Short Communication

A Novel Photoelectrochemical Assay for Cysteine Based on the Target-Induced Generation of Photosensitizer

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A novel photoelectrochemical (PEC) assay was proposed for the specific detection of cysteine (Cys) based on the strategy of target-triggered generation of photosensitizer. The photosensitizer precursor, 1-(2,4-dinitrobenzenesulfonyl)-2-dihydroxybenzene (**1**), was obtained by coupling 2,4-dinitrobenzenesulfonyl chloride with catechol (CA). In the presence of Cys, compound **1** can be specifically converted to CA which could coordinate on the surface of TiO₂ nanotubes (TiO₂ NTs) and act as effective photosensitizer. The resulted CA-decorated TiO₂ NTs displayed a significantly enhanced photocurrent response. Thus, an efficient Cys PEC assay was obtained with high sensitivity and selectivity. Moreover, the proposed strategy for the development of PEC assays by adapting the target-responsive photosensitizer precursor would provide a general format for versatile PEC sensing.

Keywords: Photoelectrochemical, TiO₂ nanotubes, Cysteine, Photosensitizer

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