## K19 Detection of Alcohol Metabolites in Urine Using HPLC With Conductivity Detection

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The goal of this presentation is to expand the current knowledge of detection methods for three Phase II ethanol metabolites (ethyl glucuronide, ethyl sulfate, and ethyl phosphate), and offer a simple, comparable method.

This presentation will impact the forensic science community by allowing the detection of alcohol intake without the worry of contamination due to bacteria, as well as offering a confirmatory analysis mid-assay.

After consumption of alcohol, the bulk of the ethanol dose (95-98%) is eliminated in a two stage oxidation in the liver, first to acetaldehyde then further to acetic acid. A very small fraction of ethanol (<0.1%) undergo phase II conjugation reactions to produce ethyl glucuronides via UDP- glucuronidase, ethyl sulfates via sulfotransferases, and ethyl phosphate via dephosphorylation of ATP. Modern postmortem and behavioral toxicology has focused on glucuronides, allowing for easy detection due to high abun- dance of metabolites from that pathway. This detection is not without its problems, including false negatives due to bacterial infections.

Previous work in this laboratory has used pulsed amperometric detec- tion to detect ethyl-glucuronide, a metabolite of alcohol. This work expands on that, by allowing all three metabolites, ethyl glucuronide, ethyl sulfate, and ethyl phosphate to be detected in a single chromatographic run. All three are ionic in biological matrices, including urine, making them ideal candi- dates for conductivity detection following ion chromatographic separation.

This poster will outline the development of the ion chromatographic separation of the three metabolites and their subsequent detection using conductivity detection. Analytical figures of merit will be given, and the method will be compared against existing approaches. Sample preparation will be discussed in detail. This project will have long standing effects in the forensic science community by allowing detection of alcohol intake without the worry of contamination due to bacteria, as well as offering a confirmatory analysis mid-assay.

**Alcohol, HPLC, Conductivity**

 ** Presenting Author*