25 years of research excellence

The Menzies Journey
(1988 – 2013)

Today, the University of Tasmania’s Menzies Research Institute Tasmania, is recognised as one of Australia’s leading medical research institutes. The Institute, formerly known as the Menzies Centre for Population Health Research, was established in 1988 on the vision and foresight of Professor Terry Dwyer who was the newly appointed head of the Department of Community Health at the University of Tasmania, and Professor Ian Lewis, the Dean of the Medical School.

When the Centre first opened in January 1988 there was a handful of staff. Today, Menzies has over 260 staff and students. The Institute has been sustained over the last 25 years through the support of our State and Federal Governments, the Menzies Foundation, the University of Tasmania and the extraordinary generosity of the Tasmanian community.

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In a reasonably short time, Menzies has been responsible for many significant research achievements that have provided important health benefits both locally in the Tasmanian community and around the world. From a scan of international headlines, you can see that Menzies has been part of a number of remarkable discoveries - from its ground-breaking work into the link between babies’ sleeping positions and sudden infant death syndrome (SIDS), the association of higher vitamin D levels with a lower relapse risk in multiple sclerosis, to the recent finding that mild iodine deficiency during pregnancy is linked to reduced educational outcomes in children.

Upon reading the history of Menzies, it is impressive to see the rapid rate of progress that has been achieved – from focusing primarily on population health in its first years, to today, where its scientific expertise focuses on five research themes - population health and primary care; neurodegenerative disease and brain injury; cardio-metabolic health and diseases; musculoskeletal health and diseases; and cancer, genetics and immunology research. Today, Menzies performs excellent basic laboratory, clinical and population health research with a focus on the major diseases affecting the Tasmanian community. Menzies research aims to improve patient care and clinical outcomes for the community.

Menzies has been fortunate to be led by three outstanding individuals – initially Professor Terry Dwyer and Professor Simon Foote and more recently Professor Tom Marwick, whose focus and clear direction is leading Menzies to new heights.

Continued page 2

It is hard to believe that we are half way through the year – and what an outstanding year it has already been for Menzies.

In early May, we celebrated our 25th anniversary in style, with almost 400 guests attending the official anniversary event, and being witness to an engaging public debate on the introduction of a vitamin D screening program in Australia.

The event gave the attendees a feel for the dynamic energy that we have in the Institute, as well as proudly showcasing the exceptional achievements Menzies has accomplished over the past 25 years. If you were unable to join us for this event, the full video is now available to view on our website at www.menzies.utas.edu.au.

To hear more about our research first hand, I encourage you to attend one of the free public talks being held over the next six months. Details on these events can be found on page 6.

I would like to take this opportunity to thank everyone who has already generously donated to our winter fundraising appeal. As I hope you know, our research simply would not be possible without the strong support we receive from the community.


Yours sincerely,

Professor Tom Marwick
Director

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Menzies 25th celebration draws huge crowd

Menzies celebrated its 25th Anniversary on Friday 10 May in the new UTAS Medical Science Precinct. We received an overwhelming response from our supporters wanting to be part of this milestone celebration.

Award-winning science writer and broadcaster Bernie Hobbs hosted a debate on the hot topic: Vitamin D: Should a regular screening program be introduced in Australia? Following the debate, guests were invited to join staff and students for drinks and canapés and to view the new public areas of the Medical Science 2 building.

Menzies 25th Anniversary Event was proudly supported by Cascade Brewery, Hill Street Grocer, John Holland Fairbrother Joint Venture, Spreyton Cider Co, Tasmanian Spreyton Fresh and Treasury Wine Estates.

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From front page

The new UTAS Medical Science Precinct that houses Menzies today provides the vital facilities needed for Menzies to remain at the forefront - both in Australia and internationally - in medical research, clinical translation and education, well into the future.

We are extremely grateful for all those who have nurtured and supported Menzies over the last 25 years.
Saving the Tassie devil from extinction

We know that human cancer is not contagious – you don’t just catch it. But devil facial tumour disease (DFTD) is different. It breaks this ‘rule’. DFTD is a transmissible cancer that devils pass on to each other by biting.

