, Goubier A, Heyerick A, Plebanski M (2018) Design of peptide-based nanovaccines targeting leading antigens from gynecological cancers to induce HLA-A2.1 restricted CD8(+) T cell responses. *Front Immunol* 9:2968.

199. Yiallourou SR, Arena BC, Wallace EM, Odoi A, Hollis S, Weichard A, Horne RSC (2018) Being born too small and too early may alter sleep in childhood. *Sleep* 41:zsx193.

200. Ying L, Yan F, Meng Q, Yu L, Yuan X, Gantier MP, Williams BRG, Chan DW, Shi L, Tu Y, Ni P, Wang X, Chen W, Zang X, Xu D, Hu Y (2018) PD-L1 expression is a prognostic factor in subgroups of gastric cancer patients stratified according to their levels of CD8 and FOXP3 immune markers. *OncoImmunology* 7:e1433520.

201. Ying L, Yan F, Williams BRG, Xu P, Li X, Zhao Y, Hu Y, Wang Y, Xu D, Dai J (2018) (-)-Epigallocatechin-3-gallate and EZH2 inhibitor GSK343 have similar inhibitory effects and mechanisms of action on colorectal cancer cells. *Clin Exp Pharmacol Physiol* 45:58-67.

202. Yu L, Wu D, Gao H, Balic J, Tsykin A, Han TS, Liu YD, Kennedy CL, Li JK, Mao JQ, Tan P, Oshima M, Goodall GJ, Jenkins BJ (2018) Clinical utility of a STAT3-regulated microRNA-200 family signature with prognostic potential in early gastric cancer. *Clin Cancer Res* 24:1459-1472.

203. Yuen HLA, Low MSY, Fedele P, Kalff A, Walker P, Bergin K, Coutsouvelis J, Grigoriadis G, Spencer A (2018) DCEP as a bridge to ongoing therapies for advanced relapsed and/or refractory multiple myeloma. *Leuk Lymphoma* 59:2842-2846.

204. Zahid H, Subbaramaiah K, Iyengar NM, Zhou XK, Chen IC, Bhardwaj P, Gucalp A, Morrow M, Hudis CA, Dannenberg AJ, Brown KA (2018) Leptin regulation of the p53-HIF1alpha/PKM2-aromatase axis in breast adipose stromal cells-a novel mechanism for the obesity-breast cancer link. *Int J Obes (Lond)* 42:711-720.

205. Zhai J, Luwor RB, Ahmed N, Escalona R, Tan FH, Fong C, Ratcliffe J, Scoble JA, Drummond CJ, Tran N (2018) Paclitaxel-loaded self-assembled lipid nanoparticles as targeted drug delivery systems for the treatment of aggressive ovarian cancer. *ACS Appl Mater Interfaces* 10:25174-25185.

206. Zhang G, deWeerd NA, Stifter SA, Liu L, Zhou B, Wang W, Zhou Y, Ying B, Hu X, Matthews AY, Ellis M, Triccas JA, Hertzog PJ, Britton WJ, Chen X, Feng CG (2018) A proline deletion in IFNAR1 impairs IFN-signaling and underlies increased resistance to tuberculosis in humans. *Nat Commun* 9:85.

Reviews

1. Abd Rahman R, DeKoninck P, Murthi P, Wallace EM (2018) Treatment of preeclampsia with hydroxychloroquine: a review. J Matern Fetal Neonatal Med 31:525-529.

2. Ahmed N, Escalona R, Leung D, Chan E, Kannourakis G (2018) Tumour microenvironment and metabolic plasticity in cancer and cancer stem cells: perspectives on metabolic and immune regulatory signatures in chemoresistant ovarian cancer stem cells. Semin Cancer Biol 53:265-281.

3. Alasseiri M, Ahmed AU, Williams BRG (2018) Mechanisms and consequences of constitutive activation of integrin-linked kinase in acute myeloid leukemia. Cytokine Growth Factor Rev 43:1-7.

4. Aleksova J, Ng KW, Jung C, Zeimer H, Dwyer KM, Milat F, MacIsaac RJ (2018) Bone health in chronic kidney disease-mineral and bone disorder a clinical case seminar and update. Intern Med J 48:1435-1446.

