

Woolcock Institute of Medical Research

BIENNIAL REPORT

2018 + 2019



Our work makes a difference to people's lives

www.woolcock.org.au

WOOLCOCK 
LEADERS IN BREATHING & SLEEP RESEARCH

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Portrait of Professor Ann Woolcock. Artist: Anne Spudvilas (2002)

ABOUT US

WHO WE ARE

Currently ranked as the leading sleep and respiratory research institute in Australia, the Woolcock is a globally renowned network of researchers and clinicians who deal with the causes, prevention, diagnosis and treatment of respiratory disease and sleep disorders.

OUR HISTORY

The late Professor Ann Woolcock (1937–2001) established the Institute in Sydney in 1981 with a vision to become Australia's centre of excellence for respiratory research. Originally called the Institute of Respiratory Medicine, the Institute was renamed in 2002 in honour of its founder. The Woolcock Institute soon outgrew its first home at the Royal Prince Alfred Hospital, Camperdown and expanded into several locations. In 2008 the Woolcock moved to the purpose-built laboratory and clinical complex in nearby Glebe where it remains today. The move was made possible with the generous support of the state and federal governments. In recent years our activities have continued to grow and diversify into related areas such as paediatric sleep disorders, lung cancer and emphysema.

OUR VISION

Improved quality of life for individuals and families affected by sleep, breathing and lung disorders.

OUR ASPIRATION

The Woolcock aspires to maintain our world leading research impact by the translation of sleep, respiratory and lung cancer research into better clinical outcomes globally.

OUR VALUES

RESPECT

- We support open, respectful discussion, effective communication, transparent decision making and productive internal governance practices
- We always show respect for staff, patients, families and carers as well as referring clinicians

EXCELLENCE

- We strive for excellence and innovation in research, research translation, clinical care and patient outcomes

PARTNERSHIP

- We actively seek mutually beneficial internal and external partnerships
- We strive to obtain the best possible outcomes with our multidisciplinary and multifaceted approach to addressing respiratory and sleep disorders

SUPPORT

- We support and, where possible, resource individuals and teams to achieve their goals and potential

OPPORTUNITY

- We explore creative ways of providing quality career and learning opportunities for researchers, students, associates and staff

Woolcock named world's best in field

In 2018 the Woolcock Institute of Medical Research was ranked the top specialist sleep and respiratory health research centre in the world by the influential data firm Times Higher Education.

These global rankings placed the Woolcock 52nd in the world for research excellence based on citations for publications within each field of research. It was the highest-ranked specialist sleep and respiratory research centre globally. The listing put the Woolcock 5th among Australia's best research organisations, and confirms it as the highest-ranked medical research centre associated with the University of Sydney.

PARTNERSHIPS AND AFFILIATIONS

The Institute has strong affiliations with many organisations including the University of Sydney, the University of Technology Sydney (UTS), the University of New South Wales (UNSW), Sydney Local Health District, Northern Sydney Local Health District, National Lung Hospital in Hanoi, Vietnam and several other major health districts, health care provider networks, professional bodies, commercial companies and research funding organisations.

In addition, the Woolcock's scientists and clinicians collaborate with colleagues across Australia, Asia, Europe and North America. We also operate a branch office in Vietnam (Woolcock Vietnam).



KEY PRIORITIES

- Strengthening our world class position by broadening and deepening our range of research into sleep and respiratory disorders
- Building on progress with lung cancer and emphysema initiatives to change the life of patients
- Expanding the work of the clinics and improve the patient voice
- Establishing a new physical home for the Woolcock
- Developing a program for recruitment of PhD students
- Increasing the contribution of philanthropy to the Woolcock sustainability and success

- Improving our profile by increasing our media and social media presence
- Establishing new clinical research networks in NSW, nationally and internationally
- Exploring ways to build our impact in Asia particularly Vietnam

STRATEGIC OBJECTIVES

Each of our five strategic objectives is supported by a comprehensive set of actions and initiatives as detailed in our Strategic Plan 2019-2021.

(1) Research

- Strategic Objective: To grow research quality and impact, and enhance research training.

(2) Clinics, Clinical Care and Education

- Strategic Objective: To maximise clinic quality, research engagement, and the impact of education activities.

(3) Partnerships

- Strategic Objective: To grow and deepen mutually beneficial research and clinical partnerships and collaborations.

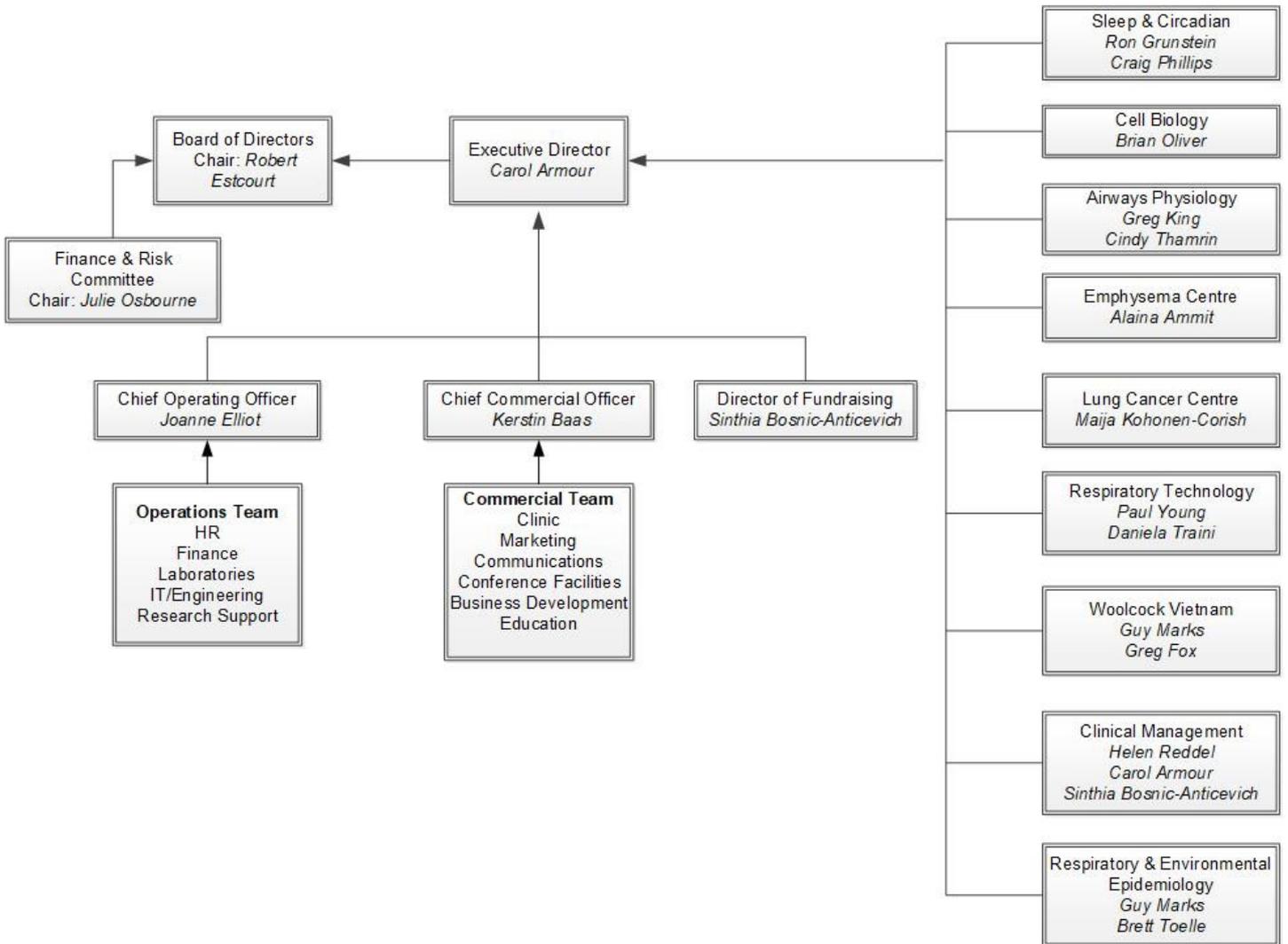
(4) Development and Branding

- Strategic Objective: To refresh and enhance our brand and reputation and step up performance in development and fundraising.

(5) The Organisation, People and Systems

- Strategic Objective: To continue to improve organisational efficiency and effectiveness.

OUR ORGANISATION





Mr Robert Estcourt
Chairman

In reviewing and reporting on the progress of the Institute in 2018 and 2019, I think it is worthwhile to remind ourselves all of what we are and what we aspire to be.

The Woolcock Institute's vision is to create a better quality of life for people with sleep, breathing and lung disorders and their families. We will achieve this with our research and work as a one stop shop for the treatment of respiratory and sleep disorders.

I believe that over the past seven years Carol Armour and her team at the Woolcock have achieved an incredible amount in fulfilling that task. They have built on the foundations of her predecessors Ann Woolcock and Norbert Berend to oversee a significant expansion of the breadth and depth of the Institutes activities. We are sometimes so close to it all the we do not recognize what has been achieved. It is worth reviewing some of the headline statistics.

As well as continuing with respiratory and sleep research, new areas of research have been entered into in emphysema and lung cancer.

- Staff have increased from 79 to 213 people.
- We have over 200 researchers working out of the Institute.
- At a time when the success rate in NHMRC grants has fallen from over 20% to around 14%, we have been able to increase our grant funding by about 25%
- Researchers at the Institute are now managing grants amounting to just over \$45m.

The Institute has also expanded in other important areas:

- It plays a leading role in developing the next generation of researchers. We generally have about 50 post-graduate students studying here at any one time.
- It is not an ivory tower. The Institute runs several education programs to ensure its knowledge and messages get out into the community. It now participates in a number of health and GP forums, and

- We carry out some 3,000 in house sleep studies every year of which 700 are paediatric and have recently commissioned more paediatric beds. We manage almost 10,000 clinical appointments each year.

This progress has been facilitated by a steady upgrade in equipment and resources. For example, re-engineering our IT capacity. In the last two years we have invested in a new data storage system, an upgrade of our audio-visual facilities, a new intranet and a web-based volunteer recruitment application to support research projects. Developing new platforms and new ways of working lays the foundation for further improvements going forward.

Importantly progress has happened despite ongoing financial constraints. It has been achieved by hard work, the support of many people, universities and donors, and dedicated staff who ensure that every dollar goes as far as possible.

The Woolcock is now a large and busy operation. It is a happy place and attracts researchers and those interested in our areas of work from all round the world.

None of this would not have been achieved without a dedicated staff and support from the whole community. These include the state and federal governments, the Sydney Health District, Sydney University as well as UTS and University of New South Wales and very importantly the many donors who form part of the Woolcock community.

So, a lot has been achieved. We have globally recognised researcher leaders, we are a globally recognized leader in our chosen fields, we have wonderful facilities and have become the "go to" place for research in our areas. On the surface we are well set for the future.

Unfortunately, we are still unable to shake off our major constraint - finance. As much as we have achieved, we know that if we had the financial resources, we could achieve so much more. It really is extraordinary that a medical research institute which is recognised as the leading global respiratory and sleep institute, should find itself frequently living a hand to mouth existence and constrained in its ability to take on new worthwhile and important research projects. But it is.

The fact is if a previously successful researcher loses a grant, they lose a livelihood. We have very limited resources to tide them over, let alone bring on and develop the next generation of researchers. There is a continual "leakage" of researchers under the pressure of wishing to have some stability in their lives, leaving the industry or taking overseas appointments.

Bearing in mind the public pressure on both public and private funds this is not a problem which is likely to ease in the foreseeable future. There is no silver bullet for this

problem.

However, I do want to take this opportunity to recognize and thank all those who support us. The Federal and NSW state governments, the University of Sydney, UTS and UNSW, the Royal Prince Alfred Hospital, the Area Health Boards, Perpetual and of course all our wonderful donors. Without you we would not exist.

As I have outlined, we must find new sources of financial support. We need ideas and support to help us place the Woolcock and its activities on a truly sound long-term footing. We do need to work towards a position where we can face the future with great confidence. So, it is important that the Board and management pursue every avenue they can for a source of funds and we do appeal to the generosity of all past donors to continue their support. With this in mind the Board has entered into discussions with other medical research institutes to explore whether there are some areas where we can make savings by working together, whether there are some operations that can be rationalized, whether there are sources of funds we can tap into if we co-operate more fully than in the past. It is too early to see whether this will deliver results, but we will leave no stone unturned.

There are many people that I owe thanks to for the work and progress of the last few years. It is invidious to mention names except for the Executive Director, Professor Carol

Armour. She has energetically pursued a program of change and renewal without compromising the Woolcock's continued research successes. The Woolcock has benefited enormously from her enthusiasm, drive, energy and leadership. She is supported by an able management team and Research Committee and my thanks go to them for their unstinting work for the Institute.

I must express my sincere thanks to my colleagues on the Board. It has been a busy 2 years and the exceptional voluntary service and dedication they bring to the Woolcock is of great value. All have shown exceptional dedication to the job required. During the year Professor Arthur Conigrave retired from the Board when he retired as Dean of Medicine at Sydney University and Carmel Tebutt has chosen not to stand for re-election to the Board on the completion of her current term. My thanks go to both Arthur and Carmel for their support, wisdom and work for the Woolcock during their Board tenure.

Lastly, I extend my thanks to all the team at the Woolcock. They are an outstanding group of dedicated researchers. My regard for them is enormous; it is a privilege to be associated with them. I, the Board and the community cannot thank them enough for their dedication and work.

EXECUTIVE DIRECTOR'S REPORT



**Professor
Carol Armour AM**
Executive Director

Our Institute has built on its world leading success in 2018 to be even stronger in 2019. Our Research Leaders are building their teams and fostering the next generation so that Woolcock research into sleep and respiratory disorders continues to lead the way in diagnosis, treatment and prevention.

Professor Helen Reddel has been responsible for one of the 6 most impactful stories in Respiratory Medicine in 2019. Her work as Chair of the International Science Committee for GINA has changed treatment recommendations for asthma to minimise severe asthma attacks and potential deaths. The combination of a low dose corticosteroid and long acting beta agonist is now recommended by GINA as first step/initial therapy. It has been described as the most significant change in asthma management in the last 30 years. Professor Reddel received the research excellence award from Sydney Research/Sydney Local Health district in 2019. Professor Reddel also received the Society Medal from the Thoracic Society of Australia and NZ.

Professor Maija Kohonen-Corish joined us in 2019 to head our new lung cancer program. Professor Kohonen-Corish has a distinguished career in cancer research especially lung cancer and her work will focus on innovative approaches to improving immunotherapy outcomes in lung cancer. Now she is working on harnessing the microbiome to improve the outcomes of therapy.

The Respiratory Technology team including Professors Paul Young, Daniela Traini, Dr Hui Ong and Dr Rania Salama have received multiple grants including from the Marie Bashir Institute, NSW Industry Fund, as well as an award for excellence in teaching from the University of Sydney. Professors Young and Traini also have several ARC and ARC linkage grants with their team. Their work encompasses a large variety of work from an investigation of new mechanisms of particle formation in thunderstorms to developing advanced nanotechnologies for targeting biofilm.

Major NHMRC Investigator grants/Research Fellowships have been awarded to Professor Daniela Traini, Professor

Guy Marks, Professor Ron Grunstein and Dr Rick Wassing. Special NHMRC Boosting Dementia Fellowships were awarded to Associate Professor Craig Phillips and Drs Camilla Hoyos and Angela D'Rozario. These grants are awarded to leaders in their field.

The Sleep and Circadian group (including Professors Ron Grunstein, Craig Phillips, Nat Marshall, Chris Gordon, Delwyn Bartlett and Drs Camilla Hoyos and Angela D'Rozario) have received many awards including a large NHMRC award to investigate sleep apnoea and dementia. The Sleep group has been innovative in working with a national team on a Cooperative Research Centre which is now drawing to a conclusion. The collaboration with industry has developed new IP and projects which will go forward to improve our understanding of alertness and the issues with shift work. The Sleep and Circadian group has also been successful in receiving MRFF funds.

The Respiratory Physiology group headed by Professors Greg King and Cindy Thamrin and including Drs David Chapman and Claude Farah are working on remote monitoring of disease and improving sleep quality in COPD and have received support from a donor and the American Thoracic Society Foundation.

Professor Sinthia Bosnic-Anticevich has received 2 major grants from industry (GSK) to investigate the burden of respiratory disease in general practice and to develop an identification and referral tool to use with severe asthma in community pharmacy.

Once again our friends at Perpetual have supported our research. In 2019 Dr Brett Toelle and Associate Professor Delwyn Bartlett received a grant to investigate emotional wellbeing in adults who have COPD – delivering on an unmet need.

The Emphysema Centre led by Professor Alaina Ammit joins together all the researchers at the Woolcock who are involved in emphysema/COPD research. Their projects focus on basic discovery and potential new pathways for treatment, to home monitoring of people with lung conditions and gathering information on pulmonary rehabilitation and the success of hospital referrals. The Emphysema Centre also worked on establishment of the Breathlessness Clinic for the community.

