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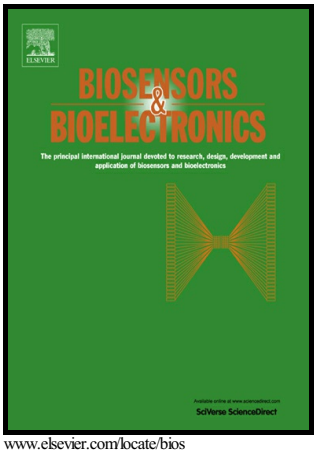

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Nitrogen-doped graphene quantum dots-labeled epitope imprinted polymer with double templates via the metal chelation for specific recognition of cytochrome c

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ABSTRACT

A novel fluorescent sensor nitrogen-doped graphene quantum dots (N-GQDs)/SiO_2/molecular imprinting polymer（N-GQDs/SiO_2/MIP）was fabricated by surface imprinting and epitope imprinting to recognize and detect the target protein cytochrome c (Cyt C) with fluorescence quenching. In the polymerization process, the C- and N-terminal nonapeptides of Cyt C were selected as the double templates which were fixed by functional monomer (zinc acrylate) through metal chelation and steady six-membered ring. The linear range of fluorescence quenching for this receptor towards Cyt C was 0.20-60 μM, and the detection limit was 0.11 μM. The precision for six times replicate determination of Cyt C at 30 μM was 1.20%, and the imprinting factor (IF) was 3.06. The recoveries of the material to Cyt C in urine were 99.3% to 114.0%. In brief, this work proposed a strategy to prepare a new type fluorescent imprinting polymer based on N-GQDs and provided an attractive perspective for the detection of protein by using the combination of N-GQDs and molecular imprinting technique.