Determination of Platinum Originating from Carboplatin in Human Urine and Canine Excretion Products by Inductively Coupled Plasma Mass Spectrometry

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We present highly sensitive, rapid methods for the determination of Pt originating from carboplatin in human urine and canine urine, feces, and oral fluid. The methods are based on the quantification of Pt by inductively coupled plasma mass spectrometry, and allow quantification of 7.50 ng/L Pt in human and canine urine (in 15 μL of matrix), 15.0 ng/L Pt in canine oral fluid (in 15 μL of matrix), and 0.105 ng/g Pt in canine feces (in 5 μg of matrix). Sample pretreatment mainly involved dilution with appropriate diluents. The performance of the methods fulfilled the most recent FDA guidelines for bioanalytical method validation. Validated ranges of quantification were 7.50 to 1.00 × 10⁴ ng/L Pt in human and canine urine, 0.105–30.0 ng/g Pt in canine feces, and 15.0 to 1.00 × 10⁴ ng/L Pt in canine oral fluid. Canine urine and oral fluid cannot be easily obtained. Therefore, we also investigated the validity of the usage of human matrix samples for the preparation of calibration standards and quality control samples as alternatives, to be used in future clinical studies. The assays are used to support biomonitoring studies and pharmacokinetic studies in pet dogs treated with carboplatin.