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Poster

## [P26-10] P26-10: Assay of toxicants

Chair: Steven How-Yan Wong, USA

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## [P26-10-9] A simple and rapid solid phase extraction method for analysis of THC and THC-COOH in oral fluid using LC-MS/MS

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### Background

11-nor-9-carboxy-9-tetrahydrocannabinol (THC-COOH) quantification in oral fluid (OF) requires highly sensitive analytical methods as it is present in low pg/mL concentrations. We developed a sensitive and efficient LC-MS/MS method for simultaneous determination of THC and THC-COOH in OF. Both analytes were extracted using a simple and rapid SPE method without pre-conditioning, evaporation and reconstitution.

### Methods

0.75 mL OF-buffer mixture (0.25 mL OF + 0.5 mL buffer) was combined with internal standard (IS) solution. Proteins were precipitated by addition of acetonitrile. The mixture was decanted onto a SAX SPE plate. After wash, eluates were diluted with 60 L water.

Extracted compounds were separated on a reverse phase column chromatographically followed by analysis on a triple quadrupole mass spectrometer. Data were acquired in selected-reaction monitoring (SRM) mode. Two SRM transitions for each analyte/IS were measured with polarity switching and ion ratios were calculated for confirmation.

### Results

OF samples were processed by protein precipitation followed by SPE using SOLA plates. These fritless plates deliver robust processing at elution volumes as low as 25 L, thus eliminating evaporation and reconstitution step and allowing for high-efficiency, cost-efficient analytical methods. The whole SPE process took about 20 min and can be fully automated.

The LOQ was 10 pg/mL for THC-COOH and 0.1 ng/mL for THC with ion ratio confirmation in oral fluid. The linearity range was 10-1000 pg/mL for THC-COOH and 0.1-100 ng/mL for THC. The intra-assay precision was better than 9.5% RSD. The inter-assay precision was better than 8.4% RSD. The recovery rate ranged from 85% to 106% for THC-COOH and from 56% to 65% for THC. The matrix effect ranged from 80% to 126% for THC-COOH and from 95% to 99% for THC in oral fluid.

### Conclusions

We developed a simple and rapid SPE method (no pre-conditioning, no evaporation, or reconstitution) for analysis of THC-COOH and THC using LC-MS/MS in forensic toxicology laboratories. The LOQ for THC-COOH was 10 pg/mL with ion ratio confirmation. Quantification of both analytes provides the opportunity to improve interpretation of cannabinoid OF results by eliminating the possibility of passive inhalation and providing markers of recent cannabis smoking.