

MEDICAL AND SCIENTIFIC COMMITTEE

ANNUAL LAY REPORT 2015

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| Lay Project Title: | Turning the immune system against cancer |
| Chief Investigator(s): | A/Prof Michael Kershaw, A/Prof Phil Darcy |
| Unit/Institution: | Cancer Research, The University of Melbourne |
| Years Funded: | 2014-2016 |

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| 1 | <p>Lay Abstract</p> <p>Doctors have found that T cells, a type of white blood cell, taken from the blood of cancer patients and modified in the laboratory can react against tumours when given back to the patient. However, often T cells lack strength on their own. There are many other types of white blood cell, but doctors have not yet tried modifying these. In this project we are seeking to use other modified white blood cells together with T cells to create a stronger unified attack on cancer. With the support of the Cancer Council of Victoria we have produced a special breed of mouse that has genetically modified white blood cells of the immune system to provide them with molecular “weapons” to fight cancer. During the second year of support, we have tested white blood cells from these mice to see if they can react against cancer cells. We found that they could indeed react in the test tube as seen in a couple of ways. Firstly, the white blood cells secreted a variety of biochemicals that could perhaps slow down tumour growth. These biochemical may also be able to help recruit lots of different types of white blood cell into the tumours, where they might be able to act against the tumour. In addition to these experiments in test tubes, we also had some success treating tumour-bearing mice using an injection of white blood cells from the special breed of mouse. Tumour growth was slowed considerably. In the next year of funding, we hope to follow on from these findings in mice to be able to treat a few more types of cancer. Hopefully, this work will eventually find a type of white blood cell that has great anti-cancer activity and then we can see if the same sort of human white blood cells can be made to react against cancer. This may lead to a new type of treatment for cancer in future.</p> |
| 2 | <p>Please list <u>all papers arising from this research project</u>, which have been published, or accepted for publication, in refereed journals since the commencement of this grant. Please list in chronological order, include title, sequence of authors, first, and last pages, name, volume and date of journal.</p> <p><i>Briefly annotate major findings within these publications</i></p> <p>Yong YS, Sharkey J, Duscio B, Venville B, Wei WZ, Jones RF, Slaney CY, Arnau GM, Papenfuss AT, Schröder J, Darcy PK, Kershaw MH. Embryonic lethality in homozygous human Her-2 transgenic mice due to disruption of the Pds5b gene. PLOS One 2015 Sep 3;10(9)</p> <p><i>In this publication we described the mouse model of cancer we use in Aim 2 of our studies,..</i></p> <p>Carmen S.M. Yong, Jennifer A. Westwood, Jan Schröder, Anthony T. Papenfuss, Bianca von Scheidt, Maria Moeller, Christel Devaud, Phillip K. Darcy, Michael H. Kershaw. Expression of a chimeric antigen receptor in multiple leukocyte lineages in transgenic mice. Plos One 2015 Oct 27;10(10)</p> |

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| | <p><i>This paper describes the work performed in the special breed of mouse showing that their white blood cells were genetically modified to stick to cancer cells.</i></p> |
| <p>3</p> | <p>Please list any presentations relating to this research project that were made at scientific meetings during 2015.</p> <p><i>Please identify the meeting, provide the title of your presentation and indicate the type of presentation (plenary, invited, selected, poster etc, or session chair)</i></p> <p><u>Presentations by PhD student Carmen Yong:</u></p> <p>Sept 2015 4th European Congress of Immunology (ECI) Vienna, Austria Poster presentation: Redirecting immune subsets through genetic manipulation for enhancing adoptive immunotherapy.</p> <p>Feb 2015 27th Lorne Cancer Conference Lorne, Vic Poster presentation: Redirecting immune subsets through genetic manipulation for enhancing adoptive immunotherapy.</p> <p><u>Award to PhD student Carmen Yong:</u></p> <p>May 2015 Cancer Therapeutics Australia (CTx) Top up scholarsip. Amount: \$10,000 per annum</p> |
| <p>4</p> | <p>Certification by Chief Investigator</p> |
| | <p>I confirm that the above details are correct.</p> <p style="text-align: center;">  Signature: _____ Date: <u>28/1/2016</u>_____</p> <p style="text-align: center;">Michael Kershaw</p> |