Finding new treatments for a blood stem cell cancer (myeloproliferative neoplasms)

Project Description

Project duration:	Honours
Description:	Myeloproliferative neoplasms (MPNs) are chronic blood cancers that produce extreme numbers of mature blood cells, which clog blood vessels causing blood clotting. Most MPN patients require life-long drug treatments to control their blood cell numbers and live with the constant risk of evolution of the disease to more aggressive myelofibrosis or acute myeloid leukaemia (AML), where average survival is less than 5 years for myelofibrosis and 6 months for AML. Therefore, there is an urgent need to develop better therapies for MPN patients. Blasts from patients produce abnormally high levels of the inflammatory cytokine oncostatin-M (OSM), suggesting that OSM may play an unappreciated major role in the pathobiology of MPNs. This project is to investigate the role of OSM and its receptor OSMR on MPN disease progression and MPN response to treatment in pre-clinical models. This will establish whether OSM could be a therapeutic target to better treat MPN. The project will involve mouse model of MPN including bone marrow transplantation from mouse mutated for MPN. The progression of MPN will be monitored by blood cell counts (once a month) by regular tail bleeds, and mice will be harvested 18-20 weeks post transplantation. MPN progression will be analysed by flow cytometry, blood cell count and qRT-PCR, immunohistochemistry.
Expected outcomes and deliverables:	Please highlight what applicants can expect to gain/learn from participating in the project, and what they will be expected to complete as a part of the project. This project will provide insights on the role of OSM on MPN progression and will help the development of much needed therapy for MPN patients The research will be conducted at Mater Research-UQ based in Translational Research Institute (TRI). Student will have access to work class core facilities. As part of this project, student will learn mouse model of myeloproliferative neoplasms, bone marrow transplantation, tail bleeding, mouse injections, mouse tissue harvest, techniques such as flow cytometry, quantitative real time PCR, ELISA, immunohistochemistry, and western blot. At the end of the project student will gain experience working with small animals and Haematology/Immunology techniques.

Suitable for:	Please highlight any particular qualities that individual supervisors are looking for in applicants to assist with the selection process. • Strong organisational and management and record keeping skills • Ability to learn news practical skills in animal research, immunology techniques, sophisticated flow cytometry instruments, new software to analyse multidimensional data. • Ability to work collaboratively with colleagues • Possess analytical and problem-solving skills • Advanced computer skills in particular programs such as Microsoft Excel, Microsoft Word and Microsoft Outlook • Enthusiasm for Haematology research
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