5. Aleksova J, Rodriguez AJ, McLachlan R, Kerr P, Milat F, Ebeling PR (2018) Gonadal hormones in the pathogenesis and treatment of bone health in patients with chronic kidney disease: a systematic review and meta-analysis. Curr Osteoporos Rep 16:674-692.

6. Bellofiore N, Cousins F, Temple-Smith P, Dickinson H, Evans J (2018) A missing piece: the spiny mouse and the puzzle of menstruating species. J Mol Endocrinol 61:R25-R41.

7. Bennet L, Walker DW, Horne RSC (2018) Waking up too early - the consequences of preterm birth on sleep development. J Physiol 596:5687-5708.

8. Berry W, Lundy J, Croagh D, Jenkins BJ (2018) Reviewing the utility of EUS FNA to advance precision medicine in pancreatic cancer. Cancers (Basel) 10:35.

9. Bertoldo MJ, Andraweera PH, Bromfield EG, Cousins FL, Lindsay LA, Paiva P, Regan SL, Rose RD, Akison LK (2018) Recent and emerging reproductive biology research in Australia and New Zealand: highlights from the Society for Reproductive Biology Annual Meeting, 2017. Reprod Fertil Dev 30:1049-1054.

10. Bolch C, Fahey M, Reddihough D, Williams K, Reid S, Guzys A, Cole S, Edwards A, Fung A, Hodges R, Palma-Dias R, Teoh M, Walker S (2018) Twin-to-twin transfusion syndrome neurodevelopmental follow-up study (neurodevelopmental outcomes for children whose twin-to-twin transfusion syndrome was treated with placental laser photocoagulation). BMC Pediatr 18:256.

11. Cramer SJE, Dekker J, Dankelman J, Pauws SC, Hooper SB, Te Pas AB (2018) Effect of tactile stimulation on termination and prevention of apnea of prematurity: a systematic review. Front Pediatr 6:45.

12. Croft B, Ohnesorg T, Sinclair AH (2018) The role of copy number variants in disorders of sex development. Sex Dev 12:19-29.

13. Ellery SJ, Kelleher M, Grigsby P, Burd I, Derks JB, Hirst J, Miller SL, Sherman LS, Tolcos M, Walker D (2018) Antenatal prevention of cerebral palsy and childhood disability: is the impossible possible? J Physiol 596:5593-5609.

14. Escalona RM, Chan E, Kannourakis G, Findlay JK, Ahmed N (2018) The many facets of metzincins and their endogenous inhibitors: Perspectives on ovarian cancer progression. Int J Mol Sci 19:450.

15. Evans MA, Broughton BRS, Drummond GR, Ma H, Phan TG, Wallace EM, Lim R, Sobey CG (2018) Amnion epithelial cells - a novel therapy for ischemic stroke? Neural Regen Res 13:1346-1349.

16. Galinsky R, Davidson JO, Dean JM, Green CR, Bennet L, Gunn AJ (2018) Glia and hemichannels: key mediators of perinatal encephalopathy. Neural Regen Res 13:181-189.

17. Galinsky R, Lear CA, Dean JM, Wassink G, Dhillon SK, Fraser M, Davidson JO, Bennet L, Gunn AJ (2018) Complex interactions between hypoxia-ischemia and inflammation in preterm brain injury. Dev Med Child Neurol 60:126-133.

18. Galland BC, Short MA, Terrill P, Rigney G, Haszard JJ, Coussens S, Foster-Owens M, Biggs SN (2018) Establishing normal values for pediatric nighttime sleep measured by actigraphy: a systematic review and meta-analysis. Sleep 41:zsy017.

19. Grossmann M, Ramchand S, Milat F, Vincent A, Lim E, Kotowicz MA, Hicks J, Teede H (2018) Assessment and management of bone health in women with oestrogen receptor-positive breast cancer receiving endocrine therapy: Position statement of the Endocrine Society of Australia, the Australian and New Zealand Bone & Mineral Society, the Australasian Menopause Society and the Clinical Oncology Society of Australia. Clin Endocrinol (Oxf) 89:280-296.

20. Guanizo AC, Fernando CD, Garama DJ, Gough DJ (2018) STAT3: a multifaceted oncoprotein. Growth Factors 36:1-14.

21. Ilangumaran S, Williams BRG, Kalvakolanu DV (2018) Meeting summary: 2nd Aegean Conference on Cytokine Signaling in Cancer. Cytokine 108:225-231.

