KOLLING INSTITUTE NEWS

DECEMBER 2020

Kolling researchers to improve chronic pain management

Page 3

Page 4

Researchers work to diagnose cancer earlier

Page 5

A Cardiovascular Centre of Excellence for the Kolling

Discovery into reality

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MESSAGE FROM THE ACTING EXECUTIVE DIRECTOR

This year has been a remarkable one where we have seen unprecedented change. COVID-19 has defined 2020, impacting our work, our families and the global community. Crucially, it has highlighted the importance of a robust scientific and medical research community, and the contribution of institutes like the Kolling, with a large number of highly skilled and respected researchers.

Many of our team continue to support COVID-19 related research, working on projects within the Northern Sydney Local Health District, and as part of international and multi-institutional collaborations. Our researchers are involved in trials focusing on early warning tools, the impact on patients with cardiovascular disease, and the use of blood pressure medications to reduce severe COVID symptoms.

The pandemic has presented many challenges and affected working arrangements, but despite the impact on research activity, significant progress has been made at the Kolling this year across a broad range of disciplines. A number of the recent successes and exciting contributions of Kolling Institute researchers to improve patient care and community health, are highlighted below and throughout this newsletter.

Our expertise has been recognised with state and federal government support, and generous philanthropic funding. Significant NHMRC grants have gone to Professor Gemma Figtree to establish a Cardiovascular Centre of Excellence and to Executive Director Professor Carolyn Sue for an innovative tool to assist the diagnosis of Mitochondrial disease.

Funding administered by the Michael J. Fox Foundation will pave the way for Kolling researchers to help unravel the genetic influences with Parkinson's disease. Our neuroscience team was selected after a global search for expertise to speed-up the next generation of treatments for Parkinson's.

In recent weeks, two of our cancer researchers have received funding for incredibly promising projects to improve cancer diagnosis and treatment, while the group from the Pain Management Research Institute has just received more than $2.8 million for a collection of work to improve the lives of those living with chronic pain. This body of research could influence the way chronic pain is managed across the country.

Rehabilitation researchers have launched large-scale trials which may lead to life-long improvements for those who experience a spinal cord injury. One of these trials involves Professors Ashley Craig and James Middleton, who are leading a world-first trial, with an experienced, global team.

Researchers within the lab of Ageing and Pharmacology are directly influencing clinical practice and improving care for the elderly, including many who take a combination of too many medications. Their research is also helping to identify frail patients in hospital, so that extra support can be offered.

Significant progress has been made this year by the Kolling's large musculoskeletal team, leading valuable trials and publishing sought-after research. Musculoskeletal diseases affect seven million Australians, and the team's evidenced-based approach will continue to support this large group of people.

This year has been an important one for the Kolling with the development of the new research strategy, setting the direction of the institute for the next five years. The strategic framework will strengthen our ability to achieve ground-breaking research and improve patient outcomes. It will support researchers to develop new partnerships and attract additional investment.

On behalf of Professor Carolyn Sue, I would like to thank all our researchers for their remarkable contribution in what has been a unique year, and wish them an enjoyable and relaxing time over the festive season.

Professor Chris Little
Acting Executive Director

Professor Paul Glare, Dr Karin Aubrey and Professor Paul Wrigley

Philanthropic funding brings new hope to those with chronic pain

Some of the nation's leading pain experts based within the Kolling are set to embark on research which may change the way chronic pain is managed.

The program will be carried out by the team from the Pain Management Research Institute after generous funding from the Ernest Heine Family Foundation.

Institute Director Professor Paul Glare said more than $2.82 million will go towards three projects over the next three years.

"Chronic pain affects 20 per cent of the population and one third of people over 65," he said.

"It is the major cause of disability, costing the Australian economy an estimated $73 billion a year.

"There's a pressing need to develop better management strategies, so we'll be launching these initiatives, which together have the best chance of improving the lives of those living with chronic pain."

