A novel Molecularly Imprinted Sensor based on Gold Nanoparticles/Reduced Graphene Oxide/Single-Walled Carbon Nanotubes Nanocomposite for the Detection of pefloxacin

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A molecularly imprinted electrochemical sensor was developed for the detection of pefloxacin. The molecularly imprinted polymer (MIP) was prepared via electrodeposition on the surface of a gold nanoparticles/reduced graphene oxide/single-walled carbon nanotubes modified glass carbon electrode by incorporation of pefloxacin as a template molecule during the electrochemical polymerization of o-phenylenediamine. The nanocomposite of gold nanoparticles/reduced graphene oxide/single-walled carbon nanotubes was obtained by one-step electrochemical reduction. Differential pulse voltammogram (DPV) showed a linear pefloxacin concentration range from 5.0×10^{-7} mol/L to 2.0×10^{-5} mol/L, and the detection limit was 1.6×10^{-8} mol/L. The sensor also showed high selectivity, stability and reproducibility. Moreover, the sensor was successfully applied in the analysis of actual milk samples with satisfactory recovery rates.

Keywords: molecularly imprinted polymer (MIP); electrochemical sensor; pefloxacin; gold nanoparticles/ reduced oxide graphene/ single-walled carbon nanotubes

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