

A Diagnostic Test for Cocaine and Benzoyllecgonine in Urine and Oral Fluid using Portable Mass Spectrometry

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Over **8,000** people were arrested in England and Wales for driving under the influence of drugs between March 2015 and April 2016 since the introduction of a portable drug testing device [1].



New portable device for drug testing can be placed in the back of a police van and has ability to screen for multiple drugs – limitation of current device (DrugWipe)

New test for cocaine in saliva offers **superior** selectivity and quantitative power compared to current immunoassay screening



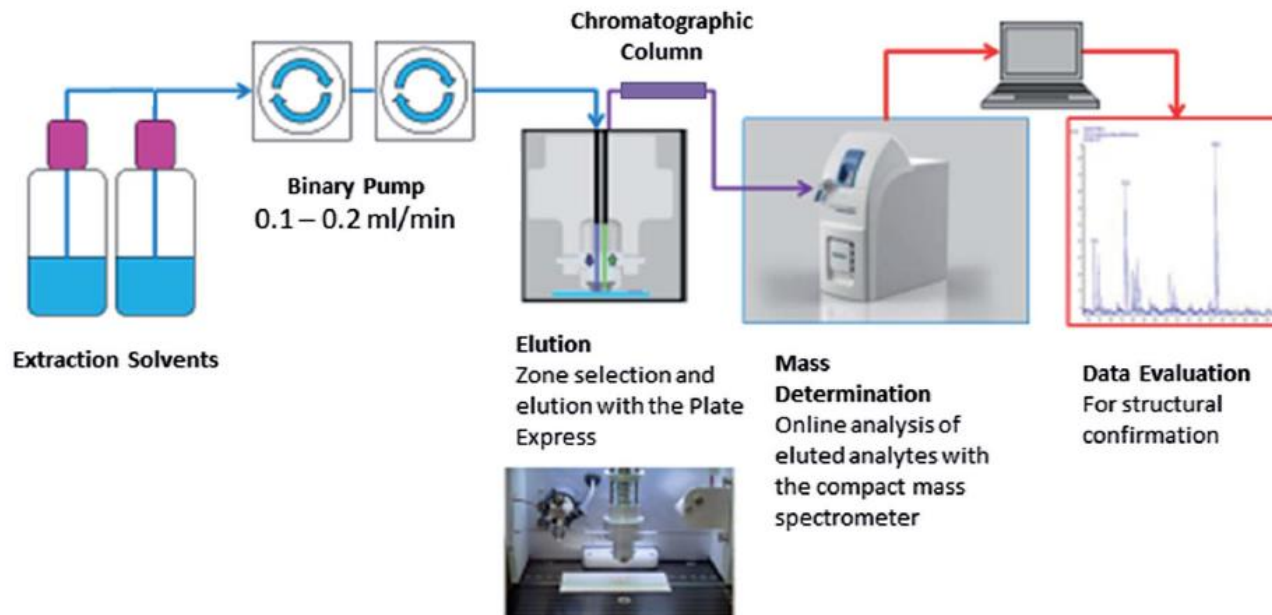
In collaboration with:

Surrey and Borders Partnership 
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[1] <http://www.bbc.co.uk/news/uk-36421367>