The projects include:

- Research led by Dr Karin Aubrey and Professor Chris Vaughan to help to develop safer and more effective medications for chronic pain.
- Research led by Professor Paul Glare and Dr Claire Ashton-James to develop digital behavioural interventions to help patients alter their attitudes and behaviour in response to pain, and lower the use of potentially harmful opioid medications.
- Research led by Associate Professor Paul Wrigley to provide better support to people with chronic pain in the community, reducing their need for emergency department (ED) care.
- Associate Professor Paul Wrigley said his project ED PainPATH represented a unique opportunity to improve access to essential support.

"It will assist people to manage distressing chronic pain through a co-ordinated care program, improving health outcomes and reducing costs," he said.

"Importantly, this initiative could be adopted across the state if it proves successful."

Dr Karin Aubrey welcomed the substantial funding for her research, saying there are currently very few effective medications for ongoing pain.

"Chronic pain is challenging to treat and there's a lot we still don't understand about what happens in the brain when chronic pain develops," she said.

"If we can gain a better understanding of how long-term pain changes the brain, we will be in a better position to reduce it.

"Our research will aim to identify new drug targets that influence chronic pain, and this will help us develop new medicines to effectively treat the pain."

Professor Glare said the team are incredibly grateful to the Ernest Heine Family Foundation for this very generous funding, particularly at this time of economic uncertainty.

New funding launches exciting project to detect cancer earlier

Congratulations to Kolling cancer researcher and Sydney Vital fellow Dr Yaser Hadi Gholami on being awarded the prestigious 2020 Physics Grand Challenges grant.

The Grand Challenges project was initiated by the University of Sydney's School of Physics to drive new discoveries and breakthroughs that will transform the world.

$250,000 will be directed to Dr Gholami's innovative research which aims to significantly improve diagnostic techniques for cancer.

Dr Gholami is thrilled to have received the large, competitive grant.

"This has been my dream since I started studying physics. I strongly believe this will be the first step towards establishing the field of quantum medicine in the diagnosis of cancer," he said.

"Our project will involve fundamental work which I believe will support generations to come in the diagnosis and treatment of a range of cancers."

Clinicians currently use MRI or PET scans to detect cancer, but the imaging devices can only detect the cancer at a certain size. There are also some limits with existing blood, urine and tissue testing.

"Our approach will mean that we can detect cancer at a very early stage, and in many cases, before the cancer has had the chance to spread to other parts of the body. This will be a real game changer.

"Our technique will be able to detect malignant cells with quantum specificity, meaning that we can detect even a very small number of cancer cells in a liquid biopsy or nano-scale metastases in a solid biopsy sample.

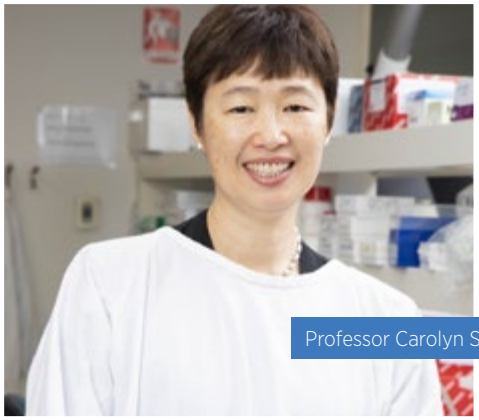
"Importantly, this will be a large-scale, collaborative project bringing doctors and physicists together to solve one of the community's biggest health challenges.

"My multidisciplinary physics team, including medical, nuclear, particle and quantum physicists from the University of Sydney will be working with the nuclear medicine team at Royal North Shore Hospital, including Professor Dale Bailey, and researchers Prof Alexander Engel and Prof Mark Molloy.

"We also anticipate international collaboration with colleagues at the Harvard Medical School to help translate our research into practical application."

Dr Yaser Gholami

Professor Gemma Figtree



Professor Carolyn Sue

Kolling researchers to drive exciting new projects following funding success

The Kolling's Professor Gemma Figtree has led a successful bid for a Cardiovascular Centre of Excellence, securing $2.5 million in funding from the National Health and Medical Research Council. (NHMRC)

Around 20 national and international collaborators will be involved in the research, targeting the global heart disease epidemic through new diagnostic techniques and prevention strategies.

