

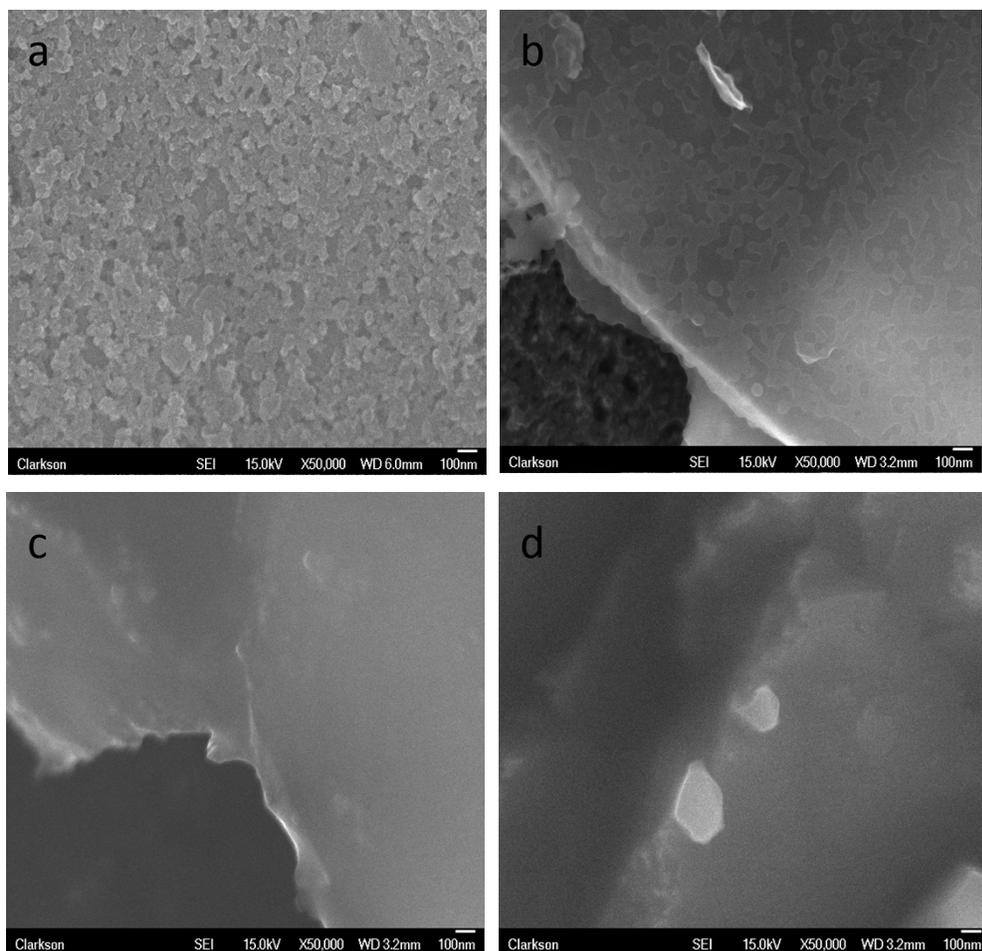
## SUPPORTING INFORMATION

### **A generic amplification strategy for electrochemical aptasensors using a non-enzymatic nanoceria tag**

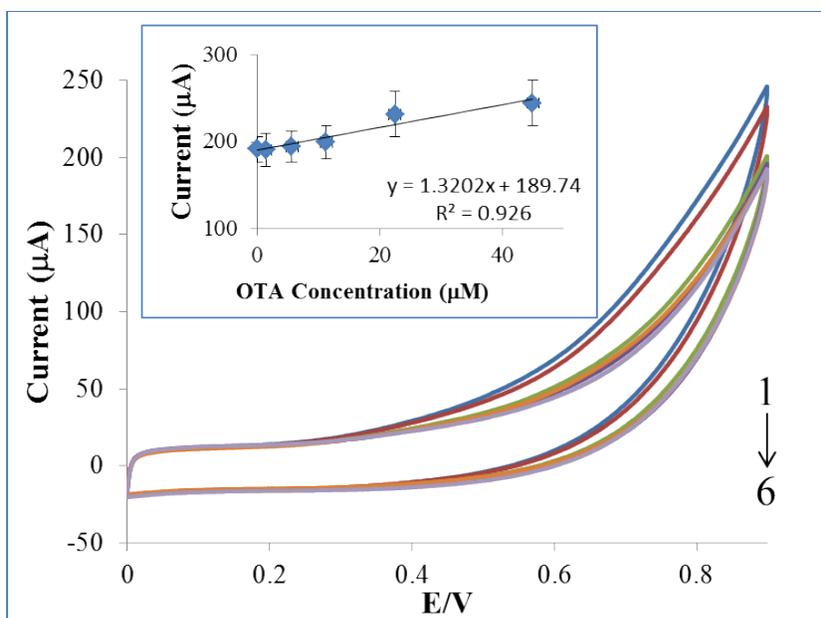
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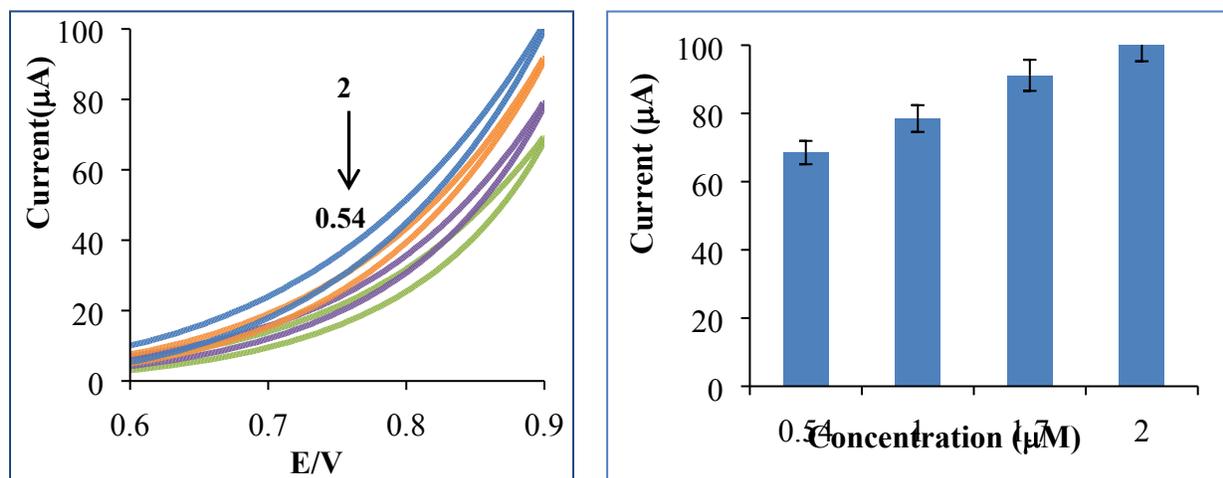
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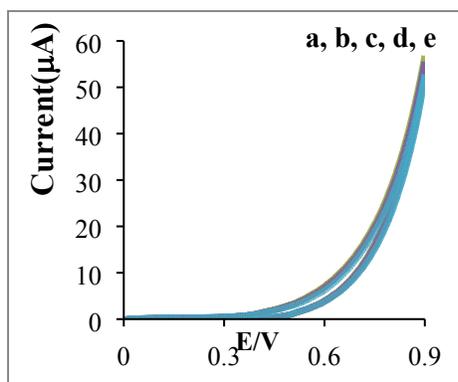
**Figure S1.** SEM image of nCe; a) bare SPCE; b) GO modified SPCE; c) GO/EDC modified SPCE; d) GO/EDC/aptamer modified SPCE: white spots indicating the presence of aptamer on the electrode surface.



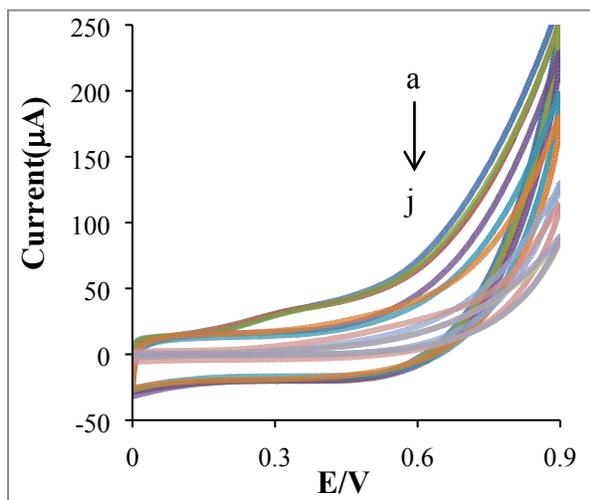
**Figure S2.** Cyclic voltammograms of  $\text{H}_2\text{O}_2$  oxidation obtained using 16.5 mg/mL nCe incubated with different OTA concentrations of **1)** 45  $\mu\text{M}$  **2)** 22.5  $\mu\text{M}$  **3)** 11.25  $\mu\text{M}$  **4)** 5.625  $\mu\text{M}$  **5)** 1.40625  $\mu\text{M}$  **6)** 0.08  $\mu\text{M}$  OTA (inset shows the OTA concentration dependency at 0.9 V).



**Figure S3. A)** Cyclic Voltammograms of 0.2 M  $\text{H}_2\text{O}_2$  with different amounts of nCe-OTA. **B)** Corresponding bar graph.



