MALAGHAN INSTITUTE OF MEDICAL RESEARCH

MEDIA RELEASE

Funding for pioneering cancer vaccine research

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The Malaghan Institute of Medical Research has developed an internationally-recognised cancer immunotherapy research platform that has led to its involvement in clinical trials for non-Hodgkin's lymphoma, metastatic melanoma and glioblastoma. With three new innovative cancer research programmes now underway as a result of recent funding from the Wellington Medical Research Foundation Inc (WMRF), the Institute is a step closer towards its goal of providing cancer sufferers with more effective non-invasive ways of treating their disease.

Cancer immunotherapy is emerging as one of the most promising alternative approaches to cancer treatment, with the potential to eradicate cancer without the adverse side-effects of conventional treatments such as chemotherapy and radiation therapy.

In cancer immunotherapy, patients are treated with a vaccine that is generated by combining their own specialised immune cells with tumour tissue. Once injected back into the patient, these custom-made vaccines are able to stimulate immune responses that seek out and kill cancer cells.

Dr Ian Hermans, who oversees the Malaghan Institute's cancer vaccine clinical trials, says that the full potential of cancer vaccination has yet to be realised and the WMRF funding will be used to improve the potency of these cancer vaccines.

"Immunotherapy of cancer is well tolerated and specific, but its efficacy remains variable. Promising vaccine regimens such as dendritic cell-based vaccination need to be improved if immunotherapy is to be used routinely as a viable alternative, or adjunct, to existing therapies."

One of the projects to have received WMRF funding is that of Dr Hermans' PhD student Dianne Sika-Paotonu, whose groundbreaking research into the development of designer cancer vaccines won her the Advancing Human Health and Wellbeing category of the 2008 MacDiarmid Young Scientist of the Year Awards.

"We have been investigating the interplay between the dendritic cells used to create the cancer vaccine and those of the patient's immune system, in order to design strategies that will improve the effectiveness of the vaccine," said Ms Sika-Paotonu. "These studies have highlighted a less appreciated model of immune cell activation that has the potential to significantly increase the potency of the cancer vaccine and thus its ability to eradicate cancer."

There are several different types of dendritic cells circulating in our blood and lymphatic systems that are capable of driving different types of immune responses. Malaghan Institute Research Fellow Dr Troels Petersen will use his WMRF funding to characterise these different classes of dendritic cells in more detail.

"Ultimately, by better understanding the function of individual dendritic cell subsets, it will be possible to specifically target and manipulate them clinically in a range of diseases," he says. "For example, targeting the dendritic cell subsets that are most efficient at stimulating immune responses that lead to the eradication of tumours could enhance the therapeutic effect of the tumour vaccine."

Another recipient of the WMRF funding, Prof Mike Berridge, who heads the Malaghan Institute Cancer Cell & Molecular Biology Group, is part of a multidisciplinary team working with Wellington neurosurgeon Mr Martin Hunn to develop a targeted immunotherapeutic approach for the treatment of patients with the aggressive brain tumour glioblastoma multiforme (GBM).

"With the best treatment available, patients with GBM have an average life expectancy of 15 months from diagnosis," said Prof Berridge. "Effective therapy will need a multi-disciplinary approach using a combination of strategies, of which immunotherapy using dendritic cell vaccination is one potential arm."

The goal of Prof Berridge and Mr Hunn's research is to develop ways to target the immune response against the elusive tumour stem cells, a small collection of self-renewing cells present within the tumour that are responsible for relapse, metastasis and death, because they survive conventional treatments that kill the bulk of the tumour.

Prof Berridge says that in order to cure cancer the tumour stem cells must be successfully eliminated. "One promising approach is to exploit the exquisite specificity and sensitivity of the immune system, which should circumvent drug and radiation resistance mechanisms operating in tumour stem cells. We are particularly focused on developing this form of immunotherapy for tumours of the brain, and to this end have developed experimental tools for enriching tumour stem cells from surgically removed tissue from patients with glioblastoma multiforme."

It is clear that different immunotherapy approaches will benefit individual cancer patients in different ways that will depend on the type of cancer and the patient's response to the therapy, which is why the WMRF funding of these basic biomedical and translational cancer research programmes is so critical.

The Malaghan Institute of Medical Research is New Zealand's premier vaccine and immunology research centre and is based at Victoria University's Kelburn campus, Wellington. The Institute operates independently and is a charitable trust. Researchers at the Malaghan Institute are focused on developing innovative ways to harness the strength and potency of the immune system, the body's own natural defence against disease, to treat cancer, asthma, arthritis, multiple sclerosis and infectious disease.

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This media release is also available for viewing on our website *www.malaghan.org.nz* with links to relevant individuals and research groups.