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Rapid and portable aflatoxin sensor using screen printed graphene electrode

In this work, we present a new electrochemical DNA biosensor using screen-printed graphene electrode and Hoechst 33258 intercalator for detection of *Aspergillus flavus* DNA that produces aflatoxin B1. The principle of detection is based on suppression of activity of redox molecules (H33258), which will be intercalated between A-T based of hybridized DNA of *Aspergillus flavus* that produces aflatoxin B1, resulting in a decrease of anodic current (ΔI). There are five processes including DNA extraction, DNA amplification, hybridization, mediator mixing and electrochemical detection. For electrochemical detection, the detected current will be converted to aflatoxin concentration within 20 s. The measured value will be shown on LED display. A good linear relationship in obtained over concentration range of 0 to 400 ppb. The developed AflaSense was applied to successfully determine aflatoxin in 52 samples.

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