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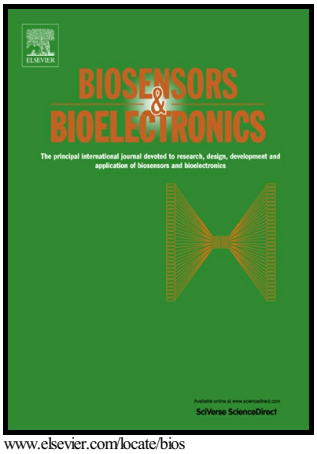

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Switchable fluorescence of gold nanoclusters for probing the activity of alkaline phosphatase and its application in immunoassay

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A B S T R A C T

In this work, a novel strategy for modulating the fluorescence of gold nanoclusters (Au NCs) is developed. The fluorescence of bovine serum albumin (BSA) protected Au NCs is firstly quenched by $KMnO_4$ and then restored by ascorbic acid (AA) due to the deterioration/restoration of the surface structure. Based on which, a novel "switch–on" fluorescent assay for probing the activity of alkaline phosphatase (ALP) is developed with a detection limit as low as 0.002 U/L. In addition, this testing protocol is also expanded to the detection of the inhibitor of ALP and mouse IgG (as a model), the detection limits are 15 ng/mL for the inhibitor of 2,4–Dichlorophenoxyacetic acid (2,4–DA) and 1.5 pg/mL for mouse IgG. The present method paves a new way to develop convenient, sensitive, and selective metal NCs–based fluorescent "turn–on" probes with promising applications in versatile biosensing.

Keywords: gold nanoclusters, alkaline phosphatase, immunoassay, fluorescent