Professor Figtree has welcomed the significant funding, with one Australian suffering a heart attack every 10 minutes, many without prior warning.

"Our research will investigate what contributes to atherosclerosis beyond the traditional risk factors, and this will broaden our understanding of how to manage patients who suffer a heart attack without any risk factors," she said.

"We will look to establish new biomarkers and clinical pathways for detection of atherosclerosis, while the team will also be working to develop secondary prevention strategies.

"The Centre of Excellence is an exciting step in the battle against heart disease, and demonstrates the increasing co-ordination of cardiovascular research across the country.

"It also highlights the tremendous expertise we have here within the Kolling and on the Royal North Shore Hospital campus."

NHMRC funds will also go towards an innovative project developed by the Kolling's Executive Director Professor Carolyn Sue to improve access to diagnosis for mitochondrial disease patients.

"Mitochondrial disease is the most common inherited metabolic condition. It can be diagnosed using whole genome sequencing, but access to testing is currently restricted," Prof Sue said.

"Through this project, we will partner with the NSLHD and the NSW Ministry of Health, to develop a unique web-based platform to support the diagnosis of patients with or suspected to have Mitochondrial disease.

"The platform will assist health professionals including GPs to deliver a precise genetic diagnosis, and importantly, this will inform treatment and family planning.

"I'm delighted to see this ground-breaking project progress. It represents many years in the planning and promises to deliver significant national and global benefits.

"We are well placed to achieve results given the clinical and scientific expertise within the hospital and the Kolling's neurogenetics team."

Dr Amanda Hudson

Cancer expertise recognised

The Kolling's Dr Amanda Hudson will lead an exciting pilot study after being awarded an innovation grant by the Mark Hughes Foundation for brain cancer research.

The Bill Walsh Lab scientist is one of a select group to have received funding from the foundation. Her research will now investigate the early detection of disease progression in brain cancer.

Dr Hudson said identifying changes in tumour growth early is the key to maintaining the wellbeing of cancer patients.

"Our project aims to improve the monitoring of patients with brain cancer, so that we can identify if a tumour has begun to grow, even before any symptoms develop," she said.

"This would allow ineffective treatments to be stopped, and other treatments that may be able to control the tumour to begin as soon as possible."

Currently brain tumours are monitored with imaging or through surgery, but these techniques have limitations.

This project will use simple blood tests to find factors or protein biomarkers in the blood that change as tumours change.

"Blood samples will be taken at routine clinical check-ups so that patients don't need to come to the clinic more than necessary.

"This will allow us to follow these factors along each patient's journey with brain cancer.

"We'll be able to see how the factors change with treatment and over time, and we may be able to predict if the tumour will respond to the treatment.

"We've already identified some protein biomarkers in the tumours that change as the tumours starts to grow. We will now test these in the blood to see if those levels also change.

"We will also be looking for all of the proteins in blood, which will help predict the behaviour of the tumour.

"If this project is successful, it will greatly assist the management of patients with brain cancer. "

Kolling researchers join global search for new insights into Parkinson's disease

Professor Carolyn Sue with Dr Gautam Wali and Dr Ryan Davis

Kolling Institute researchers will help drive an exciting international project to identify the genetic links to Parkinson's disease and new ways to treat the debilitating disorder.

The program will bring together leading researchers from Sweden, the United States and Australia after a $12.5 million grant from the Aligning Science Across Parkinson's initiative, which will be administered by the Michael J. Fox Foundation for Parkinson's Research.

The Kolling Institute's Executive Director Professor Carolyn Sue is thrilled to be involved, with the degenerative movement disorder impacting more than six million people worldwide.

"Parkinson's disease is one of the biggest neurological health challenges this century, affecting an increasing number of people due to our ageing population," she said.

Professor Sue, who is also the Director of Neurogenetics at Royal North Shore Hospital, said the project will use state-of-art technologies and a very specialised approach involving gene editing.

"Our research will investigate three specific genes linked to the disease, including the LRRK2, PARKIN and A-SYNUCLEIN genes," she said.

"By understanding how genes contribute to Parkinson's disease, we will be in a better position to identify new therapies that could slow the disease process.