Professor Bandana Saini received an Award for Excellence from the Faculty of Medicine and Health from the University of Sydney for her work in gender equity, diversity and inclusion.

The Vietnam team is coordinating projects across 11 provinces. Focussed mainly on tuberculosis, its diagnosis and treatment. The team of Professors Guy Marks, Greg

Fox and Dr Nguyen Thu Anh, are also working on asthma and COPD in the region.

Towards the end of 2019 Professor Brian Oliver provided much needed advice for the media on the effects of the expanding bushfire crisis and air pollution on our lungs. Professor Oliver is also working on providing much needed advice about the harmful effects of e-cigarettes and the mechanisms of the disease silicosis.

In addition to the work that Professor Oliver is doing on air quality, the NHMRC Centre of Research Excellence for Air Quality with Professor Guy Marks and Dr Brett Toelle and their collaborators (more than 40 researchers from around Australia and Internationally), is undertaking collaborative research projects and translating their research into practice. Their research aims to understand the health impacts of air pollution and new energy sources. Professor Guy Marks leads and is involved in several Centres of Research Excellence as well as managing multiple NHMRC project grants. Professor Marks has been appointed as President (2019-2021) of the International Union against Tuberculosis and Lung Diseases (a global public health organisation).

The Woolcock is seen as a place to come to for advice and good scientific evidence. Our research leaders continue to be responsive to the community's needs. We are a team who pulls in the same direction to achieve the best outcomes for those with respiratory and sleep problems. The team involves the support/operational staff, the clinic and sleep support staff, the clinicians who focus our attention on clinical problems and the researchers who work hard in a research environment starved of funds. Thank you to you all.

Thank you to my management team of Joanne Elliot (Operations) and Kerstin Baas (Clinic and Marketing) as well as Sinthia Bosnic-Anticevich (Fundraising) who are invaluable for the success of our organisation. Finally thank you to our Board, we are very lucky to have such a supportive group of people helping us to achieve. We ask a lot but you always help us out in so many ways - your encouragement and advice is invaluable. We owe you so much. Lastly our Board Chair, Mr Robert Estcourt has enabled me in so many ways, your help and constant support has made sure that the Woolcock is what it is today.



PROFESSOR ALAINA AMMIT

Professor Alaina Ammit is the Director of the Woolcock Emphysema Centre. The Centre is Australia's only research centre dedicated to the fight against chronic obstructive pulmonary disease (COPD). The high-tech collaborative centre leads the way with research to better understand, treat and prevent this disease. Professor Ammit's research focus is the elucidation of the mechanistic basis of inflammation in chronic respiratory diseases. Her research goal is to discover new targets for drug discovery. She has earned an international reputation for her research, demonstrated by > 110 publication with citations > 4,000, a h-index of 34, and a career total of > \$6 million from a range of funding bodies (including NH&MRC, ARC, and philanthropy). Professor Ammit has demonstrated research leadership through national and international research contributions and high-level engagement with the research community and the peak societies. Her current appointments also include: Member of the Medical Research Advisory Committee of the ARC; NH&MRC Grant Review Panel Member; Elected Member of the ATS Nominating Committee; Associate Dean (Research Excellence) and Professor of Respiratory Pharmacology in the Faculty of Science at the University of Technology Sydney.



PROFESSOR CAROL ARMOUR AM

Professor Carol Armour has worked in asthma research at a basic scientific and clinical level. Her investigations span the breadth of asthma research from cellular mechanisms to the translation of new ways to treat asthma within the health system. She is on the Australian Respiratory Council, The National Asthma Council and has chaired the National Asthma Monitoring Advisory Committee, worked on the National Therapeutic Guidelines and the Australian Medicines Handbook. From 2003 - 2006 she was a member of the NHMRC Research Committee and was the Chair of the Training Awards Committee. She was Pro-Vice Chancellor, Research, at The University of Sydney, from 2006-2009. In 2005 she was made a Fellow of the Pharmaceutical Society for her services to the profession, and she was awarded the Australasian Pharmaceutical Science Association (APSA) medal for research in 2007. She is currently a Professor of Pharmacology in the Faculties of Medicine and Health. She is the Executive Director of the Woolcock Institute of Medical Research. She was made a Member of the Order of Australia for significant services to medical education in the 2019 Honours list.



PROFESSOR SYNTHIA BOSNIC-ANTICEVICH

Professor Synthia Bosnic-Anticevich is an internationally recognised leader in clinical pharmacy research in the field of respiratory medicine, in particular the quality use of respiratory medicines. She leads national and international research groups focusing on the use of respiratory medicines in different patient populations. She works across the continuum of health care settings, with a multi-dimensional and inter-professional approach to better understand and improve health outcomes for patients using respiratory medicines. She is the author of over 80 research publications and has attracted over \$11 million of research funding. She is actively involved in the mentoring and supervision of research students and early career researchers. Professor Bosnic-Anticevich is on the executive committee of Allergic Rhinitis in Asthma (ARIA), the body responsible for creating guidelines for the management of allergic rhinitis and Chair of the Pharmacy ARIA group. Professor Bosnic-Anticevich is a member of the executive committee of the Respiratory Effectiveness Group, an investigator-led, not-for-profit research initiative that has been set up in recognition of the potential value of real-life research and the need to harness real-life evidence to inform meaningful practice guidelines, drug licensing and prescribing decisions. In this capacity she provides international leadership in setting research standards and excellence in real-life research and in evaluating mechanisms for integrating real-life research into clinical guidelines and practice.



ASSOCIATE PROFESSOR GREG FOX

Associate Professor Greg Fox is a Pulmonologist and Epidemiologist from the Woolcock Institute of Medical Research and the University of Sydney, Australia. His research primarily focuses upon active case-finding for tuberculosis (TB), control of drug resistant TB and the use of technology to enhance TB control. He lived in Vietnam for four years, during which time he helped to establish a multi-center randomized controlled trial of contact investigation for TB. He subsequently completed a post-doctoral fellowship at McGill University in Canada. Associate Professor Fox collaborates closely with the Vietnam National TB Program to undertake multi-center studies focused upon strengthening global TB control policies. He leads the V-QUIN MDR-Trial, a clinical trial evaluating the effectiveness of levofloxacin to treat latent TB infection among contacts of patients with MDR-TB, in partnership with the Vietnam National TB Program.



PROFESSOR RON GRUNSTEIN AM

Professor Ron Grunstein has been a consultant physician in sleep disorders for over 30 years and a pioneer in improving patient care in sleep medicine in Australia and internationally. He is currently a Senior Principal Research Fellow of the National Health and Medical Research Council (NHMRC's highest level research appointment) and Professor of Sleep Medicine at the University of Sydney. Ron heads the Sleep and Circadian Research Group at the Woolcock and the NHMRC's Centre of Research Excellence in Sleep and Circadian Translational Neurobiology aka "Neurosleep". As well, he is Program Leader in the Co-operative Research Centre in Alertness, Safety and Productivity part-funded by the Commonwealth Department of Industry to answer the challenge of poor sleep and sleepiness impacting on driving, work and society in general. From 2007-2011, Professor Grunstein served as President of the World Sleep Federation, the umbrella body for sleep researchers and clinicians internationally organising successful world congresses in Cairns and Kyoto. He was awarded the Australasian Sleep Association Distinguished Achievement Award in 2010, the Kleitman Award, the premier award of the American Academy of Sleep Medicine in 2011 and the Royal Prince Alfred Foundation Medal for Excellence in Medical Research in 2012. In 2014, he received the Distinguished Professor Award from the Sydney Medical School. He has published over 250 peer reviewed articles in sleep research and 40 book chapters. He has a Bachelor of Medicine and Surgery and MD degrees from The University of Sydney and a PhD from the University of Gothenburg in Sweden. He was made a Member of the Order of Australia for significant services to medical education in the 2019 Honours list.



PROFESSOR GREG KING

Professor Greg King is a medical graduate of Otago University and a clinician-researcher at the Woolcock Institute of Medical Research, The University of Sydney and Royal North Shore Hospital. He is Conjoint Professor of Respiratory Medicine, the Sydney Medical School, The University of Sydney and Medical Director of the Respiratory Investigation Unit. He has a research interest in the mechanics of airways disease in relation to clinical aspects of disease. His expertise includes complex measurements of airway and lung function, including the forced oscillation technique, multiple breath nitrogen washout and 3-dimensional ventilation imaging and CT imaging. He currently supervises 6 PhD students (5 as primary supervisor) and postdoctoral fellows from science and medical backgrounds. He has a clinical and research interest in asthma, COPD and bronchiolitis in haemopoietic stem cell transplant recipients. Professor King maintains active participation in the activities of the TSANZ, APSR and ATS in terms of teaching, professional development and executive committee function.



PROFESSOR MAIJA KOHONEN-CORISH

Professor Maija Kohonen-Corish is a molecular geneticist with a long track record of discovery in translational research, including cancer genetics and colitis-associated cancer. She completed BSc and MSc at the University of Helsinki in Finland. This was followed by a PhD in human genetics at John Curtin School of Medical Research in Canberra, where she also established one of the first laboratories in Australia to identify the inherited gene mutations in Lynch Syndrome families (1991 – 2000). She obtained certification in molecular genetics by the Human Genetics Society of Australasia in 2005. She was the head of lung and colon cancer research at Garvan Institute of Medical Research 2002 – 2017 and was awarded the Cancer Institute NSW Fellowship for the maximum 3 terms (2005 – 2014). During this time she discovered new biomarkers of lung and colon tumours and developed a new mouse model of proximal colon cancer which resembles the mesenchymal subtype in humans. Her laboratory described two novel tumour suppressor functions for the MCC gene in DNA repair and cell-cell adhesion. They also established a MCC-knockout mouse that has provided a new model for colitis-associated cancer. She was appointed Director of the Woolcock Centre for Lung Cancer in 2019 to investigate the role of the microbiome in lung cancer and its links to the efficacy of immunotherapy. She also continues to study the cancer risk in inflammatory bowel disease and to test possible new cancer therapies by exploiting the DNA repair defect caused by MCC silencing. She is an invited member of the Variant Interpretation Committee of the International Society for Gastrointestinal Hereditary Tumours that produces international guidelines how to interpret the pathogenicity of the inherited gene defects in Lynch Syndrome.



PROFESSOR GUY MARKS

Professor Guy Marks is a respiratory physician and environmental epidemiologist. His main research interests are in chronic respiratory disease (asthma and COPD), tuberculosis control and the adverse health effects of exposure to air pollution. He is Professor of Respiratory Medicine at UNSW, South Western Sydney Clinical School. He is currently an NHMRC Senior Principal Research Fellow (NHMRC's highest level research appointment). He is head of the Respiratory and Environmental Epidemiology group at the Woolcock and an Honorary Professor at The University of Sydney (Sydney Medical School). His other major roles include Editor-in-Chief (lung diseases) of the International Journal of Tuberculosis and Lung Disease, Vice President of the International Union Against Tuberculosis and Lung Disease, Director of the Australian Centre for Airways Monitoring, Chair of the NSW TB Advisory Committee, and Chair of the NSW Chief Health Officer's Expert Advisory Committee on Air Pollution. In 2019 he was appointed President of the International Union Against Tuberculosis and Lung Disease. He also received an Achievement Award by the NHMRC in 2014 for being the top-ranked applicant for a Research Fellowship in that year.



PROFESSOR BRIAN OLIVER

Professor Brian Oliver is a translational researcher supported by an NHMRC Career Development Fellowship level 2 (Industry) – the aim of which is to identify and develop new ways of treating respiratory diseases. He is also a Professor at the University of Technology, Sydney (UTS). His scientific training began at the National Heart and Lung Institute, UK, with Prof Peter Barnes. He then had further training in both molecular biology and then virology at Professor Sebastian Johnston's laboratory at Imperial College London, UK before commencing his PhD (awarded in 2005) at The University of Sydney (supervised by Prof Judith Black).

He leads a productive team of researchers investigating the pathophysiology of respiratory diseases, with an emphasis on understanding mechanisms leading to disease exacerbations and progression. He is head of the Respiratory Cellular and Molecular Biology Group, at the Woolcock, the co-director of the Environmental Respiratory Group of SPHERE, the treasurer of LAM Australia, and the industry liaison officer of the TSANZ NSW.



ASSOCIATE PROFESSOR CRAIG PHILLIPS

Associate Professor Craig Phillips is an NHMRC Research Fellow at the Woolcock Institute of Medical Research. Most of his research has focused on how sleep apnea and its treatment impact on cardio-metabolic health using rigorously designed randomised controlled trials. He was the first researcher to examine arterial stiffness in patients with sleep apnea using a non-invasive tonometry technique. He is more broadly examining the impact of rotating shift work on markers of cardio-metabolic health using our unique chronobiology facilities at the Woolcock. Additional work includes examining how molecular clocks are altered in conditions of disturbed sleep and how neurovascular dysfunction in sleep apnea impacts on neurobehavioral and cognitive function.



CLINICAL PROFESSOR HELEN REDDEL

Professor Helen Reddel is a respiratory physician working to improve treatment for asthma and COPD. She is a Research Leader in the Clinical Management Group at the Woolcock Institute of Medical Research, Chair of the Science Committee of the Global Initiative for Asthma (GINA), Clinical Adviser for the Australian Centre for Airways Disease Monitoring (ACAM), and a member of the Australian Asthma Handbook Guidelines Committee. Professor Reddel's current research focusses on strategies to improve the management of asthma and COPD, with interest in improving the quality prescribing and use of respiratory medications in primary care, and in population level monitoring of asthma and COPD through ACAM. She is co-chairing a multinational longitudinal study of 15,000 patients with asthma and/or COPD that aims to identify underlying disease mechanisms so that targeted treatments can be developed. Professor Reddel has a strong focus on improving communication between patients and health professionals, and on making guidelines not only evidence-based, but also practical and practice-centred.



PROFESSOR BANDANA SAINI

Professor Bandana Saini's expertise lies in the implementation of clinical practice models focused on respiratory and sleep health within Australian primary care. She has led and collaborated in implementing and evaluating several successful community pharmacy-based service trials in projects involving: screening/case detection (sleep disorders, chronic obstructive pulmonary disease, tuberculosis (Cambodia)); patient self-management support (allergic rhinitis, sleep disorders, asthma); clinical audits (insomnia medications, insomnia related practice, smoking cessation); pharmacovigilance (insomnia medications); pharmacy education (problem based learning, peer assessment); as well as community health education program research (asthma, smoking cessation in high schools). Her skills include trial design and implementation, stakeholder engagement, pedagogical inquiry, and qualitative methodologies. Her research has been implemented in pharmacy settings overseas, for example, in Indonesia. Her research provides a link between public health and health economic concepts as well as clinical aspects of community pharmacy roles in chronic respiratory/sleep disorders.

She has received funding from several sources including the Department of Health, NHMRC, Pharmacy Council of NSW and Asthma Australia, as well as a recent award of an NHMRC Translating Research into Practice Fellowship (TRIP Fellowship 2017-19). She is currently the Chair of the Medicines Committee of the Australasian Sleep Association (ASA), a member of the ASA's Clinical Committee as well as on the Pharmacists Advisory Group (National Asthma Council) and the Primary Care Advisory Committee (Lung Health Foundation).



ASSOCIATE PROFESSOR CINDY THAMRIN

Associate Professor Cindy Thamrin is a Research Leader and NHMRC Career Development Fellow at the Airway Physiology and Imaging Group, Woolcock Institute of Medical Research, and a Senior Research Fellow at the University of Sydney. She has a dual background in respiratory physiology and electronic engineering from the University of Western Australia. Her PhD in 2006 at the Telethon Institute for Child Health Research, Perth, extended a lung function test known as the forced oscillation technique to track changes in airway mechanics with lung volume. Her postdoctoral research at the University Hospital of Bern, Switzerland, focused on assessing future risk in asthma using novel variability analyses of lung function. Her current research interests are the clinical application of new lung function tests, and advanced respiratory data analytics, especially applied to home tele-monitoring of asthma and COPD.



DOCTOR BRETT TOELLE

Dr Brett Toelle is a Senior Research Fellow working within the Respiratory and Environmental Epidemiology Group. For over 27 years he has been involved in population studies of lung disease which have included studies of pre-school children, schoolchildren, twins, community based adults and occupational work groups. His recent work has focused on asthma as the participants in the Childhood Asthma Prevention Study (CAPS) transition through puberty and on COPD as part of the Australian Burden of Lung Disease (BOLD) project of adults aged 40+ years from six sites around the country. He is also a psychologist and undertook a PhD investigating “Factors associated with non-adherence to prescribed asthma medication”. During his psychology internship he worked with psychologists in the sleep research group and clinicians at the Royal Prince Alfred Insomnia Clinic.



PROFESSOR DANIELA TRAINI

Professor Daniela Traini is a Professor in Respiratory Science and Research Advisor for Health and Medical Research at Faculty of Medicine and Health, The University of Sydney and was an ARC Future Fellow. She is an international leader in pulmonary drug delivery and her research portfolio covers all areas of respiratory research, from bench to bedside. Professor Traini leads the Respiratory Technology group at the Woolcock Institute and works in collaboration with Professor Young. Over the last 13 years since joining the University of Sydney, and before, during her 5 years in industry, she developed a leading research program on aerosol drug delivery, from powder engineering, aerosol generation and characterization, to in vitro and in vivo lung deposition with clinical outcomes. Professor Traini has extensive experience in both academic and industrial pharmaceuticals, and still retains strong link with the pharmaceutical industry. Since 2005 she has published over 200 full peer reviewed manuscripts, has 6 patents and has attracted more than \$12M in competitive funding.



