

PROJECT INFORMATION

Project Title Biomarker discovery in cancer patients with chemotherapy-induced cardiotoxicity
Hypothesis:

PROJECT ATTRIBUTES AND BENEFIT TO THE STUDENT

Brief description of project: <p>Improvements in the treatment of cancer have resulted in an increasing population of cancer survivors. However current data suggests that up to 30% of these survivors will die from cardiovascular complications induced by the toxicity of chemotherapeutic drugs to the heart. Early detection of cardiotoxicity is paramount to improved cardiovascular outcomes for cancer patients, but lack of effective biomarkers delay the diagnosis of cardiotoxicity. Our cardio-oncology centre has recruited chemotherapy-naïve cancer patients and are following their cardiovascular outcomes in the months after chemotherapy treatment. This project aims to identify novel biomarkers in plasma/serum that will predict whether these patients will develop cardiotoxicity after chemotherapy.</p>
Student's role in the project: <p>The student will be trained in processing of patient blood samples, which involves the isolation of plasma, serum and peripheral blood mononucleocytes. The student will also be trained in the analysis of plasma/serum using enzyme-linked immunosorbent assay (ELISA).</p>
Student's benefit from their involvement: <p>The student will benefit from receiving training in the laboratory techniques described above. Successful completion of this project may result in the publication of the data in journals/conferences which can be added to the student's CV. This project has the potential to lead into further study e.g Honours/PhD.</p>
Research Location Information (where the project work will be conducted)
Campus: Hunter Medical Research Institute Building & room number HMRI Level 3 East

Supervisor's Information (primary supervisor should be in SBSP)	
Supervisor Name: Doan Ngo	Academic Appointment at UON: A/Prof
Preferred Phone: 02 40339386	
E-mail Address: Doan.ngo@newcastle.edu.au	

PROJECT INFORMATION

Project Title: The discovery of cardioprotective drug in chemotherapy-induced cardiotoxicity

Hypothesis: SGLT-2 inhibitor is a novel strategy to prevent and treat chemotherapy-induced cardiovascular toxicity.
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PROJECT ATTRIBUTES AND BENEFIT TO THE STUDENT**Brief description of project:**

Advances in treatment have led to improved survival of patients with cancer but have also increased death and disability due to treatment side effects, in particular, cardiovascular diseases (CVD). In fact, most cancer therapies have adverse cardiovascular effects. Sodium–glucose co-transporter 2 (SGLT-2) inhibitors are a novel class of antidiabetic drugs with cardiovascular benefits beyond other antidiabetic drugs. SGLT2i have demonstrated impressive cardioprotective effect in Type-2 diabetic patients. The main mechanisms underlying their cardioprotective effects have been attributed to improvement in cardiac cell metabolism, improvement in ventricular loading conditions, as well as reduction of cardiac cells necrosis and cardiac fibrosis.

To date, the cardioprotective concept of SGLT-2 inhibitors that has not been evaluated in chemotherapy-induced cardiotoxicity. In this study, we will be examining the cardioprotective profile of conventional cardiovascular drugs such as ACE inhibitors, beta blockers and the other potential cardioprotective drugs such as empagliflozin, dapagliflozin from class of SGLT-2 inhibitors in cardiotoxicity.

Student's role in the project:

- Cell culture: Human cardiomyocytes, cancer cell lines.
- perform cell functional test: cell tier glo, LDH assay.
- perform RNA extraction, PCR
- perfrom protein extraction, western blot.
- Perform Elisa assays on cellular samples and human plasmas.

Student's benefit from their involvement:

- Learning essential lab skills
- Getting Involved in medical research “bench to bed side”
- Improving teamwork and communication
- Great research training ground for student if consider to do honours degree

Research Location Information (where the project work will be conducted)**Campus: HMRI****Building & room number : Level 3 East****Supervisor's Information (primary supervisor should be in SBSP)****Supervisor Name: A/Prof Doan Ngo****Academic Appointment at UON:****Preferred Phone:****E-mail Address: Doan.Ngo@newcastle.edu.au**