

2017 CSCC Award for Innovation in Laboratory Medicine
Sponsored by Roche Diagnostics

University Health Network
Dr. Vathany Kulasingham

The CSCC is pleased to announce that the 2017 Award for Innovation in Laboratory Medicine will go to Dr. Vathany Kulasingam and the University Health Network for the development and implementation of a shot-gun proteomics based amyloidosis subtyping assay by Mass Spectrometry.

This Award, sponsored by Roche Diagnostics, recognises a clinical laboratory that has distinguished itself by outstanding accomplishment through innovation in Clinical Chemistry or Laboratory Medicine in one or more of the following:

- Innovation in strategic planning and implementation of laboratory services based on best practices.
- Innovation in development of new laboratory programs.
- Promotion of positive public image for laboratory medicine.

Amyloidosis, characterized by abnormal deposition of misfolded proteins into various organs, affects approximately 200,000 people in North America. Several subtypes of amyloid exist and each is caused by a different protein. Management of amyloidosis differs radically for different amyloid subtypes. As such, accurate characterization of the amyloid fibrils is important. Congo red (CR) staining remains the gold standard method for diagnosis of amyloidosis and subtype classification is currently established by using clinical, genetic and Immunohistochemistry (IHC) techniques. Such strategies suffer from a lack of specificity, inaccuracy and high cost. This created an opportunity for a shot-gun proteomics-based diagnostic application to accurately subtype amyloids and improve patient care. While mass spectrometry (MS) has been used in clinical diagnostic laboratories for toxicology, TDM and small molecule analysis, its use in protein identification for clinical purposes has been quite rare. To date, there are no laboratories in Canada offering such a clinical assay and only a few laboratories around the world that have such a capability. Out-of-country testing involves lengthy turnaround times (TAT) (attributed to delays in obtaining Ministry approval and result reporting ranging from 1-3 months), high cost, and ultimately, poor outcome for patients. Given the clinical need and expertise in MS and instrumentation available at the University Health Network (UHN) in Toronto, they developed an MS method to subtype amyloids in formalin-fixed paraffin embedded (FFPE) tissue. This collaborative venture with pathology and biochemistry consisted of performing CR staining, laser microdissection, protein extraction and digestion, tandem MS and extensive bioinformatics to characterize the proteomic composition of the amyloid deposit. The clinical impact of the new test has already been tremendous: TAT of <2 weeks has allowed for clinicians to initiate treatment in a timely fashion. To date, the UHN has analyzed approximately 200 samples over 2 years. Given the rarity of this disease, the fact that they have subtyped 200 cases thus far clearly shows an unmet clinical need and the value added by developing this test in-house and offering it to all Canadians.

Dr. Vathany Kulasingam is a Clinical Chemist with the Department of Clinical Biochemistry, Laboratory Medicine Program, University Health Network, and Assistant Professor with the Department of Laboratory Medicine and Pathobiology, Faculty of Medicine, University of Toronto. Dr. Kulasingham received her PhD from the University of Toronto in 2008, completed her training in Clinical Biochemistry

at the University of Toronto in 2010, received certification from the CSCC and became a Fellow with the CACB in 2011.

Congratulations to Dr. Vathany Kulasingam and the University Health Network as recipients of the 2017 Award for Innovation in Laboratory Medicine.