PROFESSOR PAUL YOUNG

Professor Paul Young is a Professor in Respiratory Technology at Sydney Medical School (Discipline of Pharmacology), Head of Respiratory Technology at the Woolcock and was an ARC Future Fellow. Professor Young has 20 years' experience in inhalation drug development with a focus on medical device engineering and industry engagement. He is an internationally recognised expert in the field of inhalation technology and has published >170 peer reviewed journal articles since 2002 (>3000 citations), 6 patents, 16 book chapters and more than 150 conference proceedings. He has an H-index of 32 and 5-year i10 index of 97. Professor Young has received > \$15M in projects and infrastructure support since 2005 and has a proven track record in securing Category 1 ARC and NHMRC funding. His research team of around 20 personnel are considered world leaders in the field of aerosol science.

DISTINGUISHED ALUMNI



PROFESSOR SANDRA ANDERSON AM

Professor Sandra Anderson is a world-renowned respiratory scientist. Her research passions lie in the areas of exercise-induced asthma, mucociliary clearance and innovative therapies. The culmination of Professor Anderson's passion for science has led to a diagnostic product and formulations for the treatment of Cystic Fibrosis (CF) and non-CF bronchiectasis. In honour of Professor Anderson's commitment to the field, she has received numerous awards. Her commitment to science, mentorship, collaboration and engaging people to undertake robust and translational science is a key driver for people at the Woolcock and we are proud to have her as a Woolcock Distinguished Alumna.



PROFESSOR MARIE BASHIR AD

Professor Marie Bashir has invested time and energy in the Woolcock over many years. As a medical practitioner herself, she supports the Woolcock model of care of respiratory and sleep patients as well as investigation of their disease in order to improve their lives. Professor Bashir has supported our international visitors, attended all our alumni events and donated her time to support the Woolcock. In 2013 the Woolcock leaders and supporters enjoyed her hospitality at Government House. On every occasion, when asked for help, she has been willing to give of herself. She is a warm and generous supporter and we thank her for all she has done for the Woolcock.



EMERITUS PROFESSOR NORBERT BEREND AM

Professor Norbert Berend retired from his Chair of Thoracic Medicine and as Director of the Woolcock on 30 June 2012. Professor Berend led the Woolcock through a time of great change, had oversight of the negotiations to house the whole of the Institute in one building, sought funding and achieved the dream. At the time he became Director, the Institute had fewer than 20 employees in temporary homes on the University and RPA Hospital grounds. In 2012, the Woolcock had more than 150 employees and associate staff and 55 postgraduate students working in a state-of-the-art research institute. During this period he also led the development of respiratory research within the Asia Pacific region. Professor Berend has made us into what we are today.



PROFESSOR EMERITA JUDY BLACK AO

Professor Judy Black's leadership and research achievements in the field of airway smooth muscle, her role in the career development of the next generation of research leaders and her outstanding service have been a model for all of us. Professor Black has changed the thinking around the role of the airway smooth muscle in asthma. Leading by example and generously helping others to achieve success in their careers, Professor Black has been instrumental in fostering a unique environment within the Woolcock. She has encouraged a culture of giving back and helping others to succeed. She has created a legacy that will foster success within the biomedical research community for years to come. Professor Black is unique and very special to us here at the Woolcock.



PROFESSOR RUTHVEN BLACKBURN AC

Professor Ruthven Blackburn had the vision to see that Sydney needed a clinical research institute - preferably associated with the University of Sydney. At the time there was very little research being undertaken in respiratory medicine. A group of like-minded individuals led by him and Professor Ann Woolcock started the Institute of Respiratory Medicine. From there, the Woolcock started to nurture national and international stars and his vision and leadership has led to its existence today. The Woolcock remains extremely grateful to Professor Blackburn and his passing is mourned by the many in the Woolcock who knew him.



PROFESSOR JEFFREY DRAZEN

Professor Drazen, M.D. is a senior physician at the Brigham and Women's Hospital, Distinguished Parker B. Francis Professor of Medicine at Harvard Medical School, Professor of Physiology at the Harvard School of Public Health, and Adjunct Professor of Medicine at the Boston University School of Medicine. Professor Drazen has been the editor-in-chief of the New England Journal of Medicine since July of 2000.

A specialist in pulmonology, Professor Drazen maintains an active research program and has published hundreds of articles on topics such as lung physiology and the mechanisms involved in asthma. His research has had a profound influence on the treatment of asthma.

Professor Drazen has been a powerful supporter of the Woolcock. On previous visits to Australia, he has worked with our Board to talk to senior politicians at the State and Federal level – the result of which was infrastructure funding for us which has given us our world-class edge. At every visit, he is happy to talk about the way respiratory research from the Woolcock is featured at the New England Journal.

We welcome Professor Drazen as a member of our distinguished alumni and thank him for his ongoing contribution to respiratory research.



PROFESSOR CHRISTINE JENKINS AM

Professor Christine Jenkins worked tirelessly with the other research leaders as a team and led them as they considered their strategy at a time of great change. Professor Jenkins ran the education program for the Woolcock especially the Think Tank program which has considerably enriched our research and scientific interchange, as well as the professional development program for healthcare practitioners. Internationally-renowned speakers were invited to the Woolcock and the facilitation of interaction with research leaders has been highly productive. Her guidance has led to new research directions, collaborations and grants.



PROFESSOR CHERYL SALOME

Professor Cheryl Salome has had more than 25 years' experience in respiratory research, particularly in the causes and mechanisms of asthma. Professor Salome worked very closely with Professor Ann Woolcock during her career and was responsible for leading and facilitating epidemiology, cell biology and lung physiology. Professor Salome nurtured the lung physiology group, recruited PhD students, had oversight of all projects, made sure the research experience was a valuable one and then mentored these rising stars until they became independent research leaders. Her students have gone on to lead the world in lung physiology. Meanwhile, never one to step into the limelight, Professor Salome worked at the Woolcock facilitating the Friday research seminars, the Think Tank and continued to write manuscripts and successful grant applications which changed the way we think about airway disease. Professor Salome was and continues to be a star at the Woolcock.



PROFESSOR PAUL SEALE AM

Over the years Professor Paul Seale nurtured many of us, provided advice when asked, opened doors and facilitated pathways to success. He was involved in a multitude of clinical trials and fostered the next generation of medical and science students in terms of clinical pharmacology. At the Woolcock, he was particularly valued as the leader of the clinical trials unit for 10 years. Professor Seale ensured that the unit was successful, safe and governed appropriately. Professor Seale served as our deputy director, in this role he provided sage advice for the management team on all matters of governance.



ASSOCIATE PROFESSOR EUAN TOVEY

Over the many years of his scientific career Associate Professor Euan Tovey focused on allergy research, particularly the house dust mite. He has worked on measurements of aeroallergens, investigated personal exposure to allergens and ways to minimise these. He has also investigated the role of viruses in asthma exacerbations and how these viruses are transmitted. He was a senior research fellow of the NHMRC. He has been inducted into the Asthma NSW Hall of Fame. His inquisitive and innovative mind is evident by his long list of patents. He invented many novel mechanisms and devices which he also followed through with development. The Woolcock would like to thank Associate Professor Tovey for his passion and commitment to research and our Institute.



CLINICAL PROFESSOR IVEN YOUNG AM

Professor Iven Young is a senior honorary physician in the Department of Respiratory and Sleep Medicine, Royal Prince Alfred Hospital, Sydney, after being Head of Department from 1991 to 2009. He has been in respiratory consultant practice since 1978 after he returned from a post-doctoral research fellowship at the University of California where he developed his interest in pulmonary gas exchange physiology. His major interests are the investigation and management of respiratory failure and all aspects of pulmonary function testing, occupational lung disease, asthma, chronic obstructive lung disease and interstitial lung diseases. In 2016, he was awarded the Society Medal of the Thoracic Society of Australia and New Zealand (TSANZ) and also appointed as a Member of the Order of Australia "For significant service to respiratory and sleep medicine as a clinician, administrator, researcher and mentor, and to professional societies". He serves on the Board of Directors of the Australian Respiratory Council and retired from the Board of Directors of the Woolcock Institute of Medical Research in 2017 after 20 years of service.



Researchers at the Woolcock are part of a multidisciplinary team dedicated to understanding and treating respiratory and sleep disorders.

With over 200 research and clinical professionals we are a world leader in the area of research, clinical diagnosis and treatment.

AIRWAY PHYSIOLOGY AND IMAGING

Group Leaders: Professor Greg King, Associate Professor Cindy Thamrin

The Airway Physiology and Imaging Group investigates what goes wrong with the function of the airways and lungs in diseases such as asthma, chronic obstructive pulmonary disease (COPD) including emphysema, as well as in cystic fibrosis, in bone marrow transplant patients, and in smokers. The knowledge gained from these studies informs clinicians of better ways to understand, assess and treat patients. They provide a bridge for translating research from the “bench to bedside”, in other words, making research benefit patients.

The group is recognised for their expertise in clinical respiratory physiology, i.e. the science of determining how the lung goes wrong and how this causes patient symptoms. They are international leaders in complex lung function methods such as multiple breath nitrogen washout and forced oscillation technique. They also combine these measurements of function with 3-dimensional lung imaging methods: high resolution computed tomography (HRCT), magnetic resonance imaging (MRI), single photon emission computed tomography (SPECT) and positron emission computed tomography (PET). They are a diverse, interdisciplinary team comprising clinicians, basic scientists and engineers.

GRANTS

ATS Foundation/ResMed Research Award in Remote Monitoring and Management of COPD. *Home telemonitoring and predictive analytics of lung function for management of COPD* – awarded 2019-2020. Dr Claude Farah, Dr Cindy Thamrin, Professor Greg King. (\$100,000USD).

ATS Foundation/Resmed Research Grant. *Bi-level Positive Airway Pressure to Improve Sleep Quality in Chronic Obstructive Pulmonary Disease* – awarded 2018-2019. Dr David Chapman, Professor Greg King, Associate Professor Craig Phillips, Dr Charlie Irvin. (\$100,000USD).

Philanthropic Grant via University of Sydney (Mr. John Notaras). *Home telemonitoring of asthma using the forced oscillation technique* – awarded 2019-2021. Professor Greg King, Associate Professor Cindy Thamrin (\$335,931).

Philanthropic Grant via University of Sydney (Mr. Tony Berg). *Investigating mechanisms of non-reversible airflow obstruction in asthma* – awarded 2019. Professor Greg King.

AWARDS AND PRIZES

- Ann Woolcock Memorial Award, from the Respiratory Structure and Function Assembly, American Thoracic Society. (2018) Dr David Chapman.

- ANZSRS New Investigator Award Finalist (2018) Dr Paola Urroz.
- ANZSRS New Investigator Award Finalist (2019) MsTanya Badal and Dr Blake Handle.
- ATS International Trainee Award (2019) Dr Katrina Tonga.
- Australian CF Research Trust Innovation Grant, Thoracic Society of Australia and New Zealand (2018) Dr Paul Robinson.
- CSL Behring Thoracic Society of Australia and New Zealand/Lung Foundation Australia Alpha-1 Antitrypsin Deficiency Research Award (2018) Dr David Chapman.
- John Reid Prize for Physiology Research, Thoracic Society of Australia and New Zealand (2018) Dr David Chapman.
- Lung Foundation Australia/Menarini Travel Grants (2019) Dr Katrina Tonga and Dr Sabine Zimmermann.
- Robert Crapo Memorial Lifetime Achievement Award in Pulmonary Diagnostics, from the Respiratory Structure and Function Assembly, American Thoracic Society (2018) Professor Greg King.
- TSANZ Ann Woolcock New Investigator Award Finalist (2018) Dr Katrina Tonga.
- TSANZ Ann Woolcock New Investigator Award Finalist. (2019) Dr Sabine Zimmermann.
- TSANZ Ludwig Engel Award for Physiological Research, “Identification of novel pathways leading to fixed airflow obstruction in asthma.” (2018) Dr Katrina Tonga.

PhDs AWARDED

Dr Stephen Milne, “Understanding complex lung function measurements in COPD: forced oscillation, nitrogen washout, and novel functional imaging techniques”, University of Sydney, Supervisors: Professor Greg King, Dr Claude Farah, Associate Professor Cindy Thamrin.

Dr Katrina Tonga, “Complex lung physiology and airway inflammation in adults with asthma and fixed airflow obstruction”, University of Sydney, Supervisors: Professor Greg King, Dr Claude Farah, Professor Brian Oliver, Associate Professor Cindy Thamrin.

Dr Jacqueline Huvanandana, “Advanced analyses of physiological signals in the neonatal intensive care unit”, University of Sydney, Supervisors: Professor Alistair

McEwan, Dr Mark Tracy, Associate Professor Cindy Thamrin, Dr Murray Hinder.

Dr Catherine Farrow, "Ventilation heterogeneity and airway closure in asthma measured by SPECT/CT", University of Sydney, Supervisors: Professor Greg King, Professor Dale Bailey.

MASTERS THESIS PASSED

Mr Liam Acheson (MPhil (Med)), "The Respiratory and Cardiovascular Impacts of Orchestral Performance on Trumpet Players: An Observational Cohort Study", University of Sydney, Supervisors: Dr Leigh Seccombe, Associate Professor Cindy Thamrin.

HONOURS THESES PASSED

Ms Grace Prael (2nd class Hons, BMedSci), "Can an Elastic Corset Improve Pulmonary and Cardiac Function in Chronic Obstructive Pulmonary Disease?", University Technology Sydney, Supervisor: David Chapman.

Mr Edward Jaegal (1st class Hons, BMedSci), "Obesity and COPD: Do Two Wrongs Make a Right?", University Technology Sydney, Supervisor: David Chapman.

Ms Riva Shirol (2nd class Hons, BMedSci), "Is There A Better Way to Measure Lung Function in Idiopathic Pulmonary Fibrosis?", University Technology Sydney, Supervisor: David Chapman

PROMOTIONS

2019 Associate Professor Cindy Thamrin, promoted to Principal Research Fellow, University of Sydney.



CLINICAL MANAGEMENT

Group Leaders: Professor Carol Armour, Professor Helen Reddel, Professor Sinthia Bosnic-Anticevich and Professor Bandana Saini.

The Clinical Management Group investigates the care of people with asthma and COPD in the community, clinic and hospital environment. We design models of care, perform clinical trials and work in practice to improve the daily care of these diseases by health care professionals. Our research is patient-centred, ensuring care involves the patient in decision making about their health and in day-to-day management of their respiratory condition. The group collaborates with GPs, pharmacists, nurses, research psychologists, asthma educators, physiotherapists, speech pathologists and specialist respiratory physicians to provide better respiratory care for patients in the future. We also interact with professional organisations to make sure that our research is adopted in practice for better health care.

GRANTS

Commonwealth Government of Australia, Pharmacy Trial Program, Department of Health and Ageing. *Getting asthma under control using the skills of the community pharmacist* - awarded 2017-2020 Professor Carol Armour, Professor Sinthia Bosnic-Anticevich, Associate Professor Bandana Saini and others (\$2,199,100).

Medical Research Institute of New Zealand Grant. *Novel START (Novel Symbicort Turbuhaler Asthma Reliever Therapy): RCT of the efficacy and safety of an ICS/LABA reliever therapy regimen in asthma* – awarded 2015-2019 Professor Helen Reddel shared with Professor Guy Marks and Dr Brett Toelle and others (\$1,233,795).

NHMRC Clinical Centre of Research in Severe Asthma – awarded 2014-2019 Professor Helen Reddel shared with Professor Greg King and Professor Guy Marks and others. (\$2,498,171).

NHMRC ECR Fellowship. *An integrated approach to improving patient-centred care in chronic obstructive pulmonary disease* – awarded 2017-2020. Dr Claudia Dobler (mentor Professor Carol Armour) (\$438,768).

NHMRC Project Grant. *An integrated general practice and pharmacy-based intervention to promote the prescription and use of appropriate preventive medications among individuals at high cardiovascular risk* – awarded 2015-2020. Professor Carol Armour and Associate Professor Bandana Saini with others (\$2,296,358).

NHMRC TRIP fellowship. *Improving the role of community pharmacists in respiratory health*. Associate Professor Bandana Saini – awarded 2017-2019 (\$177,197)

Perpetual IMPACT Philanthropy grant. *Decreasing the burden of chronic lung diseases in the community*. Professor Sinthia Bosnic-Anticevich – awarded 2017-2018 (\$77,834).

TEVA Pharmaceuticals, ISS Program). *Inhaler technique mastery and maintenance in general medical practitioners: Easy Low Instruction Over Time (Dr ELIOT)* – awarded 2017-2018. Professor Sinthia Bosnic-AnticevichS, Dr Vicky Kritikos, Ms Biljana Cvetkovski and others (\$150,000).

