

## Fabrication of an Electrochemical Sensor for *Helicobacter pylori* in Excrement Based on a Gold Electrode

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doi: 10.20964/2017.10.19

Received: 16 June 2017 / Accepted: 29 July 2017 / Published: 12 September 2017

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This study presented the determination of *Helicobacter pylori* using a gold electrode (AuE)-based electrochemical biosensor in which the electroactive label was  $\beta$ -cyclodextrin ( $\beta$ -CD). The covalent immobilization of a thiol-decorated single-stranded DNA probe on the AuE surface occurred through the formation of a Au–S bond. The DNA hybridization was monitored via the differential pulse voltammetry (DPV) method, where the electrochemical signals for reduction of the  $\beta$ -CD bound to the double-stranded DNA (dsDNA) were measured. The electrochemical signal was linearly related to the target DNA concentration (0.3 nM–0.24  $\mu$ M) when measured under optimal conditions, and the limit of detection (LOD) was determined to be as low as 0.15 nM, suggesting that measurements with our developed biosensor were highly repeatable and reproducible. In addition, our proposed biosensor was successfully applied to the determination of *Helicobacter pylori* in excrement.

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**Keywords:** Electrochemical biosensor;  $\beta$ -cyclodextrin; *Helicobacter pylori*; Excrement; Thiol modification

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