22. Jane Bennett C, Elizabeth Walker R, Louise Blumfield M, Gwini SM, Ma J, Wang F, Wan Y, Dickinson H, Truby H (2018) Interventions designed to reduce excessive gestational weight gain can reduce the incidence of gestational diabetes mellitus: A systematic review and meta-analysis of randomised controlled trials. Diabetes Res Clin Pract 141:69-79.

23. Jarred EG, Bildsoe H, Western PS (2018) Out of sight, out of mind? germ cells and the potential impacts of epigenomic drugs. F1000Res 7:F1000 Faculty Rev-1967.

24. Jones SA, Jenkins BJ (2018) Recent insights into targeting the IL-6 cytokine family in inflammatory diseases and cancer. Nat Rev Immunol 18:773-789.

25. Kampan NC, Xiang SD, McNally OM, Stephens AN, Quinn MA, Plebanski M (2018) Immunotherapeutic Interleukin-6 or Interleukin-6 receptor blockade in cancer: challenges and opportunities. Curr Med Chem 25:4785-4806.

26. Knol R, Brouwer E, Vernooij ASN, Klumper F, DeKoninck P, Hooper SB, Te Pas AB (2018) Clinical aspects of incorporating cord clamping into stabilisation of preterm infants. Arch Dis Child Fetal Neonatal Ed 103:F493-F497.

27. Kusuma GD, Barabadi M, Tan JL, Morton DAV, Frith JE, Lim R (2018) To protect and to preserve: novel preservation strategies for extracellular vesicles. Front Pharmacol 9:1199.

28. Liu H, Mukherjee S, Liu Y, Ramakrishna S (2018) Recent studies on electrospinning preparation of patterned, core–shell, and aligned scaffolds. J Appl Polym Sci 135:46570.

29. Maresch CC, Stute DC, Alves MG, Oliveira PF, de Kretser DM, Linn T (2018) Diabetes-induced hyperglycemia impairs male reproductive function: a systematic review. Hum Reprod Update 24:86-105.

30. Michelle DT, Ashley M (2018) An update on the NLRP3 inflammasome and influenza: the road to redemption or perdition? Curr Opin Immunol 54:80-85.

31. Morrison JL, Berry MJ, Botting KJ, Darby JRT, Frasch MG, Gatford KL, Giussani DA, Gray CL, Harding R, Herrera EA, Kemp MW, Lock MC, McMillen IC, Moss TJ, Musk GC, Oliver MH, Regnault TRH, Roberts CT, Soo JY, Tellam RL (2018) Improving pregnancy outcomes in humans through studies in sheep. Am J Physiol Regul Integr Comp Physiol 315:R1123-R1153.

32. Neville BA, Forster SC, Lawley TD (2018) Commensal Koch's postulates: establishing causation in human microbiota research. Curr Opin Microbiol 42:47-52.

33. Nguyen HH, van de Laarschot DM, Verkerk AJ, Milat F, Zillikens MC, Ebeling PR (2018) Genetic risk factors for atypical femoral fractures (AFFs): a systematic review. JBMR Plus 2:1-11.

34. Niederberger C, Pellicer A, Cohen J, Gardner DK, Palermo GD, O'Neill CL, Chow S, Rosenwaks Z, Cobo A, Swain JE, Schoolcraft WB, Frydman R, Bishop LA, Aharon D, Gordon C, New E, Decherney A, Tan SL, Paulson RJ, Goldfarb JM, Brännström M, Donnez J, Silber S, Dolmans MM, Simpson JL, Handyside AH, Munné S, Eguizabal C, Montserrat N, Izpisua Belmonte JC, Trounson A, Simon C, Tulandi T, Giudice LC, Norman RJ, Hsueh AJ, Sun Y, Laufer N, Kochman R, Eldar-Geva T, Lunenfeld B, Ezcurra D, D'Hooghe T, Fauser BCJM, Tarlatzis BC, Meldrum DR, Casper RF, Fatemi HM, Devroey P, Galliano D, Wikland M, Sigman M, Schoor RA, Goldstein M, Lipshultz LI, Schlegel PN, Hussein A, Oates RD, Brannigan RE, Ross HE, Pennings G, Klock SC, Brown S, Van Steirteghem A, Rebar RW, LaBarbera AR (2018) Forty years of IVF. Fertil Steril 110:185-324.e185.