AWARDS

- Member of the Order of Australia (AM) for significant service to medical education, and to asthma management (2019). Professor Carol Armour.
- Payne-Scott Professorial Distinction, University of Sydney (2018). Professor Carol Armour.
- Research Excellence Award, Sydney Research/Sydney Local Health District (2019). Professor Helen Reddel
- Society Medal from the Thoracic Society of Australia and NZ (2019). Professor Helen Reddel

PhDs AWARDED

Dr Pamela Alphonse. *Managing Paediatric Asthma-A study of Parents' Responsibilities and their support networks"* (2019) University of Sydney. Supervisor: Professor Sinthia Bosnic-Anticevich

Dr Elizabeth Azzi *Insight into Asthma Management Practices in an Australian Primary Care Setting"* (2019). University of Sydney. Supervisor: Professor Sinthia Bosnic-Anticevich

Rachel Tan *The Management of Allergic Rhinitis in the Community Pharmacy: A real-life study of current practice in Australia"* (2019). Supervisor: Professor Sinthia Bosnic-Anticevich

HONOURS THESES PASSED

Thomas Bradbury *Predicting asthma outcomes from medication dispensing patterns"* (2019) Supervisor: Professor Sinthia Bosnic-Anticevich

RESPIRATORY AND ENVIRONMENTAL EPIDEMIOLOGY

Group Leaders: Professor Guy Marks and Dr Brett Toelle

The Respiratory and Environmental Epidemiology Group conducts research to investigate the prevalence of and risk factors for respiratory disease in different population groups. They are also investigating community based public health interventions to manage a range of chronic respiratory diseases. Active areas of research include the impact of air quality and other environmental exposures such as wind turbine generated infrasound, on health, characterising asthma, and COPD in the community. They also have an interest in the symptom of breathlessness in the Australian community. This group uses epidemiological and public health methods to answer these research questions.

The group has three main areas of activity:

Respiratory and Environmental Epidemiology (R&EE).

This program covers several areas including impact of air quality on respiratory health, ongoing analyses of data collected as part of a primary prevention of asthma study and a national research project to quantify COPD. They are also working in the areas of tuberculosis treatment and case finding.

Centre for Air Pollution, Energy and Health Research (CAR).

CAR is a Centre of Research Excellence funded by the National Health and Medical Research Council. This group focuses on research into the impact of air pollution and energy transitions on human health and translates that research into contributions to policy that aims to mitigate that impact. CAR provides an opportunity to build the capacity for early career researchers by offering post-doctoral fellowships, travel grants, PhD top-ups, seed funding grants and research specific training. CAR engages its partner organisations and the public through organising workshops, symposiums and public lectures.

Australian Centre for Airways Disease Monitoring (ACAM).

ACAM was initially established at the Woolcock in 2002 as a collaborating unit with the Australian Institute of Health and Welfare. Since 2018 it has been an independent centre within the Woolcock. It aims to assist in reducing the burden of chronic airways disease, including asthma and COPD, in Australia by developing, collating and interpreting data relevant to prevention, management and health policy for chronic airways disease. ACAM has recently collected data from more than 10,000 Australians as part of National Breathlessness Survey and has plans to repeat the survey at regular intervals.

GRANTS

ARC Linkage Grant. *Airborne ultrafine particles in Australian cities: sources, effects and mitigation* – awarded 2019-2021. Professor Guy Marks (\$890,203).

Canadian Institutes of Health Research Grant. *Tackling the two greatest obstacles to Tuberculosis elimination: Treatment of latent infection and drug resistant disease* – awarded 2015-2022. Professor Guy Marks (CAN\$8,400,000).

Medical Research Institute of New Zealand Grant. *Novel START (Novel Symbicort Turbuhaler Asthma Reliever Therapy): RCT of the efficacy and safety of an ICS/LABA reliever therapy regimen in asthma* – awarded 2015-2019. Professor Guy Marks and Dr Brett Toelle shared with Professor Helen Reddel (\$1,233,795).

NHMRC Centre of Research Excellence. *Centre for Research Excellence in Tuberculosis Control on both sides of our border* – awarded 2018-2022. Professor Guy Marks and Associate Professor Greg Fox (\$2,442,780).

NHMRC Centre of Research Excellence. *Centre of Research Excellence in Severe Asthma* – awarded 2014-2019. Professor Guy Marks shared with Professor Greg King and Professor Helen Reddel (\$2,498,171).

NHMRC Centre of Research Excellence. *Energy transitions, air pollution and health in Australia* – awarded 2016-2020. Professor Guy Marks (\$2,491,229).

NHMRC Development Grant. *Development and validation of a latent tuberculosis diagnostic* – awarded 2017-2019. Professor Guy Marks (\$534,865).

NHMRC Project Grant. *Air pollution and mortality and morbidity in adult Australians (APMMA Study): a large population based cohort study.* Awarded 2018-2020. Professor Guy Marks and Dr Christine Cowie (\$1,041,408).

NHMRC Project Grant. *Improving Global Tuberculosis Control with the AuTuMN Platform* – awarded 2018-2020. Professor Guy Marks (\$655,059).

NHMRC Research Fellowship. *A world that breathes more easily: research for improving global lung health* – awarded 2019-2023 (\$963,270). Professor Guy Marks.

NHMRC Research Fellowship. *Interventions for improving lung health* – awarded 2014-2018. Professor Guy Marks (\$897,925.00).

NHMRC Targeted Call for Research. *Multidimensional assessment of the health impacts of infrasound: Two RCTS* – awarded 2016-2020. Professor Guy Marks, Dr Christine Cowie, and Dr Brett Toelle shared with Professor Ron Grunstein, Associate Professors Delwyn Bartlett, Nathaniel Marshall, and Craig Phillips (\$1,943,922).

Perpetual IMPACT Philanthropy grant. *Emotional Wellbeing in COPD* – awarded 2019-2020. Dr Brett Toelle and

Associate Professor Delwyn Bartlett (\$84,000).

Sydney Partnership for Health, Education, Research and Enterprise (SPHERE). *Respiratory, Sleep and Environmental and Occupational Health Clinical Academic Group* – awarded 2017-2019. Professor Guy Marks (\$451,000).

Sydney South East Asian Studies Centre (SSEASC) Grant. *Public health impact of exposure to ambient air pollution in Hoan Kiem District, Hanoi, Vietnam* – awarded 2019. Professor Guy Marks (\$10,000).

AWARDS, APPOINTMENTS AND PRIZE

International Union against Tuberculosis and Lung Diseases (a global public health organisation). President-Elect (2018-2019) and President (2019-2021) Professor Guy Marks

Scientia Professor, University of NSW, Sydney. Professor Guy Marks

HIGHLIGHTS 2018-2019

CAR produced 10 submissions to state and federal government with the aim to translate our research into actionable policy recommendations, to influence policy, to raise our profile as the 'go to' source for evidence-based policy.

CAR hosted education seminars with international visitors Professors Antonio Gasparini and Joachim Heinrich and conducted 13 training events, that ranged from technical workshops to stakeholder engagement meetings and a national symposium co-hosted by the NSW Department of Industry.



Group Leader: Professor Brian Oliver

The group aims to uncover the molecular and cellular mechanisms underlying chronic respiratory diseases such as asthma, COPD, lymphangiomyomatosis (LAM) and pulmonary fibrosis.

They have three main areas of expertise:

- Molecular pathophysiology (Professor Brian Oliver)
- Fibrosis (Dr Pawan Sharma)
- Understanding the influence of diet on airway function (Dr Dikaia Xenaki)

These themes are investigated using genetic and molecular approaches on patient tissue samples and novel in-vitro models of the airways. The aims are to discover what drives disease processes and to discover new treatments and/or improve existing ones.

2018 marked the start of our research into the potential adverse health effect of e-cigarettes, an area at the time that was very controversial. Many thought e-cigarettes were harmless, and unfortunately this has proven not to be the case, and in extreme cases use can be fatal (i.e. e-cigarette, or vaping, product use associated lung injury (EVALI)). Our other area of notable research during this period was the investigation of the effects of dietary fats upon lung inflammation. In retrospect the results are now not surprising, but at the time the notion that eating an unhealthy diet could affect asthma control, and directly induce airway inflammation was new concept in airways disease research.

GRANTS 2018-2019

NHMRC Project Grant. *Understanding why in-utero exposure to inhaled oxidants predispose people to develop asthma and COPD* – awarded 2019-2022. Brian Oliver, Hui Chen, Alen Faiz (\$1,043,742)

NHMRC Project Grant. *Elucidation of the Aetiology of Airway Remodelling in COPD* – awarded 2016-2018. Professor Brian Oliver (\$630,000).

NHMRC Project Grant. *Mechanisms of impaired bronchodilator response associated with fatty acid intake in obese asthma* – awarded 2015-2018. Professor Brian Oliver shared with Professor Paul Young and others (\$668,469.25).

Other noticeable achievements were the award of research fellowships to Dr Anna Yeoung to study silicosis from iCare (300k) and Dr Jeremy Chan to study mechanisms in COPD from the NHMRC (400k).

AWARDS AND PRIZES

2018-2019 was an outstanding period of productivity for research students in the cell biology group. This was recognised by the following awards:

- 2019 ATS International Conference Abstract Scholarship
- Ann Woolcock Early Investigator Award Finalists
- APSR Travel Scholarship to attend ATS International Conference
- Asia Pacific Society of Respiriology Abstract Session Award 2018
- Asia Pacific Society of Respiriology Abstract Session Award 2019
- ATS PAR Scholarship
- CAR symposium, Best poster
- Early Career Scientist in Transplantation Award Finalists – International Society of Heart and Lung Transplant Conference, Nice, France (2018)
- Lung Foundation Australia/A Menarini Australia - Travel Grant 2018
- TSANZ Travel Award Recipients

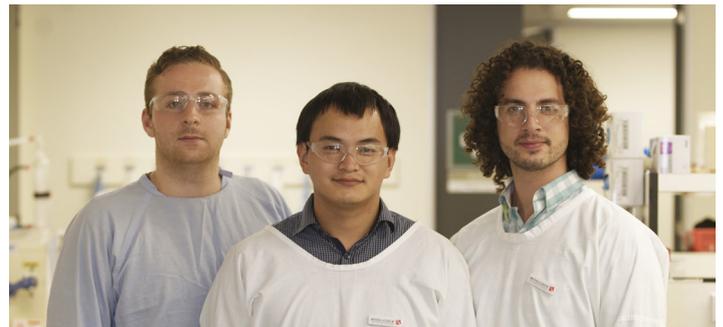
PhDs AWARDED

Alicia Mitchell (PhD 2018 – University of Technology Sydney)

Sandra Rutting (PhD 2019 – University of Newcastle)

PRESENTATIONS

Collectively over 50 international presentations were made over 2018-2019 including presentations at the two premier respiratory conferences the American Thoracic Society Conference and The European Respiratory Society's Annual Congress.



Researchers at the Woolcock

RESPIRATORY TECHNOLOGY

Group Leaders: Professor Daniela Traini and Professor Paul Young

The Respiratory Technology Group was established in 2012 to bridge the gap between fundamental respiratory science (molecular pharmacology and cell biology) and clinical research (physiology, epidemiology and clinical management). The group is a leader in the areas of aerosols drug formulation, device development, testing and delivery.

GRANTS 2018-2019

ARC Discovery grant. *Engineering better sprays for leaf coating: from drop impact to retention* – awarded 2018. Dr P Spicer, Professor Paul Young (\$465,000)

ARC Discovery Grant. *One for all and all for one: Engineering a drug delivery platform for DNA vaccines to the lung* – awarded 2015-2018. Professor Daniela Traini and Professor Paul Young (\$482,738).

ARC Discovery grant. *Cause and effect: new mechanisms of particle formation in thunderstorm* – awarded 2019. Professor Daniela Traini, Dr Hui Xin Ong and others (\$550,000).

ARC Linkage grants. *Advanced nanotechnologies for targeting biofilm* – awarded 2017-2019. Professor Daniela Traini and Professor Paul Young (\$420,000).

ARC Linkage grants. *Improving respiratory drug delivery through targeted nozzle design* – awarded 2018. Professor Paul Young and others (\$360,000: \$555,000 including Partner contribution).

Bosch Small Equipment Grant. *qNano Gold TRPS Nanoparticle Analysis System for Shared Use in the Open-access Bosch Molecular Biology Facility* – awarded 2018. Professor Daniela Traini, and others (\$26,000)

Macquarie University Research Seeding Grant. *Surveillance of the biofilm underworld using novel imaging Technology* – awarded 2019. Dr S Cheng, Dr Hui Xin Ong., Dr M Li (\$45,000)

Marie Bashir Institute for Infectious Diseases and Biosecurity MBI Seed Funds. *Studying the respiratory biofilm underworld on a chip* – awarded 2019. Dr Hui Xin Ong, Dr S Cheng, Professor Paul Young, Dr D Carter (\$20,000)

MTP-Connect. *Ab-initio pharma | Formulation and GMP product manufacturing services for clinical trials in Australia* – awarded 2018. Professor Paul Young, Professor Daniela Traini and Dr Hui Xin Ong. (\$1,000,000 including Partner contributions)

NHMRC Development Grant. *Targeting Cystic Fibrosis Using a Novel Inhalation Therapy* – awarded 2017-2018. Professor Daniela Traini and Professor Paul Young (\$421,545.00)

NHMRC Project Grant. *Mechanisms of impaired bronchodilator response associated with fatty acid intake in obese asthma* – awarded 2015-2018. Professor Paul Young, Professor Brian Oliver and others (\$668,469.25)

NSW Industry and Community Engagement SEED Program. *BOOST -Fit out of the Marie Bashir Institute* – awarded 2018. Professor Paul Young, Professor Daniela Trani D, Dr Hui Xin Ong (\$200,000)

NSW Industry and Community Engagement SEED Program. *Efficient Aerosol Biofilm Eradication* – awarded 2019. . Professor Daniela Traini, Dr Hui Xin Ong (\$50,000)

NSW TechVoucher. *Investigation of NextScience formulation to assess biofilm eradication* – awarded 2019. Professor Daniela Traini, Dr Hui Xin Ong (\$30,000)

Perpetual IMPACT Philanthropy. *Non-Invasive Nasal Epithelia Profiling for Early Diagnosis of Lung Cancer* – awarded 2018. Dr Hui Xin Ong, Dr S Kao (\$126,545)

Woolcock Emphysema Centre PhD Scholarship. *Lung Mechanobiology- How Breathing Can Destroy a Lung in Emphysema* – awarded 2019. Dr H. XD. Ong, Dr P Bradbury, Dr J Chou, Professor Brian Oliver, Professor Paul Young (\$90,000)

AWARDS AND PRIZES

Sydney Medical School Postgraduate Award: Excellence in Teaching (Team) (2019) – Dr Rania Salama, Professor Paul Young, Professor Daniela Traini, Dr Hui Xin Ong

Jesse Xu. Pat Burnell Young Investigator Award at the 30th Drug Delivery to the Lungs Conference in Edinburgh (2019). Jesse Xu is supervised by Dr Hui Xin Ong, Professor Daniela Traini and Professor Paul Young at the Woolcock and Dr Michael Byron and Dr Johnathan Williamson, Clinical Specialists at RPA and Liverpool Hospitals, respectively.

'SUPRA Supervisor of the Year' at the University of Sydney (2018) both Professor Daniela Traini and Professor Paul Young were nominated.

SLEEP AND CIRCADIAN RESEARCH GROUP

Group Leader: Professor Ron Grunstein

CO-OPERATIVE RESEARCH CENTRE (CRC) FOR ALERTNESS, SAFETY AND PRODUCTIVITY

Theme Leader: Associate Professor Christopher Gordon

The Alertness CRC commenced in 2014 with 7 years funding of \$70 million in cash and in-kind resources from 3 universities (University of Sydney, Monash University, Flinders University) and 28 industry, government and non-government organisations (NGO) including the Woolcock Institute of Medical Research. It aims to address the challenge of reversing the impaired productivity and safety implications of insufficient sleep and shift work.

There are four major platform projects that drive the activities of the Alertness CRC and these are:

1. Laboratory-based development of systems and biomarkers to assess circadian, sleep and alertness states
2. Modelling and software development for prediction of alertness and optimisation of scheduling and a data fusion system for the estimation, prediction and control of individual alertness dynamics
3. Assessing individual vulnerability to shift work and integrated interventions for alertness management in the healthcare setting
4. Sleep disorder phenotyping

There are a number of major outputs from this project consortium which drive commercialization opportunities: (i) sleep health management decision support tools, (ii) novel mobile applications to manage insomnia and a shift work tool, (iii) circadian light design software, (iv) AlertSafe rostering software, (v) fatigue risk management algorithm.

HEALTH PSYCHOLOGY

Theme Leader: Associate Professor Delwyn Bartlett

This theme consists of our psychologists who specialise in behavioural sleep medicine predominantly treating insomnia and related sleep disorders (parasomnia and circadian disorders) using evidence-based non-drug approaches. Treatment includes cognitive behavioural therapy based on a psycho-education sleep program delivered by a trained sleep psychologist. This program also includes strategies to deal with ever increasing anxiety around sleep in our current society which needs to be addressed and balanced between adequate sleep without pressure around insufficient sleep. Depressive symptoms and insomnia are a bidirectional

relationship and we emphasise acceptance and the need to practice “retraining”. We use mindfulness and ACT along with CBTi to increase awareness of unhelpful thinking.

