KOLLING INSTITUTE

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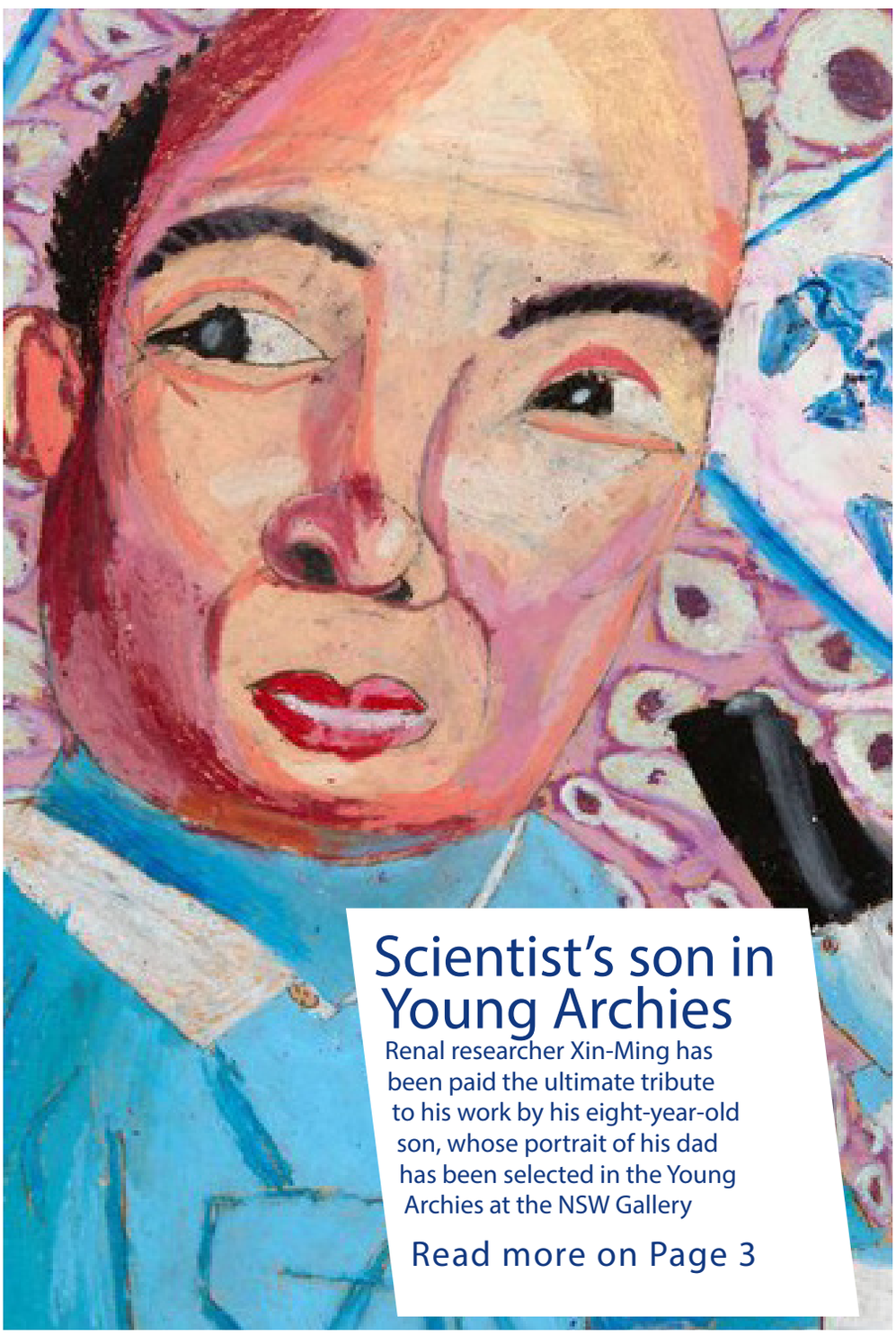
NEWS



Scientist's son in Young Archies

Renal researcher Xin-Ming has been paid the ultimate tribute to his work by his eight-year-old son, whose portrait of his dad has been selected in the Young Archies at the NSW Gallery

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Bowel cancer research to benefit patients

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- Accolades for researchers
- New drug offers hope: Type 2 diabetes
- Using Artificial Intelligence in research

MESSAGE FROM THE DIRECTOR OF RESEARCH

Since recently taking on the role as permanent Director of Research at the Kolling Institute, I'm really pleased to be working with our joint venture partners – the University of Sydney and the Northern Sydney Local Health District.