35. Pike LJ, Forster SC (2018) A new piece in the microbiome puzzle. Nat Rev Microbiol 16:186.

36. Pinares-Garcia P, Stratikopoulos M, Zagato A, Loke H, Lee J (2018) Sex: A significant risk factor for neurodevelopmental and neurodegenerative disorders. *Brain Sci* 8:154.

37. Quezada S, Castillo-Melendez M, Walker DW, Tolcos M (2018) Development of the cerebral cortex and the effect of the intrauterine environment. J Physiol 596:5665-5674.

38. Sadler AJ (2018) The role of MDA5 in the development of autoimmune disease. J Leukoc Biol 103:185-192.

39. Sharpe AJ, McKenzie M (2018) Mitochondrial fatty acid oxidation disorders associated with short-chain enoyl-coa hydratase (ECHS1) deficiency. Cells 7:46.

40. Shepherd KL, Yiallourou SR, Horne RSC, Wong FY (2018) Prone sleeping position in infancy: Implications for cardiovascular and cerebrovascular function. Sleep Med Rev 39:174-186.

41. Simon C, Greening DW, Bolumar D, Balaguer N, Salamonsen LA, Vilella F (2018) Extracellular vesicles in human reproduction in health and disease. Endocr Rev 39:292-332.

42. Skinner S, Dekoninck P, Crossley K, Amberg B, Deprest J, Hooper S, Hodges R (2018) Partial amniotic carbon dioxide insufflation for fetal surgery. Prenat Diagn 38:989-993.

43. St John JC, Srirattana K, Tsai TS, Sun X (2018) The mitochondrial genome: how it drives fertility Repro Fertil Dev 30:118-139.

44. Stojanovska V, Miller SL, Hooper SB, Polglase GR (2018) The consequences of preterm birth and chorioamnionitis on brainstem respiratory centers: Implications for neurochemical development and altered functions by inflammation and prostaglandins. Front Cell Neurosci 12:26.

45. Thong EP, Herath M, Weber DR, Ranasinha S, Ebeling PR, Milat F, Teede H (2018) Fracture risk in young and middle-aged adults with type 1 diabetes mellitus: A systematic review and meta-analysis. Clin Endocrinol (Oxf) 89:314-323.

46. Trounson A (2018) Development of in vitro fertilization in Australia. Fertil Steril 110:19-24.

47. Viaroli F, Cheung PY, O'Reilly M, Polglase GR, Pichler G, Schmolzer GM (2018) Reducing brain injury of preterm infants in the delivery room. Front Pediatr 6:290.

48. Western PS (2018) Epigenomic drugs and the germline: collateral damage in the home of heritability? Mol Cell Endocrinol 468:121-133.

49. Wilson AL, Plebanski M, Stephens AN (2018) New trends in anti-cancer therapy: combining conventional chemotherapeutics with novel immunomodulators. Curr Med Chem 25:4758-4784.

50. Winship A, Dimitriadis E (2018) Interleukin 11 is upregulated in preeclampsia and leads to inflammation and preeclampsia features in mice. *J Reprod Immunol* 125:32-38.

EPub ahead of print

1. Alexiadis M, Rowley SM, Chu S, Leung DTH, Stewart CJR, Amarasinghe KC, Campbell IG, Fuller PJ (2018) Mutational landscape of ovarian adult granulosa cell tumors from whole exome and targeted TERT promoter sequencing. Mol Cancer Res. DOI: 10.1158/1541-7786.MCR-18-0359

2. Allison BJ, LaRosa DA, Barton SK, Hooper SB, Zahra VA, Tolcos M, Chan KY, Barbuto J, Inocencio IM, Moss TJ, Polglase GR (2018) Dose-dependent exacerbation of ventilation-induced lung injury by erythropoietin in preterm newborn lambs. J Appl Physiol. DOI: 10.1152/japplphysiol.00800.2018

3. Amberg B, Hodges R, Kashyap A, Skinner S, Rodgers K, McGillick E, Deprest J, Hooper S, Crossley K, Dekoninck P (2018) Physiological effects of cold-dry versus heated-humidified partial amniotic carbon dioxide insufflation in sheep. Ultrasound Obstet Gynecol. DOI: 10.1002/uog.20180

4. Bellofiore N, Cousins F, Temple-Smith P, Evans J (2018) Altered exploratory behaviour and increased food intake in the spiny mouse before menstruation: a unique pre-clinical model for examining premenstrual syndrome. Hum Reprod. DOI: 10.1093/humrep/dey360

