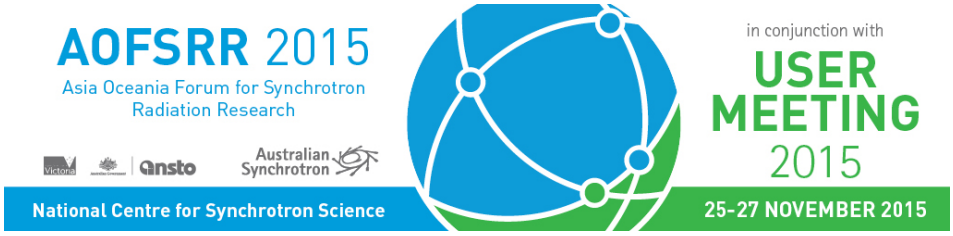

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An Atlas of Metal Dependent Histone Deacetylase Expression in the Developing and Adult Mouse Brain

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Histone deacetylases (HDACs) are enzymes that transcriptionally alter the chromatin by removing an acetyl group from the ε-amino acid from the lysine residue on the core histone tails. This allows negatively charged DNA to wrap tightly around the histones. Mammalian HDAC classes I, II and IV are categorized as metal dependent enzymes and consist of HDACs 1-11. The deacetylation of histones is commonly linked to gene silencing and is involved in many cellular pathways including apoptosis and cell cycle arrest. An understanding of normal homeostatic levels of HDAC expression is necessary for therapeutics to progress in the field of diseases linked to neurodevelopment and neurodegeneration. In order to elucidate the changes in development between embryonic and adult mouse brain we investigated the expression levels of HDACs 1-11. Firstly, a semi-quantitative method based on immunofluorescence staining was used to examine differences in the endogenous expression levels of the HDACs between E13.5, E14.5 and adult brains. Secondly, utilising focal plane array microspectroscopy (FPA) on the infrared beamline at the Australian Synchrotron, we observed spectral changes in the brain during different stages of development. Combining these experimental techniques our aim is to establish a comprehensive atlas of neurodevelopment focusing on chemical mapping obtained from FPA and the HDAC expression. Our results indicate high expression levels of HDAC 9 and 11 for all three developmental stages and HDAC 2 for embryonic brain development. Spectral changes attributing to lipid and amino acid composition were altered during different stages of neurodevelopment.

Keywords

Brain, Histone Deacetylase Expression, Neurodevelopment, Focal Plane Array, Immunofluorescence,

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