Resident Research Rotation Opportunity

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Location of Laboratory: Centre for Prions and Protein Folding Diseases

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Area of Research Interest: Neurodegeneratives diseases, Neuroprotection, Neurodegeneration

General Description of Potential Projects:

**Project 1:** Alzheimer’s disease (AD) is a progressive neurodegenerative disorder characterized by a gradual loss of memory followed by deterioration of higher cognitive functions. The neuropathological features associated with AD include the presence of intracellular neurofibrillary tangles, extracellular neuritic plaques and the loss of neurons in selected brain regions. Neuritic plaques contain a compact deposit of -amyloid (A) peptides which are believed to play a critical role in the degeneration of neurons and development of AD pathology. The brain regions severely afflicted in AD include the basal forebrain, hippocampus and cortex, whereas other regions are relatively spared or affected during late stages of the disease. At present, very little is known on the cause of selective vulnerability of these neurons or how to protect them. There is evidence that levels/activation of the lysosomal enzyme cathepsin D are increased in AD brains but its implication in the development of disease pathology or loss of neurons remains unclear. In the current project, our objective is to define the potential role of the cathepsin D in A-mediated toxicity and its significance in determining neuronal vulnerability in AD brains. This study will be carried out using *in vitro* cell culture models, animal models of AD and postmortem human AD brain tissues. *(Duration 6 months – 2 years)*