MND Research producing positive results

A long-term project at the ANZAC Research Institute to identify the genetic mutations that cause motor neurone disease (MND), and then to discover which drugs may control, cure or even prevent it, is already bringing benefits for families affected by the fatal paralysis.

“Families who want to have children come to us and ask what we can do to help them have offspring who don’t carry the fatal gene,” says Professor Garth Nicholson.

“Now this can be done, usually with the help of IVF companies such as Genea in Sydney. They take a few cells from an embryo, test them, and when they find an embryo that doesn’t carry the mutant gene, that’s the embryo that is implanted in a normal IVF process.”

This remarkable development is a direct result of the research carried out by a team led by Professor Nicholson and Dr Ian Blair. As reported in earlier editions of Discovery they were instrumental in identifying genetic mutations which cause MND, working with families and utilising a substantial bank of DNA samples built up by Professor Nicholson over 20 years.

Senior Research Fellowship for Prof Derek Hart

The NHMRC has acknowledged the outstanding work being done by Prof Derek Hart, head of the Dendritic Cell Biology and Therapeutics Group at the ANZAC Research Institute, by awarding him a Senior Principal Research Fellowship.

The SPRF is the highest form of personal funding support given by the Federal Government body and requires a recipient to be recognised as being among the world’s leading scientists in his or her field.

“It’s the recognition and the kudos, so it’s good for the ANZAC and for Concord to have an SPRF on site,” says Prof Hart.

After being appointed Professor of Transplantation and Immunotherapy at the University of Sydney, Prof Hart arrived at the ANZAC Research Institute last year to continue his work in finding ways to overcome transplant rejection and to generate immune therapies for cancer.

The unique subsets of white cells, known as dendritic cells, are responsible for initiating and directing immune responses.

“The work we’re doing here is really focused on looking at the molecules on the surface of the dendritic cells and other white blood cells, and manufacturing antibodies to those molecules,” he explains.

“The dendritic cells play a fundamental role in transplant rejection and drive the major complication of bone marrow transplantation. Our potential first therapeutic product is aimed at suppressing or eliminating the dendritic cell, and it’s now been licensed for a trial, which we hope will take place in Sydney.”

Prof Hart says a further investigation is looking at taking dendritic cells out of the body and incubating them with cancer targets to produce a therapeutic cancer vaccination.

The significance of research into dendritic cells was lauded by the Nobel Foundation this year when the Prize for Physiology and Medicine was shared by Canadian-born Prof Ralph Steinman, of The Rockefeller University in New York, who had led the world in researching dendritic cells. Sadly Ralph Steinman had died after a battle with pancreatic cancer only days before the Nobel Prize announcement was made.

Derek Hart has paid tribute the pioneering work done by his US-based colleague, which has led to the creation of a new field of study within immunology.

“It’s wonderful that the field has advanced to the point where we are creating products from dendritic cells that may become new drugs, coinciding with the Nobel Prize that recognises how important they are in the biology of the immune response,” he said.

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Role of Androgens in Polycystic Ovary Syndrome

Polycystic ovary syndrome (PCOS) is one of the most common hormonal disorders, affecting between 5% and 10% of women of reproductive age worldwide.

Women diagnosed with PCOS exhibit anovulation resulting in irregular menstruation, infertility and hyperandrogenism (causing increased unwanted hair growth and acne), together with metabolic abnormalities such as obesity, type 2 diabetes and increased cardiovascular risk.

Despite PCOS being a common endocrine disorder and despite substantial research devoted to defining the cause of PCOS, its origins remain unknown.

Dr Kirsty Walters has been granted $493,515 over three years by the NHMRC to examine the role of androgens, which are classically known as male hormones, in the development of PCOS.

“Androgens play an essential and important role in males, but recently we identified a previously unsuspected role for androgens in regulating female fertility,” explains Dr Walters.

“Androgens are implicated in the development of PCOS, but it’s not feasible for us to carry out the decisive, invasive studies in women that are needed to confirm and elucidate their roles. So this project will use a novel experimental model to investigate the role of androgens in PCOS.”

Dr Walters says the ultimate goal is to better understand the mechanisms regulating the development of PCOS and allow new treatment strategies to be identified for this common female reproductive disorder.

Associated NHMRC Grants

The Andrology Department of the ANZAC Research Institute is collaborating in studies based in Adelaide and Perth which have been funded by NHMRC grants.

- Associate Professor Ann Conway is taking part in a study led by Prof Gary Witter of the University of Adelaide to see if testosterone can prevent the pre-diabetic conditions of obesity and metabolic syndrome from deteriorating into full diabetes. The Andrology Department at Concord Hospital is one of 6 study centres in this investigation and the Institute’s Andrology laboratory is the study’s central steroid assay centre. At $4.8m this is the largest NHMRC grant in 2011-12.

