It used to be considered impossible for the human brain to repair itself after injury, but accumulating evidence now shows that the brain can repair itself following injury.

Menzies researchers have added further evidence to the case by discovering that nerve cells (neurons) in undamaged parts of the brain can remodel themselves in response to acquired brain injury.

This study into brain plasticity has given new hope to those suffering from acquired brain injury.

Acquired brain injury affects about one in 45 Australians.

Brain injury is damage to the brain acquired after birth through traumatic injury such as accidents and falls, or through non-traumatic injury such as stroke, tumour or infection.

It is estimated that 2500 Tasmanians acquire a brain injury each year, resulting in a reduced capacity for independent living.

The consequences of brain injury remain severe as there are still no effective treatments.

The mature brain has traditionally been considered a static structure, incapable of repair following injury.

Menzies’ Senior Research Fellow, Dr Tracey Dickson says that accumulating evidence now indicates the damaged adult brain actively responds to brain injury and that the mature brain may retain a capacity for the remodelling of neuronal networks.

“These studies demonstrate a novel neuronal response to traumatic brain injury,” Dr Dickson said. “Our data suggests that specific regions of the brain are capable of significant remodelling following injury, specific to neuronal type.”

Lead author on the research paper, and Menzies’ PhD student, Ms Catherine Blizzard explains there are two types of neurons in the cortex – pyramidal neurons and interneurons.

“We looked at both types and found that pyramidal neurons attempt axonal regeneration into the injury site, whereas interneurons reorganised their processes away from the injury site to undamaged areas of the cortex,” Ms Blizzard said.

“Interestingly, our studies demonstrate that neurons in the adult brain have an unappreciated capacity for remodelling away from the actual injury, and that these neurons are attempting to rewire the brain following an injury.”

The research team is now trying to identify ways in which this healing response can be encouraged, which could form the basis of new therapies.
In today’s world medical research is moving to new heights. It is improving prognoses and treatments beyond anything previously possible. Here at Menzies, our expectation is that our research will be an integral part of these new developments.

Indeed these are exciting times for us. The quality of our work and the commitment of our researchers, together with our many supporters and key stakeholders, lead me to feel a great sense of excitement and enthusiasm about what’s to come. I look forward to what the next 12 months will bring and I thank you for being part of this journey.

In this edition, we bring you some of our latest research developments including a story on the brain’s ability to rewire itself after injury, the link between diabetes and depression, and uncovering the potential risk factors related to reducing the number of falls in horse racing.

These achievements signify the increasing quality and reputation of our researchers. I hope you enjoy reading this our latest edition of the Bulletin.

Professor Simon Foote

Understanding the link between depression and diabetes

Around one million Australian adults and 100,000 young people live with depression each year, and an estimated 1.23 million Australians will be diabetic by the end of 2010. Many of these Australians are afflicted by both conditions. New research from the Menzies Research Institute Tasmania has shed light on the well-known, but poorly understood link between diabetes and depression.

Depression is one of the most common mental health problems, with one in five people likely to experience depression at some stage of their lives. Depression is more than just a low mood – it’s a serious illness. People with depression find it hard to function every day and may be reluctant to participate in activities they once enjoyed. The most common onset is between the ages of 30 and 40 years, with a later peak between 50 and 60 years.

Depression is more common in people with diabetes. This may be a consequence of having and managing diabetes, but there is clear evidence that depressed adults are up to 37 per cent more likely to develop type 2 diabetes than those adults who are not depressed. What has been less clear until now is the underlying biological mechanism explaining this relationship.

Diabetes is a disease where the hormone insulin, essential for the conversion of glucose (sugar) into energy, is no longer produced in sufficient amounts by the body, or the insulin produced is not working properly. Type 2 diabetes represents around 85-90 per cent of all cases of diabetes in Australia and is characterised by an inability to use insulin effectively in the body. Type 2 diabetes usually affects people over the age of 45 and is treated by encouraging healthy eating and regular exercise in addition to the use of medication in many cases.

Menzies’ Research Fellow, Dr Sue Pearson, looked at data from more than 1700 young adults, aged between 26 and 36 years of age. It is the first study to look at the link between diabetes and depression using a ‘gold standard’ measure for depression in a population-based study, and to be undertaken on a younger population. More importantly, it offers new insights into the possible causal mechanism linking depression to diabetes.

