Dear members of the ANZBMS Council,

RE: Report for travel undertaken with funding from the Christine and T J Martin Travelling Fellowship 2011.

I would like to thank the ANZBMS for awarding me with this major travelling fellowship. Its significance is great due to the fact that this award is granted to honor the outstanding scientific contributions of Professor Jack Martin and in memory of his beloved wife Christine Martin. The award has provided me with the opportunity to meet and present our work to a number of prominent international scientists including Associate Professor Christa Maes (KU Leuven), Doctor Kejll Laperre (Bruker), Professor Leslie Silberstein (Harvard University) and Ken Conte (CompuCyte) as well as to attend the Annual meeting of the American Society for Bone and Mineral Research.

Laboratory: Cell and Gene Therapy Applications, Faculty of Medicine, The University of Leuven, Belgium. Contact: Associate Professor Christa Maes.
The first destination of the fellowship was a visit to Associate Professor Christa Maes Laboratory. A/Prof. Maes is a world-renowned expert in vascular biology. She has established methods for the immunostaining of bone marrow vasculature on paraffin sections. During the week visit, A/Prof Maes kindly walked me through two very different immunostaining protocols. It was good to learn subtle difference in the techniques used between our labs and to pick up new tricks and tips for each procedure. The visit also provided me with the opportunity to present and discuss our research with A/Prof Maes and her lab members and to get valuable feedback and new ideas. This was particularly important as we are preparing this work for publication. We also discussed the possibility for co-operative projects in the future.

Laboratory: Bruker MicroCT, Antwerp, Belgium. Contact: Dr Kjell Laperre.
I next travelled North to Antwerp to visit Dr Kjell Laperre at Bruker, the manufacturer of the Institute's Micro-CT machine. Over the week, we discussed the potential of using new compounds and the best methods to use to resolve and analyse bone and vasculature. We also discussed and updated our current SOP for microCT acquisition and analysis. Here, I received some further training in microCT system and software analysis that covered image acquisition, image reconstruction and data analysis. We were also able to attain a new method for automate trabecular and cortical bone selection and analysis. These new procedures have significantly reduced operator time, in addition to improving the accuracy of the data by eliminating operator bias.

Laboratory: Joint Program in Transfusion Medicine, Centre for Human Cell Therapy, Children's Hospital Boston, Professor of Pathology, Harvard Medical School. Contact: Professor Leslie Silberstein.
We have established two co-operative projects with Professor Silberstein's Laboratory. The first is based on defining the impact of myeloablative therapies on bone and the bone marrow microenvironment, and its effects on haematopoiesis. The second is based on transgenic mice models and defining the effects of genetic knockdowns on bone and the bone marrow microenvironment. Prof. Silberstein's research focuses on understanding niche-induced signals/pathways and how they regulate haematopoietic stem cell/progenitor development and function. His lab has established the methodology for fluorescent quantitative imaging of bone marrow tissue sections by Laser Scanning Cytometry (LSC). They have trained me in the techniques required to prepare bone sections for LSC including optimal sample preparation that encompasses tissue harvesting and preparation, fixation, sectioning and staining. The visit to the lab also provided me with the chance to present and to discuss the results of our studies, as well as to further cement the two on-going co-operative projects.

Laboratory: CompuCyte Corporation, Westwood, MA, USA. Contact: Ken Conte
In 2012, St Vincent's Institute (SVI) purchased a Laser-Scanning Cytometer (LSC). This LSC is amongst the most powerful and versatile cellular analysers available, as it combines the capabilities of microscopy and cytometry. It will identify, quantify and map the spatial distribution of multiple cell types concurrently within a tissue section, without the need for isolating cells or disturbing the normal micro-architecture of the bone. On installation of the machine, we received two-days of basic operator training by Ken Conte. This travel grant offered me an additional opportunity to receive a further 4-days of training at the CompuCyte Corporation, the manufacturer of the LSC. The training course covered basic and advanced operator features for LSC and iCys program analysis. Working in conjunction with Prof. Silberstein's lab and the expertise of Ken Conte, we were able to develop several customised application and analysis templates for use on our LSC.

Meeting: American Society for Bone and Mineral Research (ASBMR), October 12-16, Minnesota.
Lastly, I attended the Annual meeting of the American Society for Bone and Mineral Research (ASBMR) in Minnesota. Here, I presented our research into the impact and mechanisms of myeloablative therapies on the bone marrow microenvironment and implications for preventing bone loss and improving blood cell recovery in cancer patients. As a result, I received a number of very positive responses and critical feedback, especially from clinicians in the field of cancer biology.

Overall outcomes
This travelling fellowship has allowed me the opportunity to attain state-of-the art skills from experts in their field including the ability to generate high-resolution mapping of entire bone sections, the use of automated trabecular and cortical bone selection and analysis and the chance to resolve some of the our technical issues. The intellectual input from experts in their field and the new ideas gained on this trip has been invaluable. Additionally, visiting these laboratories and discussing the approaches that all of these individuals utilise to answer their own research questions has provided me with a more comprehensive approach to my own research. I thank ANZBMS for their generous support and to all the amazing scientists that have made this trip so memorable for me.

Thank-you,

Julie Quach, PhD