
# Research Scholars Award

# 2009

Trim Record: E08/29547

**Commencing Janaury 2009**

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**Title:** “Development of Proton Computed Tomography for Application in Proton Radiation Therapy”

**Lay Summary:** Currently, proton therapy treatment plans are carried out using images taken with Xray CT scans. However, the process of converting the data acquired with X-ray CT to the values required by the treatment planning software results in an uncertainty in the range of the proton beam within the patient. The goal of this project is to develop a novel imaging modality that uses protons instead of X-rays to image the patient pretreatment. Images acquired with proton computed tomography will allow for a better prediction of where the radiation dose will be deposited at treatment time.

The Scholarship was awarded to:

- Mr Scott Penfold

**Administering Institution:** University of Wollongong
**Research Location(s):** University of Wollongong; Loma Linda University Medical Centre

**Grant Reference:** 08/RSA/1-02

$ 25,000 over 1 year

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**Title:** “Preclinical studies of a novel plant toxin, persin, as an anti-cancer agent.”

**Lay Summary:** Phytochemicals have provided an abundant source of anti-cancer agents. This project will determine the mechanism of action of a novel plant toxin, persin, that has unique in vivo actions in the mammary gland, and potent cytostatic and cytotoxic effects in breast cancer cells in vitro, possibly mediated via effects on the microtubular architecture. Previous studies have also shown that persin exhibits synergistic proapoptotic effects with the anti-estrogen, tamoxifen. The project will involve a range of molecular and cellular biology techniques to determine the molecular targets of persin action, critical for its further preclinical development as an anti-cancer agent.

The Scholarship was awarded to:

- Ms Elizabeth Shelley

**Administering Institution:** Garvan Institute of Medical Research
**Research Location(s):** Garvan Institute of Medical Research

**Grant Reference:** 08/RSA/1-07

$50,000 over 2 years

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**Title:** “Recognition of senescent cancer cells by the immune system”

**Lay Summary:** Cancer occurs when mutations to a cell’s genome allow it to divide uncontrollably, however, these precancerous lesions also need to avoid elimination by the immune system to cause disease. Recent research by Dr Swarbrick shows that when mammary tumours are induced to undergo senescence, a state where they remain alive but cannot replicate, then the immune system can recognise and eliminate them. We plan to investigate how this occurs, thus identifying novel drug targets that could activate the immune system to specifically eliminate cancerous cells. These studies have particularly relevance for basal-like breast cancer which currently have no effective treatments.

The Scholarship was awarded to:

- Mr Simon Junankar

**Administering Institution:** Garvan Institute of Medical Research
**Research Location(s):** Garvan Institute of Medical Research

**Grant Reference:** 08/RSA/1-09

$50,000 over 2 years

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**Title:** “Oligodendrogliomas with LOH 1p19q: Identifying Genes associated with Therapeutic Chemosensitivity”

**Lay Summary:**
Malignant brain tumours are a devastating cancer with 500 new patients diagnosed annually in NSW. However, a subset of patients diagnosed with oligodendroglioma, possessing the co-deletion of chromosome arms 1p and 19q, have a much better survival forecast. We will identify genes that are altered in these patients using exon microarray analysis. We hypothesise that gene profiles will differ in oligodendroglioma patients with and without the 1p/19q co-deletion and that these genes confer better survival and response to treatment. Our goal is to identify new gene targets for therapy, thus improving survival and quality of life for brain tumour patients.

The Scholarship was awarded to:

- Mrs Cathy Payne

**Administering Institution:** University of Sydney
**Research Location(s):** Kolling Institute of Medical Research

**Grant Reference:** 08/RSA/1-13

$50,000 over 2 years

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**Title:** “Biomarkers of phenotype, prognosis and response to therapy in pancreatic cancer”

**Lay Summary:** Pancreatic cancer is the 4th leading cause of cancer related deaths in our society. This research is aimed at the discovery of novel biomarkers with the ability to forecast prognosis and response to different treatments in patients with pancreatic cancer. Ultimately, this will lead to the “individualisation” of the treatment for each patient, so that the most appropriate therapy could be prescribed without delay. This would significantly improve the survival and the quality of life in patients with pancreatic cancer.

