

CAMAG DBS-MS 500

FULLY AUTOMATED DRIED BLOOD
SPOT EXTRACTION SYSTEM

FORENSIC DRIED BLOOD SPOT APPLICATION



- High throughput analysis of up to 500 DBS cards per run
- Integrated optical card recognition and barcode reading module
- Automated internal standard application module
- Unique extraction module with wash station to eliminate carry-over
- Online coupling to analysis system (LC-MS, MS or Sample Collector)
- Full control through Chronos software



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CAMAG®

FULLY AUTOMATED WORKFLOW FOR THE COST-EFFECTIVE DRUG SCREENING OF LARGE POPULATIONS BASED ON THE DRIED BLOOD SPOT

The fast and cost-effective detection of illicit drugs is of major interest in workplace drug testing programs, roadside testing, therapeutic drug monitoring, rehabilitation programs and post-mortem investigations. The integration of the dried blood spot (DBS) technology offers various advantages such as simplified blood collection, reduced shipping and storage costs and reduced analysis time and labor costs due to full automation. DBS technology allows screening of a large population

with minimum equipment in a cost-effective way. After drawing, each sample is anonymized using a barcode, which is later connected to the analysis results in a database.

To show the feasibility and potential of such an approach, a drug panel of different compound classes (Table 1) was chosen and analyzed. The region of interest was defined as 10-fold below and above the reported cut-off concentration [1].

Table 1, Drug panel

Name	Cut-off level [ng/ml] [2]
Alprazolam	100
Amphetamine	100
Cocaine	150
Codeine	300
Diazepam	100
Fentanyl	5
LSD	0.5
MDMA	5
Methadone	200
Methamphetamine	100
Morphine	300
Oxycodone	100

The dried spots were scanned, spiked with deuterated standards and directly extracted using the DBS-MS 500. The extract was transferred online to an analytical LC column and then to the electrospray ionization tandem mass spectrometry system. The acquired MRM data from MS was used for quantitation and additionally for compound verification by screening against a forensic toxicology spectral library (Figure 1).

All drugs were quantified at their cut-off level and good precision and correlation within the calibration range was obtained. The method was further applied to DBS samples from two patients with back pain and codeine and oxycodone could be identified and quantified accurately below the level of misuse.

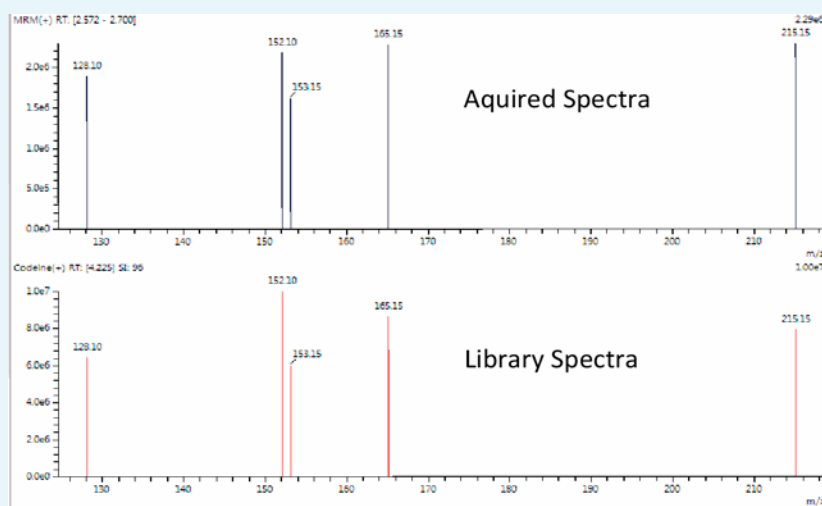
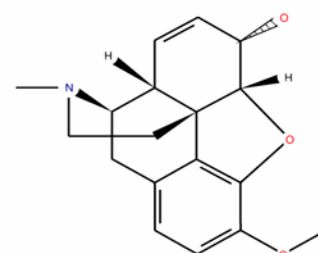


Figure 1, Sample report from library software



Library Molecule name:
Codeine

[1] Gaugler *et al.*, Fully automated drug screening of dried blood spots using online LC-MS/MS analysis, *Journal of Applied Bioanalysis*, Vol.4, No.1, 7-15, 2018
[2] Baer DM. Cutoff and toxicity levels for drug of abuse testing, 2016

