

the NeuRA

magazine

Issue 22 | Spring 2017

Stepping up research into Parkinson's Disease



- Banking on it. Sydney Brain Bank setting the standard
- Understanding prevalence of dementia in Indigenous Australians
- Discovering how stress impacts cognitive development
- Exploring Galaxies in The Brain

NeuRAtalks launches for
Mental Health Week this October
Book a seat!

Message from our Executive Director

Prof Peter Schofield



Prof Peter Schofield

During **Dementia Month** we are reminded about the importance of research and the legacy we can leave by volunteering, not just during our life, but also on our passing. NeuRA is home to the Sydney Brain Bank, where our scientists work in conjunction with researchers around the world to provide critical tissue samples required for research into Alzheimer's and other disorders of the brain.

To our brain donor volunteers, who make a decision in life to give an amazing gift that will underpin discovery for current and future generations, I sincerely thank you. The decision about brain donation to the Sydney Brain Bank should not be taken lightly, but it is one that can leave a true legacy. More information about the Brain Donor Programs can be obtained by contacting the Sydney Brain Bank Liaison Officer, Francine Carew-Jones at braindonors@neura.edu.au or 02 9399 1707.

Each year the Sydney Brain Bank supplies tissue to 30-40 research projects, many being collaborative efforts with external research institutions. Unfortunately, no government funding is provided to run this global resource.

We hope you will consider supporting our appeal to raise vital funds needed to keep the Sydney Brain Bank open to contribute to the global research effort in understanding the causes and potential treatments for Dementia and other disorders of the brain.

Our sincere thanks go to Lucille Bloch for sharing her story, and for the loving and generous engagement she continues to show NeuRA after the passing of her late husband Keith, and the gift of his brain to the Sydney Brain Bank.

We also hope you will participate in our up-coming Mental Health Week program in October, which will include a series of FREE NeuRAtalks hosted in Sydney and Melbourne, a number of corporate talks, and a FREE online series that will be hosted on our special events page found at www.neuratalks.org

NeuRA is committed to the ongoing research and discovery of cures for disorders of the brain. We welcome and gratefully acknowledge your support through donations, bequests in your will, and through the legacy of discovery by considering a donation to the Sydney Brain Bank.

A handwritten signature in black ink, appearing to read 'P. Schofield'.

Prof Peter R Schofield *FAHMS PhD DSc*
Executive Director and CEO

NeuRA Events

Mental Health Week at NeuRA

NeuRA is hosting a series of special NeuRAtalks across Mental Health Week in October to bring greater awareness and put a spotlight on the important research work being undertaken by NeuRA in this field. Across Mental Health Week NeuRA will be Lighting the Way with a series of FREE talks in Sydney and Melbourne, as well as launching an amazing series online. If you cannot book to attend one of the FREE series - you can book online to watch the NeuRAtalks series on your laptop or mobile phone. Simply go to www.neuratalks.org to book a FREE ticket or register for the series online.

Mitchell Physiotherapy Charity Ball



Mitchell Physiotherapy Group, established in Maitland, Kurri Kurri and Dungog, has chosen NeuRA as the beneficiary of their annual charity event.

A Roaring 20s themed gala night supporting Motor Impairment was held with Gatsby style and sparkle. Guests heard from two patients about the benefits they received from Mitchell's highly skilled motor impairment physiotherapists. All funds raised will contribute to Motor Impairment research at NeuRA where the first International Motor Impairment Conference will be held in 2018. We thank Mitchell Physiotherapy for their interest, support and raising \$7,200 on the night.

Bequest Lunch with a Bouquet



NeuRA hosted a wonderful bequest lunch under the stewardship of Leonie Harle who has been the Bequest Manager

at NeuRA for 10 years. People came from far and wide, including Singapore, to attend this special lunch. This included an address by NeuRA's Prof Peter Schofield and a warm and encouraging address from Mrs Betty C Lynch OAM, who spoke about the benefits of giving a bequest in life.

