

Abstract

Rapid and Label-Free Electrochemical DNA Biosensor for Detecting Hepatitis A Virus [†]

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The hepatitis A virus (HAV) presents one of the most important foodborne pathogens causing a worldwide health problem each year. The control of HAV outbreaks remains difficult as conventional PCR-based methods fail to detect low levels of the virus in water and foods. We developed a highly sensitive and specific analytical method for detection of HAV. The device comprises a thiol-terminated DNA probe, complementary to the specific HAV sequence, embedded onto a gold electrode where the DNA hybridization is a sensing mechanism. The electrochemical measurements demonstrated that this device detected HAV DNA template over a wide concentration range from 10 fg/ μ L to 1 ng/ μ L with the calculated limit of detection of 0.398 fg/ μ L for the complementary ssDNA sequence and 3.2 fg/ μ L for viral cDNA obtained by PCR, respectively. The DNA-sensor developed can be potentially adopted as an easy-to-use and low cost method for screening HAV in contaminated food samples.

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