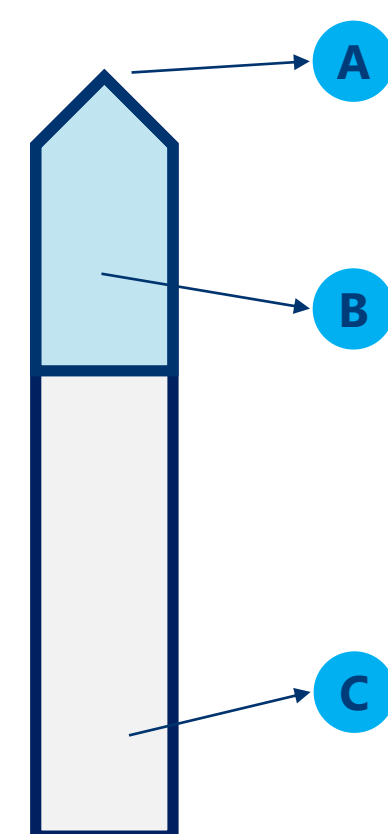


# Coated Blade Spray-Tandem Mass Spectrometry for Rapid Screening and Quantitation of target drugs in Oral Fluids Samples

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## A. Sharp tip for direct transfer to MS

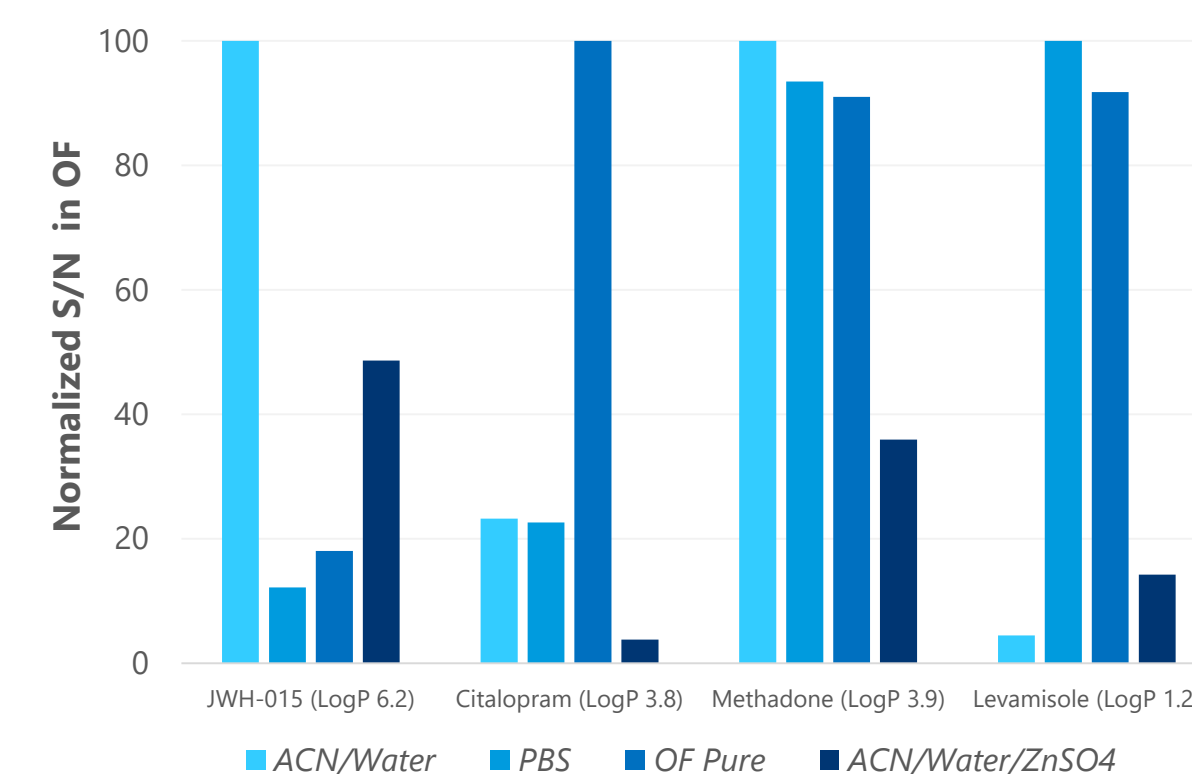
Facilitating stable ESI and ions to be directed to MS inlet to MS