For more information on leaving a legacy towards medical discovery please contact NeuRA's Bequest Manager on 1300 888 019.

Launch of the Child Safety Good Practice Guide



NeuRA, The Sydney Children's Hospital, NSW Health Kidsafe, and the European Child Safety Alliance worked together to produce the Australian Child Safety Good Practice Guide which was recently released at NeuRA. The aim of the guide, is to provide greater focus on child injury prevention planning within the community, whilst reminding families that simple safety steps around the home and in the play area, can make a major difference to child safety outcomes. Injuries are the number one cause of death among children over the age of one. Every year in New South Wales around 60 children aged 0-17 years die as a result of an unintentional injury and a further 20,000 are hospitalised. Estimates of the average acute hospital costs for paediatric patients is \$5,200 per patient.

Dr Julie Brown from NeuRA said, "This guide provides an invaluable resource for government and advocates for child safety. The guide summarises all we know on what works to prevent injury, and for researchers it identifies the gaps in knowledge. In this way, it will enable the most effective use of limited resources for preventing unintentional injury among children".



Sydney Science Festival comes to NeuRA

NeuRA welcomed the Sydney Science Festival with an engaging presentation called 'Train the Brain', held in the new John and Betty Lynch Seminar Room. In this seminar, a number of our leading scientists discussed the latest news in research around Alzheimer's and other forms of dementia, and engaged the audience in a series of exercises designed to help train your brain to keep fit.



Video story online

www.neura.edu.au/magazine/issue-22/



Are you getting enough sleep?

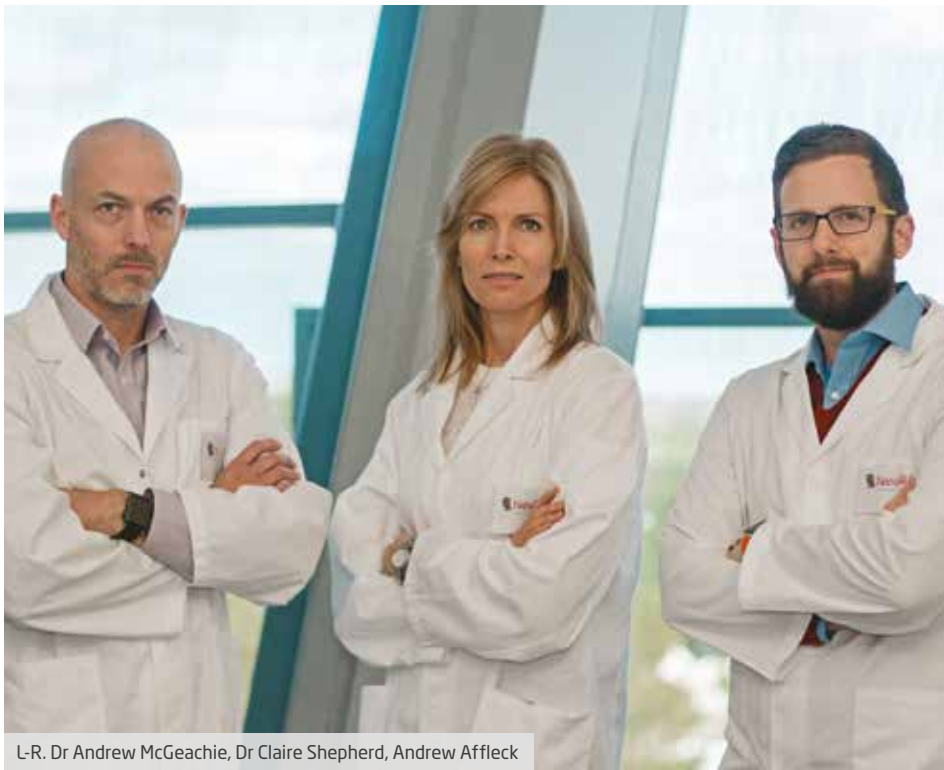
Recently NeuRA participated in Sleep Week, bringing to attention that more than 1 million Australian adults suffer from obstructive sleep apnoea (OSA). In a special television interview on Channel 9 News, NeuRA researchers Dr Jayne Carberry and Assoc Prof Danny Eckert highlighted the adverse effects OSA can have on every organ in the body, and the serious health, safety and economic consequences costing the Australian community more than \$5 billion a year. They also discussed the role NeuRA is playing in the development of emerging new therapies for personalised management approaches for OSA.

