BIOELECTROCHEMISTRY: WHAT CAN WE LEARN ABOUT BRAIN PROTEINS Sanela Martic, Department of Forensic Science, Environmental and Life Sciences Program, Trent School of Environment, Materials Science Program, Water Quality Center, Trent University, Peterborough, ON K9L 0G2, Canada. (sanelamartic@trentu.ca)

Biolectrochemistry is a powerful analytical tool offering opportunities for new discoveries to be made in the field of peptide and protein biochemistry, which are often unobtainable using standard analytical methods. Using proteins on Au surfaces, we demonstrated that fundamental biomolecular interactions can be monitored using cyclic voltammetry and electrochemical impedance spectroscopy. We reported on using electrochemical methods for detection of protein-protein interactions, protein-ligand interactions, enzymatic catalysis, enzyme inhibition, and metallation while focusing on tau protein biochemistry.¹ The solution electrochemical studies provided information with regards to redox activity of metallo-peptide complexes and their relative stability. Bioelectrochemical methodologies were used to gain insight into various facets of protein and peptide biochemistry, and represent promising bioanalytical tools.

[1] A) Carlin, N., Martic-Milne, S. (2018). Anti-tau antibodies based electrochemical sensor for detection of tau protein. J. Electrochem. Soc.165: G3018-G3025. B) Jahshan, A., Esteves, J.O.V., Martic-Milne, S. (2016). Evaluation of ferritin and transferrin binding to tau protein. J. Inorg. Biochem. 162: 127-134. C) Trzeciakiewicz, H., Esteves, J.O.V., Carlin, N., Martic, S. (2015). Electrochemistry of heparin binding to tau protein on Au surfaces. Electrochim. Acta. 162: 24-30.