## B. Open-bed SPE

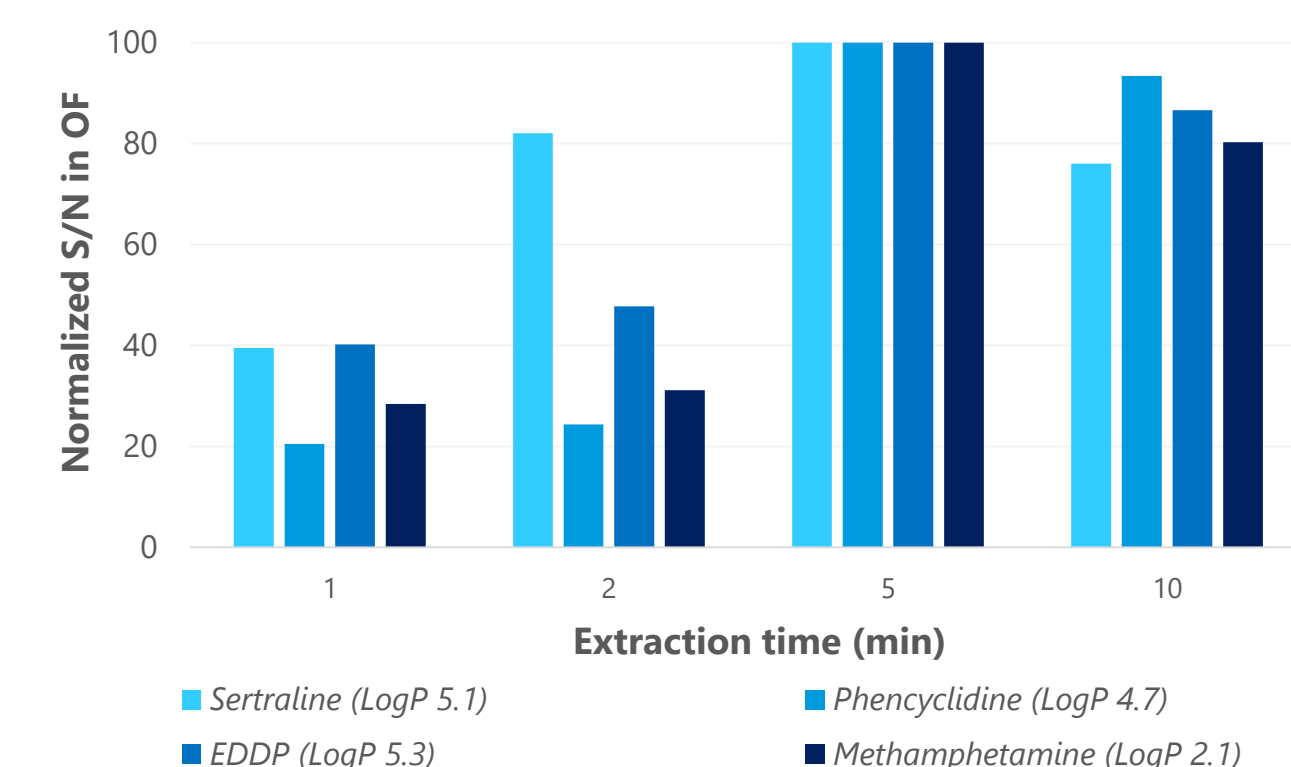
- ✓ Biocompatibility and high selectivity for small molecules (coverage of a wide range of compounds)
- ✓ No collection of macromolecules and salts (enrichment of analyte molar fraction). Minimize matrix effects and ionization suppression.
- ✓ Minimum sample pre-treatment. No need for sample filtration.
- ✓ Easy coupling with analytical instrumentation (via either LC-MS/MS or direct to MS)

## C. Stable, conductive and non-porous solid substrate

Stainless Steel blade suitable for matrices with diverse shapes, viscosities and stiffness



**Figure 1** Evaluation of sample modifiers as a means to enhance S/N via CBS-MS/MS. Extractions from analytes spiked at 10 ng/mL in OF



**Figure 2** Effect of increasing extraction time versus S/N of different analytes spiked at 10 ng/mL in OF via CBS-MS/MS

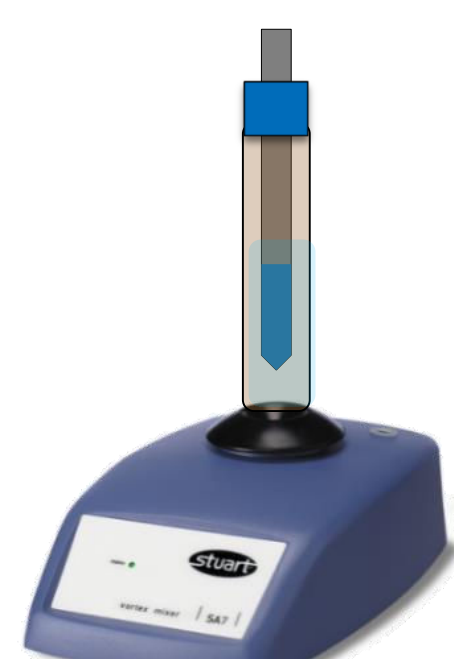
## What is Coated Blade Spray (CBS)?