Watch their full interview.



Video story online

www.neura.edu.au/magazine/issue-22/



L-R. Dr Andrew McGeachie, Dr Claire Shepherd, Andrew Affleck



Sydney Brain Bank – a World Class Facility

The Sydney Brain Bank has been operating since 2005 and has collected brain tissue from over 500 donors. The Sydney Brain Bank at NeuRA facilitates world-class research and breakthroughs in ageing and neurodegenerative disorders. Globally the Sydney Brain Bank supplies tissue to 30-40 research projects a year, with many of these projects a collaborative effort with external research institutions.

Led by Dr Claire Shepherd, recently appointed to position of Director of the Sydney Brain Bank, the team has developed a new method which

will allow them to characterise one of the key pathologies underlying Alzheimer’s disease using a simpler, cost effective and less labour-intensive method without compromising on the quality and sensitivity of the diagnosis.

Says Dr Shepherd, “At the Sydney Brain Bank, we collect, characterise and store the brain tissue from individuals that have died from ageing or neurodegenerative disorders so that we can facilitate medical research.”

“This new method will be advantageous because post-mortem human brain

research takes a lot of time and money to do well - we undertake a comprehensive screen of every brain we collect. Doing this more cost effectively will allow us to collect more cases and facilitate more research into ageing and neurodegenerative disorders,” says Dr Shepherd.

At the Sydney Brain Bank, working with a large number of clinical research programs means the majority of donors have been involved in longitudinal clinical research studies. This data allows researchers to understand the relationship between someone’s



“This new method will be advantageous because post-mortem human brain research takes a lot of time and money to do well - we undertake a comprehensive screen of every brain we collect. Doing this more cost effectively will allow us to collect more cases and facilitate more research into ageing and neurodegenerative disorders,” says Dr Shepherd.



clinical symptoms in life and the pathology in their brains at death.

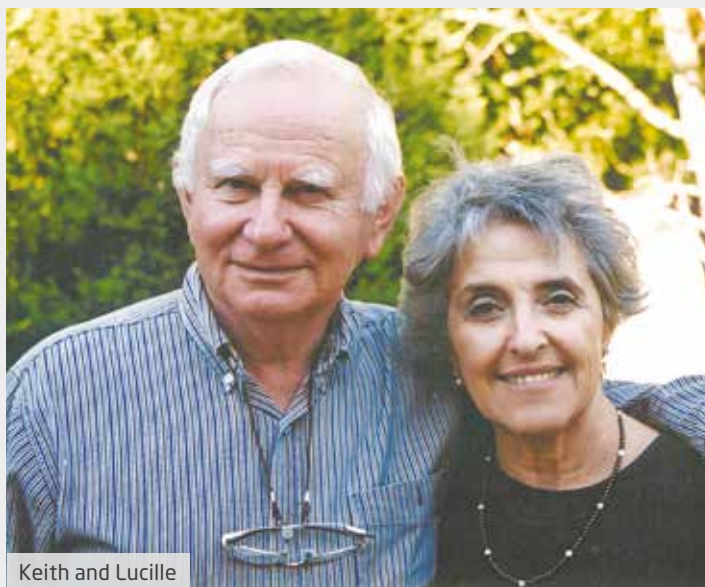
There is currently no definitive diagnosis for these disorders in life. The Sydney Brain Bank at NeuRA uses research diagnostic criteria to characterise the brain changes and identify the specific neurodegenerative disease they were suffering from.

