Enbrel treatment promotes transplanted donor human mesenchymal precursor cell survival following spinal cord injury

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I attended the Society for Neuroscience 2015 annual conference to give a poster presentation of data generated from my PhD project. The project combines anti-inflammatory Enbrel treatment with donor human mesenchymal precursor cell (hMPC) transplantation in an attempt to reduce the inflammatory damage that occurs immediately after spinal cord injury (SCI) and to improve donor cell survival. This combinatorial treatment may lead to greater improvements in functional (locomotor) and morphological (cyst size) outcomes than what is currently seen with each therapy separately. The data showed that while Enbrel treatment appeared to improve donor cell survival in all Enbrel + hMPC treated animals (at 4 weeks post-transplantation); the combined treatment did not have any significant additional effect in reducing cyst size when compared to hMPC transplantation alone. There were also no significant differences in any of the functional outcomes for any treatment group. Additionally, there were no significant differences in functional or morphological outcomes with animals transplanted with viable versus non-viable (control) hMPCs, suggesting that the presence of cellular material at the injury site will result in a reduction in cyst size. Presenting at Society for Neuroscience 2015 gave me the opportunity to discuss and receive feedback on the work presented from a diverse group of neuroscientists. I discussed the improved survival and beneficial effects of hMPCs in SCI models and the possible mechanisms by which hMPC transplantation can lead to improvements in functional and morphological outcomes, specifically the differences between viable and non-viable cells. I was also able to discuss the potential benefits and limitations of anti-inflammatory therapies (to be administered as soon after SCI as possible) in minimising the secondary inflammatory damage that occurs following SCI; specifically the optimal dose, timing and duration of these treatments and the balance between inflammation being protective and/or damaging following SCI. The feedback and the discussions that I had will be extremely useful during the writing stage of my thesis and will add to the discussion and future directions of the research here in Australia.

I saw many posters relating to my project with focuses on neuroprotective therapies, cell transplantation approaches and ways to delivery stem cells to sites of injury, and the use of hydrogels and other scaffolds to protect and repair the spinal cord following injury. There were also many combinatorial therapies being investigated for the repair of traumatic brain and spinal cord injury models. I was also able to attend several “nanosymposia” on different strategies to improve functional and morphological outcomes following traumatic brain and spinal cord injuries that focussed on nerve regeneration, cell transplantation and neuroprotective approaches.

I attended several professional development workshops on career development, networking, funding opportunities and publishing in scientific journals. These workshops provided a lot of information and advice on the different career paths available to me, ways to advance my career, and possible challenges I may face with a career in research, that I have not had exposure to before. It was very useful to hear from a number of scientists with different backgrounds and experiences, and at different stages in their careers. These talks exposed me to the number of people and wealth of information that is available to help with a number of different issues, ie guidelines and advice

related to career development, applying for grants, advice for preparing manuscripts and publishing in journals.

Nanosymposia Attended

"Advances in Spinal Cord Injury Research"

"New Progresses in Nerve Regeneration and Transplantation"

"Spinal Cord Injury: Therapeutic Strategies"

"Traumatic Brain Injury: Cellular and Mechanisms"

Professional Development Workshops Attended

"Careers Beyond the Bench" presented by scientists working outside academia

"How Do I Fund My Science?" presented by professionals from government (NIH) and private funding bodies

"A Guide to Publishing in Journals" presented by editors and publishers from Elsevier neuroscience journals

"Successful Career Advancement Through Networking" presented by scientists at different stages in their careers with different networking experiences