

## NEW BIOCHIP ARRAY PLATFORM FOR THE SIMULTANEOUS SCREENING OF DRUGS OF ABUSE IN ORAL FLUID IN UNDER 20 MINUTES

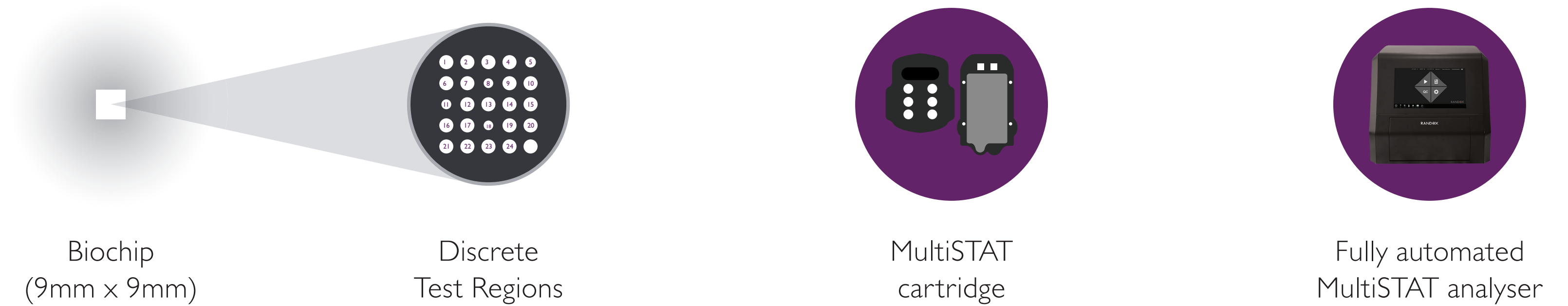
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### Introduction

Oral fluid collection is quick, simple, non-invasive and can be easily observed. Biochip array technology enables multi-analytical screening of drugs of abuse from a single oral fluid sample in under 20 minutes with the new biochip analyser Evidence MultiSTAT, which leads to drug test consolidation and time and labor effective screening. This study reports the analytical evaluation of this application.

### Methodology

Simultaneous competitive chemiluminescent immunoassays on a biochip surface were applied to the fully automated Evidence MultiSTAT analyser, which processes a self-contained cartridge containing all the components required for the assays. Sampling against a cut-off sample, the results are qualitative.



### Results

#### Cut-offs

Matrix: oral fluid

Assay	Cut-off	Assay	Cut-off
α - PVP	2 ng/mL	6-MAM	2 ng/mL
Amphetamine	50 ng/mL	Methadone	4 ng/mL
Barbiturates	50 ng/mL	Methamphetamine	50 ng/mL
Benzodiazepines I	10 ng/mL	Opiates	10 ng/mL
Benzodiazepines II	10 ng/mL	Oxycodone	8 ng/mL
BZG/Cocaine	20 ng/mL	PCP	5 ng/mL
Buprenorphine	1 ng/mL	THC	2 ng/mL
Fentanyl	1 ng/mL	Synthetic Cannabinoids (JWH-018)	5 ng/mL
Ketamine	50 ng/mL	Synthetic Cannabinoids (UR-144)	10 ng/mL
LSD	1 ng/mL	Tramadol	4 ng/mL

#### Accuracy

Assessment of spiked samples at different concentrations: 50 negative samples spiked at concentrations >cut-off, 10 negative samples spiked at concentrations <cut-off and 40 blank negative samples. The agreement (%) was calculated as the percentage of correct reports out of the total number of samples analysed (n=100).

Assay	Spike +	Spike -	Agreement (%)	Assay	Spike +	Spike -	Agreement (%)
α-PVP	+ 50	0	100	6-MAM	+ 50	1	99
	- 0	50			- 0	49	
Amphetamine	+ 50	0	100	Methadone	+ 50	0	100
	- 0	50			- 0	50	
Barbiturates	+ 50	0	100	Methamphetamine	+ 50	0	100
	- 0	50			- 0	50	
Benzodiazepines I	+ 50	0	100	Opiates	+ 50	0	100
	- 0	50			- 0	50	
Benzodiazepines II	+ 50	0	100	Oxycodone	+ 49	0	99
	- 0	50			- 1	50	
BZG/Cocaine	+ 49	0	99	PCP	+ 50	0	99
	- 1	50			- 0	50	
Buprenorphine	+ 49	0	99	THC	+ 50	0	100
	- 1	50			- 0	50	
Fentanyl	+ 50	0	100	Synthetic Cannabinoids (JWH-018)	+ 50	0	100
	- 0	50			- 0	50	
Ketamine	+ 50	1	100	Synthetic Cannabinoids (UR-144)	+ 50	0	100
	- 0	49			- 0	50	
LSD	+ 50	0	100	Tramadol	+ 50	0	100
	- 0	50			- 0	50	

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#### Authentic oral fluid samples assessment

Assay	n=90	Evidence MultiSTAT		
		+	-	Agreement (%)
Amphetamine (cut-off: 50 ng/mL)	LC/MS	+ 1 - 5	0 84	94
Benzodiazepines (cut-off: 10 ng/mL)	LC/MS	+ 10 - 4	1 75	94
BZG/Cocaine (cut-off: 20 ng/mL)	LC/MS	+ 30 - 11	2 47	86
6-MAM (cut-off: 2 ng/mL)	LC/MS	+ 52 - 9	0 29	90
Methadone (cut-off: 4 ng/mL)	LC/MS	+ 64 - 2	0 24	98
Methamphetamine (cut-off: 50 ng/mL)	LC/MS	+ 0 - 0	0 90	100
Opiates (cut-off: 2 ng/mL)	LC/MS	+ 55 - 8	0 27	91

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### Conclusion

Data indicate that the Evidence MultiSTAT system enables simultaneous screening of twenty drug classes in <20 minutes in oral fluid with extremely sensitive cut-offs and reproducible and accurate qualitative results.