5. Brouwer E, Knol R, Vernooij ASN, van den Akker T, Vlasman PE, Klumper F, DeKoninck P, Polglase GR, Hooper SB, Te Pas AB (2018) Physiological-based cord clamping in preterm infants using a new purpose-built resuscitation table: a feasibility study. Arch Dis Child Fetal Neonatal Ed. DOI: 10.1136/archdischild-2018-315483

6. Chen Z, Liu X, Li F, Li C, Marquez-Lago T, Leier A, Akutsu T, Webb GI, Xu D, Smith AI, Li L, Chou KC, Song J (2018) Large-scale comparative assessment of computational predictors for lysine post-translational modification sites. Brief Bioinform. DOI: 10.1093/bib/bby089

7. Cohen E, Baerts W, Caicedo Dorado A, Naulaers G, van Bel F, Lemmers PMA (2018) Cerebrovascular autoregulation in preterm fetal growth restricted neonates. Arch Dis Child Fetal Neonatal Ed. DOI: 10.1136/archdischild-2017-313712

8. Cousins F, O DF, Ong YR, Breault DT, Deane JA, Gargett CE (2018) Telomerase reverse transcriptase expression in mouse endometrium during re-epithelialization and regeneration in a menses-like model. Stem Cells Dev. DOI: 10.1089/scd.2018.0133

9. Cumming HE, Bourke NM (2018) Type I IFNs in the female reproductive tract: the first line of defense in an ever-changing battleground. J Leukoc Biol. DOI: 10.1002/JLB.MR0318-122RR

10. Deane JA, Ong Y, Cousins FL, Gargett CE (2018) Bone marrow-derived endometrial cells: transdifferentiation or misidentification? Hum Reprod Update. DOI: 10.1093/humupd/dmy041

11. Dunleavy JEM, O'Bryan M, Stanton PG, O'Donnell L (2018) The cytoskeleton in spermatogenesis. Reproduction. DOI: 10.1530/REP-18-0457

12. Ellery SJ, Goss MG, Brew N, Dickinson H, Hale N, LaRosa DA, Walker DW, Wong FY (2018) Evaluation of 3K3A-activated protein c to treat neonatal hypoxic ischemic brain injury in the spiny mouse. Neurotherapeutics. DOI: 10.1007/s13311-018-0661-0

13. Evans J, Infusini G, McGovern J, Cuttle L, Webb A, Nebl T, Milla L, Kimble R, Kempf M, Andrews CJ, Leavesley D, Salamonsen LA (2018) Menstrual fluid factors facilitate tissue repair: Identification and functional action in endometrial and skin repair. Faseb J. DOI: 10.1096/fj.201800086R

14. Falcao-Tebas F, Kuang J, Arceri C, Kerris JP, Andrikopoulos S, Marin EC, McConell GK (2018) Four weeks of exercise early in life reprograms adult skeletal muscle insulin resistance caused by paternal high fat diet. J Physiol. DOI: 10.1113/JP276386

15. Findlay JK, Dunning KR, Gilchrist RB, Hutt KJ, Russell KL, Walters KA (2018) Follicle selection in mammalian ovaries. In The Ovary, 3rd Edn. Leung P, Adashi E, eds. London: Academic Press. DOI: 10.1016/C2016-0-04488-1

16. Flenady V, Ellwood D, Bradford B, Coory M, Middleton P, Gardener G, Radestad I, Homer C, Davies-Tuck M, Forster D, Gordon A, Groom K, Crowther C, Walker S, Foord C, Warland J, Murphy M, Said J, Boyle F, O'Donoghue K, Cronin R, Sexton J, Weller M, McCowan L (2018) Beyond the headlines: fetal movement awareness is an important stillbirth prevention strategy. Women Birth. DOI: 10.1016/j.wombi.2018.12.001

17. Foreman M, Hare L, York K, Balakrishnan K, Sánchez FJ, Harte F, Erasmus J, Vilain E, Harley VR (2018) Genetic link between gender dysphoria and sex hormone signaling. J Clin Endocrinol Metab. DOI: 10.1210/jc.2018-01105

