High Throughput Screening and confirmation of 41 Pain Panel Drugs in Oral Fluid by an Integrated On-Line Extraction UHPLC-MS/MS System

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Saliva test is one of the easiest, cost-effective and most accurate ways to measure the presence of drugs in the body. Collecting saliva sample is relatively non- invasive, easier to procure and reduced risk of sample adulteration. However, saliva matrix display much lower levels of drug compounds compared to urine samples, making the need to test at lower cut-off levels more important. Liquid chromatography-tandem mass spectrometry (LC-MS/MS) is a technique of choice for both screening and confirmation lower levels because it is sensitive, specific, and accurate.

Solid Phase Extraction (SPE) is widely used for sample clean up before LC-MS/MS analysis. It is costly and time consuming. Here we present a high throughput, cost effective and sensitive procedure for screening and confirmation of Pain Panel Drugs (PPDs) in Synthetic Saliva using Thomson filter vial for sample preparation and using an integrated On-Line Extraction (OLE)-UHPLC-MS/MS System for sample analysis. The lower limit of quantitation (LLOQ) was 0.2 ng/mL and upper limit of quantitation (ULOQ) was 100 ng/mL. The linearity regression coefficient R^2 was >0.99. The blanks show no interference of the analysis at the LLOQ level. The sub ng/mL level PPDs detection with about three orders of dynamic detection range will cover the clinical research needs.

The sample preparation time was less than a minute by transferring saliva sample to filter vial and diluting with same volume of 60% methanol/water containing internal standard (IS) followed by mixing and press filtering. Forty one pain drugs were evaluated. Two MRM transitions were used for each compound. The first peak and last peak eluted at 0.9 minutes and 3.3 minutes, respectively. Thirteen isotope labeled drugs were used as IS that had retention time spreading from 0.9 minutes to 3.27 minutes. The total method run time was 8.5 min including re-equilibration. The time for the entire procedure is less than 10 minutes.