

Short communication

Electrochemical Determination of Protease with Improving Sensitivity by Electrochemical-chemical-chemical Redox Cycling

Guo-Cheng Han, Jiating Hou, Xiao-Zhen Feng, Zong-Li Huang, Wang Gu and Zhencheng Chen*

School of Life and Environmental Sciences, Guilin University of Electronic Technology, Guilin, Guangxi 541004, People's Republic of China

*E-mail: chenzhchen@163.com

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Redox-labeled peptides attached on the electrode surface have allowed for the determination of various proteases. Herein, we reported a simple method to improve the sensitivity of redox-labeled electrochemical protease biosensors by employing an electrochemical-chemical-chemical redox cycling. Specifically, ferrocene (Fc) conjugated to the peptide substrate immobilized onto the electrode surface was oxidized into ferrocenium (Fc^+); then, Fc was regenerated from Fc^+ by ascorbic acid. In the presence of tris(2-carboxyethyl)phosphine (TCEP), ascorbic acid was also regenerated immediately after its oxidation, therefore resulting in the further increase in the oxidation current. To demonstrate the feasibility of this amplified strategy, thrombin was tested as a model analyte.

Keywords: Proteases; Electrochemistry; Redox-label; Signal amplification; Redox cycling

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