A sample preparation device that can be directly interface to mass spectrometry instrumentation for rapid screening and quantitation

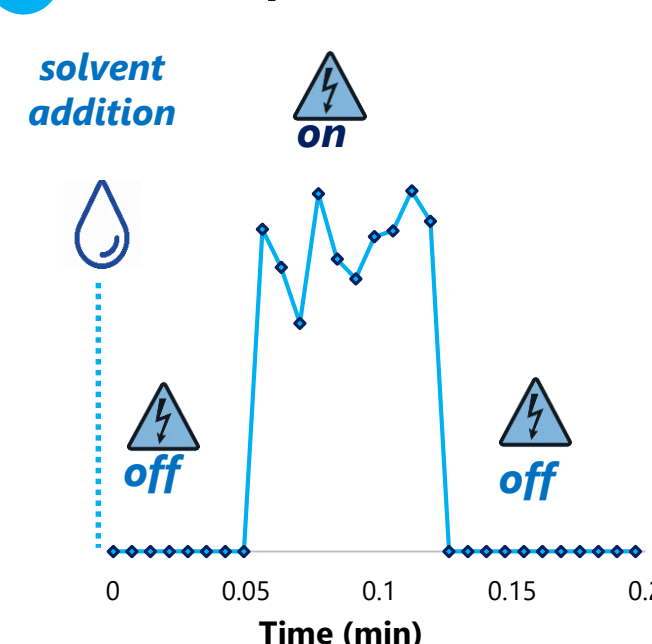
*In this work, we demonstrate how CBS coupled to MS/MS enables rapid screening and quantitation of controlled substances and pain management drugs in bulk and droplet samples of Oral Fluids*

**Our results corroborate that analyte collection times must be selected on the basis of signal-to-noise ratios, rather than mere instrumental signal as when performing SPME-LC-MS/MS based analysis [3-4]**

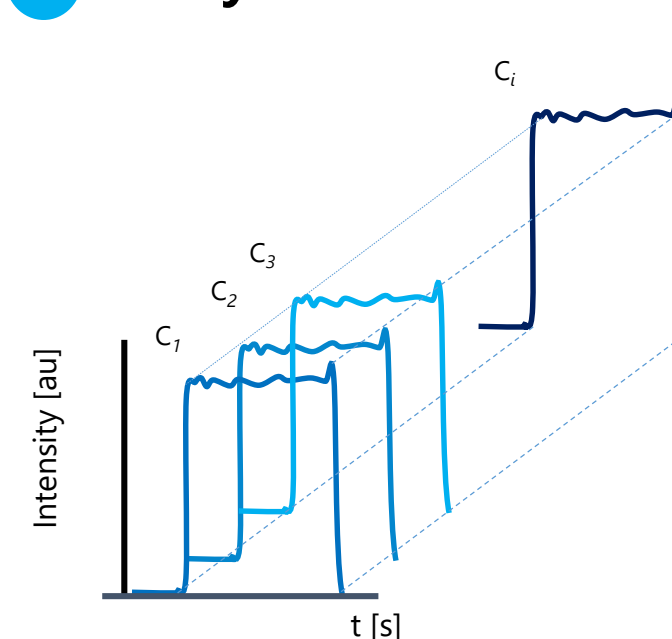
### A Extraction → B Elution/Ionization → C Analysis via direct-to-MS



