Harnessing the body’s own cells to fight prostate cancer

Scientists in the ANZAC Research Institute’s Dendritic Cell Research team are becoming increasingly excited and optimistic that they are on the brink of creating a vaccine which can not only defeat a major cancer but also prevent relapse.

It is an exciting development built on the possibility that a patient’s immune system can be re-programmed to fight cancer.

Immunologist Dr Phillip Fromm is part of a Sydney-wide project which is a leader in the world in this area. Working in collaboration with the haematology departments at Concord and Royal Prince Alfred Hospitals, Chris O’Brien Lifehouse cancer treatment centre, Royal North Shore Hospital and Royal Prince Alfred Hospital surgeons, Dr Fromm is examining ways in which the immune system can be trained to fight cancer, focussing initially on prostate cancer.

“Our research team is very interested in a very rare type of white blood cell, an immune cell called a dendritic cell. It’s the general of the immune system and tells all the other immune cells what to do,” says Dr Fromm.

“If we can utilise this type of cell, to instruct the immune system that the cancer is different, or altered from other cells in the body, we can mount an immune response against it. It’s the same way that we fight off infections. In this way, we can re-train a patient’s own immune system to recognise its own cancer. Many patients begin to develop immune responses to their cancers, but then, as the cancer gets bigger, they get turned off. We’re asking the question, can we re-start the process?”

Dr Fromm has been awarded an Early Career Fellowship by the Cancer Institute NSW, worth $566,445 over three years, which will enable clinical trials to be started.

“A lot of the current immune therapies target the end stage of the immune response, the effector arms that are involved in the actual killing of cancer cells. We think if we can target the immune system earlier, then not only can we get those killing T-cells to kill cancer cells but we can develop what’s called immunological memory. In this way it’s much like a vaccine to an infectious disease. Your immune system remembers and if it ever sees it again it will have to get rid of it.”

The research and treatment being developed are not confined to prostate cancer but can be applied to a range of cancers, including leukaemia and brain cancer. Prostate cancer is the most common cancer diagnosed in Australia and represents 30 percent of all cancers diagnosed in Australian men.

“The vaccine is a cellular vaccine. We can purify these special cells out of a patient’s blood using similar procedures to those used in a stem cell transplant. Ideally, we would like to do it just after initial treatment when the bulk of the cancerous mass has been removed and the immune system is in better condition. You’ve really got an opportunity to prevent a relapse, and that will be important because it would really mean you’ve cured it.

This will open new horizons for cancer treatment

“IT’s great to see this get off the ground in Australia. Our group was able to complete a clinical trial in Brisbane a few years ago, using older technology. We’ve now improved it dramatically with a much better system for getting those dendritic cells out of a patient’s blood. For the first time in the world we’ve been able to put genes from these tumour antigens into these blood dendritic cells and have them train a T-cell to kill a cancer cell.”

Dr Fromm points out that “dendritic cell vaccination” is expected to have very low side effects. This means that it would not be restricted by a patient’s age, so it could be used in elderly patients who may be considered ineligible for some existing radical treatments such as bone marrow transplants for leukaemia which have side effects too severe for older patients.

“This will open new horizons for cancer treatment,” says Dr Fromm.
Meet our new Board Members

**Dr Roderick Bain OAM**

Dr Roderick Bain graduated from Queensland University Medical School in 1967 quickly followed by a resident medical year at Royal Hobart Hospital. The following year he commenced a four year stint with the Royal Australian Navy as a full-time Medical Officer, completing three tours of duty in Vietnam during the time of Australia’s involvement in that conflict. This entailed medical postings both ashore and at sea. In 1973 he commenced Anaesthetics and Intensive Care training in London and Sydney teaching hospitals, gaining both his UK and Australian specialist fellowships. This was followed by 25 years of private practice on the NSW Central Coast, assisting with the opening of two new private hospitals and enlarging the existing public hospital’s facilities to handle a rapidly expanding local community.

During this time Dr Bain joined the local RSL sub-Branch and took on the additional role of a RSL State Councillor, which he currently retains along with being the RSL (NSW) medical advisor. To have been invited to join the board of the ANZAC Research Institute has given him enormous pleasure and he looks forward to supporting and contributing towards the group’s endeavours, creating further benefits for both the veteran and wider general community through the work done at the Concord Hospital facilities.

**Lieutenant General (Ret’d) Ken Gillespie AC DSC CSM**

Ken Gillespie retired as Chief of the Australian Army in July 2011 after a distinguished 43 year career, which began when he enlisted as an apprentice bricklayer, aged 16. He was identified early as a potential leader and in 1972 graduated from the Officer Cadet School at Portsea, Victoria, to be commissioned into the corps of the Royal Australian Engineers.