It's an important time for translational medical research in Australia and I look forward to supporting and promoting the excellent work that we are doing here.

A key part of our success relies on access to core facilities and state-of-the-art equipment and it's encouraging to see the Kolling's mass spectrometry core lab has now been officially launched.

It will give our researchers, especially those working in the field of bowel cancer, the chance to work with world-leading technology and experts like Professor Mark Molloy. It's a great example of how we are embracing new technologies to influence our research practices and patient outcomes.

An important priority moving forward will be the development of the Kolling Institute's Research Strategy. This will be a valuable body of work to provide a road map for our medical research into the future, and help ensure our efforts lead to improved health outcomes for patients.

I am also pleased to announce the successful recipients of a new program to support early to mid-career researchers with their travel expenses.

Bryony Winters from the Pain Management Research Institute, and Kelly McKelvey and Yaser Hadi Gholami from the Bill Walsh Translational Cancer Research Lab, which are both part of the Kolling, successfully applied for the Beryl and Jack Jacobs Travel Award.

It's aimed at promoting the cutting edge research performed at the Kolling, as well as building collaborative links with our international partners. The award has been generously supported by the Skipper Jacobs Charitable Trust.

Finally, I recently returned from the World Parkinson Congress in Kyoto where I had the opportunity to hear and talk to Nobel Prize winner Shinya Yamanaka. It was a wonderful opportunity to be part of an event with representatives from over 60 countries. The congress was well attended by clinicians and scientists and patients, all engaged with the recent discoveries in Parkinson's disease research.

SCIENTIST'S SON PAINTS TRIBUTE

Kolling renal researcher Associate Professor Xin-Ming Chen used to worry that his young son Matthew resented his long hours at work.

There were times when Matthew, 8, struggled to understand why his dad's commitment to reducing the risk of kidney disease for diabetics seemed to keep him away from his family.

But now, after reading Matthew's beautiful tribute to his dad's life-saving endeavours, Xin-Ming is thrilled his work is a source of family pride.

Matthew, in Year 2 at Hornsby North Public School, is a finalist in the 5-8 year category of the annual Young Archie award, part of the Archibald Prize run by the NSW Gallery.

His third Young Archie entry (his first earned an honourable mention three years ago; his second made the finals in 2017) is a stunning oil pastel of his dad at work in the lab.

Matthew spent nine hours on his entry, which is one of 10 in the running to take out the prize for his age group.

His entry reads: "I have drawn my dad because he is a great medical scientist and also a wonderful father. My dad's daily job is to examine cells, a tiny world in the human body, through a microscope to find out if cells are healthy or sick. This information is very important for medical doctors. My dad can capture any small changes in a cell with his sharp eyes. My dad told me junk food may cause damage to cells in the human body. He loves me and cares about family. I want to become a medical scientist like my daddy when I grow up."

Xin-Ming with his son Matthew's portraiture at NSW Gallery

The Young Archie portrait competition is open to artists between the ages of five and 18, and their work "must be of a person who is special to you – someone who is known to you and who knows you and plays a significant role in your life".

Xin-Ming said he was delighted by Matthew's words.

"He knows I do this because I want to help patients," Xin-Ming said.

"It's very encouraging to know Matthew supports and understands me."

Xin-Ming and his team of 15 with Professor Carol Pollock are looking at ways to reduce the risk for the almost-50 per cent of Type 2 diabetics who develop kidney disease.

It's a double jeopardy which is very close to home – Xin-Ming was diagnosed with Type 2 diabetes in 2003.

The Young Archie winners will be announced on August 10.

DATES FOR DIARY

The Kolling Foundation, the fundraising partner for the Kolling Institute, has several fundraising events coming up you can get involved in.

Winter Wonderland Masquerade Ball, July 20, 2019

The ball supports pancreatic cancer research at the Bill Walsh Translational Cancer Research Laboratory.

For more details, visit the events section at: www.Kolling.com.au

City2Surf, August 11, 2019

The Sun-Herald City2Surf is the world's largest fun run.

