

MOLECULARLY IMPRINTED POLYMERIC NANOPARTICLES AS PLASTIC ANTIBODIES FOR DETERMINATION OF COCAINE

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Drug consumption is considered a health problem and a problem of urban violence. Cocaine (COC) is an illicit drug that is the second most commonly consumed overall, after cannabis [1]. In this work, we have developed a protocol for the determination of cocaine using molecularly imprinted polymeric nanoparticles (nanoMIPs) as antibody mimics in ELISA assay. For that, nanoMIPs were obtained via solid-phase synthesis. After that these nanoparticles were used as mimics of antibodies in competitive ELISA for the detection of COC.

The average hydrodynamic diameters of nanoMIPs were 234.9 nm and the polydispersity index was 0.149. These values obtained confirm their nanoscale sizes and then were tested as plastic antibodies in ELISA assay for the determination of COC and some of their metabolites. Furthermore, the conditions of ELISA assay were optimized and the specificity was checked through cross reactivity with other kind of drugs.

The results showed that nanoMIPs could be good replacement of antibodies in ELISA assay due to their high selective and sensitive recognition of the respective template. Due to this, nanoMIPs shown linear response in the cocaine concentration range from 10^{-3} nM to 100 nM.

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[1] Almeida, V.; Cassella, R.; Pacheco, W. *Forensic Sci Int.* 2015, 251, 50-55.