A range of appointments followed, including a posting to the UK as the Australian Exchange Instructor at the Royal School of Military Engineering in 1986-87. In 1989 he was second in command of the 2nd Australian Contingent to the UN Transition Assistance Group in Namibia and in 1998 was a member of the Royal College of Defence Studies in the UK.

In 2008 Lieutenant General Gillespie was made Chief of Army, effectively becoming CEO of an enterprise with 48,000 staff and a $6 billion budget. He then conceived, planned and successfully implemented a significant corporate restructuring, maintaining high industry outputs in complex security, fiscal and political environments.

Since retiring Ken has been appointed to the boards of several companies, is a consultant to government departments and businesses on leadership, is an ambassador for national bowel and prostate cancer organisations, and is an active supporter of ex-service organisations.
Anthony Cutrupi, who spent 2015 at the ANZAC Research Institute as an Honours Student and is now working towards his PhD there, has won the Kids Cancer Alliance award for the best poster presentation at the NSW annual scientific meeting of the Australian Society for Medical Research.

Anthony is supervised by Associate Professor Marina Kennerson in the Northcott Neuroscience Laboratory, investigating hereditary motor neuropathy. The Laboratory has been recognised internationally for significant discoveries about genetic mutations in families with hereditary motor neurone disorders.

“One particular family has been worked on for the past decade and it wasn’t until last year that we managed to find something which we could work with,” says Anthony. “We were able to identify structural variation mutation causing a large DNA re-arrangement within this family. “We’re now trying to identify genes using lymphoblast cells, which we obtain from blood, to select candidate genes to assess in a neural specific system.”

Anthony’s award was for explaining this research by means of poster presentations at major scientific meetings. He joined the Institute last year after completing a double degree in Science and Arts at Sydney University, majoring in psychology and achieving Honours in cell pathology.

“I was always interested in neuroscience but never saw myself getting into genetics. I always wanted to be a neurologist and be involved in research into motor neurone disease, and the ANZAC Research Institute has provided me with this wonderful opportunity.”

Queen’s Birthday Honour for David Le Couteur

Congratulations to Professor Le Couteur, Director of the Biogerontology Laboratory of the ANZAC Research Institute and Senior Staff Specialist Physician in Geriatric Medicine at Concord Hospital. It is an honour well deserved, although, in his own words, “absolutely unexpected.”

“This is recognition for the work of a large number of people with whom I’ve had the pleasure of working at the ANZAC Research Institute,” he says.

“Without the co-operative culture at this Institute much of the research work simply would not be possible and this honour recognises everyone who contributes to our study of geriatric medicine and ageing. I hope it will encourage others to see it as an area worth pursuing.”

Professor Le Couteur points out that 15 percent of the population is over the age of 65 yet that group already uses two-thirds of the health care system, and the proportion of older Australians is growing.

“We have a project just started at the ANZAC Research Institute to develop nanomedicines, the use of microscopic particles to improve the effects of drugs, hoping to reverse the changes that occur in the liver with ageing. If we can do this we may be able to avoid the onset of diabetes and high cholesterol.”

Professor Le Couteur is also chief investigator in the ongoing Concord Health and Ageing in Men Project (CHAMP), an epidemiological study of a wide range of health related issues and disease in older men. The project is targeted at the ageing process and includes an examination of the use, and overuse, of medications by older people.
Local Health District Award

Dr Vivien Chen has received the Sydney Local Health District’s Annual Health Research Infrastructure Award.

Dr Chen is a haematologist at Concord Hospital and a researcher at the ANZAC Research Institute.

The Annual Health Research Infrastructure Award provides $10,000 in support to a researcher with high basic science research potential. Dr Chen’s work explores the side effects of a cancer drug which provides new insight into targeting cardiovascular disease.

The award was presented to Dr Chen during the Sydney Local Health District's fourth Innovation and Research Symposium which was attended by more than 1000 people.

Renewal of MRSP Infrastructure Support

The ANZAC Research Institute was very pleased to learn recently that it was successful in the 2016-2020 round of the Medical Research Support Program (MRSP).

This renews the NSW government support for maintaining the Institute’s operations, which has continued since the Institute’s opening in 2000.

Through the MRSP, the Office of Health and Medical Research within the NSW Ministry of Health provides four year grant funding to support the costs of operating independent Medical Research Institutes in this state. By this means the MRSP supports state-wide capacity to deliver world class health and medical research through the provision of research infrastructure funding.

Economic estimates have shown that for every dollar received in research funding for specific projects, an additional 60-80 cents is needed to cover the indirect costs of providing scientists with state-of-the-art equipment and high end research facilities and services. The MRSP is a major source of the Institute’s indirect support for these vital purposes.

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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