The Scholarship was awarded to:

- Dr David Chang

**Administering Institution:** Garvan Institute of Medical Research
**Research Location(s):** Garvan Institute of Medical Research

**Grant Reference:** 08/RSA/1-15

$50,000 over 2 years

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**Title:** “Chemotherapy and cognitive decline: Is exercise a remedy?”

**Lay Summary:** Improvements in cancer care mean people live longer. Cancer survivors experience difficulties adjusting to normal life, both functionally and emotionally. For a subset of cancer survivors chemotherapy, which has effectively treated their cancer, results in on-going cognitive impairment (“chemo-brain”). Exercise improves learning and memory in both humans and animals; we anticipate that exercise will remedy the cognitive deficits that can be associated with chemotherapy. We will investigate this using an animal model of chemo-brain and a randomised clinical trial. A biomarker, brain-derived neurotrophic factor (BDNF) is functionally important for cognition; we will be evaluating its role in reducing cognitive impairment.

The Scholarship was awarded to:

- Ms Joanna Fardell

**Administering Institution:** University of Sydney
**Research Location(s):** University of Sydney

**Grant Reference:** 08/RSA/1-16

$50,000 over 2 years

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**Title:** “The role of dysregulation of CHOP in adaptation of human melanoma cells to endoplasmic reticulum (ER) stress”

**Lay Summary:** The outcome for patients with melanoma is poor once the cancer spreads beyond the skin. This is because metastatic melanoma is resistant to current drugs used in treatment. This research will examine how melanoma cells avoid being killed by these drugs. We believe that melanoma cells are different to other cells because they do not produce high levels of a protein called CHOP in response to drugs. It is known that production of CHOP is important in how the drugs kill. Understanding how melanoma cells prevent production of CHOP will help in improving the effectiveness of melanoma treatment.

The Scholarship was awarded to:

- Mr Christopher Lavis

**Administering Institution:** University of Newcastle
**Research Location(s):** Newcastle Mater Hospital; University of Newcastle

**Grant Reference:** 08/RSA/1-18

$50,000 over 2 years

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**Title:** “Molecular mechanisms of adrenocortical tumorigenesis and response to therapy.”

**Lay Summary:** Malignant adrenocortical tumours are rare but potentially lethal cancers that occur unpredictably in children and young adults. The mechanisms of tumour formation and recurrence after surgical removal remain elusive. The oral chemotherapeutic agent mitotane is often used after surgery, but a response is seen in less than half. Better targeted treatments are urgently needed and this research will study the molecular events that cause adrenocortical cancer, in order to identify new targets. In addition, we will develop new strategies to improve mitotane response. The ultimate goal is to improve the outcome of patients with adrenocortical cancer.

The Scholarship was awarded to:

- Dr Lyndal Jillian Tacon

**Administering Institution:** University of Sydney
**Research Location(s):** Kolling Institute of Medical Research

**Grant Reference:** 08/RSA/1-22

$50,000 over 2 years

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**Title:** “THE ROLE OF ADIPONECTIN IN HEPATOCELLULAR CARCINOMA”

**Lay Summary:** Primary liver cancer or hepatocellular carcinoma is a leading cause of cancer deaths worldwide and accounts for approximately 1000 deaths in Australia annually with a rising incidence in both men and women. It is associated with chronic viral hepatitis and liver cirrhosis. Even in patients with viral hepatitis, obesity has been shown to increase the risk of cirrhosis and liver cancer. This study will investigate the role of the fat tissue derived molecule adiponectin in liver cancer.