DFTD is similar to an organ transplant. The DFTD cancer cells from one devil are transplanted to another devil. Unless you are an identical twin giving tissue to your other twin the human immune system will recognise the transplant as foreign and try and reject or destroy it. This same ‘rejection’ does not occur in devils, where the transplanted cancer cells grow without rejection by their immune system. There are no exceptions. All devils appear to be susceptible. Why devils fail to reject the cancer cells could be due to a poor immune system or that devils (like twins) are genetically similar.

Our research has shown that devils have a very good immune system. Therefore they should respond to the foreign DFTD tumour cells. There must be something missing from DFTD cancer cells to avoid rejection by the devil’s immune system.

Researchers from Menzies collaborated with researchers from Zoology at the University of Tasmania, DPIPWE’s Animal Health Laboratory, University of Sydney, University of Cambridge (UK), and University of South Denmark. The research investigated whether the DFTD cancer cells were invisible to the devil’s immune system.

On the surface of nearly every cell are major histocompatibility complex (MHC) molecules. These molecules are ‘immune recognition molecules’ that enable the immune system to determine if a cell is healthy, diseased (e.g. infected by a virus or a cancer cell) or foreign (e.g. from another individual). If the cell is healthy, no action is needed. If the cell is not healthy, an immune response is activated.

Our research revealed that DFTD cancer cells lack these ‘immune recognition molecules’. DFTD cancer cells are therefore invisible to the devil’s immune system allowing them to develop into the disfiguring cancers, eventually causing death.

The discovery that DFTD cancer cells do not display the ‘immune recognition molecules’ on their cell surface is a major advance in our understanding of how this cancer can be transmitted between devils without inducing an immune response. A limited genetic difference between devils may contribute, but lack of expression of these molecules is the main reason for transmission.

The devil has no chance of responding unless the DFTD cancer cells are made ‘visible’ to the devil’s immune system. The good news is that the genes that code for the ‘immune recognition molecules’ are still present and it should be possible to turn them back on. Our research discovered that by treating the DFTD cancer cells in the laboratory with natural chemicals produced by the devil’s immune system these ‘immune recognition molecules’ can be turned back on. This would make the DFTD cancer cells become visible to the devil’s immune system, resulting in an immune response to these foreign cells.

The ability to turn on these ‘immune recognition molecules’ provides an important clue towards the development of a vaccine. But it is a clue, not an answer. There are no guarantees as there are many challenges to convert this clue into an effective vaccine. An immediate challenge is to turn these genes back on long enough to induce a response.

Our research aims to overcome such challenges with the primary objective to protect the Tasmanian devil in the wild. Should a safe and effective vaccine be developed it could initially be used to protect devils in the insurance population before they are re-introduced into the wild. It could also be used in physically isolated areas where an intensive trapping and vaccination program could be undertaken.

*This is an edited version of an article that appeared in The Sunday Tasmanian*
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 February 2013 – May 2013.

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New Community Support
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Mersey Bank Jersey Stud
Southern Cross Care (Tas) Inc
St Mark’s Opportunity Shop
Tasmanian Combined Chapter Management
Winifield Dairy Pty Ltd
(CR Ward)

Family Tree
Clive Pearce

The Menzies Research Institute Tasmania is deeply indebted to all our generous supporters and donors. A full list of all our supporters for 2012 and 2013 is available on our website under www.menzies.utas.edu.au/about us/supporters. Thank you.

Listed below are our Everyday Angels – our supporters who make regular gifts to Menzies.

Everyday Angels
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Flying Doctors support Menzies’ reach across Tasmania

Menzies is delighted to have received generous support from the Royal Flying Doctor Service (RFDS) Tasmania this year. This is the first in what we anticipate will be a mutually beneficial and multi-year partnership, supporting and improving the health of people in Tasmania’s regional and remote locations.

The RFDS Tasmania donation of $40,000 for 2013 will be used directly to fund a research assistant working on the ASPREE study. The ASPREE study is a double-blind randomised controlled trial of low dose aspirin for healthy ageing. The study aims to determine whether the potential benefits of aspirin outweigh the risks for people over age 65.

The research assistant will travel around the state in Menzies’ new Tasmanian BioBus to collect, process and store blood and other bio-specimens from ASPREE participants, for long-term storage in the ASPREE Healthy Ageing Biobank.

