ANZAC Research Institute
discovery
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ANOTHER BREAKTHROUGH IN FINDING CAUSE OF MOTOR NEURON DISEASE

Dr Ian Blair, Prof Garth Nicholson and Ms Kelly Williams from the ANZAC Research Institute are part of an international team who have identified a new genetic mutation which causes the fatal paralysis, Motor Neuron Disease.

Until recently the cause of MND was unknown. The newly identified gene encodes a protein, called FUS, which is closely related to the function of another MND protein called TDP-43. As we reported in "Discovery" last year, Ian and Garth led the research team that pointed to TDP-3 causing another form of MND.

Both these proteins slowly build up in neurons and eventually kill them, to cause MND. For the first time a common form of damage that kills motor neurons has been discovered.

MND destroys motor nerves that extend from the brain and spinal cord to all the muscles in the body, controlling the ability to move, breathe, eat and drink. Sufferers are gradually confined to a wheelchair, breathing difficulties usually follow, and death is common within 3 to 5 years.

This latest discovery by the ANZAC Institute team, working in conjunction with researchers at Kings College in London, is an important step towards developing effective screening, prevention and treatment of this fatal and hitherto untreatable disease. Work can now start on finding drugs that target the common damage mechanism, aiming to prevent the fatal build up of these proteins.

OPENING OF ASBESTOS DISEASES RESEARCH INSTITUTE AT THE BERNIE BANTON CENTRE

ADRI Director, Professor Nico van Zandwijk, with Karen Banton and her grandson Jack at the official opening.

Prime Minister Kevin Rudd has officially opened the world's first research facility, the Asbestos Diseases Research Institute, dedicated solely to research on asbestos-related diseases.

The Asbestos Diseases Research Institute is housed in a new building named in honour of the late Bernie Banton, who campaigned tirelessly on behalf of all asbestosis sufferers until his own death from mesothelioma in late 2007. The ADRI will study pathways to diseases and use this new knowledge to deduce new ways to improve screening, make for earlier diagnosis and provide better treatment for the asbestos cancer mesothelioma.

The Bernie Banton Centre will also provide an additional floor extending the ANZAC Research Institute's facilities.

The Asbestos Diseases research Institute now joins the ANZAC Research Institute in tripling the research capacity of the Concord Hospital campus.

At the official opening on January 21st, the Prime Minister pledged $5 million to complete and extend the Bernie Banton Centre, including the development of new research facilities for early stage, pre-clinical testing of new potential treatments.

Mr Rudd reminded those who gathered for the opening that by the middle of the century it is estimated more than 20,000 cases of mesothelioma will be diagnosed in Australia.

"Next year around 500 Australians will be diagnosed with asbestos-related diseases," he said.

As well as the Prime Minister, guests at the opening included NSW Governor Prof. Marie Bashir, Premier Nathan Rees, former Premier Bob Carr who is chairman of the ADRI board, and members of the Banton family, including Bernie's widow Karen and grandson Jack.

STUDENTS MAKE THE MOST OF SUMMER

The ANZAC Research Institute played host to nine university students over the summer, offering this special group of scholarship winners a unique opportunity to obtain experience in medical-related research.

Students and staff (from left): Dr Marina Kennerson, Keta McDowell, Vanessa Thomas, Shannon Chu, Li Ann Ooi, Dr Yu Zheng, Sharon Hu, Dr Ulla Simanainen, Assoc Prof Peter Liu, Julian Pavey, Dr Kirsty Walters, Dr Hong Zhou

Each student undertook an eight-week research project, working under the supervision and guidance of senior staff at the Institute, helping them decide whether their postgraduate futures lie in research.

The Summer Scholarship scheme was established in 2004 by the University of Sydney's Faculty of Medicine Research Committee, based on a scheme developed by the ANZAC Research Institute.

Daniel Galanos, Li Ann Ooi, Caitlin Gillis, Vanessa Thomas

PROVIDING A LINKAGE BETWEEN CONCORD AND OMAN

Organiser, tutors and students taking part in the Computational Biology course at Sultan Qaboos University in January. Dr Kennerson is third from the right in the front row.

Dr Marina Kennerson came back to the ANZAC Research Institute after the summer break with more unusual travel tales than most – she spent much of January at the Sultan Qaboos University in Muscat, Oman, conducting a genetic linkage workshop as part of a Computation Biology course.