18. Gu W, Wang L, Wu Y, Liu JP (2018) Undo the brake of tumour immune tolerance with antibodies, peptides and small molecule compounds targeting PD-1/PD-L1 checkpoint at different locations for acceleration of cytotoxic immunity to cancer cells. Clin Exp Pharmacol Physiol. DOI: 10.1111/1440-1681.13056

19. Hapangama DK, Drury J, Da Silva L, Al-Lamee H, Earp A, Valentijn AJ, Edirisinghe DP, Murray PA, Fazleabas AT, Gargett CE (2018) Abnormally located SSEA1+/SOX9+ endometrial epithelial cells with a basalis-like phenotype in the eutopic functionalis layer may play a role in the pathogenesis of endometriosis. Hum Reprod. DOI: 10.1093/humrep/dey336

20. Hart RJ, Doherty DA, Mori TA, Adams LA, Huang RC, Minaee N, Handelsman DJ, McLachlan R, Norman RJ, Dickinson JE, Olynyk JK, Beilin LJ (2018) Features of the metabolic syndrome in late adolescence are associated with impaired testicular function at 20 years of age. Hum Reprod. DOI: 10.1093/humrep/dey371

21. Horne RS, Wijayaratne P, Nixon GM, Walter LM (2018) Sleep and sleep disordered breathing in children with down syndrome: Effects on behaviour, neurocognition and the cardiovascular system. Sleep Med Rev. DOI: 10.1016/j.smrv.2018.11.002

22. Huynh J, Chand A, Gough D, Ernst M (2018) Therapeutically exploiting STAT3 activity in cancer - using tissue repair as a road map. Nat Rev Cancer. DOI: 10.1038/s41568-018-0090-8

23. Khong SML, Lee M, Kosaric N, Khong DM, Dong Y, Hopfner U, Aitzetmüller MM, Duscher D, Schäfer R, Gurtner GC (2018) Single-cell transcriptomics of human mesenchymal stem cells reveal age-related cellular subpopulation depletion and impaired regenerative function. Stem Cells. DOI: 10.1002/stem.2934

24. Knarston IM, Robevska G, van den Bergen JA, Eggers S, Croft B, Yates J, Hersmus R, Looijenga LHJ, Cameron FJ, Monhike K, Ayers KL, Sinclair AH (2018) NR5A1 gene variants repress the ovarian-specific WNT signalling pathway in 46,XX disorders of sex development patients. Hum Mutat. DOI: 10.1002/humu.23672

25. Krishnan SM, Ling YH, Huuskes BM, Ferens D, Saini N, Chan CT, Diep H, Kett MM, Samuel CS, Kemp-Harper BK, Robertson AAB, Cooper MA, Peter K, Latz E, Mansell A, Sobey CG, Drummond GR, Vinh A (2018) Pharmacological inhibition of the NLRP3 inflammasome reduces blood pressure, renal damage and dysfunction in salt-sensitive hypertension. Cardiovasc Res. DOI: 10.1093/cvr/cvy252

26. Laurent I, Astere M, Zheng F, Chen X, Yang J, Cheng Q, Li Q (2018) Adrenal venous sampling with or without adrenocorticotropic hormone stimulation: a meta-analysis. J Clin Endocrinol Metab. DOI: 10.1210/jc.2018-01324

27. Leong TL, Gayevskiy V, Steinfort DP, De Massy MR, Gonzalez-Rajal A, Marini KD, Stone E, Chin V, Havryk A, Plit M, Irving LB, Jennings BR, McCloy RA, Jayasekara WSN, Alamgeer M, Boolell V, Field A, Russell PA, Kumar B, Gough DJ, Szczepny A, Ganju V, Rossello FJ, Cain JE, Papenfuss AT, Asselin-Labat ML, Cowley MJ, Watkins

DN (2018) Deep multi-region whole-genome sequencing reveals heterogeneity and gene-by-environment interactions in treatment-naive, metastatic lung cancer. Oncogene. DOI: 10.1038/s41388-018-0536-1

28. Leung DTH, Nguyen T, Oliver EM, Matti J, Alexiadis M, Silke J, Jobling TW, Fuller PJ, Chu S (2018) Combined PPARg activation and XIAP inhibition as a potential therapeutic strategy for ovarian granulosa cell tumors. Mol Cancer Ther. DOI: 10.1158/1535-7163.MCT-18-0078