The psychologist-led sleep clinic and research team seek to better understand and treat those with poor sleep and poor sleep practices.

NEUROBIOLOGY

Theme Leader: Doctor Angela D’Rozario

The research undertaken by the Sleep Neurobiology Research Team provides neurophysiology and neuroimaging insights into cognitive deficits and daytime sleepiness in people with sleep disorders, severe mental illness and neurodegenerative disease. Their work encompasses a broad program of research undertaken as part of the NHMRC Centre of Research Excellence to Optimise Sleep in Brain Ageing and Neurodegeneration (CogSleep CRE) and includes several large trials funded by NHMRC project grants. Technological advances in measuring brain wave activity using our high-density electroencephalography (EEG) systems, together with neuroimaging expertise provide a powerful platform for our growing research program. The team uses these tools to discover new biomarkers for identifying patients at greater risk of cognitive impairment, both in terms of next day functioning i.e., vigilance failure and motor vehicle accidents, but also over the longer term, i.e., accelerated cognitive decline with ageing. They examine the mechanisms of how altered brain wave activity during sleep impairs learning and memory processes and leads to poor brain health. The team also evaluates innovative novel treatment approaches to restore normal sleeping patterns and improve cognition and clinical outcomes.

EPIDEMIOLOGY/CLINICAL TRIALS

Theme Leader: Associate Professor Nathaniel Marshall

The Epidemiology and Clinical Trials Team aims to investigate the prevalence, causes, risk factors and consequences of sleep disorders as well as rigorously test the effectiveness of established and emerging treatments in sleep health. They design clinical trials and statistically analyse clinical trials in conjunction with other research teams. They regularly conduct systematic reviews and meta-analyses on pressing clinical questions where they gather all high-quality data from around the world into single documents to better help doctors and patients make evidence-based decisions about their care. They are also leading a laboratory-based experiment into whether very loud infrasound generated by wind turbines affects human physiological systems.

CARDIO-METABOLIC

Theme Leader: Associate Professor Craig Phillips

The CIRUS Cardiometabolic Research Team aims to understand the role of sleep in maintaining cardiovascular and metabolic health and how sleep and circadian disturbance might advance cardiometabolic diseases such as diabetes and heart disease. Their research is exploring these relationships in the setting of shift-work where sleep and circadian disturbance is common, and in obstructive sleep apnoea (OSA). Although obesity is the main driver of OSA and associated cardiometabolic conditions, there is now evidence to suggest that once established, OSA further promotes cardiometabolic disease and weight gain and that it also hinders weight loss. This is now being explored in a study where CPAP treatment for OSA in the presence of weight loss is being assessed for its additional benefit in reducing diabetic risk and blood pressure. The team are also beginning to explore how neurovascular dysfunction in OSA might promote cognitive decline and dementia.

RESPIRATORY FAILURE

Theme Leaders: Associate Professor Brendon Yee and Associate Professor Amanda Piper

Respiratory disorders that increase the effort to breathe or are associated with weakness of the respiratory muscles, affect the pattern and depth of breathing. Sleep exaggerates any abnormalities in breathing, and over time can lead to inadequate breathing identified by high levels of carbon dioxide and low levels of oxygen both at night and during the day. If left untreated or treated inappropriately, inadequate breathing can lead to reduced quality of life, unnecessary hospitalisations and even premature mortality. Breathing during sleep can be markedly improved by applying positive pressure to the airways to assist inspiratory efforts. Understanding who is at risk, when best to start therapy and what ventilation strategy works best are important issues to ensure people with chronic respiratory disorders receive the best evidence-based care. One aim of the current research program is to explore the role of CPAP modalities in obesity hypoventilation syndrome.

GRANTS

Alertness CRC. *Development of a sleep restriction therapy "Sleep Right Tonight" App for behavioural management of insomnia* – awarded 2017-2018. Associate Professor Christopher Gordon, Professor Ron Grunstein and colleagues (\$177,383).

Alertness CRC. *Development of an automated multivariate and multimodal tool for detection of rapid eye movement sleep behaviour disorder* – awarded 2017-2018. Professor

Ron Grunstein and colleagues (\$10,700).

Australian Government Research Training Program Scholarship. Awarded 2018-2021. Anastasia Suraev.

Diabetes Australia Near Miss Grant. *Treating sleep apnoea after weight loss to maintain cardio-metabolic health in the obese with pre-diabetes* – A Randomised Controlled Trial – awarded 2017-2018. Professor Ron Grunstein, Associate Professor Brendon Yee, Dr Camilla Hoyos and Associate Professor Craig Phillips (\$60,000).

Heart Foundation Vanguard. *Blockade of Orexin Signalling in Hypertension (The BOSH Study)* – awarded 2019. Professor Ron Grunstein and colleagues (\$75,000).

Heart Foundation Vanguard. *The effects of long term low-dose colchicine on cognition and brain health in patients with established coronary artery disease - A randomised-controlled study* – awarded 2019. Dr Camilla Hoyos, Dr Shantel Duffy and colleagues (\$75,000).

Lambert Initiative. *A randomised, double-blind, crossover trial investigating the dose-dependent effects of purified oral cannabidiol (CBD) on driving performance in healthy volunteers* – awarded 2019-2021. Dr Danielle McCartney, Dr Camilla Hoyos, Ms Anastasia Suraev, Professor Ron Grunstein and colleagues (\$217,974).

Lambert Initiative. *Cannabinoids and sleep: A randomised, placebo-controlled crossover pilot study of 20:1 CBD:THC for insomnia* – awarded 2018-2020. Professor Ron Grunstein, Dr Camilla Hoyos (Co-PI) and colleagues (\$255,712).

MRFF RART Award. *Oximetry screening to detect sleep-disordered breathing in severe mental illness* – awarded 2019. Professor Ron Grunstein, Associate Professor Brendon Yee, Dr Angela D'Rozario, Associate Professor Nathaniel Marshall and colleagues (\$120,000).

MRFF RART Award. *The effectiveness of a mobile application delivering behavioural therapy for insomnia in primary care* – awarded 2019. Associate Professor Christopher Gordon, Associate Professor Delwyn Bartlett, Professor Ron Grunstein, Dr Keith Wong and colleagues (\$130,000).

MRFF RART Award. *Weight loss for sleep disordered breathing: Translating Sleep, Lifestyle, Energy, Eating, Exercise Programme into practice* – awarded 2019. Dr Elizabeth Cayanan, Associate Professor Brendon Yee, Dr Keith Wong, Associate Professor Craig Phillips, Professor Ron Grunstein (\$165,000).

National Natural Science Foundation of China. *The study of central mechanism of EA on Sishencong improving the sleep structure and cognitive function in patients with stroke*

based on *PSG-fMRI* – Awarded 2018-2021. Associate Professor David Wang and colleagues (¥500,000).

NHMRC Boosting Dementia Research Initiative. *REducing Sleep Apnoea for the PrEvention of Dementia (REShAPED): a multi-site feasibility RCT* – awarded 2019-2023. Professor Ron Grunstein, Associate Professor Craig Phillips, Dr Camilla Hoyos, Associate Professor Nathaniel Marshall and colleagues (\$1,468,684).

NHMRC Boosting Dementia Research Leadership Fellowship. *Improving Sleep to Reduce Dementia Risk* – awarded 2018-2021. Associate Professor Craig Phillips (\$709,585.00).

NHMRC Centre of Research Excellence. *National Centre for Sleep Health Services Research – Positioning Primary Care at the Centre of Sleep Health Management* – awarded 2017-2021. Professor Ron Grunstein and colleagues (\$2,500,000).

NHMRC Centres of Research Excellence. *NeuroSleep: The Centre for Translational Sleep and Circadian Neurobiology* – awarded 2014-2018. Professor Ron Grunstein, Professor Simon Lewis, Dr Keith Wong, Associate Professor Nathaniel Marshall and others (\$2,496,740).

NHMRC Centres of Research Excellence. *The Centre of Research Excellence to Optimise Sleep in Brain Ageing and Neurodegeneration (CogSleep)* – awarded 2019-2024. Professor Ron Grunstein, Professor Simon Lewis, Associate Professor Craig Phillips, Dr Angela D’Rozario, Dr Camilla Hoyos and colleagues (\$2,500,000).

NHMRC Fellowship Career Awards. *Addressing Therapeutic Challenges in Sleep Disorders* – awarded 2016-2020. Professor Ron Grunstein (\$851,980).

NHMRC Project. *A new clinical tool to assess fitness-to-drive in obstructive sleep apnea* – awarded 2018-2020. Professor Ron Grunstein, Dr Keith Wong, Dr Angela D’Rozario and colleagues (\$727,962).

NHMRC Project. *Local Sleep in the Awake Brain: An Underlying Cause of Neurobehavioural Deficits in Sleep Apnea?* – awarded 2018-2020. Professor Ron Grunstein, Dr Angela D’Rozario, Associate Professor Craig Phillips, Dr Keith Wong, Dr Camilla Hoyos and colleagues (\$582,330).

NHMRC Targeted Research. *Multidimensional Assessment of the Health Impacts of Infrasound: Two Randomised Controlled Trials* – awarded 2016-2020. Professor Guy Marks, Professor Ron Grunstein, Associate Professor Nathaniel Marshall, Associate Professor Craig Phillips, Dr Brett Tolle, Associate Professor Delwyn Bartlett and colleagues (\$1,943,933).

NHMRC-ARC Dementia Research Development Fellowship. *Sleep, plasticity and neurodegeneration: Enhancing sleep to prevent cognitive decline in Mild Cognitive Impairment* – awarded 2016-2020. Dr Angela D’Rozario (\$525,116).

NHMRC-ARC Dementia Research Development Fellowship. *Sleep-wake disturbances and cardio-metabolic dysfunction in at risk dementia: a novel pathway in neurocognitive decline* – awarded 2016-2020. Dr Camilla Hoyos (\$558,305).

Office of Global Engagement/Partnership Collaboration Awards. *The impact of shift work on energy and macronutrient intake in nurses, Australia and Taiwan: The TASTE Study* – awarded 2019-2020. Associate Professor Christopher Gordon, Associate Professor Nathaniel Marshall, Dr Elizabeth Cayanan, Dr Maria Comas Soberats, Dr Camilla Hoyos, Associate Professor Craig Phillips and colleagues (\$17,000).

Oracle Cloud Innovation Accelerator Program. *Unlocking sleep biomarkers in insomnia disorder* – awarded 2019. Associate Professor Christopher Gordon and Dr Tancy Kao (\$USD25,000).

Perpetual IMPACT Grant. *Light therapy in elderly people to improve sleep, cognition and daytime alertness* – awarded 2017-2018. Associate Professor Christopher Gordon and Dr Maria Comas Soberats (\$161,772).

RACP NHMRC Award for Excellence Scholarship (Dixon). *Obesity Hypoventilation Syndrome and Neurocognitive Dysfunction* – awarded 2015-2018. Dr Sheila Sivam (\$30,000).

USYD & Fundan University China. *Neural oscillations across space and time: properties and functional roles* – awarded 2019. Dr Angela D’Rozario, Dr Tancy Kao and colleagues (\$140,000).

USYD and NHMRC Equipment. *Wallac Wizard Gamma Counter* – awarded 2018. Professor Ron Grunstein, Professor Simon Lewis and colleagues (\$48,000).

Vice Chancellor’s Research Scholarship. Awarded 2018-2021. Anastasia Suraev.

SEED GRANTS

Charles Perkins Centre Seed Funding Grant. Exploring the effects of a 12-week combined exercise and psychoeducation program on inflammatory markers, hippocampal subfield volume, mood and memory in older adults with cognitive impairment – awarded 2019. Dr Shantel Duffy and colleagues (\$5,000).

USYD School of Psychology Seed Grant. Neurovascular

dysfunction as a mechanism underpinning cognitive decline in obstructive sleep apnoea – awarded 2018. Dr Angela D’Rozario and colleagues (\$20,000).

USYD School of Psychology Seed Grant. The Effects of Sleep on Veridical and False Memories – awarded 2018. Dr Angela D’Rozario and colleagues (\$20,000).

AWARDS

- CogSleep Travel Award (2019) Carla Haroutonian
- CRC Alertness PhD Awards finalist (2019) Melissa Aji
- James B. Skatrud New Investigator Award, Assembly on Sleep and Respiratory Neurobiology, American Thoracic Society (2018) Dr Camilla Hoyos
- NHMRC National Institute for Dementia Research Australia Dementia Forum, Best Poster Award (2018) Dr Angela D’Rozario
- Sleep Research Society. Advances in Circadian and Sleep Science Meeting, Travel Award (2019) Dr Camilla Hoyos
- SLEEP, Associate Editor (2019-). Associate Professor Nathaniel Marshall
- University of Sydney School of Psychology and Faculty of Science - selected as an emerging female leader in research to participate in the Franklin Women Mentoring Program, (2018) Dr Angela D’Rozario
- University of Sydney Summer Scholarship Project Deans Prize (2019) Justin Wu supervised by Associate Professor David Wang
- USYD Childcare Assistance Travel Support Scheme Award (2018 & 2019) Dr Angela D’Rozario
- World Sleep Vancouver, Young Investigator Award (2019) Aaron Lam
- Young Researcher Award, Sydney Innovation and Research Symposium (2018) Dr Camilla Hoyos

HIGHLIGHTS 2018-2019

- In 2019 Professor Ron Grunstein was awarded Member of the Order of Australia (AM) for significant service to medical education and research in the field of sleep disorders.
- In 2018 Professor Ron Grunstein, Associate Professor Christopher Gordon and Professor Sharon Naismith

presented the Sydney Research Spotlight session at the Sydney Local Health District Innovation Week. They spoke on the topic “Sleep – who needs it anyway”.

- Professor Ron Grunstein and Dr Sheila Sivam commenced the Narcolepsy and Excessive Sleepiness Clinic.
- In 2019 Professor Ron Grunstein, Associate Professor Nathaniel Marshall and Associate Professor Christopher Gordon appeared at the Commonwealth Government’s Inquiry into Sleep Health Awareness.
- Several distinguished international sleep medicine academics visited the Woolcock and presented their research in special lectures – this included Professor Hans Van Dongen (Washington State University); Associate Professor David Plante (University of Wisconsin); Professor Derk-Jan Dijk (University of Surrey); Associate Professor Ryan Vandrey (John Hopkins University); Professor Tea Lallukka (University of Helsinki); Professor Luis De Lecea (Stanford University) and Professor David Gardner (Dalhousie University).

PhDs AWARDED

2018: Dr Anna Mullins, Dr Sheila Sivam (University of Sydney)

2019: Dr Yasmina Serinel, (University of Sydney),

PRESENTATIONS

Melissa Aji, Exploring the user preferences and needs for mobile apps for sleep – a mixed – methods study, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Melissa Aji, A feasibility study of a mobile app to treat insomnia, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Dr Tom Altree, Predictors of weight loss in obesity and obstructive sleep apnoea, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Dr Tom Altree, Adverse events after pulmonary function testing with recent myocardial infarction, Thoracic Society of Australia and New Zealand, Gold Coast, Australia, March 2019.

Associate Professor Delwyn Bartlett, Overview of common questionnaires used to assess problems initiating and maintaining sleep in adults, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Associate Professor Delwyn Bartlett, Case study workshop – interpretation of sleep problems and treatment/further assessment pathways based on questionnaire data in adult patients, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Associate Professor Delwyn Bartlett, Case histories of sleep in mothers and babies, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Associate Professor Delwyn Bartlett, Sleep awareness and education for nurses, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Associate Professor Delwyn Bartlett, What have we learnt about sleep from chronic cannabis use and withdrawal, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Associate Professor Delwyn Bartlett, Current insomnia research at the Woolcock, World Sleep, Vancouver, Canada, September 2019.

Dr Elizabeth Cayanan, The impact of shiftwork on human energy intake: a systematic review, European Sleep Research Society meeting, Basel, Switzerland, September 2018.

Dr Elizabeth Cayanan, Practical strategies to initiate and sustain weight loss in clinical and tertiary settings, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Dr Julia Chapman, Intraindividual stability of NREM sleep quantitative EEG measures in obstructive sleep apnoea, 32nd Annual Meeting of the Associated Professional Sleep Societies, APSS, Baltimore, Maryland, USA, June 2018.

Dr Julia Chapman, Subjective symptoms, not objective circadian measurements, are predictive of depression in insomnia disorder, World Sleep, Vancouver, Canada, September 2019.

Dr Julia Chapman, Subjective symptoms, not objective circadian measurements, are predictive of depression in insomnia disorder, Australasian Chronobiology Society, Sydney, October 2019.

Dr Janet Cheung, Usage transitions between natural products, over-the-counter and prescription sleep aids: a longitudinal cross-lagged analysis, European Sleep Research Society meeting, Basel, Switzerland, September 2018.

