ANALYSIS OF NEURODEGENERATIVE DISEASE RELATED NEUROPATHOLOGY IN RETINA AND OLFACTORY BULB OF RODENT MODELS

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Meet QPS at AAIC 2017
Booth #217

Alzheimer’s disease (AD) is the most common form of neurodegenerative dementia. Major hallmarks of the disease are: (1) extracellular plaque-idependent deposition of the β-amyloid peptide (Aβ) and (2) intracellular neurofilamental tangles of hyperphosphorylated tau. Research suggests an association between AD and functional impairments of sensory systems. In fact, the occurrence of tau-mediated glaucoma has been recently reported, as well as AD protein-associated pathology in the sensory system (M. Chiassé et al., 2016). The current study is designed to analyze the neuropathological changes occurring both in brain and retina of different AD animal models and address suitable biomarkers for early screening tests for AD.

RESULTS

Microglia and astroglia were detected with antibodies against IB1 and GFAP, respectively (Figure 1). Expression is detectable in all areas of interest and is currently subject to quantitative image analysis.

Figure 1: Glutamylation in AD relevant models. Immunofluorescent labelling of IB1 (green) and GFAP (red) in brain and retina images obtained. Lastly, further biochemical investigation of the tissues will be executed to receive a further characterization of possible 1) to detect whether gliosis occurs in AD-affected tissues, 2) detect tau accumulation, 3) identify β-amyloid plaques, and 4) evaluate if there is a variation in the level of neurotransmitters. Ongoing research will now focus on the quantitative analysis of the images obtained. Lastly, further biochemical investigation of the tissues will be executed to receive a further characterization of neurodegeneration in the sensory system.

SUMMARY

AD models analysed in this study, together with the specific antibodies tested, provide us with a powerful tool to analyse neurodegeneration in sensory systems. In fact, by means of triple immunofluorescent labellings performed in our target tissues, it is possible 1) to detect whether gliosis occurs in AD-affected tissues, 2) detect tau accumulation, 3) identify β-amyloid plaques, and 4) evaluate if there is a variation in the level of neurotransmitters. Ongoing research will now focus on the qualitative analysis of the images obtained. Lastly, further biochemical investigation of the tissues will be executed to receive a further characterization of neurodegeneration in the sensory system.