NEW INSIGHTS INTO ESTIMATING THE TIME SINCE DEPOSITION OF BLOODSTAINED EVIDENCE USING APPLIED SPECTROSCOPY AND ELECTROCHEMISTRY. Theresa Stotesbury. Ontario Tech University, Faculty of Science – Forensic Science Program, 2000 Simcoe Street North, Oshawa, ON, L1G 0C5, Canada. (theresa.stotesbury@ontariotechu.ca)

The identification and quantification of (bio)molecules and their metabolism, formation, degradation and persistence are important features of forensic evidence; and in particular, are useful in time series estimation approaches to date evidence. For example, estimating the time since deposition (TSD) of a bloodstain can provide important medicolegal information for crime scene investigation (e.g. answering the question, “When did the bloodshed occur?”). Research in this area primarily investigates either hemoglobin OR genetic material degradation over time. In this talk I will present overviews of two recent studies from our laboratory that contribute to the TSD literature. The first will focus on combining hemoglobin (alpha and beta bands) and DNA degradation (base pair size) metrics using UV-VIS spectroscopy and high-resolution automated electrophoresis to improve the accuracy of linear mixed TSD models. The second will focus on using a novel electrochemical method using differential pulse voltammetry for TSD modelling with a clear diagnostic change at approximately 96 hours. In all cases, adding the random effect of the biological replicate accounted for a large proportion of the variation in signal. Effects of environmental and storage conditions relevant to crime scene investigation will also be discussed.