LIMITATIONS of the BRAIN

Supporting NEURA’S RESEARCH

Increased appetite IN FTD

Identifying RISK GENES

page 3
sincerely thank you.

here at NeuRA as it can hasten the process of turning ideas into cures by

Philanthropy is key to the future of improved health and medical outcomes

researchers who are paid through competitive grants from the National

project needed financial backing in its trial stages to provide sufficient

proposing an innovative approach to an unresolved health problem, Kim’s

Kim Delbaere’s NHMRC grant success for the Standing Tall project. While

evaluate a new home-based exercise program called Standing Tall, which

leaders of the future while addressing the problems of today. In the same

in dementia research and in falls prevention this project will train research

project to examine the causes, consequences and costs of injury-related

Two recent examples of grants that have commenced this year include

invests in the very best ideas, and the ones which are most likely to lead

a competition that sees only the most compelling applications supported.

researchers are competing to have the best ideas and most relevant

Writing a grant application is analogous to submitting a tender:

money to satisfying researchers’ curiosity; rather they ask broad strategic

The process of tendering for a continuing research career is a tough road.

projects supported. With only one in six project grants being funded, it’s

researchers are competing to have the best ideas and most relevant

Any grant application is analogous to submitting a tender:

writing a grant application is analogous to submitting a tender:

We will be continuing our work investigating

Road traffic injuries are predicted to become

The World Health Organization estimates

AREAS DO YOU COVER?

In an NHMRC-funded randomised controlled trial, called

Research plan logical and feasible, and does the research team have the

Researchers are inviting people aged 18-55 years old, with a diagnosis

Dr Julie Brown

Dr Julie Brown’s research is in injury prevention on our roads.

Many riders, particularly large men and small

Many riders, particularly large men and small

Our recent research has shown that ~40% of people living with schizophrenia may

canakinumab, a human

Dr Justine Gatt and colleagues showed certain genetic

We’ve found that there is a big variation

We will be continuing our work investigating

Making this equipment accessible to all riders,

Making this equipment accessible to all riders,

To participate, please contact Isabella Jacomb, (02) 9399 1858,

The study will determine whether canakinumab, a human

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On our radar.

We have knowledge and better crash protection

Making this equipment accessible to all riders,

Roads safer for motorcycle riders?

How will your research make the roads safer for motorcycle riders?

We hope that our work will lead to more

Many riders, particularly large men and small

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our men, has a lot of room for improvement in the area of impact protection.

We also know that some types of motorcycle

In warm or long rides in hot Australian

Our aim is to assist

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Professor George Paxinos believes that there is one thing about the brain that is largely ignored - its cognitive, emotional, and motivational limitations.

He has been mapping the brain and creating detailed atlases for over four decades, and has come to the conclusion that overestimating this much-hailed organ will lead to humanity’s eventual demise unless we can understand our very human limitations.

DO WE NEED A REALITY CHECK WHEN DISCUSSING THE BRAIN?

Prof Paxinos and his colleague Prof Charles Lester have made it their life’s work to understand the brain and its mechanisms. They do this by creating maps that are published in several languages and are used globally as references. Prof Paxinos is passionate about the brain, but is calling for a reality check.

“The over-confidence we are now seeing in the abilities of the brain is only working on the basis of our genetic endowment and the environmental influences on it, neither of which we have control over.”

He believes that once we properly recognise our constraints, we might better understand our actions and be better able to solve major world problems. “If our brains were smaller we would not have language, which made science possible and the subsequent development of technology, same of which threaten humanity.”

“If on the other hand the brain were larger, then it might have been able to solve our problems. The brain is just not the right size for survival. Perhaps a reality check is needed and we should take our brains off the pedestal of infallibility.”

ARE WE IN CONTROL - DOES SIZE REALLY MATTER?

With the knowledge Prof Paxinos has gained over the years, he posits that there is one thing he can say for sure, “the brain is only working on the basis of our genetic endowment and the environmental influences on it, neither of which we have control over.”

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“Not since Narcissus fell in love with his own reflection has there been such adoration of a bodily organ.”

