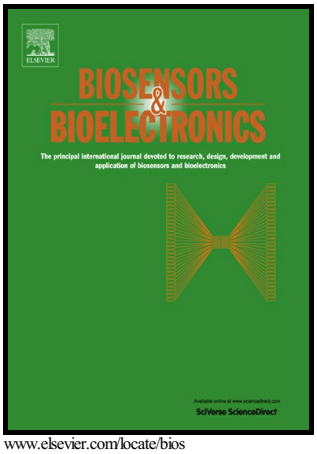

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PII: S0956-5663(17)30825-4
DOI: https://doi.org/10.1016/j.bios.2017.12.028
Reference: BIOS10173

To appear in: *Biosensors and Bioelectronic*

Received date: 30 September 2017
Revised date: 15 December 2017
Accepted date: 19 December 2017

Cite this article as: Syed Rahin Ahmed, Jack Mogus, Rohit Chand, Eva Nagy and Suresh Neethirajan, Optoelectronic Fowl Adenovirus Detection Based on Local Electric Field Enhancement on Graphene Quantum Dots and Gold Nanobundle Hybrid, *Biosensors and Bioelectronic,* https://doi.org/10.1016/j.bios.2017.12.028

Optoelectronic Fowl Adenovirus Detection Based on Local Electric Field Enhancement on Graphene Quantum Dots and Gold Nanobundle Hybrid

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ABSTRACT

An optoelectronic sensor is a rapid diagnostic tool that allows for an accurate, reliable, field-portable, low-cost device for practical applications. In this study, template-free *In situ* gold nanobundles (Au NBs) were fabricated on an electrode for optoelectronic sensing of fowl adenoviruses (FAdVs). Au NB film was fabricated on carbon electrodes working area using L(+) ascorbic acid, gold chroloauric acid and poly-*l*-lysine (PLL) through modified layer-by-layer (LbL) method. A scanning electron microscopic (SEM) image of the Au NBs revealed a NB-shaped Au structure with many kinks on its surface, which allow local electric field enhancement through light–matter interaction with graphene quantum dots (GQDs). Here, GQDs were synthesized through an autoclave-assisted method. Characterization experiments revealed blue-emissive, well-dispersed GQDs that were 2–3 nm in size with the fluorescence emission peak of