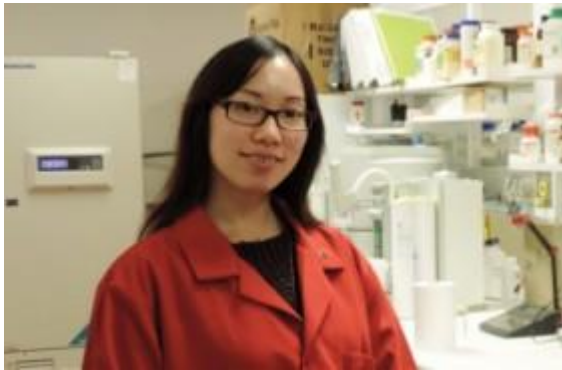


## Studying the genes that are switched on and off in the brain

10th December, 2015



**In March this year we wrote about Dr Cheryl Li, an early career researcher from the University of Sydney who received the Ian Ballard Travel Award, to collaborate and learn from experts at King's College London in the UK.**

Having recently returned from her twelve week visit, Dr Li has provided MS Research Australia with an update.

Dr Li visited the laboratories of Professor Jonathon Mill, a world-renowned expert in the genetic study of post-mortem tissue samples at the Institute of Psychiatry. This trip was an opportunity for Dr Li to learn specialised skills in the analysis of DNA extracted from brain tissue so that she can continue her investigations using tissue donated to the MS Research Australia Brain Bank.

Dr Li has been studying the genes that are switched on and off in the brains of people with MS, and comparing this with brain tissue donated by healthy individuals. Whilst at the laboratory of Professor Mill, Dr Li was trained in a number of specialised analysis techniques and was able to work on a collaborative project using tissue collected at the Institute of Psychiatry including brain tissue from individuals who had MS and also from people who did not have MS.

In particular, Dr Li was studying the tissue from a region of the brain called the thalamus, which has been shown to be important in MS. She was looking for specific differences in a measure called DNA methylation. DNA methylation refers to the 'bookmarking' of DNA with chemical tags. This process helps to regulate the level of gene activity, by identifying which genes are switched on or off.

She found that in the DNA from the MS brain tissue, there were differences in the level of methylation compared to the same regions in healthy controls, and in particular, found important differences in several genes that play a role in the immune system. These genes will be a target for further study to understand if they play a role in the development of MS. This work highlights the value of studying human tissue to deepen our understanding of the genetics of MS. Better understanding of how genes can control the interaction between the brain and immune system may lead to the development of targeted new therapies.