During 2017, Dr Claire Shepherd travelled to the UK to visit several British Brain Banks and to work with their researchers to understand their processes and share ideas and techniques.

By working with international researchers, NeuRA aims to strengthen and harness a more collaborative global approach between the various Brain Banks and to help address many research questions - working together is a more powerful way to go.

The Sydney Brain Bank is funded by NeuRA and our generous donors and receives no government support.

Leaving a Legacy of Discovery



Keith and Lucille

Keith and Lucille had never considered how medical research could benefit from the donation of a brain until their world came crashing down. After noticing changes in her husband, it was revealed that Keith was living with frontotemporal dementia. About one year later, he was also diagnosed with Parkinson's disease. They desperately wanted to help future generations, and decided together that the best way to do that was through brain donation. They knew their precious gift would not only be of tremendous value to researchers now, but that it would create a legacy of discovery for years to come. After Keith's passing and subsequent donation, an examination of his brain revealed that he was in fact not living with Parkinson's disease, but had lived with both frontotemporal dementia and the early stages of Alzheimer's disease. These types of findings are crucial in helping researchers and clinicians better diagnose and treat a wide range of brain diseases and is an key part of the reason why Lucille and Keith thought it important to bequest their brains to science at the Sydney Brain Bank.



Watch Lucille's story online

www.neura.edu.au/magazine/issue-22/

You can partner with the Sydney Brain Bank by making a donation today.

foundation.neura.edu.au/brainbank

All donations over \$2 are tax deductible.

Understanding the Risk of Falls in People with Parkinson's Disease

Dr Joana Caetano, Dr Jasmine Menant and Prof Stephen Lord

Balance and walking impairments are disabling symptoms of Parkinson's disease that adversely affect performance of daily activities, reduce independence and increase the risk of falls. Around 60% of people with Parkinson's disease fall at least once a year, with a large proportion (50-86%) falling multiple times in this period. Decline in the ability to adapt stepping and walking behaviour, particularly under challenging conditions, may contribute to trips and slips; which are a frequently reported cause of falls in people with Parkinson's disease.

To further our understanding of fall risk in people living with Parkinson's disease, we conducted a study on the role of attention in stepping and the ability to adjust steps while walking in response to unexpected hazards. This involved a step mat test of reaction time and an obstacle course designed by PhD student Joana Caetano. Dr Menant said that great care was made in designing a test that could mimic everyday walking challenges, for example walking along in a busy street and at the last second noticing the slippery banana peel or the broken tile, that required a short, long or wide step to successfully avoid it.

The team found that compared with their healthy peers, people with Parkinson's disease had slower and more variable stepping reaction times in a situation involving a distracting task and were less able to adapt their stepping while walking. The participants were, therefore, more likely to miss step targets and strike the obstacle on the pathway. Professor Lord considers that such impaired stepping and gait adaptability places people with Parkinson's disease at an increased risk of falling when negotiating unexpected hazards in everyday life.

Our future work will investigate whether rehabilitation interventions aimed at improving stepping and walking adaptability can reduce fall risk in people with Parkinson's disease.



Dr Jasmine Menant



Dr Jasmine Menant and Prof Stephen Lord



Dr Kylie Radford and Prof Tony Broe

Prevalence of Dementia in Indigenous Communities

Prof Tony Broe and Dr Kylie Radford

Research led by Prof Tony Broe and Dr Kylie Radford has highlighted the high prevalence of dementia, particularly Alzheimer's disease, in Aboriginal communities. We are working towards understanding the causes of cognitive decline and dementia, building capacity in dementia care and supporting Aboriginal family carers, and developing culturally appropriate strategies to promote healthy brain ageing.

The next decade will see a dramatic increase in the number and proportion of older people within the Aboriginal and Torres Strait Islander population. Close to 80% of these older people live in regional and urban parts of Australia (a third in our major cities). Recently, the Koori Growing Old Well Study (KGOWS) has shown that dementia prevalence in Aboriginal Australians across NSW is three times

higher than the overall Australian population, at ages 60 years and older.

