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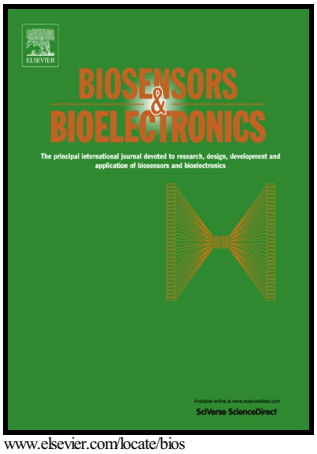

www.elsevier.com/locate/bios

PII: S0956-5663(18)30251-3
DOI: https://doi.org/10.1016/j.bios.2018.03.068
Reference: BIOS10394

To appear in: *Biosensors and Bioelectronic*

Received date: 6 January 2018
Revised date: 22 March 2018
Accepted date: 28 March 2018

Cite this article as: Kislay Singh, Swadha Jaiswal, Richa Singh, Sana Fatma and Bhim Bali Prasad, One-by-one imprinting in two eccentric layers of hollow core-shells: sequential electroanalysis of anti-HIV drugs, *Biosensors and Bioelectronic,* https://doi.org/10.1016/j.bios.2018.03.068

One-by-one imprinting in two eccentric layers of hollow core-shells: sequential electroanalysis of anti-HIV drugs

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ABSTRACT

Double layered one-by-one imprinted hollow core-shells@ pencil graphite electrode was fabricated for sequential sensing of anti-HIV drugs. For this, two eccentric layers were developed on the surface of vinylated silica nanospheres to obtain double layered one-by-one imprinted solid core-shells. This yielded hollow core-shells on treatment with hydrofluoric acid. The modified hollow core-shells (single layered dual imprinted) evolved competitive diffusion of probe/analyte molecules. However, the corresponding double layered one-by-one imprinted hollow core-shells (outer layer imprinted with Zidovudine, and inner layer with Lamivudine) were found relatively better owing to their bilateral diffusions into molecular cavities, without any competition. The entire work is based on differential pulse anodic stripping voltammetry at double layered one-by-one imprinted hollow core-shells. This resulted in indirect detection of electro inactive targets with limits of detection as low as 0.91 and 0.12 (aqueous sample), 0.94 and 0.13 (blood serum), and 0.99 and 0.20 ng mL^{-1} (pharmaceutics) for lamivudine and zidovudine, respectively in anti-HIV drug combination.