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 NHS Foundation Trust]

• 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:
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.
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

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

- New way to screen and quantify cocaine and benzoylecgonine 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)