

## **Simultaneous determination of eight drugs of abuse and codeine in saliva by liquid chromatography tandem mass spectrometry**

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Saliva is an interesting matrix for roadside or workplace drug testing compared to the more classical urine and blood. Sampling can be easily observed to prevent cheating and can proceed non-invasively. Because of this, authorities can sample independently and medical personnel is redundant at this stage. A possible drawback is the small volume that can be obtained. However, nowadays sensitive techniques are available to circumvent this issue. The detection of drugs of abuse in saliva is often performed by gas chromatography coupled to mass spectrometry. However, with this technique sample preparation is quite demanding and often derivatization is needed. Liquid chromatography coupled to mass spectrometry does not require this additional step. In addition, equal or better sensitivity can be achieved and several compounds can be determined simultaneously. A method using high-performance liquid chromatography coupled to tandem mass spectrometry is described for the determination of drugs of abuse in saliva. The method is able to simultaneously quantify amphetamines (amphetamine, methamphetamine, MDA, MDMA and MDEA), opiates (morphine and codeine), cocaine and benzoylecgonine, by using 3 internal standards. Only 200 µL of saliva was spent for analysis. The sample preparation was simple and consisted of mixed mode phase solid phase extraction. Reversed phase chromatography was performed on a narrow bore phenyl type column at a flow rate of 0.2 ml/min under gradient conditions. The effluent was brought into a quadrupole time of flight instrument by electrospray ionization, without the use of a splitter. Quantification was performed by quadratic regression curves, with the lowest point at 2 ng/ml saliva for all compounds. A validation was performed including within- (RSD < 12%) and between-day precision (RSD < 17%), accuracy (< 12% deviation) and recovery (52.3 – 98.8%). Eventually, the method was applied on samples from presumed drug users.

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