"Even if we slow the process by a small amount, the impact on patients will be significant."

Two members of Professor Sue's neuroscience research team will also join the three-year project, including Dr Ryan Davis and Dr Gautam Wali.

"We have world leading expertise in this field and have been selected to take part after a global search for innovative programs to speed-up the search for the next generation of treatments for Parkinson's," Professor Sue said.

"This collaborative project will see our team work with other world leading experts to unravel some of the fundamental mechanisms that cause Parkinson's disease and develop new ways to treat the disorder.

"The program illustrates the importance of our translational research at the Kolling Institute, where we can directly incorporate scientific breakthroughs to improve clinical care for our patients.

"It also highlights the significance of a collaborative approach, where we can harness the strengths and expertise from multiple institutions to accelerate our research progress."

Researchers offer new approach to detect frailty in older adults


Sarita Lo and Professor Sarah Hilmer

A team of researchers led by the Kolling's Professor Sarah Hilmer has developed a valuable resource to identify frail and vulnerable people in hospital, in an important step towards optimising their care.

Frail older adults have a higher risk of experiencing adverse outcomes in hospital such as falls, confusion and malnutrition, and many have longer hospital stays.

Professor Hilmer said more than 26,000 people in Northern Sydney are frail, representing a quarter of the population over 70.

"Fortunately, frailty can be managed, and in some cases reversed if detected early and provided with the appropriate care," she said.

The frailty tool developed by our team uses existing data from hospital electronic medical records, and does not require clinical staff to fill-out additional forms. Steps are now being taken to automate the process within the medical records system.

"The tool can be used to measure the prevalence of frailty amongst patients in our hospitals, and this will help ensure that models of care meet their needs.

"The patient's frailty could also be communicated to their general practitioner on discharge to guide their ongoing care in the community.

"This important new resource will help with early recognition and appropriate management, leading to better health outcomes and a better quality of life when people go home."

Sarita Lo, the research pharmacist who helped develop the tool, said it will help ensure we have adequate support to care for frail older people in hospital, whether it be geriatric medicine expertise, specialist nursing, physiotherapy, a medication review or nutrition advice.

Professor Chris Little

Kolling researcher honoured with prestigious, international role

Congratulations to the Kolling's Acting Executive Director Professor Chris Little following his election to the Board of Directors of the Orthopaedic Research Society.

It is regarded as the world's leading orthopaedic research society, representing clinicians and researchers across the scientific spectrum from fundamental science to clinical research and clinical trials.

Professor Little, the Director of the Raymond Purves Bone and Joint Research Lab, has been elected to the high-profile, international board for two years.

"I'm deeply honoured to have been elected to the board, and excited to be part of this world-leading musculoskeletal research society," he said.

"I have been a member of the society for more than 20 years, and it's been a critical part of my research over that time, providing collaborations and mentors that have shaped my career.

"I would like to support the society so it can have the same positive impact on today's emerging musculoskeletal researchers as it did for me.

"Despite the scale of musculoskeletal diseases across the community, there is a clear need for additional funding and support, and fresh ideas. The sector is often the poor cousin when it comes to key announcements.

"There's a tremendous number of people and organisations working across the musculoskeletal field, and I'm convinced that by working together, we will be in a better position to secure additional funding and improve long-term health outcomes.

"It really begins and ends with excellence in research, and if we provide an environment of learning, mentorship and collaboration, and enable great research across the sector, we will make tangible health gains."

Every week counts in the lead up to birth

The Kolling's Women and Babies Research team is calling for a reduction in the number of early births, with the latest research highlighting the benefits of birthing as close to 40 weeks as possible.

Twenty years ago, the majority of women gave birth at 40 weeks. Today it's between 38 and 39 weeks and continuing to get earlier.

This trend is due to the growing number of planned early births at 36, 37 and 38 weeks, either by induction of labour or by planned caesarean section prior to the onset of labour.

Women and Babies Research Director Professor Jonathan Morris said we now have increasing evidence around the benefits to babies when they're born as close to 40 weeks as possible.