29. Liu YD, Yu L, Ying L, Balic J, Gao H, Deng NT, West A, Yan F, Ji CB, Gough D, Tan P, Jenkins BJ, Li JK (2018) Toll-like receptor 2 regulates metabolic reprogramming in gastric cancer via superoxide dismutase 2. Int J Cancer. DOI: 10.1002/ijc.32060

30. Martherus T, Oberthuer A, Dekker J, Hooper SB, McGillick EV, Kribs A, Te Pas AB (2018) Supporting breathing of preterm infants at birth: a narrative review. Arch Dis Child Fetal Neonatal Ed. DOI: 10.1136/archdischild-2018-314898

31. Massillo C, Dalton GN, Porretti J, Scalise GD, Farre PL, Piccioni F, Secchiari F, Pascuali N, Clyne C, Gardner K, De Luca P, De Siervi A (2018) CTBP1/CYP19A1/Estradiol axis together with adipose tissue impacts over prostate cancer growth associated to metabolic syndrome. Int J Cancer. DOI: 10.1002/ijc.31773

32. Mian Q, Cheung PY, O'Reilly M, Barton SK, Polglase GR, Schmolzer GM (2018) Impact of delivered tidal volume on the occurrence of intraventricular haemorrhage in preterm infants during positive pressure ventilation in the delivery room. Arch Dis Child Fetal Neonatal Ed. DOI: 10.1136/archdischild-2017-313864

33. Mukherjee S, Darzi S, Rosamilia A, Kadam V, Truong Y, Werkmeister JA, Gargett CE (2018) Blended nanostructured degradable mesh with endometrial mesenchymal stem cells promotes tissue integration and anti-inflammatory response in vivo for pelvic floor application. Biomacromolecules. DOI: 10.1021/acs.biomac.8b01661

34. Parambi A, Davies-Tuck M, Palmer KR (2018) Comparison of maternal and perinatal outcomes in women with super obesity based on planned mode of delivery. Aust N Z J Obstet Gynaecol. DOI: 10.1111/ajo.12870

35. Pillman KA, Goodall GJ, Bracken CP, Gantier MP (2018) miRNA length variation during macrophage stimulation confounds the interpretation of results: implications for miRNA quantification by RT-qPCR. RNA. DOI: 10.1261/rna.069047.118

36. Ramanathan A, Zhou L, Marzbanrad F, Roseby R, Tan K, Kevat A, Malhotra A (2018) Digital stethoscopes in paediatric medicine. Acta Paediatr. DOI: 10.1111/apa.14686

37. Ranzil S, Walker DW, Borg AJ, Wallace EM, Ebeling PR, Murthi P (2018) The relationship between the placental serotonin pathway and fetal growth restriction. Biochimie. DOI: 10.1016/j.biochi.2018.12.016

38. Salamonsen L (2018) My womban's life: understanding human endometrial function. Reproduction. DOI: 10.1530/REP-18-0518

39. Sarma UC, Findlay JK, Hutt KJ (2018) Oocytes from stem cells. Best Pract Res Clin Obstet Gynaecol. DOI: 10.1016/j.bpobgyn.2018.07.006

40. Sehgal A, Dahlstrom JE, Chan Y, Allison BJ, Miller SL, Polglase GR (2018) Placental histopathology in preterm fetal growth restriction. J Paediatr Child Health. DOI: 10.1111/jpc.14251

41. Sehgal A, Gwini SM, Menahem S, Allison BJ, Miller SL, Polglase GR (2018) Preterm growth restriction and bronchopulmonary dysplasia: The vascular hypothesis and related physiology. J Physiol. DOI: 10.1113/JP276040

42. Sehgal A, Murthi P, Dahlstrom JE (2018) Vascular changes in fetal growth restriction: Clinical relevance and future therapeutics. J Perinatol. DOI: 10.1038/s41372-018-0287-4

43. Shepherd KL, Yiallourou SR, Odoi A, Brew N, Yeomans E, Willis S, Horne RSC, Wong FY (2018) Effects of prone sleeping on cerebral oxygenation in preterm infants. J Pediatr. DOI: 10.1016/j.jpeds.2018.08.076

44. Sher I, Daly C, Oehme D, Chandra RV, Sher M, Ghosh P, Smith J, Goldschlager T (2018) Novel application of the Pfirrmann disc degeneration grading system to 9.4T MRI: higher reliability compared to 3T MRI. Spine. DOI: 10.1097/BRS.0000000000002967