What is it that helps one person age successfully, and causes another to develop age-related diseases like dementia? Scientifically, we know too little about normal ageing and what factors influence some people, and not others, to develop diseases that affect the brain. Only by studying healthy elderly people, as well as those with problems, can we know what normal ageing looks like and learn more about staying healthy as we age. In collaboration with our Aboriginal community partners, our rigorous population-based approach allowed us to accurately assess the prevalence of dementia, not just those already 'in the system' and seeking treatment or care.

NeuRA's Aboriginal health and ageing team, with collaborators,

are now conducting a follow-up study (KGOWS-II) to determine the social and biomedical risk and protective factors for dementia across the lifespan. In 2016, NeuRA also initiated the Koori Active and Healthy Ageing Project. This research will develop effective, culturally appropriate, and accessible strategies to promote vitality and healthy brain ageing and prevent dementia in Aboriginal communities. This research is supported by NeuRA's ongoing Koori Dementia Care Project, which aims to build capacity in dementia understanding and care with Aboriginal community controlled and mainstream service providers.

As one older Aboriginal participant observed: "Healthy ageing is your mind staying young".





New Youth Research Program

Risk factors for mental illness

Assoc Prof Melissa Green is leading research to discover how stress-related mechanisms disrupt brain maturation early in life, setting off a cascade of effects which impede normal cognitive and emotional development.

Her research uses neuroscience methods to examine the biological effects of stress among adults with severe mental disorders, as well as complementary methods from epidemiology to understand the mechanisms of mental disorder in developing children.

Victims of early childhood maltreatment are among those at highest risk of developing mental disorders. Assoc Prof Green's newly funded project, conducted in collaboration with the NSW Government Department of Family and Community Services (FACS), will determine dynamic states of 'risk' and 'resilience' for mental disorders among children who have been maltreated before the age of 5 years.

Assoc Prof Green said, "The first few years of life represent the most rapid period of brain development, with increased plasticity of the brain making it highly sensitive to prolonged stress. Exposure to stress at this stage in the life-course may critically influence brain development in ways which put children at risk of developing mental disorders in later life."

The new project was funded by the Australian Rotary Health's 'Mental Health of Young Australians' scheme and is embedded within the NSW Child Development Study (NSW-CDS), led by Prof Vaughan Carr (UNSW and NeuRA).

This study uses repeated waves of longitudinal record linkage to follow a population cohort of approximately 87,000 children as they develop through middle childhood, adolescence, and into young adulthood.

The Rotary funded project will continue to use this routinely collected government data alongside cross-sectional surveys that were administered to the NSW-CDS child cohort at age 5 and 11 years, to determine patterns of 'risk' and 'resilience' which are evident in childhood competencies or developmental vulnerabilities. Childhood competencies will include social and emotional functioning, as well as cognitive achievements, for which normative skill levels can be determined in the general population.

The team are particularly interested in determining protective factors (e.g. availability of family and school supports) which are associated with 'resilience' profiles among maltreated children, in contrast to factors which confer this persistent risk profile across early and middle years of childhood. Findings from the study will be used to make policy recommendations regarding the earliest detection of children at risk of mental disorder, and will determine targets for timely interventions to promote life-long resilience in children who are subjected to early-life adversity.

City2Surf Family Fun



When Renae and her family were told their vital, fun loving mum had been given the devastating news she had a rare degenerative disease (Multiple System Atrophy), they were at a loss. Unable to change the diagnosis

or her future, they banded together to do something. They would help research so future patients had a better chance.

Renae gathered her large family and network of friends and got behind her City2Surf run, raising \$7,301.

She finished the 14 kilometres and they supported her by donating generously to research at NeuRA. The results were wonderful and her family and friends felt the love and support they needed during this very tough time. Her proud mum watched her strong courageous daughter and both shared pride in each other.

