

Christine and T J Martin Research Travel Grant 2012 Final Report – Ashika Chhana

Dear members of the ANZBMS Council,

Firstly, I would like to thank ANZBMS for awarding me the 2012 Christine and T J Martin Travel Grant and giving me the opportunity to gain new research and life experiences abroad. This award allowed me to travel to the University of Oxford in England, where I was able to extend our research into the mechanisms of bone damage in chronic gout in the laboratory of Dr James Edwards in the Botnar Research Centre. While in Europe, I also attended the annual meeting of the European Calcified Tissue Society (ECTS) in Lisbon, Portugal.

Laboratory visit: Dr James Edwards, Botnar Research Centre, Institute of Musculoskeletal Sciences, Nuffield Orthopaedic Centre, University of Oxford, England.

This travel grant enabled me to visit England for the first time and in terms of weather, England did not hold back. I landed in London in late March and exited the airport to find that it was snowing, sleeting and extremely cold. I was wearing jandals - perhaps the most inappropriate footwear choice I could have made, other than going barefoot. Nonetheless, I quickly settled into Oxford and fell in love with the history and culture of old-learning that Oxford emanates.

I was based in Dr James Edwards' laboratory in the Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences (NDORMS). Dr Edwards' research interests lie in understanding the links between ageing, diet and skeletal degeneration, with a particular focus on the role of SIRT1 and adiponectin. Dr Edwards also has a background in histopathology and immunohistochemistry (IHC), techniques which I had not used before my visit to his lab. My primary aim during this lab visit was to obtain nine tissue samples taken from gouty joints that were stored in the Oxford Musculoskeletal Biobank, and perform IHC looking for changes in markers that are associated with new bone formation. Dr Edwards kindly showed me how to process human tissue samples for histological analysis including embedding and sectioning. He also included the theory behind each step, which gave me a greater understanding of this research technique.

Unfortunately, of the nine gouty joint samples we looked at, none contained suitable sites of adjacent bone and tophus. However, I was able to use some osteoarthritis samples to optimise the IHC protocols for some of our chosen antibodies (DKK-1, sclerostin, DMP-1 and β -catenin). This was done with the help of Ali Zarei, a PhD student in Dr Afsie Sabokbar's lab in NDORMS. Ali has extensive experience with performing IHC on human bone tissue and was full of helpful tips and knowledge which helped me optimise my protocols. I will continue to use these protocols in the Auckland Bone & Joint Group, staining the gouty bone samples we currently have as well as any samples we obtain in the future. We are also currently using *in vitro* methods to further explore the mechanisms of new bone formation in advanced gout, which will be used to support our IHC findings. Any results published from this study will acknowledge the support of the Christine and T J Martin travel grant.

Our lab is also planning to collaborate with Dr Edwards on a project investigating the role of adiponectin in osteoporosis. During my time in Oxford, I helped create stable 2T3 cell lines that have knocked down expression of adiponectin receptor 1 or adiponectin receptor 2. To do this, I used lentiviral particles, a transduction method that I have not previously used. We are trying to establish this protocol in the Auckland Bone & Joint Group at the moment. The adiponectin receptor knockdown cells will be used to do preliminary *in vitro* work before we move onto using adiponectin receptor knockout mice which are available to Dr Edwards.

I also appreciated the opportunity to take part in the weekly lab meetings held with members from Dr Edwards' lab, as well as Dr Claire Edwards' research group. These informal meetings were good for learning about other research that was being done by these groups, as well as an opportunity for me to present and discuss my own research. I am also grateful to Dr Claire Edwards for supporting me during my visit with consumables, ordering reagents/equipment and allowing me to work within her lab space. In addition, the Botnar Research Centre also runs a weekly programme where external guest speakers are invited to give a seminar on relevant topics. These were always interesting and informative.

Conference attendance: The European Calcified Tissue Society (ECTS) meeting, 18-21 May, Lisbon, Portugal.

I also attended the 50th annual ECTS meeting in Lisbon. This was my first ECTS meeting and the conference was highly enjoyable for a number of reasons. I presented a poster showing the effects of urate crystals on tenocyte viability and function, and the implications for tendon involvement in chronic gout. The poster was well received and comments from other researchers and clinicians were particularly useful as we are now preparing this work to be published. The conference also had a good mixture of clinical and basic science, usually run as concurrent sessions. I very much enjoyed the opening ceremony lectures describing the progress made in the past 50 years in bone biology, bone imaging and treatment of bone diseases. Lastly, I was reunited with my supervisors, Prof. Jill Cornish and Dr Dorit Naot (also attending the meeting), which made exploring the beautiful city of Lisbon all the more exciting.

Overall Outcomes

This travel grant has given me the opportunity to experience working in new laboratories and appreciate research that is being carried out in other parts of the world. The new histological techniques I have learnt will be particularly useful for research investigating joint damage in gout as well as other projects in our lab. The chance to meet other researchers in the bone and joint field and discuss current research projects has been very valuable; and has helped give me a more comprehensive understanding of my own research. I would like to thank ANZBMS and AMGEN for their generous support, as well as all the individuals who made this trip memorable and thoroughly enjoyable.

Thank you,

Ashika Chhana.