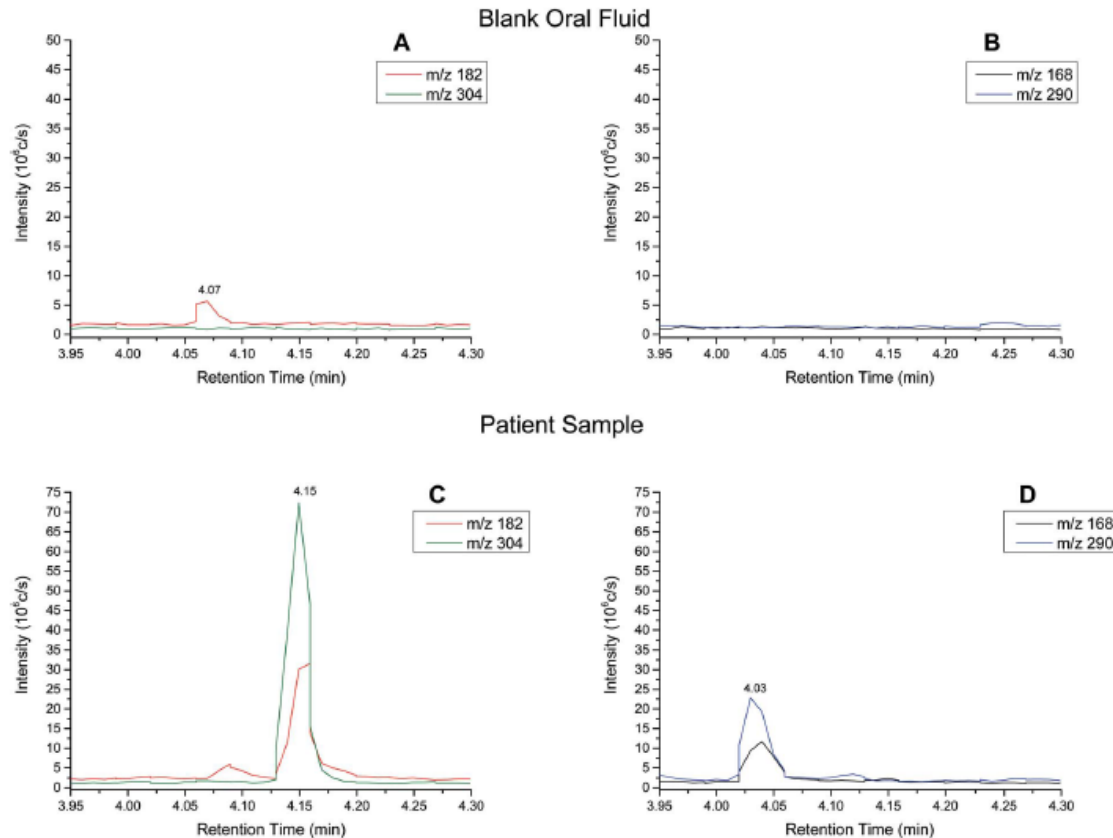
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- Plate Express™ combined with Advion's expression® compact mass spectrometer for an automated analysis method
- Chromatography column used to reduce ion suppression effects, used in combination with in-source fragmentation, allows high sensitivity using single quadrupole MS
- Ten microlitre of sample (urine/saliva) analysed using the set-up below:



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- Analysis of oral fluid samples collected from two patients showed detectable signals for cocaine and benzoylcegonine
- No interferences were observed from endogenous analytes in the blank matrix



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- Method sensitivity (limit of detection) < 31 ng/ml in oral fluid and <21 ng/ml in urine samples
 - Cut-off levels for drug testing
 - Urine: 150 ng/ml for both screening and confirmation
 - Saliva: 30 ng/ml for screening; 8 ng/ml for confirmation

Table 4 Limit of detection (LOD) and quantitation (LOQ) for cocaine and benzoyllecgonine in pooled urine and pooled oral fluid

Sample	Analyte	LOD (ng ml ⁻¹)	LOQ (ng ml ⁻¹)
Pooled urine	Cocaine	10	19
	Benzoyllecgonine	21	42
Pooled oral fluid	Cocaine	31	44
	Benzoyllecgonine	17	27

- Limitation of current method sensitivity for oral fluid
 - Samples diluted by 3 ml buffer used to store oral fluid samples and additional 0.5 ml of internal standard added
 - Only 10 µl of buffer solution used for analysis

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- New way to screen and quantify cocaine and benzoyllecgonine in biological fluids using a combination of surface extraction, liquid chromatography and portable mass spectrometry
- Current method offers a low cost, flexible and portable set up for drug analysis on flat surfaces
- Proof of concept using urine and saliva samples collected from patients
- Relevant levels of sensitivity (<31 ng/ml) with good linearity (R^2 0.998)



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NEW ATLAS



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