Dr Angela D'Rozario, The brain and sleep apnea: multimodal insights into cognitive impairment, Adelaide Sleep Retreat

Adelaide, November 2018.

Dr Angela D'Rozario, Altered sleep neurophysiology and cognitive dysfunction, Center for the Neurobiology of Learning and Memory Learning and Memory, Dept of Psychiatry and Human Behavior, UC Irvine, CA, USA, August 2018.

Dr Angela D'Rozario, High density EEG for sleep research – an example of the use of new technology to build a research program, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Dr Angela D'Rozario, Objective measurement of sleep in mild cognitive impairment: a systematic review and meta-analysis, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Dr Angela D'Rozario, High-density EEG signatures in obstructive sleep apnoea – exploring cognitive deficits and response to treatment, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Dr Angela D'Rozario, Sleep and neurobehavioral function – emerging insights from quantitative EEG and high-density EEG approaches, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Dr Angela D'Rozario, Abnormal sleep neurophysiology in mild cognitive impairment and sleep-disordered breathing populations, World Sleep, Vancouver, Canada, September 2019.

Dr Angela D'Rozario, NREM sleep neural oscillations and executive dysfunction in older adults at risk of dementia, NHMRC National Institute for Dementia Research Australia Dementia Forum Hobart, June 2019.

Dr Angela D'Rozario, Targeting sleep spindles to optimise sleep quality and improve memory in mild cognitive impairment, NHMRC National Institute for Dementia Research Australia Dementia Forum, Sydney, June 2018.

Dr Shantel Duffy, Are MRS markers are associated with cognitive decline and clinical trajectory in older adults, Organisation for Human Brain Mapping Satellite Conference, Newcastle, October 2019.

Dr Shantel Duffy, CogStep: A home-based psychoeducation and exercise program for older adults with mild cognitive impairment or early stage Alzheimer's disease, NHMRC National Institute for Dementia Research Australia Dementia Forum Hobart, June 2019.

Dr Shantel Duffy, Physical activity levels are associated with spectroscopic markers of oxidative stress and neuronal

integrity in older adults with mild depressive symptoms, Alzheimer's Association International Conference, Los Angeles, United States of America, June 2019.

Dr Shantel Duffy, Exploring the link between changes in the rest-activity cycle and neuropsychological outcomes in older adults at risk for dementia, American College of Sports Medicine, Orlando, United States of America, May 2019.

Dr Moran Gilat, Melatonin for REM sleep behaviour disorder in Parkinson's disease: A double blind, randomised, placebo-controlled trial, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Associate Professor Christopher Gordon, Novel technologies for alertness and insomnia – insights from the CRC model, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Associate Professor Christopher Gordon, What's the hype with Insomnia phenotypes: Uncovering the evidence to date, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Associate Professor Christopher Gordon, The impact of treating insomnia upon functional health, psychological wellbeing and sleep-related quality of life: a randomised controlled trial with mediation analysis, European Sleep Research Society meeting, Basel, Switzerland, September 2018.

Associate Professor Christopher Gordon, Treatment response of insomnia disorder phenotypes and subtypes to standardised digital cognitive behavioural therapy, European Sleep Research Society meeting, Basel, Switzerland, September 2018.

Associate Professor Christopher Gordon, Differences exist in metabolic rate in insomnia compared to healthy sleepers: evidence of physiological hyperarousal in insomnia, European Sleep Research Society meeting, Basel, Switzerland, September 2018.

Associate Professor Christopher Gordon, The relationship between anxiety, chronotype, melatonin onset and sleep on depression symptoms in insomnia, European Sleep Research Society meeting, Basel, Switzerland, September 2018.

Associate Professor Christopher Gordon, Neurophysiological hyperarousal in insomnia based on slow wave activity: evidence of subtypes, World Sleep, Vancouver, Canada, September 2019.

Professor Ron Grunstein, Narcolepsy: Current Treatments and Future Pharmacological Developments, Sleep Down

Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Professor Ron Grunstein, Untangling the knots – a historical examination of evidence for OSA and obesity, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Professor Ron Grunstein, Delivering weight loss in a sleep clinic, World Sleep, Vancouver, Canada, September 2019.

Carla Haroutonian, Novel word learning and lexical integration in mild cognitive impairment: role of spindles and slow wave activity in overnight consolidation, World Sleep, Vancouver, Canada, September 2019.

Dr Camilla Hoyos, Sleep disordered breathing and mild cognitive impairment – treatment effects and barriers, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Dr Camilla Hoyos, Medicinal Cannabis for sleep disorders-review of the literature, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Dr Camilla Hoyos, Sleep and circadian rhythm alterations in older people with depression, World Sleep, Vancouver, Canada, September 2019.

Aaron Lam, Delineating the role of OSA and mild cognitive impairment profiles in memory recall in older adults at-risk of dementia. World Sleep, Vancouver, Canada, September 2019.

Associate Professor Nathaniel Marshall, Efficacy of prolonged release melatonin for REM sleep behaviour disorder in Parkinson's disease: a double blind, randomised, placebo-controlled trial, European Sleep Research Society meeting, Basel, Switzerland, September 2018.

Associate Professor Nathaniel Marshall, The epidemiology of the sleep apnoea cancer link, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Associate Professor Nathaniel Marshall, Melatonin for REM sleep behaviour disorder in Parkinson's disease: A double blind, randomised, placebo-controlled trial, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Associate Professor Nathaniel Marshall, Magnesium supplementation for restless legs syndrome and periodic limb movement disorder: A systematic review, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Associate Professor Nathaniel Marshall, Incidence and treatment of OSA in the psychiatric population, World Sleep, Vancouver, Canada, September 2019.

Associate Professor Craig Phillips, Cardiovascular and Renal Consequences of Sleep Apnea (Course Organizer and Chair), World Sleep, Vancouver, Canada, September 2019.

Associate Professor Craig Phillips, Combining weight loss with CPAP for OSA treatment: Are there any benefits? World Sleep, Vancouver, Canada, September 2019.

Associate Professor Craig Phillips, Sleep Physiology Year In Review – Measures of propensity to sleep and alertness symposium, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Associate Professor Craig Phillips, Q & A with NHMRC Expert Panel Members – Ideas Grants, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Dr Yasmina Serinel, Diurnal changes in central blood pressure and pulse pressure amplification in obstructive sleep apnoea, Sleep Down Under (Australasian Sleep Association ASM), Brisbane, October 2018.

Dr Sheila Sivam, Impact of 3 months of PAP Therapy on Neurocognitive Function in Obesity hypoventilation syndrome, European Sleep Research Society, Basel, Switzerland. September 2018.

Dr Sheila Sivam, Obesity hypoventilation syndrome and neurocognitive function – Impact of positive airway pressure, European Respiratory Society (ERS), Paris, France. September 2018

Dr Sheila Sivam, Slow frequency EEG activity in obesity hypoventilation syndrome, World Sleep, Vancouver, Canada, September 2019.

Anastasia Suraev, Sleep and ageing: What do cannabinoids have to do with it? ForeFront 11th Scientific Meeting, Sydney, November 2019.

Anastasia Suraev, Cannabis – Weeding Out the Facts, AUSMED Conference, Sydney, June 2019.

Anastasia Suraev, Cannabis use patterns for sleep disorders in Australia: A subanalysis of an online cross-sectional survey, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Associate Professor David Wang, Analysing morphine-induced respiratory depression in obstructive sleep apnoea

patients using new technologies – a randomised double-blinded placebo-controlled study, European Sleep Research Society meeting, Basel, Switzerland, September 2018.

Associate Professor David Wang, The effect of morphine on sleep: is there a genetic effect? – An RCT study, World Sleep, Vancouver, Canada, September 2019.

Associate Professor David Wang, Effect of an acute moderate dose of morphine on OSA, Sleep Down Under (Australasian Sleep Association ASM), Sydney, October 2019.

Dr Rick Wassing, Restless REM sleep in insomnia disorder impedes overnight regulation of emotional distress, ForeFront 11th Scientific Meeting, Sydney, November 2019.

Dr Rick Wassing, Restless REM sleep impedes overnight emotion regulation in insomnia disorder, European Sleep Research Society meeting, Basel, Switzerland, September 2018.

Associate Professor Brendon Yee, Non-invasive ventilation in COPD. Non-Invasive ventilation in OHS, TSANZ: Tasmania Branch Meeting 2018, Hobart, Australia, October 2018.

Associate Professor Brendon Yee, Sleep medicine and research training opportunities in Australia, World Sleep, Vancouver, Canada, September 2019.

WOOLCOCK EMPHYSEMA CENTRE

Director: Professor Alaina Ammit

The Woolcock Emphysema Centre is the 'go-to' hub for Australia's 300,000 sufferers and top researchers wanting to change the way this respiratory condition is treated. The Centre, run from our headquarters in Glebe, Sydney, works to improve the lives of patients by ensuring earlier diagnosis, better treatment options and ultimately a cure which will allow thousands of people to avoid these conditions altogether. By integrating clinical and basic research, the facility can innovate rapidly and revolutionise the way these respiratory diseases are studied and treated.

HIGHLIGHTS 2018-2019

- Establishment of the Breathlessness Clinic – a multidisciplinary clinic where cardiology, respiratory and allied health professionals collaborate to investigate and diagnose breathlessness in an integrated, yet targeted treatment plan specific to each patient's needs.
- Publication of 35 journal articles detailing cutting-edge research discoveries that help us increase our scientific understanding of emphysema and to improve clinical treatment.
- Enrollment of 33 research students in total (including 21 PhD students) working on projects directly focused on COPD.
- Recruitment of 10 new researchers working in the labs or in hospital clinics across Sydney.
- Award of ~ \$2,500,000 of funding from national and international funders to further research in COPD.
- Development of a model of care in community pharmacy. This is an innovative model of care for emphysema which might benefit many people living in the community.
- Initiation of the first study in Australia to bring together pulmonary rehabilitation coordinators from large evidence-based pulmonary rehabilitation programs across NSW (Prince of Wales Hospital, Royal Prince Alfred Hospital, Concord Hospital, Northern Sydney Local Health District Chronic Disease Community Rehabilitation Service, St Vincent's Hospital, St George Hospital, Sutherland Hospital, Westmead Hospital, Liverpool Hospital). This research is significant as it will be the first data to provide information on the effect of pulmonary rehabilitation in people with COPD on hospital admissions in the current Australian health system and will inform future health policy.
- Creation of the COPD Network that brings together respiratory clinicians in teaching and private hospitals

across Sydney. Powered by the COPD Database, a database that links clinical parameters with lung function, we have built infrastructure and collaboration between the clinical sites and developed and shared best practice treatment. To date, 254 patients have been recruited and the network now includes respiratory clinics at Royal North Shore Hospital, Concord Hospital, and Macquarie Hospital, with Westmead and Blacktown Hospitals coming on board soon.

GRANTS

Members of the Woolcock Emphysema Centre have been awarded funding from national and international funders to further research in COPD.

ATS Foundation/Resmed Research Grant. *Bi-level Positive Airway Pressure to Improve Sleep Quality in Chronic Obstructive Pulmonary Disease* – awarded 2018. Dr David Chapman, Professor Greg King, Associate Professor Craig Phillips, Dr Charlie Irvin. (\$100,000USD).

NHMRC Project Grant. *Understanding why in-utero exposure to inhaled oxidants predispose people to develop asthma and COPD*. Brian Oliver, Hui Chen, Alen Faiz - awarded 2019-2022 (\$1,043,742)

NHMRC Project Grants. *Switching tristetraprolin on to turn off inflammation in COPD*. Awarded 2018 – 2020. Alaina J. Ammit, and others (\$532,745)

Perpetual IMPACT Philanthropy Grant. *Emotional Wellbeing in COPD* – awarded 2019-2020 (\$84,000). Dr Brett Toelle and Associate Professor Delwyn Bartlett.

Rebecca Cooper Foundation. *Impact of maternal vaping on lung infection and asthma development in the offspring* - awarded – 2018. Dr Pawan Sharma, (\$100,000)

SPHERE (Maridulu Budyari Gumal) Respiratory, Sleep and Environmental Health (RSEH) Clinical Academic Group Professor Brian Oliver and Pawan Sharma (\$60,000)

Group Leaders: Professor Guy Marks and Associate Professor Greg Fox

The Woolcock offices in Vietnam were established in 2010 to support the implementation of NHMRC-funded research into tuberculosis and lung disease. Since then projects in Vietnam have been awarded \$20 million in research funding and have included 130,000 participants across multiple sites. The Woolcock has offices in Hanoi, Ho Chi Min City and Ca Mau and the implementation of projects across 11 Provinces is overseen by Country Director Dr Nguyen Thu Anh. The Woolcock Vietnam currently employs over 60 local researchers and, as activity within the projects increases, the number of employees continues to grow. Our research program in Vietnam is testing new strategies to reduce the burden of tuberculosis, improve care for chronic lung diseases and reduce antibiotic resistance. The group is also using new cutting-edge technologies to improve patient care. Our studies in Vietnam have provided the evidence needed to improve the health of people affected by tuberculosis worldwide.

GRANTS

NHMRC / NAFOSTED International Joint Calls Grant. *Harnessing new mHealth technologies to Strengthen the Management of Multidrug-Resistant Tuberculosis in Vietnam: The V-SMART Trial* (2019-2021). Associate Professor Greg Fox, Professor Guy Marks and others (\$496,103 and \$150,000).

NHMRC Project Grant. *Ending Tuberculosis. A cluster RCT of community-wide universal testing and treatment for latent TB infection in high prevalence settings* (2019-2023). Professor Guy marks, Associate Professor Greg Fox and others (\$6,458,052).

NHMRC Project Grant. *Prevention of multi-drug resistant tuberculosis in a high prevalence setting: 'Connecting the DOTS' in Vietnam* – awarded 2015-2019. Associate Professor Greg Fox, Professor Guy Marks and others (\$3,234,514).

NHMRC/Department of Foreign Affairs and Trade joint call. *Combating the emergence and spread of antimicrobial resistant infectious diseases in Vietnam: the V-RESIST study* (2018-2021). Associate Professor Greg Fox, Professor Guy Marks and others (\$2,480,000).

NHMRC/GACD Grant. *An integrated health sector strategy to combat COPD and asthma in Vietnam: A pragmatic stepped intervention cluster randomized trial* – awarded 2017-2022. Professor Guy Marks and Associate Professor Greg Fox and others (\$1,894,348).

AWARDS AND PRIZES

- Eureka Awards for Infectious Disease Research Finalists in 2018 and 2019. Professor Guy Marks and Associate Professor Greg Fox
- Sydney Research Hub, Research Excellence Award, Associate Professor Greg Fox

HIGHLIGHTS 2018-2019

- Professor Guy Marks was appointed as the President of the International Union Against Tuberculosis and Lung Disease, a leading global organization for lung health that is celebrating its 100th anniversary.
- The Active Case-finding for Tuberculosis 2 (ACT2) Trial, published in the New England Journal of Medicine demonstrated, that screening the close contacts of patients with tuberculosis doubles the detection of tuberculosis. This study provides important evidence that will help many high-burden countries scale up their TB screening.
- The ACT3 Trial, also published in the New England Journal of Medicine, showed that screening of whole communities using modern molecular tests can reduce the burden of tuberculosis by almost a half. This study provides a new direction in TB control for high-burden countries.



WOOLCOCK CENTRE FOR LUNG CANCER RESEARCH & LUNG CANCER RESEARCH NETWORK

WOOLCOCK CENTRE FOR LUNG CANCER

Director: Professor Maija Kohonen-Corish

The revolutionary new Centre for Lung Cancer Research was built at the Woolcock with the financial support of NSW Health and the Office of Health and Medical Research. This modern, purpose-built research centre is now well-established and is changing the way a deadly cancer is diagnosed, treated and studied both in Australia and globally. Our flagship projects include:

- Understanding how the human microbiome is altered in lung cancer and identifying the optimal microbiome profiles that naturally increase the efficacy of immunotherapy.
- Development of innovative stents and surgical aids for patients undergoing surgery for lung cancer
- Identification of markers that can be used for early diagnosis of lung cancers in at-risk patients

This will lead to the development of new interventions to boost therapy responsiveness for all lung cancer patients and provide early diagnosis for those at risk.

Acting as a hub for researchers working in the area of lung cancer, the facility is collecting tissue, cellular material and patient-related information to a dedicated biobank and data centre. Several projects are running in the state-of-the-art laboratory in collaboration with local health districts and research institutes.

LUNG CANCER RESEARCH NETWORK

Chair: Professor Matthew Peters and Dr Emily Stone

The Lung Cancer Research Network promotes interdisciplinary basic and clinical research across NSW and Nationally. Data generated from the Centre's research will grow across the Lung Cancer Research Network, allowing researchers to go from "bedside to bench and back again."

With this centralised, coordinated and collaborative approach to specifically target lung cancers, the Centre and its Network will plug the gap in respiratory cancer research. And in doing so, it will save lives and change the treatment landscape for sufferers and their families.