"There's very important development in the last few weeks of pregnancy," he said.

"A baby's brain for instance increases in weight by 50 per cent in the last four-to-five weeks of pregnancy.

"For every week that a baby is born earlier than 39 weeks, there is a small but significant increase in the risk of the child performing less well in school assessments.

"Our research indicates that for every week a baby can remain safely inside their mother's womb, their short and long-term health and developmental outcomes improve."

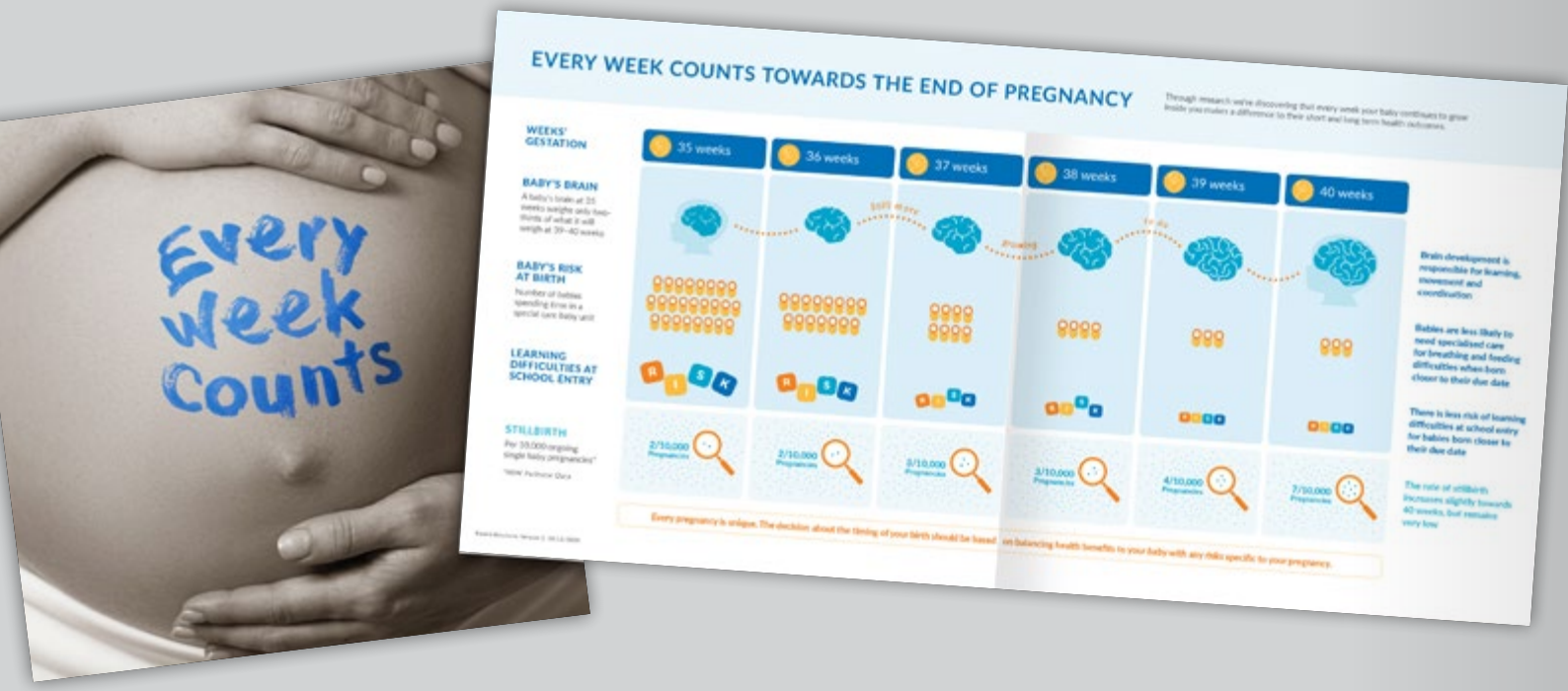
Professor Morris acknowledges the circumstances around each birth need to be considered.

