SURFACE-ENHANCED RAMAN ANALYSIS OF BENZODIAZEPINES USING GOLD COLLOIDAL DISPERSIONS. Erika L. Doctor, MS and Bruce McCord, PhD, Florida International University, International Forensic Research Institute, 11120 SW 8th Street, Miami, FL 33199

Forensic science drug laboratories are reporting a significant increase in the prevalence of benzodiazepines in submissions from drug-facilitated sexual assault cases. Surface enhanced Raman spectroscopy (SERS) is proposed as a novel technique for the analysis of trace quantities of benzodiazepines in aqueous samples. This technique is straightforward to use, utilizes easily prepared substrates and simple instrumentation. Analytes which are structurally very similar can be distinguished due to the spectral information provided. The limits of this technique will also be discussed.

Aqueous colloidal dispersions of gold nanoparticles were synthesized using a modified Lee Meisel 1% sodium citrate method. Diluted benzodiazepine samples were added to the colloidal dispersions and SERS spectra were obtained. Aggregating agents were compared for enhancement of the spectral characteristics. Detection limits for the aggregates were characterized in the ng/mL range.