

## Determination of metronidazole in blood plasma and pharmaceutical sample by high performance liquid chromatography (HPLC) after preconcentration using directly suspended droplet microextraction (DSDME)

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**Background and Aims:** Sample preparation is a necessary part of any analytical procedure, especially in biological samples content trace amounts of drugs. Because of common techniques inability to determination of trace pharmaceutical samples, separation science has been focused on the development of new sample preparation techniques, which are more effective. Directly Suspended Droplet Microextraction (DSDME) is a novel sample preparation technique, whose main advantage is simple operation with a high enrichment factor, low cost, and low consumption of organic solvent. This method was applied to determination of trace amounts of metronidazole in blood after preconcentration and separation from complicated matrix of plasma.

**Methods:** In this work, a free suspended droplet of an organic solvent (25  $\mu$ l) is delivered to the top-center of an aqueous sample (5 ml) while being agitated by a stirring bar placed on the bottom of the sample vial. After 25 min, the organic droplet which contains extracted metronidazole, withdrawn with a syringe and injected into the HPLC. Effect of various parameters, such as organic solvent, extraction time, microdroplet volume, PH and stirring speed were investigated. All experiments were carried out at room temperature.

**Results:** Under the optimal conditions, metronidazole was preconcentrated by enrichment factors ranged from 100 to 150. Linearity ( $r = 0.999$ ), was obtained in the range of 0.2–3000 ng.ml<sup>-1</sup> and limit of detection was 0.11 ng.ml<sup>-1</sup>. Relative standard deviations ( $n=8$ ) were 2.09% and 0.72% for 9 and 2000 ng.ml<sup>-1</sup>, respectively. The method was successfully applied to determination of metronidazole in biological and pharmaceutical samples.

**Conclusions:** The aim of the present work was to develop a rapid, sensitive and reliable method for the quantitative determination of drugs in many complicated matrixes. The results were obtained indicate that the method has a high enrichment factor, good linearity, reasonable recovery and excellent selective clean up of samples.

**Keywords:** Droplet; Biological samples; Metronidazole; Preconcentration; HPLC