Determination of Famotidine as antiulcer drug in serum samples with high selectivity using a MIP-based electrochemical sensor by photopolymerization

Goksu Ozcelikay Akyildiz
Ankara University, Faculty of Pharmacy, Analytical Chemistry Department, Ankara, 06560, Türkiye
goksu.ozcelikay91@gmail.com

Abstract
Famotidine (FAM) is an efficacious competitive drug and a reversible inhibitor of H2-histaminergic receptor action used to manage acid production in the stomach [1]. Electrochemical methods are widely used for analyzing or detecting target analytes from various samples. A molecularly imprinted polymer (MIP) is produced by polymerization in the presence of a target molecule. The polymerization comprises a monomer, initiator, cross-linker, and target molecule. MIP aims to form artificial receptors for target molecules [2]. In this study, a new molecularly imprinted polymer (MIP) based sensor was developed for the selective detection of FAM by the photopolymerization of 4-aminobenzoic acid (4-ABA) in the presence of FAM on the glassy carbon electrode (GCE). The surface characterization was performed with cyclic voltammetry (CV), electrochemical impedance spectroscopy (EIS), and scanning electron microscopy (SEM). The conditions such as monomer: template ratio, dropping volume, photopolymerization time, removal solution, removal, and rebinding time for a successful MIP system were tested. The analytical performance of the NIP (non-imprinting polymer) based sensor was also evaluated to control the MIP-based sensor. The selectivity of the developed sensor was also tested with similar compounds with FAM. The results showed that the developed sensor could achieve to detection of FAM from synthetic serum samples. The analytical performance of the sensor was evaluated, and it seems a good correlation between the concentration of FAM and currents.

References

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