- The Institute’s Andrology laboratory, as the national reference centre for sex steroid assays, is taking part in research examining reasons why cardiovascular disease affects men earlier and with greater severity than women. This study by Prof Bu Yeap from the University of Western Australia will investigate the effects of the sex steroids testosterone and estradiol on cardiovascular disease and the outcomes. The Andrology lab will employ its own novel mass spectrometry methods to measure blood levels of testosterone and estradiol using its novel mass spectrometry assays.
Older Australians and the use of High-Risk medicines

As our bodies age we’re more likely to have a range of medicines prescribed for us, but are they all appropriate, and what long-term effects do they have? Over the next four years Dr Daniela Gnijdic will be utilising a number of data bases to ascertain just what medicines are being prescribed for Australians aged 60 plus and how their use is impacting important clinical outcomes, including deaths, and admissions to hospital and aged care facilities.

“The main challenge in older people is that as you age you use more medicines, and this increases the risk of adverse drug reactions,” says Dr Gnijdic.

“We also have all the age-related physiological changes which influence how we handle medications, so all of that together puts older Australians at greater risk of adverse outcomes.”

Dr Gnijdic points out that medication that’s suitable for a 40-year-old is not necessarily appropriate for a 70-year-old, because, for example, our liver and kidneys don’t metabolise and eliminate drugs in the same way as they did when we were younger.

Working within the Biogerontology group headed by Professor David Le Couteur and funded by an National Health and Medical Research Council (NHMRC) Early Career Fellowship, Dr Gnijdic will access data from the largest cohort of older Australians, the “45 and Up Study”, and a national cohort derived from the Pharmaceutical Benefits Scheme database.

“This project is unique and novel because it will provide evidence at the population level relating to the prevalence of high risk prescribing and trends, how individual and health system factors influence high risk prescribing, and the likely clinical consequences for this age group,” she says.

The “45 and Up Study” commenced in 2005 and has a total database of 250,000 people who have agreed to their medical records being used for research, although Dr Gnijdic will study only those aged 60 and above.

Her project’s aim is to improve the quality use of medicines by older Australians and to identify strategies to improve their prescription for older adults.

Early intervention could prevent strokes

Many Australians may be aware that stroke is this country’s third biggest killer after coronary heart disease and lung cancer, but less well know is the role that atrial fibrillation plays in causing many strokes.

Atrial fibrillation is an irregular beating of the heart, where the top part of the heart beats very rapidly while the lower part beats normally or at an increased rate.

“It makes patients feel really lousy, they get very tired and they don’t feel like they’re able to do their normal daily activities,” explains researcher Lis Neubeck.

“Not everyone is symptomatic but for those who are it’s really distressing. It also massively increases the risk of stroke, so you have a 5 to 7 fold increased risk of having a stroke if you have atrial fibrillation.”

It’s a disorder which is surprisingly common, currently affecting about 240,000 Australians, with the numbers rising considerably in older age groups.

Lis Neubeck’s recently completed PhD research looked at ways of reducing the risks for patients with coronary heart disease, and tested a cardiac rehabilitation program which patients could follow in their own time, without having to attend a hospital based program. Her new research project, supported by an Early Career Fellowship, is to investigate ways of reducing the risks of stroke in patients with atrial fibrillation.

“Often we find the first time that people are aware they have atrial fibrillation is when they present here at Concord after having a stroke, so we’re taking a step back in the process to try to prevent people from having a stroke,” she says.

Patients with atrial fibrillation will be identified during their hospital admission or after they’ve had an ECG at Concord Hospital’s pre-admission clinic.

“We’ll then do a one-on-one consultation to assess their individual risk, developing a program for them, and then following up by telephone.

“There’s also a suggestion that if we can reduce risk, by reducing overweight, decreasing the amount of alcohol people drink, getting them to exercise more, that might also help to reduce the risks associated with atrial fibrillation specifically the risk of subsequent stroke,” she says.
Fuzzy Wuzzy twin is unveiled

Our “mascot” – the bronze statue of Fuzzy Wuzzy Angel Raphael Oembari helping Pte Dick Whittington at Buna on Christmas Day 1942 - now has a twin.

The replica, created by the original designer, Dr Maryann Nicholls, was unveiled and dedicated in a ceremony on Kokoda Day, November 3rd. It has been erected outside the education centre at the nearby Kokoda Track Memorial Walkway.

Dr Nicholls’ original work, standing 1.3 metres high, was unveiled outside the ANZAC Research Institute offices in July 2001 and is based on a famous photograph taken by George Silk and published in Life magazine in 1943.

A group from Papua New Guinea, including the chief of Kokoda Village, Benjamin Ijumi, travelled to Sydney to contribute a cultural performance as part of the dedication ceremony.

A group from Papua New Guinea braved the rain to help unveil the Fuzzy Wuzzy statue, along with (on right) Rusty Priest, KTMW chairman and former deputy chairman of the ANZAC Health & Medical Research Foundation, Mayor of Canada Bay Angelos Tsirekas and Kokoda village chief Benjamin Ijumi.

GIVING OPPORTUNITIES

Please use this form if you wish to make a donation to help the ANZAC Institute in its exciting medical research, or if you would like to receive further information. We would love to hear from you, our supporters.

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