The Scholarship was awarded to:

- Dr Sarah Walker

**Administering Institution:** University of Sydney
**Research Location(s):** Westmead Hospital; Westmead Millennium Institute

**Grant Reference:** 08/RSA/1-32

$75,000 over 3 years

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**Title:** “Selective killing of mismatch repair deficient cancer cells”

**Lay Summary:** As at 2005, Colon cancer was the fifth most common cancer in NSW and the third most common cause of cancer death. Human non-polyposis colorectal cancer (HNPCC) is a notoriously difficult cancer to treat. This is because these cancer cells lack DNA mismatch repair, a pathway that prevents DNA mutation in normal cells and that many conventional cancer treatments target to kill cancerous cells. We wish to investigate a novel mechanism that selectively destroys cells lacking mismatch repair, so that new cancer therapeutics can be developed that can be systemically administered but that have very little side effects for patients. Such a therapeutic could also be used as a preventative measure in families with a history of HNPCC.

The Scholarship was awarded to:

- Mr George Sharbeen

**Administering Institution:** Centenary Institute of Cancer Medicine and Cell Biology
**Research Location(s):** Centenary Institute of Cancer Medicine and Cell Biology

**Grant Reference:** 08/RSA/1-36

$25,000 over 1 year

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**Title:** “Defining the role of telomere dysfunction in cellular proliferation barriers”

**Lay Summary:** There is a fixed limit on how many times normal human cells can multiply. This is a powerful protection against cancer development. The limit is imposed by the shortening of chromosome ends (telomeres) that occurs during cellular proliferation. It is unclear how short telomeres stop proliferation, but cells may perceive shortened telomeres as dysfunctional. I will analyse the relationship between telomere shortening and dysfunction, types of dysfunction, changes during escape from proliferation limits, and whether some anticancer drugs induce telomere dysfunction. This will increase our knowledge of cancer development, and lay the basis for improved anticancer drug design.

The Scholarship was awarded to:

- Miss Zeenia Kaul

**Administering Institution:** Children’s Medical Research Institute
**Research Location(s):** Children’s Medical Research Institute

**Grant Reference:** 08/RSA/1-37

$50,000 over 2 years

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**Title:** “Determining patients and doctors preferences for chemotherapy and incorporating them into clinical decision making.”

**Lay Summary:** Chemotherapy improves survival in early lung cancer and advanced ovarian cancer but has significant side effects. Recent advances have not been widely adopted because of differing opinions about whether the benefits of these treatments outweigh their harms. This research program will determine the benefits that patients and their doctors judge necessary to make these treatments worthwhile, and how best to incorporate this information into clinical discussions and decision making.

The Scholarship was awarded to:

- Dr Prunella Blinman

**Administering Institution:** University of Sydney
**Research Location(s):** University of Sydney

**Grant Reference:** 08/RSA/1-38

$35,000 over 2 years

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**Title:** “The Role of the Grb7 Adaptor Protein in Pancreatic Cancer”

**Lay Summary:** Pancreatic cancer (PC) is the 4th leading cause of cancer death in our society. Surgery is currently the only treatment, other effective therapies are urgently needed. This proposal is focused on a potential key molecule (Grb7) and aims to elucidate its role in PC progression and metastasis. The project involves investigation of the potential of Grb7 as a prognostic marker in the disease and also identifying its mechanism of action. This may lead to novel therapeutic strategies for PC directed against Grb7, in turn improving the lives of PC patients.

The Scholarship was awarded to:

- Miss Vivienna Ong

**Administering Institution:** Garvan Institute of Medical Research
**Research Location(s):** Garvan Institute of Medical Research

**Grant Reference:** 08/RSA/1-39

$50,000 over 2 years

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**Title:** “Tackling Tobacco: An exploration of methods to reduce smoking in socially disadvantaged populations”

**Lay Summary:** Although smoking is on the decline in the general community, it remains high among severely socially disadvantaged groups. In Australia, community service organisations are ideally placed to provide smoking cessation services to their clients. Despite this potential, little has been done to encourage routine provision of smoking care. This research aims to explore the most acceptable and effective ways NSW based community services can deliver smoking cessation services to their clients. This research will contribute to our understanding of ways to decrease rates of a highly negative health risk behaviour amongst a particularly vulnerable section of the community.

The Scholarship was awarded to:

- Ms Jamie Bryant

**Administering Institution:** University of Newcastle
**Research Location(s):** University of Newcastle

**Grant Reference:** 08/RSA/1-44

$55,305 over 3 years

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