Since 2011, friends of the Kolling, as well as members of the community, have been part of City2Surf and raised funds for the Kolling Institute.

To join the Kolling Foundation team, follow these steps:

1) To join the team, visit www.city2surf2019.everydayhero.com/au/kollingfoundation-team

Blackmores Sydney Running Festival, September 15, 2019

If you are up for the challenge, why not join the Kolling Foundation team for the 10km, half-marathon or full marathon.

1. To register your entry go to Blackmores Running Festival 2019, follow the prompts, click on join team and enter "Kolling Foundation Team"

Beanstalks, Thursday 19, September 2019

The Kolling Foundation is co-hosting the Beanstalks Team Challenge with ID Events and Be Challenged.

Teams can network, strategise, develop leadership skills and improve strategic thinking, at the same time raise funds for research into life-threatening Mitochondrial Disease.

For information and to register a team, visit the events section at www.kolling.com.au

NEW DRUG OFFERS HOPE FOR TYPE 2 DIABETES' PATIENTS

When world-renowned kidney specialist Professor Carol Pollock undertook her PhD 30 years ago looking into why people with diabetes developed kidney failure, she had no idea her work would be so instrumental and life-saving today.

Using a plant-based compound – not used before in this type of research -- to inhibit salt and glucose re-absorption in the kidney, she demonstrated that in doing so abnormal kidney function due to diabetes could be normalised.

Thirty years on and Prof Pollock, from Kolling and University of Sydney, along with world leaders have just overseen a world trial of a drug developed from the same plant based compound, to reduce the risk of kidney failure in patients with Type 2 diabetes and existing kidney damage.

"The last time we saw any benefit of a drug on prevention or amelioration of kidney failure in patients with diabetes was in 2001," she said.

"Until now new therapies have not been successful despite an enormous scientific, monetary and emotional investment from clinicians, scientists, investors and patients.

"I only wish I knew of the value of intellectual property when I was in my 20s!"

For the past five years Prof Pollock, who is also a renal transplant physician at Royal North Shore Hospital, has

been involved in the steering committee of the clinical trial which was stopped prematurely last year because of overwhelming evidence the drug reduced the need for dialysis or a transplant and also reducing heart attack, stroke and death due to cardiovascular disease.

The results of the CREDENCE Trial were published in the prestigious *New England Journal of Medicine* at the same time it was presented at the World Congress of Nephrology on April 15 2019 in Melbourne.

The compound is now available to reduce the progression of renal failure in people with diabetes and to limit the need for dialysis and transplantation.

The compounds are now being assessed as to whether benefits may extend to patients with kidney disease independent of diabetes.

"This is like a lifetime achievement award, of which I am very proud, but many of my laboratory staff, in particular A/Prof Usha Panchapakesan has positively contributed to our laboratories' scientific efforts in achieving this," Prof Pollock said.

ARTIFICIAL INTELLIGENCE DETERMINING WHY SOME PEOPLE WITH WHIPLASH SUFFER LONG-TERM

In a technological breakthrough, researchers are using artificial intelligence to determine why some people with whiplash will go on to have long-term changes in their muscles.

A team of researchers across the world, led by Kolling Institute's Professor James Elliott, Dr. Andrew Smith (Regis University) and Dr. Ken Weber (Stanford University), have piloted a new method to quickly and accurately analyse complex muscles traversing the cervical spine to identify those patients at risk of a slower recovery following a whiplash injury.

In the process, they have demonstrated a way to reduce the time it currently takes to analyse the imaging from hours to just seconds, opening the way for the technology to be used widely in radiology research and clinical practice.

Researchers have used advanced Magnetic Resonance Imaging (MRI) to quantify specific structural changes – or fat infiltration -- within the muscles of the neck with the aim of identifying those who may go on to suffer long-term whiplash injuries.

But Prof Elliott, of The University of Sydney, said this method was not without challenges as it requires patients to undergo an expensive MRI and not everyone needs an MRI.

The measure further requires an individual to 'draw around muscles'; a process known as manual segmentation.

"Drawing circles around the neck muscles of interest, could take the most-experienced researcher up to two hours to complete and that is on a good day," Prof Elliott said.

"There is a need to enhance, if not automate, the segmentation process, and computers (or deep learning artificial intelligence) is a great way to do so."