Dr Kennerson is the Principal Hospital Scientist at the Northcott Neuroscience Laboratory within the Institute's campus, and this was her second teaching visit to the only public university in the Sultanate of Oman.

The workshops provide courses for students and researchers working in the area of genomic computational biology in the Middle East. Participants came from Iran, Kuwait, Tunisia, Egypt, Pakistan, Saudi Arabia, Turkey, Sudan and Azerbaijan. Dr Kennerson was responsible for teaching a two-day module in parametric linkage analysis, helping to establish collaborations and broadening the knowledge base in the Middle East of this specialised field of computational biology.

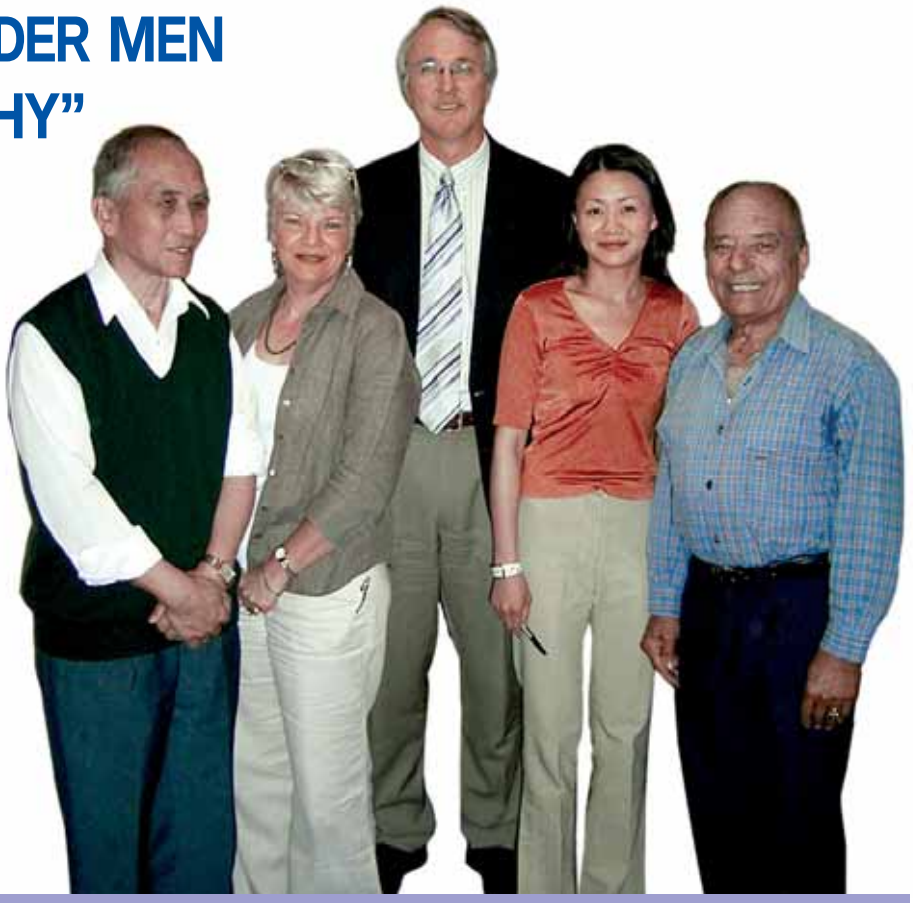
Genetic linkage analysis is a tool for mapping a disease in a family to a particular chromosome so researchers can then begin the task of identifying the causative gene.

Recognising her expertise, Dr Kennerson has been invited regularly over the past 15 years to lecture and conduct courses for many institutions here and overseas. Her initial training in use of the linkage package was in 1990 under Dr Jean-Marc Lalouel at the Howard Hughes Medical Institute in Utah, one of the original researchers who developed the linkage programs. In July last year she was invited to teach at the Complex Genetics Course at the Cold Spring Harbor Laboratory on the north shore of Long Island, New York.

Dr Kennerson assists a student with the linkage program

RESEARCH FINDS OLDER MEN ARE "PRETTY HEALTHY"

One of the world's most thorough studies of older men has come to the conclusion that Australia's older generation of males is a "pretty healthy" bunch, and those in their seventies are mostly leading very full and active lives.



Prof Bob Cumming (centre) with team members Sue Todd and Angeline Koh and two of the men enrolled in CHAMP

The Concord Health and Aging in Men Project (CHAMP), which started in 2005, has examined more than 1700 men who were then aged 70 or older and lived in the Burwood, Strathfield and Canada Bay municipalities, close to the ANZAC Research Institute.