"Any benefits of prolonging pregnancy need balancing against the small risk of stillbirth which increases with gestational age from 2 per 10,000 ongoing pregnancies at 35 weeks of gestation up to 7 per 10,000 ongoing pregnancies at 40 weeks of gestation.

"With new research data now available, we would like to see women offered information around the risk of stillbirth.

"It's important for women and their healthcare providers to be able to make informed decisions based on the latest evidenced-based data and research."

Further information is available through the 'Every Week Counts' campaign brochures and website. www.everyweekcounts.com.au



New medication may offer long-acting relief for those with knee osteoarthritis

A study has been launched to investigate the benefits of a new injectable medication for those with knee osteoarthritis.

The condition can have a profound impact on a person's life, leading to physical limitations, ongoing pain and joint instability.

There are broader implications too which can make it difficult for those with the condition to engage in social, community and occupational activities.

Significant resources and expertise are being directed towards the disease, and a number of clinical trials and research studies are underway to develop new interventions and tests that may alleviate the symptoms of the condition.

One of these promising trials is being led by Professor David Hunter and his team from the Kolling Institute and Royal North Shore Hospital.

The Excellence Study will evaluate a new injectable medication that has been formulated to provide both short-term and long-acting relief from pain, inflammation and mobility impairments.

Many current medications for knee osteoarthritis offer only short-term relief, while this new medication may offer relief for up to six months.

Volunteers are being recruited for the study and further community support is needed.

Details about the eligibility criteria can be found in the registration survey form.

Interested volunteers can click on the link provided in the form to register their interest for the study.

To find out more: https://redcap.sydney.edu.au/surveys/?s=4T7XWDW33T

Researchers assess new approach to post-operative care

With increasing evidence around the benefits of physiotherapy after surgery, a project is set to get underway examining new ways to extend the support.

The BOOST project will investigate how hospitals can deliver more frequent exercise programs for patients with hip fracture, through an innovative model of care involving physiotherapists and other healthcare workers.

The program will be led by the University of Sydney's A/Professor Alison Harmer and Clinical Lecturer and physiotherapist Marie March, and will be trialled in the Northern Sydney and Western Sydney local health districts.

Sydney Health Partners has provided the initial $25,000 for the trial, which will involve the team from Hornsby Ku-ring-gai Hospital's physiotherapy department and orthogeriatric service.

The Kolling's Professor Jim Elliott has welcomed the chance to be involved in the project, which he hopes may extend post-operative care.

"We know there are wide ranging benefits of more intensive physiotherapy after surgery, from improved patient mobility to shorter hospital stays," he said.

"The lack of availability of physiotherapists in many hospitals means this can't always be delivered adequately and in a timely fashion."

The research team will be looking at how the existing non-physiotherapy workforce can be trained to deliver high-quality post-operative exercise for patients with hip fracture.

This approach will be evaluated using a variety of methods, including patient outcomes, cost and patient-reported experience.

"We are looking forward to the collaborative project and hope it will help inform future models of care, improving patient outcomes and recovery after some surgeries," Professor Elliott said.

"It will be a great opportunity for our district team to be part of the joint initiative working closely with A/Prof Harmer and Ms March."

Executive Director joins elite group of Australian health professionals

Congratulations to the Kolling's Executive Director Professor Carolyn Sue, elected a Fellow of the Australian Academy of Health and Medical Sciences for her outstanding contribution to health and medical research in Australia.

Professor Sue is part of a distinguished group recognised for their personal achievement, outstanding leadership and continuing involvement in health and medicine-related sciences in Australia.

"I am honoured to be elected as a Fellow of the Australian Academy of Health and Medical Sciences and join many inspirational colleagues who I have long since admired," she said.

"I would like to acknowledge both my clinical and laboratory research teams who share this recognition with me as we work together to find better ways to improve the lives of the patients we care for."

Professor Carolyn Sue

Professor Sue is a neurologist, internationally respected for her expertise in mitochondrial disorders and Parkinson's disease. As a clinician scientist at the Kolling Institute and Royal North Shore Hospital, Professor Sue runs the country's largest tertiary referral clinic for patients with complex neurogenetic conditions, including Parkinson's disease, mitochondrial diseases and other inherited movement disorders.

