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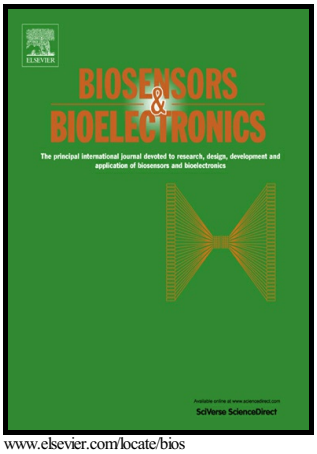

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Target-triggered signal-on ratiometric electrochemiluminescence sensing of PSA based on MOF/Au/G-quadruplex

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ABSTRACT

Signal-amplified ratiometric electrochemiluminescence (Sa-RECL) provides an attractive appoch to maximize signal-to-noise ratio through enhancing signals and eliminate interferences. In this work, we prepared a novel metal-organic framework (MOF)/Au/G-quadruplex as both quenchers and enhancers to fabricate a target-triggered ratiometric ECL sensor for high sensitive and accurate detection of prostatic specific antigen (PSA). The ratiometric ECL sensor using the dual-potential-dependent ECL emitters (quantum dots (QDs) and luminol) and MOF/Au/G-quadruplex not only achieved signal self-calibration but also realized cooperative amplification. After the sequential hybridization among of complementary DNA-QDs, PSA aptamer and pDNA-Au-Hemin-MIL-DNAzyme and the further competition of PSA, the pDNA-Au-Hemin-MIL-DNAzyme probe would keep away from the electrode surface, causing a switchover of their ECL signals from “off-on” state to “on-off” state. The ratiometric ECL aptasensor exhibits high-sensitive and accurate analytical performance toward PSA with a linear detection range from 0.5 to 500 ng mL^{-1} and a detection limit of 0.058 ng mL^{-1} (S/N = 3). The novel ratiometric ECL

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