Significant Discovery in MND Research

Motor Neuron Disease (MND) remains one of the most devastating neurodegenerative conditions, and NeuRA is at the forefront of research into this cruel disease.

Dr Yazi Ke, who heads up the Motor Neuron Disease unit, is focussed on a protein called TDP-43, and how it changes in motor neurons as MND takes hold. Excitingly, Dr Ke and team have made a significant discovery concerning this protein - specifically, how it is controlled. Furthermore, a special engineered peptide sequence that targets this protein has been developed, and has shown to improve disease progression in several mouse models. NeuRA is aiming to develop these ground-breaking discoveries into a new strategy to prevent and treat MND.

The team of Dr Ke is part of the larger Dementia Research Unit, headed by Prof Lars Ittner, who leads a world-renowned research program using cutting edge technologies in pre-clinical neurodegenerative research and drug development.

On the Road – My Bequest Stories

“Recently I had the privilege of visiting many of our donors that have said they plan to leave a bequest to NeuRA. I have driven to beautiful places such as Berry, the Southern Highlands, Canberra, the Blue Mountains and Orange. I am truly humbled by the generosity of such wonderful people. They are as passionate about finding a cure as I am, and for me, to be able to sit with them to hear their stories of why they want to support NeuRA is a real honour”, Leonie Harle, Bequest Manager.

A gift in your Will is a very special way to support NeuRA’s research and will make a lasting difference to the health of generations to come. If you are thinking of leaving a bequest to NeuRA there are several different ways you can include NeuRA.

1. Leave a specific amount
2. Leave assets such as property or shares
3. Leave a percentage of your estate
4. Leave a residual bequest (remainder of the estate after personal commitments have been dispersed)

We always encourage a residual bequest as it will not lose its value over time.

If you have any questions or would like to discuss in confidence, please contact me on **1300 888 019** - **Leonie Harle, NeuRA’s Bequest Manager**

Amanda thanks you – You are wonderful



Why? Because you showed compassion, care and understanding to Amanda Ayliffe... a 48 year old mother grandmother and participant current in the NeuRA clinical trial program - Dominantly Inherited Alzheimer

Network (DIAN). Amanda is living with the early symptoms of Alzheimer’s disease. Our team here were so encouraged to see the nearly 100 postcards of thanks received for Amanda. Your kind words were special, and we’ve no doubt that they have encouraged Amanda as she participates in the global Alzheimer’s clinical trial.

We’d also like to thank you for the donations received. You truly are a partner in the fight against dementia, and should be proud that by giving, you have contributed to the defeat of Alzheimer’s disease.

Mental Health Week 8-13 October 2017



NeuRAtalks is an new series launching this October during Mental Health Week. You can book to attend a FREE seminar in Sydney or Melbourne, or if you live outside of these areas you can watch the entire NeuRAtalks series online at www.neurataalks.org.

Find out more about NeuRA's research programs around Bipolar, Schizophrenia, Depression, the relationship between sleep and mental health, plus some exciting news on neuroscience research developments at NeuRA.

FREE to book a ticket

To book a ticket in Melbourne or Sydney, go to www.neurataalks.org

Sydney: 9th & 10th October
Melbourne: 11th October

FREE Register to watch online

You can register at www.neurataalks.org to watch the series online, commencing on Mental Health Day, 10th October at 7pm.