Alcmaeon’s concept is thought to have passed on to the island of Kos, where Hippocrates (460-370 BC), the most significant physician of antiquity, worked. Hippocrates expressed an amazingly modern view:

“Men ought to know that from the brain, and from the brain only, arise our pleasures, joys, laughter and jests, as well as our sorrows, pain, griefs and tears. Through it, in particular, we think, see, hear and distinguish the ugly from the beautiful, the bad from the good, the pleasant from the unpleasant.”

Hippocrates’ view could be taught in any neuroscience department today.

A GLOBAL EFFORT TO MAP THE BRAIN IS UNDERWAY

President Obama’s “BRAIN” Initiative is underway – it is a bold, new research effort to revolutionise our understanding of the human mind and uncover new ways to treat, prevent, and cure brain disorders like Alzheimer’s, schizophrenia, autism, epilepsy, and traumatic brain injury.

Since President Obama announced the BRAIN Initiative two years ago, dozens of leading technology firms, academic institutions, scientists and other key contributors to the field of neuroscience have responded to his call and made significant commitments to advancing the global effort, including Prof Paxinos who is a grant recipient with collaborators at Cold Spring Harbor Laboratory in New York. “Our contribution will be a map of the cells and their connectivity in the mouse.”

“I am very excited to be a part of this initiative and if my work helps other scientists looking to cure disease, I am very happy for that. But in the end, we must remember it’s our brains that, on one hand, find cures for disease but, on the other, can construct weapons of mass destruction. Understanding its limitations is equally as important as prancing its strengths.”

Professor George Paxinos, AO is an anatomist at Neuroscience Research Australia. He is an NHMRC Senior Principal Research Fellow, and Scientia Professor of Medical Sciences at UNSW.

The 4th edition of The Rat Nervous System (2003) and second edition of Brain Mapping: The Human Neuroanatomy, both co-authored by Prof George Paxinos has just been published and appeals to researchers working on other species, including humans. The fourth edition provides the latest information in the field of research on the brain, spinal cord, and peripheral nervous system. The structure, connections and function are explained in exquisite detail.

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My personal challenge ultimately benefited many...

I was diagnosed with Parkinson’s in 2008 at the age of 35. For the first few years my symptoms were mild and didn’t really affect my day-to-day life. Unfortunately, over time, my tremor slowly worsened and my ability to control fine motor skills was becoming more difficult.

I was advised that I should improve my overall fitness and core strength. I started going to a gym, working with a personal trainer and I also decided that I needed a goal to aim for. My close friend, Nicky, who is naturally a competent runner, wanted to run in the 2014 City to Surf so we agreed that we would run together. I knew this would motivate me to get fit and so the training began.

We wanted to raise money for a charity that was relevant to both Parkinson’s and Alzheimer’s (Nicki’s father suffers from Alzheimer’s). We knew that NeuRA was doing great work in brain and nervous system disease research and so we felt it was a perfect fit.

Most of my family, friends and work connections are aware of my condition but I do not make a habit of talking about it. I was therefore overwhelmed by the generosity of the many people who made donations. I clearly remember sending the email out to my address book one evening with the hope of raising a total of about $1,000 but, within 2 days, we had already exceeded this amount! The pressure was now on to complete the race.

I managed to finish in a better time than I had expected with my good friend Nicky encouraging me and pushing me along. By completing the race I had achieved my goal but the experience exceeded my expectations: the total amount of donations we raised was in excess of $5,500. Most importantly, I was extremely humbled by the generosity of so many people and it felt good knowing that my personal challenge had ultimately benefited many through NeuRA’s research.

Steve Hartley
Histology – microscopic anatomy showing cells and their organisation – is fascinating.

The intricate ways the body, whether human or animal, is put together and functions; the solutions nature comes up with to ensure developmental changes occur in order; and the beauty within the patterns and networks that are repeated on different scales.

Histological images are works of art that are beautiful to the layperson and meaningful to the medical professional and have a way of showing us that we are made of patterns, designs and colours.

This image is a digital artwork created from a histology image. In the original image, communication pathways in the rat brain were stained with silver particles.

Histological images like this one are the gold standard for visualising the brain, but can only be prepared from post-mortem tissue.

Dramatic technological advances in brain MRI have made it possible to create images of the living brain in almost equally exquisite detail to histology.

By comparing MRI to histology, our researchers are improving our ability to identify structures in the living brain, which will eventually revolutionise how we diagnose brain disease.