45. Southwick G, Paddle A (2018) Upper Arms: Rejuvenation of the arm. In Aesthetic Surgery Techniques. Frame JD, Bagheri SC, Smith DJ, Khan HA, eds. London. DOI: 10.1016/B978-0-323-41745-7.00036-9

46. Szarek M, Bergmann M, Konrad L, Schuppe HC, Kliesch S, Hedger MP, Loveland KL (2018) Activin A target genes are differentially expressed between normal and neoplastic adult human testes: Clues to gonocyte fate choice. Andrology. DOI: 10.1111/andr.12553

47. Théry C, Witwer KW, Aikawa E, Alcaraz MJ, Anderson JD, Andriantsitohaina R, Antoniou A, Arab T, Archer F, Atkin-Smith GK, Ayre DC, Bach JM, Bachurski D, Baharvand H, Balaj L, Baldacchino S, Bauer NN, Baxter AAet al (2018) Minimal information for studies of extracellular vesicles 2018 (MISEV2018): a position statement of the International Society for Extracellular Vesicles and update of the MISEV2014 guidelines. J Extracell Vesicles. DOI: 10.1080/20013078.2018.1535750

48. Thio M, Dawson JA, Crossley KJ, Moss TJ, Roehr CC, Polglase GR, Davis PG, Hooper SB (2018) Delivery of positive end-expiratory pressure to preterm lambs using common resuscitation devices. Arch Dis Child Fetal Neonatal Ed. DOI: 10.1136/archdischild-2017-314064

49. Vemuri R, Sylvia KE, Klein SL, Forster SC, Plebanski M, Eri R, Flanagan KL (2018) The microgenderome revealed: sex differences in bidirectional interactions between the microbiota, hormones, immunity and disease susceptibility. Semin Immunopathol. DOI: 10.1007/s00281-018-0716-7

50. Walter LM, Tamanyan K, Weichard AJ, Davey MJ, Nixon GM, Horne RS (2018) Sleep disordered breathing in children disrupts the maturation of autonomic control of heart rate and its association with cerebral oxygenation. J Physiol. DOI: 10.1113/JP276933

51. Wang Z, Li J, Liu JP (2018) Effects of cation charges on the binding of stabilizers with human telomere and TERRA G-quadruplexes. J Biomol Struct Dyn. DOI: 10.1080/07391102.2018.1471416

52. Weiner GM, Hooper SB, Davis PG, Wyckoff MH (2018) Respiratory and cardiovascular support in the delivery room. In The Newborn Lung, 3rd Edn. Bancalari E, ed. Philadelphia. DOI: 10.1016/B978-0-323-54605-8.00010-6

53. Wilson AL, Wilson KL, Bilandzic M, Moffitt LR, Makanji M, Gorrell MD, Oehler MK, Rainczuk A, Stephens AN, Plebanski M (2018) Non-invasive fluorescent monitoring of ovarian cancer in an immunocompetent mouse model. Cancers (Basel). DOI: 10.3390/cancers11010032

54. Wittert G, Atlantis E, Allan C, Bracken K, Conway A, Daniel M, Gebski V, Grossmann M, Hague W, Handelsman D, Inder W, Jenkins A, Keech A, McLachlan R, Robledo K, Stuckey B, Yeap BB (2018) Testosterone therapy to prevent type 2 diabetes mellitus in at-risk men (T4DM): design and implementation of a double-blind randomised controlled trial. Diabetes Obes Metab. DOI: 10.1111/dom.13601

55. Wood PJ, Strong R, McArthur GA, Michael M, Algar E, Muscat A, Rigby L, Ferguson M, Ashley DM (2018) A phase I study of panobinostat in pediatric patients with refractory solid tumors, including CNS tumors. Cancer Chemother Pharmacol. DOI: 10.1007/s00280-018-3634-4

56. Yabal M, Calleja DJ, Simpson DS, Lawlor KE (2018) Stressing out the mitochondria: mechanistic insights into NLRP3 inflammasome activation. J Leukocyte Biol. DOI: 10.1002/JLB.MR0318-124R

57. Yang X, Devianti M, Yang YH, Ong YR, Tan KS, Gurung S, Tan J, Zhu D, Lim R, Gargett CE, Deane J (2018) Endometrial mesenchymal stem/stromal cell modulation of T cell proliferation. Reproduction. DOI: 10.1530/REP-18-0266

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