“We examined how insulin resistance, which is strongly associated with depression, and the likely onset of type 2 diabetes were associated in young adults,” Dr Pearson said.

“We then went further to identify mechanisms that might explain this relationship.”

One mechanism Dr Pearson and her team explored was whether lifestyle factors may explain the relationship between depression and type 2 diabetes. The lifestyle factors included behaviours such as physical inactivity and poor dietary habits, which increase the risk of developing insulin resistance and are also more common in people with depression.

“Insulin resistance was found to be significantly increased in both men and women with depressive disorder, even after adjustment for behavioural and dietary factors,” Dr Pearson said.

A further mechanism the study explored was obesity, which is a common factor to both depression and insulin resistance. While obesity can result from poor dietary habits and physical inactivity, it is also suggested that hyperactivation of the stress pathway in depression promotes abdominal fat accumulation.

“Approximately 40–60 per cent of people who suffer from major depression exhibit hyperactivity of this stress pathway,” Dr Pearson said.

“Unlike when we adjusted for lifestyle factors, when we adjusted for waist circumference the association was greatly reduced,” Dr Pearson said.

Dr Pearson says these results suggest abdominal fat may be far more important in explaining the association between depression and insulin resistance, than behavioural factors such as diet and physical activity.
Study highlights risky career path for jockeys

A Menzies Research Institute Tasmania study has taken the first step towards developing appropriate interventions to reduce the number of jockeys injured or killed in thoroughbred horse racing. Until now, there has been no investigation into the risk factors that contribute to falls by thoroughbred racing jockeys riding in flat races undertaken anywhere in the world.

The study investigated risk factors associated with falls by licensed jockeys, participating in flat races in Australia, during the period August 2002 to July 2006.

Results reveal a licensed Australian jockey has one race fall for every 240 rides in flat racing. While any fall could be career-ending, 27 per cent of falls resulted in an injury and one in 620 resulted in death.

Associate Professor Leigh Blizzard says a United States study shows being a jockey is riskier than being a metal worker, a logging worker, a pilot, a skydiver and a boxer. It is only (deep sea) fishing workers who have a higher fatality rate.

Menzies’ researchers identified a variety of factors associated with falls, including sex of jockey, experience level, being an amateur jockey, the number of previous rides by the jockey that day, younger horse age, drier track rating, shorter race distance, lower field size, lower race grade and prize money on offer.

The study revealed common factors which could be addressed through targeted training for jockeys or with tougher requirements for horse preparation.

“Applying appropriate interventions to prevent falls requires an understanding of the numerous risk factors that are associated with these falls,” Associate Professor Blizzard said.

Falls were more common in a jockey’s first race of the day, which Associate Professor Blizzard says could indicate a problem with jockeys not being properly warmed up.

First author of the paper, Menzies’ PhD student, Ms Peta Hitchens says the findings suggest that both the jockey and horse experience will be important factors to include in a fall and injury prevention strategy.

Researcher profile: Dr Kristy Sanderson

What is the current focus of your research?

I am interested in getting a better understanding of how depression in employees affects them, their colleagues, and the business/organisation in which they work. My colleagues and I are also investigating what makes a workplace “mentally healthy,” and using these findings to trial new ways of helping employers adopt these healthy practices in their own settings.

What are some of the recent findings from your work?

We have recently completed new estimates of how much depression in the workplace is costing Australian society. The total societal cost of depression in the Australian workforce over one year was estimated at $8,180 per person or $12.6 billion in total. The vast majority of cost related to employment including lost productive time and the cost of replacing an employee from job turnover.

We looked at costs borne by the individual and the health system, in addition to costs borne by employers. We found the majority of Australians with a history of depression are able to keep working, which is very important for both them and the economy. But depression does cause a significant economic toll from lost productivity and increased job turnover.

There was also some evidence to suggest a higher risk of workplace accidents among employees with depression. These findings were based on the best available evidence we currently have, but we identified important gaps in the evidence that should be addressed.

What is the biggest challenge in your area of research?

