# Abstract

This study presents de development and validation of an ultra- high performance liquid chromatography – tandem mass spectrometry (UHPLC-MS/MS) method for the simultaneous determination of four parabens (methyl-, ethyl-, propyl-, and butyl-paraben (MeP, EtP, PrP, BuP), four bisphenols (BP) (BPA, BPB, BPF, and BPS) and two alkylphenols (nonyl phenol (NP) and tert-octylphenol (OP) in human placenta samples. After a short sample preparation time the extracts are analysed by UHPLC-MS/MS using negative electrospray ionization. Labeled internal standards and matrix-matched calibration are used for quantification of the compounds. The method was validated according FDA guideline for bio analytical methods using spiked samples at three concentration levels (0.5-5 and 25 ng g−1). The parameters accuracy and precision fulfill the criteria. Calibration curves are linear between 0.5 and 50 ng −1. The limits of detection and quantification are in the range of 0.1-0.3 ng g−1 and 0.2 -0.7 ng g−1, respectively. The applicability of the method was demonstrated on 71 human placenta samples from a Belgian cohort. The detection frequency was highest for OP (95%), EtP (86%), BPA (49%) and BPS (44%). Among the quantified compounds the highest quantification frequency was observed for OP (85%), EtP (65%) and BPA (25%). The concentrations of parabens ranged from 0.5-7.1 ng g−1 for MeP, from 0.5-4.5 ng g−1 for EtP and from 0.5-9.1 ng g−1 for PrP. The levels of bisphenols ranged from 0.5-3.9 ng g−1 for BPA, from 0.6-2.1 ng g−1 for BPF and from 0.8-1.3 ng g−1 for BPS. BPB and NP were not detected and OP levels ranged from 0.5-3.7 ng g−1. The results demonstrate that the developed analytical method is very sensitive and that levels of several compounds with known /suspected endocrine disrupting properties could be detected or quantified in human placenta samples. The results therefore suggest that fetal exposure to these compounds occurs. The method will be useful for studies to evaluate the health effects associated with this prenatal exposure.