GRANTS

Cancer Council NSW Project Grant. *Identifying the molecular drivers of colorectal cancer so that targeted therapies can be developed* Professor Maija Kohonen-Corish, Dr J E Dahlstrom – awarded 2019-2021 (\$450,000)

Perpetual IMPACT Philanthropy. *Non-Invasive Nasal Epithelia Profiling for Early Diagnosis of Lung Cancer* – awarded 2018. Dr Hui Xin Ong, Dr S Kao (\$126,545)

AWARDS

- Pat Burnell Young Investigator Award for best oral presentation, Drug Delivery to the Lung Conference, Edinburgh UK (2019) Jesse Xu
- World Conference on Lung Cancer, Barcelona, Spain, Sydney Catalyst Professor Nico van Zandwijk, Travel and Education Award (2019) Hojabr Kakavand (\$2000)

HIGHLIGHTS 2018-2019

Launch 2018:

- The Woolcock Centre for Lung Cancer Research was opened by NSW Health Minister Brad Hazzard on April 18, 2020, at the Woolcock Institute of Medical Research.

Establishment of core projects during 2019:

- Developing new tumour biomarkers and pathology tests to optimise immunotherapy
- Harnessing the human microbiome to improve immunotherapy responses in lung cancer patients
- Identifying lung cancer predisposition genes in childhood cancer patients

Maija Kohonen-Corish, Invited Speaker & Chair of Microbiome Working Group, European Hereditary Tumour Group, Annual Scientific Meeting, Barcelona, Spain 2019

NEWSPAPER ARTICLES

- The Medical Republic, Penny Durham, Aug 2019; "Vicious Cycle, why lung cancer is so unloved."
- The Age, Liam Mannix, Sep 2019, "Good lung bugs more than a gut feeling"



NSW Health Minister Brad Hazzard

The Ann Woolcock Lecture series is an annual event that honours the contribution of Professor Ann Woolcock to the research community. Invited researchers share their ideas with industry, policy makers, doctors, specialists and patients with a view to prompting new collaborations to improve respiratory health. The program also facilitates the visit of eminent respiratory clinicians and scientists to the Woolcock for an exchange of ideas, skills and techniques with our researchers.

2018

The 2018 Lecture was delivered by Professor Derk-Jan Dyk, Professor of Sleep and Physiology, Director of the Surrey Sleep Research Centre and Director of Sleep Wake Research of the Surrey Clinical Research Centre. His talk was called *Chaos In Our Body Clocks – A Pathway To Disease* and he discussed questions such as “What are body clocks?” “Where are they located and what do they regulate?”



Professor Derk-Jan Dyk

2019

The 2019 Lecture was delivered by Professor Jeffery Drazen, Editor in Chief of the New England Journal of Medicine. Professor Drazen talked *How Medical Journals opened the war on smoking*.

Professor Drazen’s talk about the history of the antismoking campaign globally was fascinating. He also talked at Grand Rounds at RPAH about data sharing in clinical trials, which was equally informative.



Professor Jeffery Drazen

EDUCATION

The Woolcock Institute of Medical Research continues to play an important role in providing accredited education to healthcare providers. In 2018 and 2019 we held a number of events attracting more than 300 healthcare professionals.

Events include:

- GP Sleep and Respiratory Symposia
- Dental Symposium
- Smoking Cessation Training Courses

OUR CLINIC

The Woolcock Clinic is a world-leading medical centre specialising in the diagnosis and treatment of all sleep and breathing disorders. Our dedicated clinicians are at the forefront of international health research and are able to support patients with the latest innovations in diagnosis and cutting-edge evidence-based medicine.

At the Woolcock Clinic, there is a team of expert medical practitioners who will provide the best possible care and treatment plans following a thorough review of a patient's medical condition.

Our unique, interdisciplinary approach ensures patients get access to a range of specialists with expert skills to treat different aspects of their sleep or breathing conditions under the one roof.

In 2018-2019 the Woolcock Clinics performed over 5,800 sleep studies, the highest number to date.

At the Woolcock Clinic, there are over 45 highly experienced specialists providing a comprehensive range of services for sleep and breathing disorders such as asthma, chronic obstructive pulmonary disease (COPD), chronic cough, allergies, obstructive sleep apnea (OSA), insomnia, narcolepsy, restless legs syndrome and parasomnias (sleepwalking) in both adults and children. There is also the Woolcock NeuroSleep Clinic which is a world-leading medical centre specialising in the diagnosis and treatment of sleep disorders, neurodegenerative and/or mental health problems.

THE WOOLCOCK THERAPY CENTRE (WTC)

Established in 2017 the WTC provides support to our patients who are suffering from obstructive sleep apnoea (OSA) by helping them to choose the CPAP equipment best suited to their needs. We have a range of different brands and styles of equipment available and patients can take these home on trial. We also provide education on how to use masks and an "after sales service" where we follow the patient up to make sure they are still using the equipment correctly. The Therapy Centre works closely with physicians, patients and researchers to continually improve upon best practices.

In each of 2018 and 2019 the Woolcock Therapy Centre conducted over 1,000 trials of CPAP machines, ensuring patients understand how to use their equipment properly.

NARCOLEPSY AND EXCESSIVE SLEEPINESS CLINIC

A new initiative in 2019 was the Woolcock Narcolepsy and Excessive Sleepiness Clinic which cares for patients who suffer from narcolepsy and cataplexy.

Narcolepsy is a chronic condition characterised by excessive daytime sleepiness and uncontrollable bouts of sleep. Approximately 60-70% of patients with narcolepsy also suffer from cataplexy. Cataplexy is a sudden loss of muscle function while conscious.

Our clinicians are at the forefront of international narcolepsy research, ensuring patients get access to the very latest approaches in care.



Stories about research at the Woolcock appear regularly in the Australian media and our researchers are often asked to contribute their expertise to topical news and current affairs stories. In 2018 and 2019 stories about sleep and asthma were a regular subject of interest to the media and smoke from bushfires at the end of 2019 was another area where our researchers' expertise was in demand.

2019

Number of media mentions: 343

Top stories:

- 27/01/2019: **Sydney Morning Herald, Angela D'Rozario**, "Your brain could be sleeping ... even while you're awake"
- 11/02/2019: **Scimex, Pawan Sharma**, "New heated tobacco device causes same damage to lung cells as e-cigarettes and traditional cigarettes"
- 10/03/2019: **Channel 7 News, Helen Reddel**, "Asthma affects one in nine Australians and many asthmatics may be paying too much for treatment they don't actually need"
- 28/03/2019: **The Limbic, Maija Kohonen-Corish**, "Lung cancer centre focus on microbiome influence"
- 31/3/2019: **Channel 9 News, Ron Grunstein**, "Party drug linked to new treatment for sleep disorder"
- 2/4/2019: **The Limbic, Sabine Zimmerman**, "Could FOT be the next home monitoring tool for COPD?"
- 26/04/2019: **Sydney Morning Herald, Rick Wassing**, "Bad memories and cringeworthy mistakes fester for insomniacs"
- 31/05/2019: **Channel 7 News, Christine Cowie**, "Government to detail how it will combat Westconnex air pollution"
- 10/06/2019: **Sydney Morning Herald, Helen Reddel**, "Julia would breathe easier if living with asthma wasn't quite so costly"
- 25/06/2019: **Channel 10 News, Dev Banerjee**, "What happens when the nightmares never stop?"
- 25/06/2019: **7.30 Report, Helen Reddel**, "Why are so many Australians not taking their asthma medication"
- 29/06/2019: **ABC Online, Brendan Yee**, "Restless legs syndrome is still a mystery to scientists, but there are things you can do to help"
- 20/07/2019: **Sydney Morning Herald, Ron Grunstein**, "Short sleep, shorter life: Australia's deadly insomnia epidemic"
- 05/08/2019: **Prime 7 News, Professor Sharon Naismith**, "Experts say sleep can also help improve memory. New research from the Woolcock Institute is examining the link between lack of shut-eye and dementia"
- 14/08/2019: **Sydney Morning Herald, Dev Banerjee**, "A midnight snack, another coffee: what is the best way to stay awake?"
- 15/08/2019: **Channel 7 News, Sinthia Bosnic-Anticevich**, "Study paints grim picture of puffer use"
- 16/08/2019: **Channel 7 News, Sinthia Bosnic-Anticevich**, "People suffering with asthma are overusing reliever medication"
- 21/08/2019: **The Medical Republic, Woolcock Institute**, "Vicious cycle: why lung cancer is so unloved"
- 5/09/2019: **Channel 9 News, Helen Reddel**, "New Mild Asthma Medication"
- 16/09/2019: **Sydney Morning Herald, Maija Kohonen Corish & Brian Oliver**, "There are bugs in your lungs. Should you try to keep them healthy?"
- 7/09/2019: **Sydney Morning Herald, Chris Seton**, "Waking up to kid's sleep: what parents need to know"
- 28/09/2019: **Sydney Morning Herald, Keith Wong**, "How shifting your body clock can benefit your health"
- 8/10/2019: **The Today Show, Dev Banerjee**, "Sleep Investigation at the Woolcock"
- 3/12/2019: **ABC News, Christine Cowie**, "NSW areas suffered from hazardous haze brought by bushfires causing problems for people with asthma and respiratory illnesses."
- 4/12/2019: **ABC News, Christine Cowie**, "There has been a spike in ambulance calls for people going to hospital with asthma and other breathing problems in several parts of NSW, including the Sydney CBD."
- 4/12/2019: **The Guardian, Christine Cowie**, "Will wearing a face mask protect me from bushfire smoke?"
- 4/12/2019: **The Australian, Brian Oliver**, "Sydney air quality twice as bad as Delhi"
- 5/12/2019: **ABC News, Brian Oliver**, "How does

poor air quality from bushfire smoke affect our health?”

- 6/12/2019: **Channel 7, Christine Cowie**, “There are new health warnings over the bushfire smoke blanketing Sydney”
- 8/12/2019: **SBS News, Guy Marks**, “What are the health impacts of Sydney’s bushfire smoke and do face masks help?”
- 11/12/2019: **Mamamia, Brian Oliver & Christine Cowie**, “Is bushfire smoke the new normal?”
- 11/12/2019: **ABC News, Brian Oliver**, “As bushfire smoke affects the health of people on the east coast, the Federal Government is still refusing to acknowledge the link between the bushfires and climate change.”

2018

Number of media mentions: 248

Top stories:

- 1/2/2018: **Medicine Today, Helen Reddel**, “Asthma: self-guided breathing exercises can improve quality of life”
- 2/2/2018: **The Daily Telegraph, Chris Seton**, “Australian children are facing a sleep crisis due to excessive screen time”
- 28/2/2018: **ABC The Catalyst, Angela D’Rossario**, “Sleep Matters”
- 1/3/2018: **Scimex, Nicholas Stow**, “Sinus microbiome study investigates link between bacteria and chronic disease”
- 23/3/2018: **Medianet, Guy Marks**, “Ensuring Clean Energy isn’t the New Cane Toad”
- 30/3/2018: **Sydney Morning Herald, Chris Seton**, “Tired students experiencing ‘jet lag’ because of early starts: study”
- 2/4/2018: **Medianet, Helen Reddel**, “Asthma patients using expensive combination inhalers may not get extra benefit”
- 18/4/2018: **Channel 7 News, Woolcock Centre for Lung Cancer Research**, “Over 10,000 Australians are diagnosed with lung cancer every year and the survival rate is less than 15%. Australia’s top cancer experts are collaborating on new studies and drug trials for the first time to find a cure for lung cancer at the Woolcock Centre for Lung Cancer Research”
- 4/18/2018: **TEN Eyewitness News, Woolcock Centre for Lung Cancer Research**, “The unveiling of the first Lung Cancer Research Centre in NSW is aiming to bring hope to more than 10,000 Australians

who are diagnosed with lung cancer each year”

- 23/4/2018 - **Doctor Portal, Juliet Foster**, “Severe asthma toolkit key resource for GPs”
- 02/5/2018: **Camden Advertiser, Guy Marks**, “World first wind turbine study calling Macarthur residents”
- 15/5/2018: **Channel Nine News, Cindy Thamrin & Greg King**, “Do you have asthma? Are you using a regular preventer?”
- 16/5/2018: **The Limbic, Cindy Thamrin**, “Home monitoring hope for asthma patients”
- 11/6/2018: **Channel 7 News, Angelina D’Rozario**, “High tech cap reveals sleep’s darkest secrets”
- 11/7/2018: **The Guild, Carol Armour**, “Parliamentary asthma group formed”
- 11/7/2018: **The Limbic, Woolcock Institute**, “Breathlessness Clinic launched by respiratory and cardiology specialists”
- 12/7/2018: **Business Daily – Christine Cowie**, “Carbon monoxide exposure in homes is a risk – here’s how to protect yourself”
- 26/8/2018: **Channel 7 News, Christine Cowie**, “Fish oil may prevent allergies in kids: Study”
- 25/8/2018: **Channel 7 News, Ron Grunstein**, “Body clock ‘remarkably robust’, charity jetsetter proves”
- 15/8/2018: **Mirage News, Sharon Naismith**, “Over 1.6m funding for new health and medical research”
- 15/8/2018: **ABC News, Guy Marks**, “Living with household mould in Australia”
- 2/11/2018: **Scimex, Pawan Sharma**, “Asthma study highlights potential new treatment targets”
- 4/11/2018: **Sydney Morning Herald, Chris Seton**, “The importance of sleep – and how to help your child get it”

Below is a list of the Board committees that operated in 2018 and 2019 and their membership:

FINANCE AND RISK COMMITTEE

Members: Robert Estcourt (C), Carol Armour, Ian White, Jayne Shaw, Joanne Elliot, Julie Osborne, Kerstin Baas.

Below is a list of the Woolcock committees that operated in 2018 and 2019 and their membership:

WOOLCOCK EXECUTIVE COMMITTEE

Members: Carol Armour (C), Alaina Ammit, Anna Mullins, Brett Toelle, Camilla Hoyos, Daniela Traini, Dev Banerjee, Joanne Elliot, Kanika Jetmalani, Kerstin Baas, Maliheh Ghadiri, Paul Young, Rachel Tan, Sinthia Bosnic-Anticevich.

NEXT GENERATION COMMITTEE

Members: Camilla Hoyos (C), Maliheh Ghadiri (C), Peta Bradbury (C), Angela D’Rozario, Biljana Cvetkovski Brian Oliver, Christine Cowie, Cindy Thamrin, David Chapman, Elizabeth Cayanan, Farid Sanai, Hojabr Kakavand, Julia Chapman, Katrina Tonga, Larissa Gomes Dos Reis, Maria Comas, Michele Pozzoli, Rick Wassing, Tong Gong.

RESEARCH COMMITTEE

Members: Brett Toelle (C), Alaina Ammit (C), Akshay Bhumkar, Bandana Saini, Brian Oliver, Carol Armour, Christine Cowie, Craig Phillips, Greg King, Hui Ong, Joanne Elliot, Lyn Moir, Maija Kohonen-Corish, Maliheh Ghadiri, Mary Collins, Nathaniel Marshall, Tayla Swann.

OPERATIONS COMMITTEE

Members: Joanne Elliot (C), Akshay Bhumkar, Ann McCarthy, Ann-Marie Gregory, Cansy Ittimani, Fliur-Louise Genevieve, Gunnar Unger, Jagit Singh, John Reynolds, Karen Edwards, Lyn Moir, Tayla Swan.

POSTGRADUATE COMMITTEE

Members: Rachel Tan (C), Anna Mullins, Aaron Lam, Carla Haroutonian, Daniela Traini, Dorothy Drabarek, Elyse Guevara-Rattray, Jack Bozier, Jesse Xu, Katrina Tonga, Larissa Gomes, Lisa Redwood, Michele Pozzoli, Sandra Rutting.

CLINIC COMMITTEE

Members: Dev Banerjee (C), Andrew Treptow, Brendon Yee, Carla Evans, Chris Blackwell, Darren O’Brien, David Iannello, Delwyn Bartlett, Elizabeth Cayanan, Malin Andersson, Michelle Donegan, Pearl Cheung, Ron Grunstein, Roo Killick, Sabine Zimmerman, Sheila Sivam, Simon Lewis, Yu Xin Kwan.