Depression is a complex and chronic disease with many individual, social and genetic causes having been identified. The multitude of causes means we need to come up with a multitude of solutions to prevent depression. One of our biggest challenges is convincing employers, both big and small, they have an important role to play in mental health promotion and mental disorder prevention. Some get the message very quickly, others are very reluctant to embrace a health condition that is still stigmatised and misunderstood. Demonstrating that depression is already costing their business money, even if it is not visible to them, is one important way we can do this. We are looking at new ways to present this evidence to employers to convince them to take a proactive approach to mental health in their workplace, to benefit both them and their staff.

What is the most interesting aspect about your work?

This work appeals to me as it is very applied and often requires balancing different needs for the research versus the end-use. The distance from scientific discovery to practical application can be much shorter than for basic scientific research.

What do you enjoy doing in your spare time?

Happiness for me is combining three favourite pastimes – burying my nose in a good book for hours, camping, and doing my bit to support our brilliant Tasmanian food and wine industry.
Navy men and women give proceeds to medical research

For over a half century the Moonah Navy Club’s home in Moonah was a place of friendship and support. At one point in time over one hundred members congregated with their wives at the clubrooms for camaraderie and fun. Pictures and mementos of navy careers line the walls. When it became time to sell their home this year, the members of the Moonah Navy Club made the generous decision to give the proceeds to a worthy cause. Many of the Club’s members have died of cancer or a heart attack, so the remaining 10 members considered it only appropriate to donate the funds to Menzies Research Institute Tasmania and the Heart Foundation.

Menzies and the Heart Foundation each received a gift of $151,000. The Moonah Navy Club Honours Scholarship Fund will support up to two honours scholars per annum at Menzies. “We hope there is joy in knowing that this gift marks the beginning of another era for the Club,” Director Professor Simon Foote said. Menzies is extremely grateful to the men and women of the Moonah Navy Club for the outstanding gift to medical research.

Medical Science 1 wins People’s Choice Award

The University of Tasmania’s Medical Science 1 (MS1) building has won the People’s Choice Award at the Tasmanian chapter of the Australian Institute of Architects Awards.

The building, designed by Lyons Architects and built by John Holland Fairbrothers Joint Venture, is a landmark Hobart building which encountered significant opposition during the development application stage. The $58 million building was opened in December 2009 and is the new home for the Menzies Research Institute Tasmania and the School of Medicine. The MS1 building at the University of Tasmania’s Medical Science Precinct, on the corner of Liverpool and Campbell Streets, features architectural references to the surrounding landscape of Hobart and the scientific research that is undertaken within the building.

Lyons Architects’ Director, Mr Adrian Stanic, said the unique design elements of the building and internal functionality have helped make it a favourite now with the public, as well as those who work and study in it.

“The building brings together the School of Medicine and Menzies Research Institute Tasmania in a co-location, which is reflected in its social and functional planning, particularly highlighted in the central feature stair connecting all levels.

“The organic nature, cellular window arrangement and curvilinear form of MS1 reference the building’s medical research and training function, as well as reflecting the surrounding mountains and Derwent River.

“Although the building design created some public controversy during the planning stage, it has been very pleasing to see it accepted, initially once it was constructed and now with this award."

“The prominent corner site and scale of the building meant it was important to achieve an architectural solution that contributes positively to the diversity of Hobart city,” Mr Stanic said.

Director of Menzies, Professor Simon Foote said he was delighted with the design of the building, and its appropriateness not only to the Hobart CBD surrounds but the pragmatic requirements of an international medical research facility.

“The goal is for research staff across all research themes to work collaboratively and our new building facilitates interaction among the researchers,” Professor Foote said.

Lyons is now working on the design for Medical Science 2 (MS2), a second stage building adjoining MS1 which will incorporate clinical teaching facilities, specialist laboratories and offices. MS2 is due for completion in late 2012.
Thank you to our valued supporters

Thank you to all of our donors for your ongoing financial support and commitment to Menzies. Listed below are new individual and community supporters of Menzies for May to July 2010:

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- and Prof John Dickey

*The Menzies Research Institute Tasmania is deeply indebted to ALL our generous supporters who kindly donated in 2010. Thank you.*
Can natural therapies effectively manage osteoarthritis?

This is the question researchers at the Menzies Research Institute Tasmania hope to answer. Menzies’ researchers have begun two new participant-based studies that will investigate the benefits of natural therapies in managing osteoarthritis (OA).

