

Enhancing Raman Spectroscopy for Rapid Quantitative Bioanalysis

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The detection of drugs be they illicit substances or prescribed medicines is needed in order to detect substance abuse or pharmacodynamics. What is needed is both the quantification of drug metabolites as well as any drug metabolites. Raman spectroscopy offers unique specificity for molecular characterization and this usually weak signal can be significantly enhanced using surface enhanced Raman scattering (SERS). Using judicious design of experiments we have recently demonstrated excellent detection and quantification for a range of drugs and biomarkers using SERS [Levene *et al.* (2012) *Analytical Chemistry* **84**, 7899-7905; Mabbott *et al.* (2013) *Analytical Chemistry* **85**, 923-931; Cowcher *et al.* (2013) *Analytical Chemistry* **85**, 3297-3302]. In this presentation we shall report the development of SERS with machine learning methods for multiplexed quantification of drugs and their metabolites.