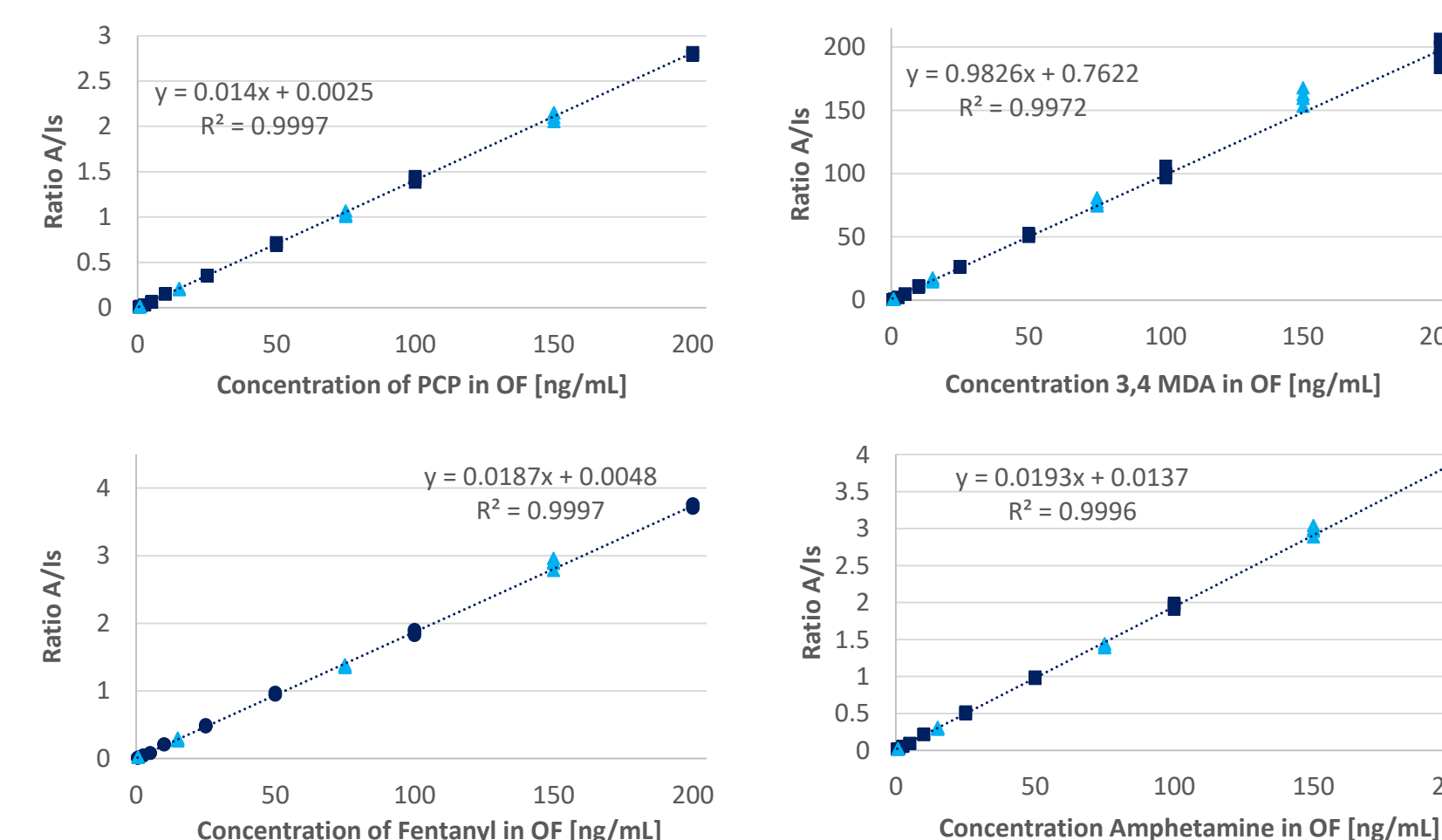
1. Blade is immersed on a vial/vessel containing the sample of interest.
2. Quick agitation (<5 min).
3. Then, the coating is rapidly rinsed with water (<10 s).



1. CBS device is placed in the front-end of the MS system for analysis.
2. A droplet of solvent is added to the coated area of the device and,
3. High-voltage is applied to the non-coated area of the blade to generate an electrospray from the tip of the blade.



1. Ratio of analyte signal to the one of the internal standard is calculated.
2. Preferably, isotopic label of the analyte of interest is used for correcting potential variability in the instrumental response



**Figure 3** Matrix match calibration plots in bulk samples of oral fluids (300 µL) via CBS-MS/MS. Validation points indicated with light blue triangles.

**Technical details**  
Elution volume: 10 µL  
Elution time: 10 s  
ESI voltage: 4 kV  
Spray time: 10 s  
Dwell time: 25 ms  
MS: SCIEX-4500 QqQ  
Sample volume: 200 µL

**References** 1. Gómez-Ríos, G.A., et al., *Angewandte Chemie*, 2014, 52, 1403-1407; 2. Gómez-Ríos, G.A., et al., *Trends in Analytical Chemistry*, 2019, 112, 201-211. 3. Kasperkiewicz, et al., *Anal. Chem.*, 2019, 91, 20, 13039-13046. 4. Khaled, A., et al., *Anal. Chem.*, 2020, 92, 8, 5937-5943