Her research has led to improved diagnosis and treatment of mitochondrial diseases, and identified the prevalence of mitochondrial DNA mutations in the community.

Under her leadership, research in the Department of Neurogenetics focuses on bridging the gap between clinical and molecular science. Professor Sue has a major interest in understanding the disease processes involved in neurological disorders, with an emphasis on developing new treatment options.

In 2019, Professor Sue was awarded the Order of Australia for significant services to medicine, and she received funding for a game-changing research project to improve our understanding of the genetic links to Parkinson's disease.

Key appointment for Kolling researcher


Dr Ryan Davis

Congratulations to the Kolling's Dr Ryan Davis following his appointment as president-elect of the Australian Society for Medical Research. (ASMR)

Dr Davis is part of the Neurogenetics team, driving research into mitochondrial diseases and Parkinson's disease.

His work bridges basic and clinical research, while he also supports the Neurogenetics Clinic at Royal North Shore Hospital to improve the diagnosis and treatment of neurogenetic conditions.

Dr Davis has welcomed his new role, saying it's a privilege to be leading the society in its 60th year.

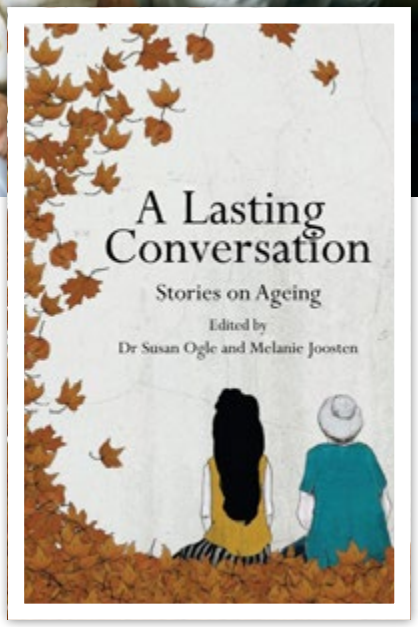
"ASMR is a strong advocate for health and medical research in Australia, with a long history of support for researchers," he said.

"The current pandemic has highlighted the need for advocacy, given the impact of COVID-19 on the sector, research jobs, and capacity across Australia.

"There is a clear need for greater investment in the basic discovery research pipeline, as well as for the health and medical research sector generally.

"Despite the challenges we've faced this year, it's an opportune time for the sector to come together to highlight the benefits of a strong health and medical research sector, from a better economy to broad health and social benefits.

"I'm optimistic that by strengthening our advocacy through a collective voice, we can deliver greater support and financial backing to the health and medical research sector."



Multi-talented clinician takes out prestigious award

There's been wonderful recognition for Royal North Shore Hospital's Associate Professor Sue Ogle.

The head of the department of aged care managed to find time this year to publish a book of short stories about ageing called, 'A Lasting Conversation. Stories on Ageing'. Sue edited the collection of stories and authored one of them.

The book has just won this year's Australasian Journal on Ageing book award, a prestigious and competitive prize.

A/Prof Ogle has welcomed the award, saying the book was a labour of love.

"Those of us who work with older people and their families enjoy hearing fascinating life stories every day," she said.

"I also love literature and the stories in this collection, all by well-known Australian authors, are beautifully written.

"They view old age from various perspectives, through the lense of older men and women, their sons, daughters or grandchildren and observers."

She said the stories explore not only sickness and frailty but many aspects of ageing including resilience and defeat, satisfaction and regret, love, loss and laughter.

"They present a picture of what it is to grow old as an Australian. Each story is original, infused with acute observations and trademark Australian wry humour," she said.

"It's this diversity, positivity and humour that makes the book a great resource for carers, students and anyone interested in ageing."

This is the second book that A/Prof Ogle has published on ageing, the first was a poetry book, 'Falling and Flying. Poems on Ageing'.

Proceeds from the book and the prize will be donated to the Penney Ageing Research trust fund which supports valuable research within the Kolling Institute, led by Professor Sarah Hilmer.

Latest News from the Kolling Institute

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