DEVELOPMENT COMMITTEE

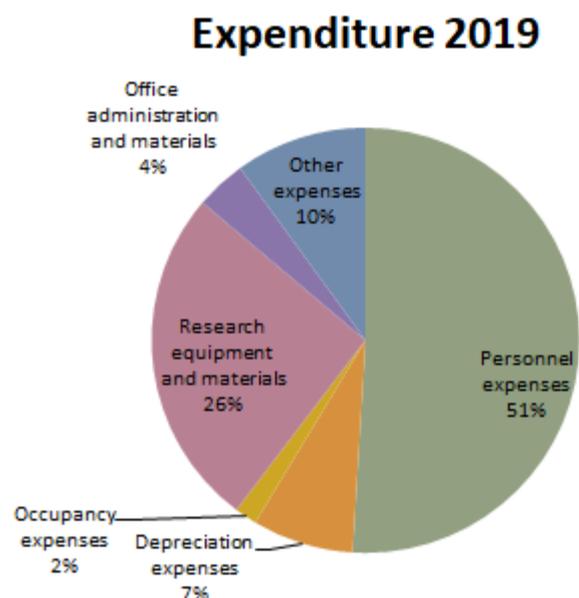
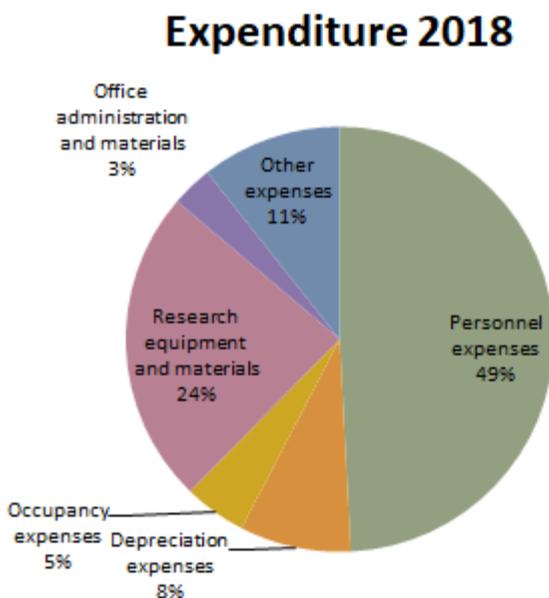
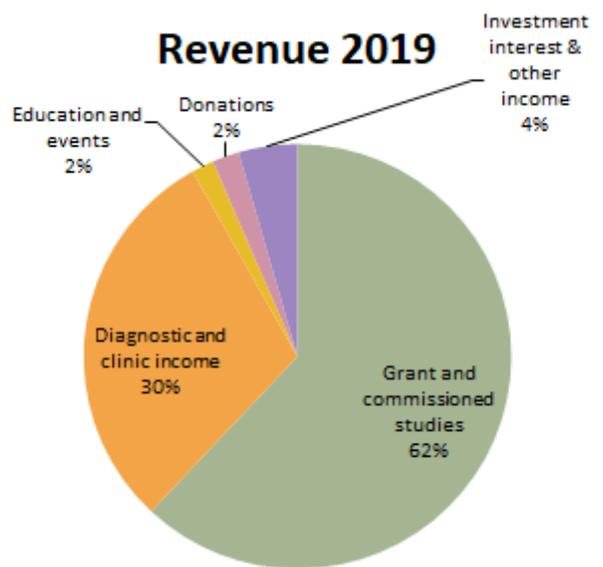
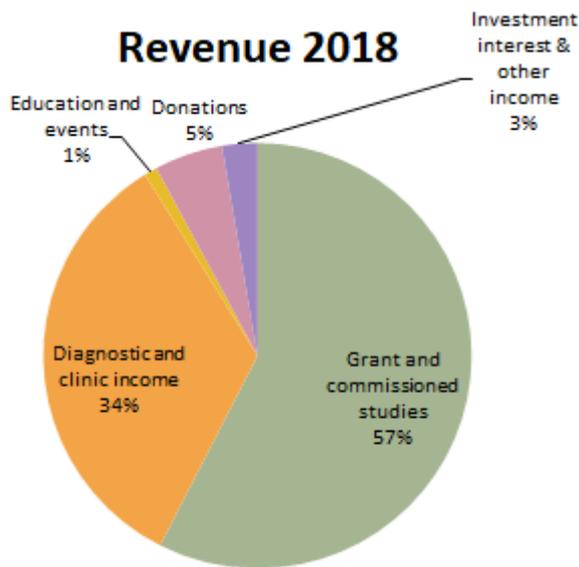
Members: Sinthia Bosnic-Anticevich (C), Alaina Ammit, Andrew Treptow, Cindy Thamrin, Craig Phillips, Emma Funnell, Hojabr Kakavand, Hui Ong, Janice Scelzo, Leanne Poulos, Maija Kohonen-Corish, Malin Andersson, Penny Dalla.

FINANCIAL PERFORMANCE

In 2018 and 2019 the Woolcock, after some years of focusing on reducing costs, has shifted to a strategy of investing in infrastructure to bring our information technology systems into the 21st century. We have invested in a new data storage system, an upgrade of our audio-visual facilities, a web-based volunteer recruitment application to support research projects and a new intranet. These investments have contributed to a more efficient and effective use of resources and offered an improved platform for internal communications. These new platforms will lay the foundations for improvements, efficiencies and new ways of working in the future.

Our research activity continues to be the main driver of activity at the Woolcock. Our work in Vietnam was bolstered by the awarding of two large grants, one in 2018 and a second in 2019 which will significantly increase our activity in this region. The Sleep and Cells groups were also awarded grants of over \$1,000,000 in 2019. This has seen our grant income increase over 2018 and 2019.

Our financial result in 2019 was a deficit of \$183,827 compared to a deficit in 2018 of \$670,265.



STATEMENT OF PROFIT OR LOSS

	\$	\$
REVENUE	2019	2018
Revenue	16,414,897	15,279,931
Total revenue	16,414,897	15,279,931
EXPENSES	2019	2018
Personnel expenses	(8,460,840)	(7,843,068)
Depreciation expenses	(1,268,789)	(1,342,909)
Occupancy expenses	(279,652)	(753,850)
Research equipment and materials	(4,300,772)	(3,818,063)
Office administration and materials	(634,756)	(494,798)
Other expenses	(1,653,915)	(1,697,508)
Total Expenditure	(16,598,724)	(15,950,196)
Surplus/(deficit) from operating activities	(183,827)	(670,265)

STATEMENT OF FINANCIAL POSITION

	\$	\$
	2019	2018
ASSETS		
Cash and cash equivalents	14,445,888	12,906,523
Trade and other receivables	1,664,706	1,778,624
Inventories	26,480	21,844
Other financial assets	1,608,578	1,266,370
Other assets	156,982	469,808
Total current assets	17,902,634	16,443,169
Property, plant and equipment	1,643,001	1,983,406
Right of use assets	535,367	0
Total non current assets	2,178,368	1,983,406
Total assets	20,081,002	18,426,575
LIABILITIES		
Trade and other payables	1,071,353	856,226
Provisions	543,643	539,154
Lease liabilities	502,436	0
Contract liabilities	10,771,049	9,767,835
Total current liabilities	12,888,481	11,163,215
Provisions	287,359	220,649
Lease liabilities	46,278	0
Total non current liabilities	333,637	220,649
Total liabilities	13,222,118	11,383,864
Net assets	6,858,884	7,042,711
EQUITY		
Retained Earnings	6,858,884	7,042,711
Total Equity	6,858,884	7,042,711



ROBERT ESTCOURT (CHAIRMAN OF THE BOARD)

Appointed 14 September 2005

Director Brookvine Pty Limited (2004-); Director and Chair of Finance and Risk Committee Radio 2RPH; Member Australasian Sleep Association Finance Committee; Investment Consultant to The Royal Australian & New Zealand College of Ophthalmologists (RANZCO) (2013-); Consultant AA Solutions (2012-); Director e-Clipse Online (2010-16); Director Innova Asset Management (2014-2015); Independent Investment Committee Member Charter Hall Opportunity Funds (2005-2014); Chairman Austock Asset Management (2007-2009), Director & Chief Executive Officer, Retail Cube Limited, 2004-2006; Principal, Estcourt Associates, 2003-; Director of AMP Portfolio Businesses, 2002-2003; Director and Head of Cobalt RunOff Services Ltd, 2000-2002; AMP Group GIO Task Force, 1999-2000; Director, AMP Asset Management, 1992-1999; Head of AMP Investments, New Zealand, 1990-1992; Head of Investment Strategy; Equity Research, AMP Investments, 1986-1990; Assistant General Manager, Investment Division, UAL Merchant Bank, 1974-1986.



PROFESSOR CAROL ARMOUR AM (EXECUTIVE DIRECTOR)

Appointed 10 April 2012

Appointed Executive Director 1 July 2012

Professor Carol Armour has worked in asthma research at a basic scientific and clinical level. Her investigations span the breadth of asthma research from the cellular mechanisms, to the translation of new ways to treat asthma within the health system. She is on the Australian Respiratory Council, The National Asthma Council and has chaired the National Asthma Monitoring Advisory Committee, worked on the National Therapeutic Guidelines and the Australian Medicines Handbook. From 2003 - 2006 she was a member of the NHMRC Research Committee and was the Chair of the Training Awards Committee. She was Pro-Vice Chancellor, Research, at The University of Sydney, from 2006-2009. In 2005 she was made a Fellow of the Pharmaceutical Society for her services to the profession, and she was awarded the Australasian Pharmaceutical Science Association (APSA) medal for research in 2007. She is currently a Professor of Pharmacology in the Faculties of Medicine and Health. She is the Executive Director of the Woolcock Institute of Medical Research. She was made a Member of the Order of Australia for significant services to medical education in the 2019 Honours list.



PROFESSOR BRUCE ROBINSON AC

Appointed 30 May 2006

Fellow in Medicine, Harvard Medical School (1986-1988); Instructor in Medicine, Harvard Medical School (1988-1989); Pioneered and Head, Molecular Genetics Unit (1989 - then transitioned to Co-Head, Cancer Genetics in 2010 - current), Co-Head of the Kolling Institute of Medical Research (1989-); Professor of Medicine (Endocrinology), University of Sydney (1992); Head, Department of Medicine, University of Sydney, Northern Clinical School (1996-2001); Chairman, Department of Medicine, University of Sydney (1998-1999); Head, Division of Medicine, Royal North Shore Hospital (1998-2006); Chairman, Hoc Mai, Australia Vietnam Medical Foundation, University of Sydney (2001-); Associate Dean (International) Faculty of Medicine, University of Sydney (2003-2005); Dean, Faculty of Medicine, University of Sydney (2006-2016); awarded Member AM (2012) on Queen's Birthday Honours; Chair, National Health and Medical Research Scientific Council (2015- current); Chair, Medicare Benefits Schedule (MBS) Review Taskforce (2015-2020); Director, Cochlear Limited (2017- current); Director, Mayne Pharma Group Limited (2014- current); Director QBiotech Group Ltd (2018- current), Companion (AC) in the General Division of the Order of Australia (2020).



JULIE OSBORNE

Appointed 30 May 2012

Non-executive director Assetinsure Holdings Pty Limited and Assetinsure Pty Limited (2014-); Chair of Audit Committee and Chair of Investment Committee; Summerland Financial Services Limited (2019-); Chair of Audit Committee; and Crown Holiday Parks Land Manager (2020-); Chair of Audit and Risk Committee; Sydney Football Stadium Community Consultative Committee (2019-); Starlight Children's Foundation - NSW Advisory Board member (2011-2015); KPMG - Executive Director, Financial Services (2016-2020); Westpac Banking Corporation - Executive Director and Head of Structured Finance, Treasury (2003–2010).



PROFESSOR MACDONALD CHRISTIE

Appointed 1 March 2013

Professor Christie completed a PhD at The University of Sydney in 1983. He was an Australian Postdoctoral Fellow in 1985 (NHMRC), a Fogarty International Fellow at Massachusetts Institute of Technology from 1985-1987 and then Senior Research Associate at the Vollum Institute in Oregon, USA from 1987-1990. Appointed as a tenured academic in the Department of Pharmacology, the University of Sydney in June 1990, where he was Head of Department from 1998-2000, full professor (personal chair) from 1999 and Medical Foundation Senior Principal Research Fellow from 1998-2002. NHMRC Senior Principal Research Fellow 2003-2018. Served as Director of Basic Research at the Pain Management Research Institute (2003-2008) and Brain & Mind Research Institute (2009-2011) University of Sydney. Appointed as Professor of Pharmacology in June 2011. Associate Dean Research, Sydney Medical School (2013 - 2015). Deputy Dean (Research), Sydney Medical School (2016-2018). Associate Dean Research, Faculty of Medicine and Health (2018-).



SIMON BLACKBURN

Appointed 20 September 2013

Director, The Hunger Project Australia (2014-), Senior Partner, McKinsey & Company, Sydney (2012-), Partner, McKinsey & Company, Sydney (2008-2012), Partner, McKinsey & Company, Boston (2004-2008), Consultant, McKinsey & Company, Boston (1997-2004), Director, Parents as Teachers, USA (2007-2013), Director Massachusetts STEM collaborative, USA (2004-2007), Research Engineer, Telstra (1992-1993).



PROFESSOR ARTHUR CONIGRAVE

Appointed 30 March 2016. Retired May 2019.

Appointed Acting Dean of Sydney Medical School in 2016 and Dean from January 2017. Prior to these appointments, Professor Conigrave held several leadership roles including Head of the School of Molecular Bioscience from 2007-10 and since 2011, Deputy Dean and Associate Dean (Finance and Administration) in Sydney Medical School. Professor Conigrave is an endocrinologist specialising in the clinical management of patients with metabolic bone disease (including osteoporosis and disorders of calcium metabolism), and an internationally recognised researcher in molecular endocrinology.



IAN WHITE (COMPANY SECRETARY)

Appointed 1 May 2012

Ian White has over 40 years' experience within the financial services industry across various general management and company secretarial roles.



PROFESSOR MATTHEW PETERS AM

Appointed 8 October 2015

Professor Matthew Peters is a Respiratory Physician and Head of Respiratory Medicine at Concord Hospital. He holds academic appointments at Macquarie University and The University of Sydney. He has long had an interest in preventative health and was Chair of Action on Smoking and Health (ASH) for many years. He is a past President of the Thoracic Society of Australia and New Zealand. He has research interests in respiratory physiology and the pulmonary and cardiac responses to hypoxia. He was made a Member of the Order of Australia for significant services to medical education in the 2019 Honours list.



JAYNE SHAW

Appointed 12 October 2016

Ms Jane Shaw has significant experience in healthcare management and an experienced clinical background in nursing. She has acted in senior management roles in two Australian private hospitals and established an Australian and international consulting business which was sold to Healthsouth, a large US Healthcare company. After this, she became the co-founder of Vision Group, a business that was successfully listed on the ASX.

Ms Shaw has been a member of several private healthcare boards involved with specialist consolidation including cardiology, cancer care, orthopaedics, and women's health and has continued to work with private equity firms on local and international healthcare transactions.

She also holds positions on the boards of Mable Technologies, the Woolcock Institute of Medical Research, and the Hareda Foundation, and as Chairman of BCAL Diagnostics.



CARMEL TEBBUTT

Appointed 22 February 2017

Director, Mental Health Australia (2019-); CEO of the NSW Mental Health Coordinating Council (2016-), Director, Media Super Limited (2015-), Director, Lysicrates Foundation (2015-2018), Director, NSW Kids In Need (2016-2018), Member for Marrickville (2005-2015), Member of the NSW Legislative Council (1998-2005); NSW Government Minister (1999-2009). NSW Deputy Premier, (2009-2011).



FIONA CAMPBELL

Appointed 22 February 2017

Fiona Campbell was admitted to practice law as a solicitor in the Supreme Court of New South Wales in 1993. She is currently a solicitor in private practice at Vizzone Ruggero Twigg Lawyers (1997-) specialising in plaintiff medical negligence and other personal injury litigation. Fiona has a particular interest in psychiatric injury and forensic mental health. She has conducted many cases for plaintiffs in numerous areas of medical specialties including orthopaedic surgery, obstetrics, maternal-foetal medicine, neurosurgery, infectious diseases, ophthalmic surgery and oncology. Prior to her employment with VRT Lawyers Fiona commenced her legal career at Blake Dawson Waldron (now Ashurst) where she joined the insurance (Medical Defence) practice group acting for a large medical indemnity insurer, United Medical Defence. Fiona gained wide ranging experience and medical knowledge acting for doctors in civil litigation as well as disciplinary and Health Care Complaints Commission proceedings.



PROFESSOR MARK REES

Appointed 8 May 2019

Professor Rees completed his PhD at the University of Wales College of Medicine in 1994 and has had academic positions at Cardiff (1989-1999), Auckland (1999-2004) and Swansea (2004-2019) Universities. His academic interests lie in the genetic basis of medical disorders with a recent focus on neurology, mental health and cardio-respiratory disease. Professor Rees is former Founder / Director of the Wales Epilepsy Research Network and a Fellow of the Royal College of Pathologists and Fellow of the Learned Society for Wales. In April 2019, he joined the University of Sydney as Deputy-Executive Dean of Research Partnerships for the Faculty of Medicine and Health (FMH). He is focusing on growing the research capacity of FMH and deliver stronger collaborative partnerships with USYD-affiliated MRI's and NSW-LHD's.

2018

Alzayer, R., Chaar, B., Basheti, I. and **Saini, B.** (2018). Asthma management experiences of Australians who are native Arabic speakers. *J Asthma* 55(7):801-810.

Beaurivage, D., Boulet, L.P., **Foster, J.M.W., Gibson, P.G.** and McDonald, V.M. (2018). Validation of the patient-completed asthma knowledge questionnaire (PAKQ). *J Asthma* 55(2):169-179.

Bestrashniy, J., Nguyen, V.N., Nguyen, ... **Nguyen, T.A., ... Marks, G.B. and Fox, G.J.** (2018). Recurrence of tuberculosis among patients following treatment completion in eight provinces of Vietnam: a nested case-control study. *Int J Infect Dis* 74:31-37.

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