

MSc DEFENCE Thursday, July 25th, 2019

Student: Amy Nguyen

Title: ANALYTICAL IMPROVEMENTS IN THE DETECTION OF AMYLOID-B PEPTIDES IN CEREBROSPINAL FLUID BY MASS SPECTROMETRY

Time and location: 10:00 AM; HLI Gourlay Conference Room, St. Paul's Hospital, 1081 Burrard Street, Vancouver, BC

Supervisor: Dr. Mari DeMarco

ABSTRACT

Alzheimer's disease (AD) is the most common form of dementia and can be broadly divided into familial (i.e., genetic) and non-familial forms. The hallmarks of AD are the accumulation of amyloid plaques and neurofibrillary tangles in the brain. Cerebrospinal fluid (CSF) peptides and proteins that are used as biomarkers of AD pathology include, amyloid-b (Ab) peptides and tau proteins. An assay based on solid phase extraction and liquid chromatography tandem mass spectrometry (LC-MS/MS) was previously developed by the laboratory and is used to detect evidence of AD pathology by quantifying wild-type Ab peptides in CSF. The aims of this thesis with respect to this LC-MS/MS method were to (1) evaluate endogenous and exogenous factors such as hemolysate, total protein, and immunoglobulins to optimize assay performance for the development of sample acceptance/rejection criteria, and (2) extend the capabilities of the method from detecting wild-type Ab peptides to also detecting Ab variants including those associated with familial AD. In summary, a criteria for sample acceptance/rejection was developed and the method was adapted to enable detection of familial AD.