"In general our men in their 70s are pretty healthy and I think our group is representative of men in Sydney, so our results suggest that Australian men in this age group are in pretty good health," says the CHAMP group leader, Prof Bob Cumming.

"Even though they might have had prostate cancer or a heart attack or whatever, they're coping with that really well, and they're actually reporting their health as being good or excellent.

"Many of them are still working. A lot of them are involved in voluntary work. Most of them don't have dementia, they're not falling over."

One interesting aspect of the study is that about 20% of the men are migrants from Italy and initial research suggests there might be some differences in physical or mental health because that group tended to come from a poorer and less well-educated background.

The study is also examining the incidence of dementia, osteoporosis and incontinence, and measuring levels of PSA (a biochemical screening test for prostate cancer.) Osteoporosis and incontinence have been regarded generally in the past as more likely to occur among older women, but the CHAMP study is now finding they are significant health problems for men too.

"We measured things like walking speed to see how that changes over time," says Prof Cumming. "We videotaped each man and had their gait analysed and the results will form the basis of a thesis for one of our PhD students. "

> ...they're actually reporting their health as being good or excellent.

Most of the men have returned to the Institute for a second series of tests, two years after the first. Nearly half are now aged over 80.

"About 10 per cent of the original group have died – perhaps that's slightly lower than we might have expected - and another 10% have declined to return, usually because they're too sick or their wives are too sick," Prof Cumming explains.

"Many men in their 80s are okay but dementia becomes increasingly common, people start falling over, incontinence becomes more common, and needing help at home doing simple things becomes more common."

Blood samples have been taken and stored from each of the men. The Institute's new mass spectrometer is proving invaluable in analysing these samples. One study is using the samples to measure activity of sirtuin enzymes.

Prof Cumming explains: "Experiments with mice have shown that sirtuin enzymes are stimulated by resveretrol. Resveretrol is found, for example, in red wine. Now we're studying blood taken to see whether men who have more active sirtuin enzymes live longer and are healthier. If we found they were important, it could have implications for medication that might switch these things on."

During the course of the next 12 months several scientific papers are likely to be published by the CHAMP group. Prof Cumming is now thinking not only of following this group of men as they grow older, but of starting a fresh study in 2015 to see what changes are apparent from one decade to the next.

CONTRACEPTION - GIVING MEN MORE CONTROL

Six years after creating headlines around the world with the news of a proof that a reliable male hormonal contraceptive could be developed, Institute researchers based at Concord Hospital's Andrology Department are now testing an improved development of a male contraceptive.

This uses an injection every 2 months rather than an implant and an injection, and the present study is extended to 400 couples in 10 centres around the world to gain experience with its use in clinical practice.

The Andrology Department is offering places for up to 30 Sydney couples in a stable relationship, willing to rely on the male partner receiving hormone injections – in the buttock – every two months for 12 to 18 months.

"We've had more than a hundred phone calls, but there are still some places" says researcher Leo Turner. "We have to recruit this year so time is limited to get involved."

"We're giving men a chance to take responsibility for family planning without the need for condoms or having a vasectomy."

The study involves other centres as part of a worldwide team, including in Melbourne, Manchester and Edinburgh (UK), Munster & Halle (Germany), Bolgna (Italy), New Delhi (India), Jakarta (Indonesia) and Santiago (Chile). The study is sponsored by the World Health Organisation and the CONRAD organisation in the USA, both of which are committed to developing safe, effective, acceptable and affordable methods for men to control their fertility.

When researchers at the hospital's Andrology Department first revealed a male contraceptive combining progestin and testosterone would work, they were using an implant combined with an injection.

"That meant a minor surgical implantation every four months whereas for this new study a simple injection every two months is so much easier," says Leo Turner.

"Now the drug company's developed an alternative as a long acting form of testosterone injection, so you can avoid implants. The injection is much closer to what we expect you'll be able to get from your GP eventually."

The study includes regular sperm counts as a safety precaution to check that the contraceptive injections are working to suppress the sperm count. When the injections stop, the sperm counts and fertility return, just like the female oral contraceptive pill wears off when stopped.

So if you're in a stable relationship, want to change contraception by trying a male method, and are not planning to have any more children within the next year or so – or you know someone in that situation – you are invited to contact the Andrology Department (9767 7222, email: contraception@anzac.edu.au) for more details.

GIVING OPPORTUNITIES

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