

## A DNA-Based Nano-biosensor for the Rapid Detection of the Dengue Virus in Mosquito

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**Abstract :** This paper describes the development of a DNA-based nanobiosensor to detect the dengue virus in mosquito using electrically active magnetic (EAM) nanoparticles as the concentrator and electrochemical transducer. The biosensor detection encompasses two sets of oligonucleotide probes that are specific to the dengue virus: the detector probe labeled with the EAM nanoparticles and the biotinylated capture probe. The DNA targets are double hybridized to the detector and the capture probes and concentrated from nonspecific DNA fragments by applying a magnetic field. Subsequently, the DNA sandwiched targets (EAM-detector probe-DNA target-capture probe-biotin) are captured on streptavidin modified screen printed carbon electrodes through the biotinylated capture probes. Detection is achieved electrochemically by measuring the oxidation-reduction signal of the EAM nanoparticles. Results indicate that the biosensor is able to detect the redox signal of the EAM nanoparticles at dengue DNA concentrations as low as 10 ng/ul.

**Keywords :** dengue, magnetic nanoparticles, mosquito, nanobiosensor

**Conference Title :** ICNB 2015 : International Conference on Nanotechnology and Biotechnology

**Conference Location :** Melbourne, Australia

**Conference Dates :** December 13-14, 2015