DONATION & RESEARCH VOLUNTEER FORM

All gifts over \$2 are tax deductible

- Yes, I would like to donate to research at NeuRA
 Yes, I am interested in participating in research at NeuRA

Title:

First Name:

Surname:

Address:

Suburb:

State:

Postcode:

Phone:

Best time & day to call:

Email:

Step 1: How I choose to give my gift:

- Please accept this one-off gift to support research at NeuRA
 I would like to invest in the future and become a *Discovery Partner* with a regular donation of \$ _____ monthly / quarterly (please select)

\$50 \$100 \$250 or

A cheque payable to the NeuRA Foundation is enclosed OR

I wish to make my gift by credit card:

Visa Mastercard American Express Diners

Card No:

Expiry Date:

Cardholder's Name:

Cardholder's Signature:

Please send me:

- Details about how I can support NeuRA in my will

- Mail this coupon in the reply paid envelope
- Call us on **1300 888 019** to make a donation over the phone
- Make a secure online donation at neura.edu.au/donate

A message from the NeuRA Foundation: The NeuRA Foundation may co-operate with other like-minded reputable Australian charities to promote our work to our respective donors. If you'd prefer that NeuRA does not share your information with other charities, please phone us on **1300 888 019**, email us at foundation@neura.edu.au or write to us using the enclosed envelope.

Thank you for generously supporting our research into diseases of the brain and nervous system.

Galaxies of The Brain

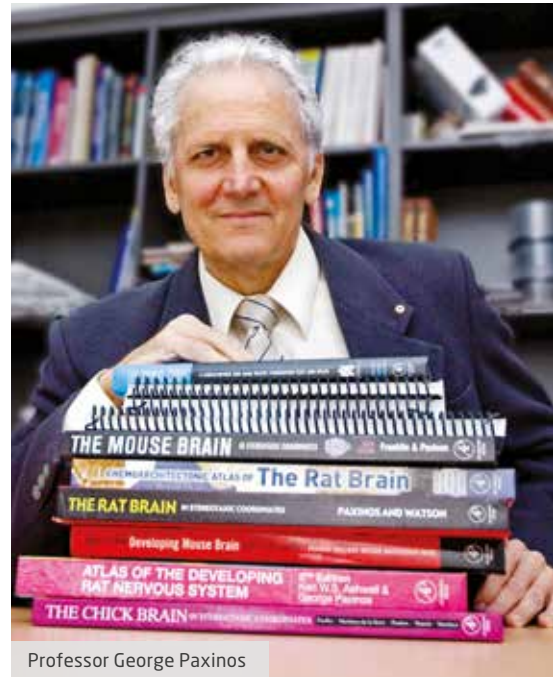
In April 2017 NeuRA Senior Principal Research Fellow, Professor George Paxinos AO received an honorary doctorate from the Ionian University, in Corfu, Greece for his landmark work on 'Mapping the Brain'.

Prof Paxinos paved the way for neuroscience research by being the first to produce an accurate three-dimensional (stereotaxic) framework for the placement of electrodes and injections in the brain of experimental animals. This is now used as an international standard.

Arriving at NeuRA in 2001, Prof Paxinos' research focused on constructing histological maps of the brain. After seeing the good work being done at NeuRA on the spinal cord, Prof Paxinos together with his colleagues constructed the first diagrammatic atlas of the human spinal cord as well as the first comprehensive atlases of the rat, mouse and rhesus and marmoset monkey spinal cord.

In the last few years at NeuRA, he has been constructing Magnetic Resonance Imaging (MRI) based atlases using advanced non-invasive brain scans of humans, rats, and mice. In 2015, he published the first comprehensive MRI atlas of the rat and is now working on the mouse and human MRI atlases. "We are using the different contrasts in the MR images as though they are different neuro-chemical stains, to identify parts of the brain. This change in direction from histology to images, makes our work more relevant to researchers and clinicians who increasingly work with images of the living brain." said Prof Paxinos.

In the coming months, Prof Paxinos will publish updated versions of seven of his atlases, combining his original foundational work with MR imaging. This has allowed his team to make the maps more accurate, greatly enhancing the advancement of neuroscience-research and giving neurosurgeons higher definition maps to facilitate their lifesaving work.



Professor George Paxinos

Insight

Prof Paxinos set to release a new edition of 'Mapping the Brain' series.

Thank you for your support

If you wish to update your preferred communications from NeuRA, please call 1300 888 019.

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