A new fluorescent sensor for dopamine detection via the generation of silver nanoparticles
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Abstract: A new strategy was designed for detecting dopamine (DA) based on the fluorescent quenching of fluorescein dye by the generation of silver nanoparticles (AgNPs). The detection principle was based on the reduction of Ag⁺ to the AgNPs by DA. The results showed that the surface plasmon band of the generated AgNPs was overlapped with the excitation spectrum of the fluorescein dye thus resulting in the fluorescent quenching phenomenon. Based on this observation, the detection of DA can be carried out by measuring the degree of fluorescent quenching of the fluorescein dye. In the presence of DA, the fluorescence intensity of the fluorescein dye can be selectively quenched while other related compounds showed less effect to the fluorescent signal. The proposed sensor could efficiently be used for DA sensing at the lowest concentration around 10 nM.

Keywords: Fluorescent dye; Fluorescent quenching; Chemical sensors; Fluorescent sensors