

# ASSESSMENT OF URINE SAMPLES WITH THE FULLY AUTOMATED BIOCHIP ANALYSER EVIDENCE MULTISTAT FOR THE SCREENING OF MULTIPLE DRUGS OF ABUSE AND CREATININE FROM A SINGLE SAMPLE UNDER TWENTY MINUTES

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## Introduction

Multi-drug detection increases the screening capacity. Biochip Array Technology (BAT) allows the simultaneous detection of multiple drugs of abuse and creatinine in less than twenty minutes from a single sample, when applied to the fully automated benchtop biochip analyser Evidence MultiSTAT.

This study reports the assessment of urine samples using this application.

## Methodology

Simultaneous competitive chemiluminescent immunoassays on a biochip surface on the Evidence MultiSTAT were employed (21 different drug types can be detected simultaneously). Sampling 25µl of urine against a cut-off sample the results are qualitative. Authentic urine samples were screened and the screening data was correlated against liquid chromatography/mass spectrometry (LC/MS) results from an independent laboratory. In addition, negative urine samples were spiked with certified reference material.

Assay	Cut-off	Assay	Cut-off
AB-PINACA	2.5 ng/mL	JWH-018	20 ng/mL
α-PVP	5 ng/mL	6-MAM	10 ng/mL
Amphetamine	200 ng/mL	Methadone	300 ng/mL
Barbiturates	200 ng/mL	Methamphetamine	200 ng/mL
Benzodiazepines I	150 ng/mL	Opiate	200 ng/mL
Benzodiazepines II	150 ng/mL	Oxycodone	50 ng/mL
Benzoyllecgonine/Cocaine	150 ng/mL	Tramadol	5 ng/mL
Buprenorphine	1 ng/mL	THC	20 ng/mL
ETG	750 ng/mL	Tricyclic Antidepressants (TCA)	150 ng/mL
Fentanyl	2 ng/mL	UR-144	10 ng/mL
Creatinine	20 mg/dL	-	-

## Conclusion

Data indicate applicability of the Evidence MultiSTAT platform to the rapid multi-drug screening (<20 minutes) of urine samples and favourable agreement with LC/MS.

## Results

### Correlation against LC/MS

The overall percentage agreement was ≥90% for all assays except for THC. THC assay: 88% agreement.

Assay	n	Agreement (%) Biochip MultiSTAT platform and LC/MS
α-PVP	98	98
Amphetamine	218	100
Barbiturates	198	100
Benzodiazepines I	218	98.2
Benzodiazepines II	218	99.5
Benzoyllecgonine/Cocaine	218	95
Buprenorphine	218	98.6
ETG	49	100
Fentanyl	218	100
JWH-018	98	100
6-MAM	218	100
Methadone	218	99.5
Methamphetamine	218	100
Opiate	218	91.7
Oxycodone	218	98.6
Tramadol	218	99.5
THC	216	88.0
Tricyclic Antidepressants (TCA)	19	89.5

Creatinine >20mg/dL in all samples indicating absence of sample dilution.

### Spiked Samples

Assay	n	Agreement (%) with expected value spike + and spike -
α-PVP	120	99.2
AB-PINACA	120	98.3
ETG	120	100
JWH-018	120	99.2
TCA	120	100
UR-144	120	99.2