Deep learning is a supervised machine learning method in the field of artificial intelligence used to solve complex pattern recognition problems. It is the same technology used by a smart phone to recognise a face or a voice.

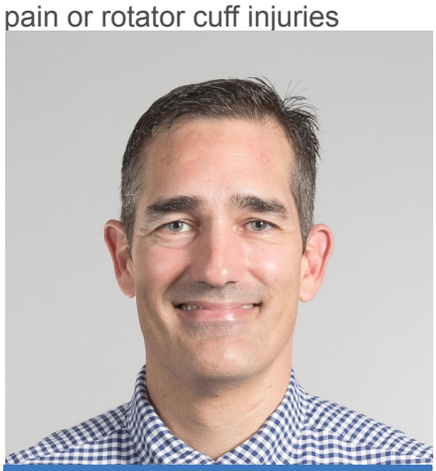
Supervised deep learning algorithms can help analyse and interpret medical images by preserving spatial information and greatly reducing the complexity of manually drawing circles on each scan.

This means that scans containing complex anatomy such as MRIs from the neck can be analysed accurately in seconds rather than hours.

"We've shown this measure is reliable, clinically friendly and incredible fast," Prof Elliott said.

"It is the first of its kind in the world to provide objective automatic segmentation of muscle markers for the chronic whiplash condition.

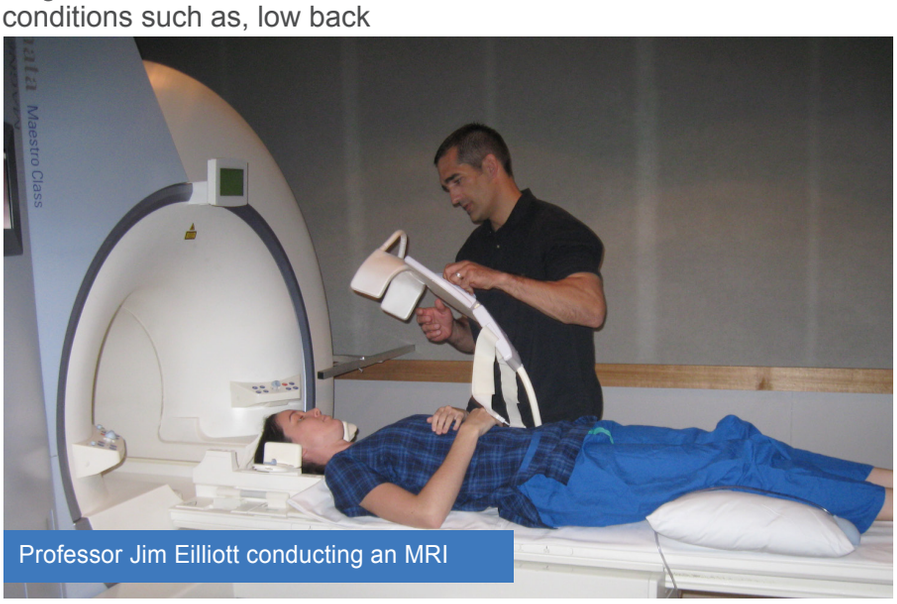
"It's now a matter of expanding this available technology to be used in other common, yet enigmatic musculoskeletal conditions such as, low back pain or rotator cuff injuries involving the shoulder."



Professor Jim Eilliott who is a world expert on whiplash injuries

"Unfortunately, there is no gold-standard diagnostic test to identify such patients as imaging tests have not consistently revealed the biological cause(s) for the wide and varied symptoms," he said.

"We have been able to use this new methodology to look at unique patterns identified in the muscles and this may lend itself to the identification of which patients are most susceptible to problems in the long-term."



Professor Jim Eilliott conducting an MRI

RESEARCHERS EARN SPOT IN THE LANCET

As one of the most respected medical journals in the world, every researcher dreams of being published in *The Lancet.*

So when Dr Karin Aubrey and Professor Paul Glare got the call telling them their piece on managing chronic pain after surgery would appear, they were understandably elated.

Their paper: “Transition from acute to chronic pain after surgery” appears as part of a three-paper series in Volume 393 of *The Lancet.*

The pair is based at Royal North Shore Hospital and part of the Pain Management Research Institute.