Arthritis is the most common chronic health problem in Australia, affecting 90,000 Tasmanians, which is over 20 per cent of the Tasmanian population. Osteoarthritis is the most common form of arthritis, affecting more than 1.3 million (one in ten) Australians. More than 41,000 hip and knee replacements were performed for OA in 2004–05.

As part of self-management, many people with OA supplement their diet with micro- or macro-nutrients, or take natural or herbal remedies. However, evidence for the effectiveness of these supplements and natural remedies is often lacking and further research is desperately needed.

The studies are looking at how effective natural remedies are in managing knee OA. Menzies’ Professorial Research Fellow, Professor Graeme Jones, will lead the participant based study looking at how a natural topical treatment assists in reducing the pain of knee OA.

Menzies’ Principal Research Fellow, Associate Professor Ding, will lead the study involving the use of Vitamin D supplements in managing the progression of knee OA.

Professor Jones said while there was currently no cure for osteoarthritis, a great amount of effort was being directed by Menzies towards improving the well-being of OA sufferers.

“With limited current treatments, Menzies is setting up these studies to determine if these therapies are effective, which will hopefully lead to an improvement in the wellbeing of osteoarthritis sufferers,” Professor Jones said.

“We hope to intervene with appropriate treatments and make a difference to the lives of those suffering from osteoarthritis.”

Professor Jones said the Menzies Research Institute is encouraging Tasmanians to get involved with the new studies and help address this serious health issue here in Tasmania.

Menzies is seeking volunteers for the studies who are over the age of 50 and have been suffering from the symptoms of knee osteoarthritis for at least six months. Anyone interested in more information or volunteering in the Vitamin D study should contact Kay Nguo on (03) 6226 7793. For the topical herbal treatment study, please contact Melanie Clark on (03) 6226 7779.

A brighter smile all round

Dr Joseph Chau has been helping his patients smile brightly for over 40 years and now he is making Menzies’ researchers smile, by raising $2,000 for medical research.

Dr Chau has raised vital funds for Menzies’ research by selling tubes of toothpaste at two of his dental practices and generously matching the proceeds. Patients contributed by purchasing the toothpaste. The fundraising has been incredibly successful with 1000 tubes of toothpaste being sold since August 2009.

Practice Manager Susan Jack said that everyone at the two locations pitched in to help.

“We had both our Hobart and Bellereive practices involved and everyone worked really hard to help us reach our target,” Susan Jack said.

Dr Chau has a favourite quote, “Whatever you do in life make sure you strive to be the best.” This is demonstrated by Dr Chau’s success in fundraising.

Professor Simon Foote, Director of Menzies, extends his gratitude to Dr Chau, his staff and patients, for their generosity.

The Art of Christmas

Each year a selection of talented Tasmanian artists donate their unique artwork to Menzies to raise funds for medical research in Tasmania. Artists include Barbie Kjar, Stuart Clues, Milan Milojeovic, Breon Martin, Patrick Grieve, Megan Keating, Helen Wright, Christine Scott, Katy Woodroffe, Geoff Dyer, Marlon Zarins and many more.

Art of Christmas 2010
Thursday 28 October
6pm – 8pm
The Long Gallery, Salamanca

Tickets $30 per person. Jazz band, canapés and beverages included.

Please join us for this special evening and in raising funds for medical research.

For more information on the event please contact Jacqueline Rodrigues on 03 6226 7712 (Thursday and Friday) or email jpr0@postoffice.utas.edu.au

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May – July 2010

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We gratefully acknowledge the gift in honour of Mother’s Day for:
Ms Claire Bendall

Photo above-left: Practice Manager Susan Jack and Dr Joseph Chau are making our researchers smile with their fundraising efforts
Dr Leon Wescombe Memorial Fund

Director of Menzies, Professor Simon Foote is honoured to announce the Dr Leon Wescombe Memorial Fund. Created by the Wescombe Family and Nathan Chilcott, this fund will assist Menzies researchers in their quest to cure or prevent cystic fibrosis. It is hoped that $100,000 will be raised over time to permanently endow the fund.

If you would like to donate to the Dr Leon Wescombe Memorial Fund please visit the UTAS Foundation website: http://www.utas.edu.au/foundation

We gratefully acknowledge the gifts received in honour of Dr Leon Wescombe from:

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