“This gift is transformative,” said Director of Menzies, Professor Tom Marwick. “It enables the reach of this important project to cover the north and western regions of Tasmania in a reliable and systematic way. It will also provide stable, quality employment for a highly skilled, local individual and deepen Menzies presence in regional and remote Tasmania.

“This partnership contributes to Menzies long term goal of improving the health of our communities and saving lives. We are most grateful to the RFDS Tasmania Board and membership for this valuable contribution,” Professor Marwick said.

RFDS Tasmania President, Malcolm White said that the role of the organisation (RFDS) is to support a range of health related services to benefit all Tasmanians. “The ASPREE study will address important health aspects for people living in regional and remote Tasmanian communities.”

Professor Mark Nelson and Malcolm White, President, RFDS Tasmania
Researcher wins State award

Menzies’ Dr Clare Smith has won the Premier’s Young Achiever of the Year Award at the 2013 Southern Cross Young Achiever Awards.

Dr Smith was awarded this prestigious prize for her work on investigating a novel therapy against malaria. A major outcome of her research was the discovery of an anti-malarial compound that could make an impact worldwide.

In 2010, there were about 219 million malaria cases and an estimated 660,000 malaria deaths. Children living in the poorest countries are the most vulnerable, with an estimated 90 per cent of all malaria deaths occurring in Africa and among children under the age of five.

Dr Smith’s research is now protected by a patent and will be progressing to clinical trials in the near future.

Dr Smith was chosen from the eight category winners and Tasmanian Premier and awards patron, Lara Giddings, presented the honour at a gala dinner attended by more than 350 people in Hobart. The awards help to identify and pay tribute to some of Tasmania’s finest young achievers.

Dr Smith recently accepted a postdoctoral research position in the United States, as a Howard Hughes Associate. She will be working under Associate Professor Chris Sassetti in the Department of Microbiology and

Menzies embraces new international students

Professor Tom Marwick recently returned from a successful trip to China in April, where he visited the Anhui Medical University (AMU) and a number of hospitals in the city of Hefei, in the Anhui province. Menzies and AMU have a fruitful collaboration that has led to six postgraduate students currently undertaking their PhD studies at Menzies.

While in China, Professor Marwick and Associate Professor Changhai Ding interviewed potential PhD candidates interested in studying at Menzies. Nine high caliber students were chosen. The new students will work in a number of research areas including oncology, multiple sclerosis, diabetes, depression and anxiety in the workplace, musculoskeletal disease and immunology.

Discovery may lead to new Alzheimer’s treatments

To transfer information quickly in our brain, our nerves are insulated like electrical cables. If nerve cells lose their insulation they can short-circuit and information is no longer transferred to where it is needed. We know from diseases like multiple sclerosis that losing insulation makes nerve cells extremely vulnerable to damage and death. This may also be true for patients suffering from Alzheimer’s disease (AD) and schizophrenia.

There is a growing body of evidence that indicates brain insulation is lost in AD before nerve cells are damaged. In fact, insulation loss could contribute directly to nerve cell loss.

By studying brain scans from patients with AD, researchers have previously found that the amount of insulation that is damaged matched the level of the patient’s dementia. The more damaged the insulation, the worse the person’s memory problems.

Collaborative research spanning the United Kingdom, Australia and Japan has discovered that the cells responsible for making brain insulation (called oligodendrocytes) are not the passive bystanders to brain function that we once thought.

Dr Kaylene Young, a senior research fellow at Menzies and her colleagues, have determined that insulating cells, the cells that protect our nerves, are made from immature cells in the brain called OPCs (oligodendrocyte precursor cells).

Dr Kaylene Young says, “this new research demonstrates that new insulation is added to brain circuitry every day.”

“The addition of new insulation to nerve cells can change the way that our brain circuits function,” Dr Young said.

“This continued addition of insulation is likely to be very important for learning, memory, vision and co-ordination, and has important implications for nervous system disease.”

Dr Young and her colleagues are currently investigating ways to hijack the natural ability of OPCs to make new insulating cells.

“The aim is to stimulate OPCs to produce more insulating cells, in order to repair the insulation damage that is seen in the brains of AD patients. Stimulating OPCs in the brain is an appealing possibility since they are found throughout all brain regions, meaning that they are already where they need to be.