Karin said she hoped the paper would continue to highlight the plight of those suffering from chronic pain.

“It is a prevalent and complex disease that needs continuing research support to understand how and why it occurs, to develop new treatment strategies and to identify and treat current patients as well as possible,” she said.

Professor Paul Glare and Dr Karin Aubrey

TEXT MESSAGES AIDING IN RECOVERY: NEW STUDY

Do you have back pain?

Researchers from Kolling are looking for people with back pain who visited the pharmacy in the previous two weeks who are willing to participate in a study.

Institute of Bone and Joint Research’s PHD student Caroline Fritsch said the study was looking at whether sending text messages on self-management for pain sufferers aided in recovery.

“The TEXT4myBACK study is a text message intervention for people with back pain,” Carolina said.

“We are currently doing the pilot study and recruiting adult patients with low back pain.

The study will involve delivery lifestyle-based self-management text messages for two weeks.”

Researchers are hoping te study will lead on to a larger trial, which they are crowdraising funds for.

For more information, visit https://crowdfunding.sydney.edu.au/project/14648.

To take part the study email text4myback.study@sydney.edu.au

NEW TECHNOLOGY TO GUIDE FUTURE BOWEL CANCER TREATMENT

Research capabilities within the Kolling Institute have been significantly broadened with new technology to assist the examination of bowel cancer.

Representatives from Sydney University, the Kolling and Bowel Cancer Australia attended the official opening of the mass spectrometry core lab – the first of its type on a hospital campus and one of the best analytical facilities in the world.

Professor Mark Molloy, Lawrence Penn chair of Bowel Cancer Research said the sophisticated technology will measure molecules with very high accuracy, providing researchers with valuable and practical information about how bowel cancer develops.

"Years ago we could measure 400-500 proteins within a sample, compared with more than 6,000 proteins now," Mark said.

"This means our data is more accurate and we have a clearer understanding of the molecular make-up of tumours.

"We would like to see our research influence future bowel cancer treatment by indicating which patients are at disease risk, which cancers will benefit from chemotherapy and radiotherapy, and which cancers are likely to recur," Mark said.

Mark's research has been further boosted with a cheque for $500,000 from Bowel Cancer Research Foundation Australia. Chairman Richard Griffin said he was very confident it would lead to some remarkable and ground breaking research, and bring relief to so many people.

ACCOLADES TO OUR CLINICAL RESEARCHERS

Two of our researchers have won awards for their clinical research.

Professor Sarah Hilmer, who is a geriatrician and pharmacologist at Royal North Shore Hospital, picked up the Innovation Development and Evaluation Award for her work into "Minimising the Functional Burden of Medications in Older Inpatients: Implementation of the Drug Burden Index".

Sarah and her team are investigating polypharmacy in older patients and the effects of de-prescribing, with this particular project on the Drug Burden Index, funded by NSW Health's Agency of Clinical Innovation.

Royal North Shore-based rheumatologist Prof David Hunter was awarded the Clinical Research Award from the Osteoarthritis Research Society International. This is the pre-eminent organisation internationally for this disease.

Prof Anastasia Mihailidou has also been accepted as a Fellow of the Cardiac Society of Australia & New Zealand.

KOLLING DIRECTOR AWARDED A QUEEN'S HONOURS

The Kolling's Director of Research Professor Carolyn Sue has been awarded a Member (AM) in this year's Queen's Birthday Honour's for her significant service to medicine, particularly mitochondrial disease.

Carolyn is a highly accomplished neurologist and is internationally regarded for her work in both Parkinson's and mitochondrial disease.

Recently appointed to the Director of Research position, Carolyn has been at the Kolling Institute since 2002. She is the Director of Neurogenetics at Royal North Shore Hospital and Director of the National Centre for Adult Stem Cell Research (Sydney).

Her expertise is internationally regarded and she was recently invited to provide expert advice at the Federal Parliament's Inquiry into Mitochondrial Donation, a new reproductive option to prevent the transmission of mitochondrial DNA disease.

"It's a real privilege to work alongside such a wonderful group of colleagues who are all trying to improve the lives of patients," Carolyn said.

"It's very gratifying to have a job you love, that solves problems and gives you a real sense of purpose, and I'm very honoured to have received this special recognition."