Report on the ISN Symposium at the Australian Neuroscience Society Annual Conference, Adelaide, 28–31 January 2014

The ISN Symposium on Trafficking and Local Translation of MRNA in Neurodegenerative Disease

The ANS annual meeting is the largest of any individual scientific Society in Australia; this year's conference attracted well over 800 delegates, which is a record for this city. With generous support from ISN, two international speakers from the USA joined two Australians to address the symposium topic. The relevant pages from the Meeting Program are appended; as will be seen, we were competing with no fewer than 5 other concurrent symposia, some of which also had international speakers and several which fell under the general rubric of molecular neuroscience. It was thus very gratifying that we attracted a large crowd – the allocated room was close to capacity – and that the audience responded very positively to the talks. It was also gratifying to note that all the speakers included unpublished data in their presentations.

John Carson (Molecular Microbiology, University of Connecticut Health Center) gave an excellent overview and introduction, and then described his novel technique to detect single translation events with real-time 2-photon imaging. He showed videos of these events taking place at trafficking granules as they move along the processes of neural cells in culture – a critical facet of RNA localization. He also discussed a novel aspect of protein synthesis from mRNA with triplet repeats. Elisa Barbarese (Neuroscience, University of Connecticut Health Center) talked about her work with TOG, a central component of granules, and discussed her studies of conditional transgenic animals in which changes in expression were confined to specific cell types. For example, TOG knockdown in oligodendrocytes yields a demyelinating phenotype where the animals exhibit behaviour akin to that of shiverer mice. Matthew Hynd from my laboratory showed new data on the levels of mRNA and miRNA moieties in synaptosomes isolated from autopsied human brain samples from Alzheimer disease (AD) cases and normal controls. His informatics had detected binding motifs for RNA binding proteins (RBPs), in the same region of 3'UTR as certain miRNA seeds, in some of the transcripts he assayed. He then described the differential expression of the relevant miRNA entities in nerve-endings from regions vulnerable to synaptic loss in AD. This provides a mechanism for the altered levels of proteins expressed from those transcripts that we have previously reported. Ross Smith (SCMB, The University of Queensland) described his work on identifying mRNA response elements, particularly for the RBPs A2, A3, and B1; he has shown that particular subtypes of A2REs may govern whether, and how, different RBPs and their cargoes are directed to different cellular processes such as dendrites and axons.

The range of questions elicited was a clear index of the excitement this symposium generated. The work described has potential to provide new paths understand to pathogenesis in neurodegenerative disease. Ross Smith and I had given Marcus Rattray a broad outline of the symposium in advance, but the coming together of the four speakers really cemented a lot of ideas and we aim to generate a review article for JNC, both from the talks themselves and from our subsequent discussions. I hope we can achieve this aim in a timely fashion.

At my request the ANS secretariat set up a banner slide with the ISN logo, entirely in ISN's signature colours, which greeted the audience as the entered and was displayed until the symposium began. As well as the symposium title it also advertised the ISN/APSN/ANS joint meeting in Cairns in 2015. I put it up again at the end of the symposium, and ANS also used it as the banner ahead of the Presidential Plenary.

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