“If we succeed in repairing the damaged brain insulation, and can re-wrap the “at risk” nerve cells, we may be able to protect and prevent these nerve cells from dying.

“Protecting nerve cells would prevent the rapid mental deterioration seen in people after they are diagnosed with AD,” she says.

This research was published in the international journal Neuron.
The effects of iodine deficiency during pregnancy

Iodine is essential during pregnancy and early life. Even mild iodine deficiency can compromise optimal brain development of the unborn child and infant.

A Menzies’ study has found that children who did not receive enough iodine in the womb performed worse on literacy tests as 9-year-olds than their peers.

The findings however, show a reduction in literacy performance, but not numeracy. This suggests that auditory, rather than visual, pathways during the unborn child’s neurological development may be impacted by mild iodine deficiency in pregnancy.

Although some children in the study were exposed to insufficient iodine during pregnancy, they all grew up in an environment considered to have adequate iodine, following the voluntary fortification of bread in Tasmania in 2001.

“This suggests that the learning difficulties resulting from lack of iodine during pregnancy are persistent, despite iodine supplementation in later life,” said Dr Kristen Hynes, chief investigator on the study.

“This may help explain why some students are more resistant to learning strategies than others. It also suggests that different approaches to learning difficulties, particularly those using auditory processing and working memory may be needed.

“This research is important because it shows that even mild iodine deficiency during pregnancy can have long term impacts on a child’s educational performance,” Dr Hynes said.

“The good news is that iodine deficiency during pregnancy and early life is preventable.

“Pregnant women should follow public health guidelines and take daily dietary supplements containing iodine.

“Women are advised to follow the current National Health and Medical Research Council recommendation and take a daily dietary supplement containing a 150μg of iodine when planning pregnancy and while pregnant and breastfeeding.

“Monitoring of women during pregnancy and breastfeeding to ensure they have sufficient dietary iodine is essential,” Dr Hynes said.

Partnership brings health economics symposium to Hobart

Poor health in the workforce affects productivity, business performance and recruitment spending. With an aging workforce and chronic disease predictions, costs are forecast to rise over the coming decades. Employers and governments are thus increasingly interested in how best to maximise employee health. Workplace health promotion is the creation of health strategies at work. The value of these programs can be assessed by health economic evaluation.

Menzies’ researchers and State Government leaders are currently working together to evaluate a Tasmanian State Service workplace health strategy (Healthy@Work). In March, this partnership hosted a symposium titled “Investing in workplace health promotion: What’s the return?” where experts in both research and policy shared knowledge on the complexities of economic evaluations of health promotion and the workplace setting. Speaker presentations are available on the Menzies website.

The day-long event brought academics, practitioners, and decision-makers together and culminated in an open panel discussion on the vision for ‘best practice’ in the economic evaluation of workplace health promotion and how to achieve better uptake of economic evidence into decision making around the workplace setting.

Many outcomes were achieved, including how best to utilise health economic techniques in the pursuit of evaluating workplace health and where to target the evidence and how to go about it. The symposium gave insight into the difficulties associated with the economics of complex public health promotion strategies with these issues to be explored through the partneringHealthy@Work project.

If you would like to be added to the mailing list for future partneringHealthy@Work events, please email: Doreen.Bate@utas.edu.au

Public talk series 2013

We invite you to join us at one of our free public talks where you will find out about the latest information and trends in medical research, and hear from our leading scientists about their latest research discoveries.

<table>
<thead>
<tr>
<th>2013 PUBLIC TALK SERIES</th>
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<tr>
<td>Dementia and other Brain Disorders</td>
<td>Wednesday, 26 June 2013 at 5.30pm</td>
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<tr>
<td>Musculoskeletal Health and Diseases</td>
<td>Wednesday, 14 August 2013 at 5.30pm</td>
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<tr>
<td>Brain Injury and Repair</td>
<td>Wednesday, 30 October 2013 at 5.30pm</td>
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Please check closer to the date for more detailed information on each talk. Visit www.menzies.utas.edu.au/public-talks
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In Memoriam

February 2013–May 2013

We gratefully acknowledge gifts made in honour of:

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