**Figure S4.** Cyclic Voltammograms of 0.2 M  $\text{H}_2\text{O}_2$  with cerium oxide a) 0 b) 30 c) 120 d) 300 e) 1200 seconds.



**Figure S5.** Cyclic Voltammograms of 0.2 M  $\text{H}_2\text{O}_2$  in the presence of nCe-OTA with varying concentrations of free OTA of a) 0.001 b) 0.01 c) 0.02 d) 0.1 e) 0.5 f) 0.9 g) 5 h) 10 i) 50 j) 180 nM.

**Table S1.** Characterization of nCe particles and nCe-OTA complex

<b>Sr No</b>	<b>Name</b>	<b>DLS particle Size distribution (nm)</b>	<b>Zeta Potential (mV)</b>
<b>1</b>	nCe particles	18.9±1.5	34.5±3.4
<b>2</b>	nCe particles-OTA complex	22±1.1	26±1.4

**Table S2.** Summary of performance characteristics of the designed sensor in comparison with other OTA ELISA based affinity immuno/aptamer assays and nanomaterials integrated aptasensors.

<i>Method</i>	<i>Detection Principle</i>	<i>Detection Limit (ng/mL)</i>	<i>Linear Range (ng/mL)</i>	<i>Refs.</i>
Electrochemical detection	Competitive ELISA assay using monoclonal antibodies in direct and indirect format on screen printed carbon electrode	60	0.05–2.5	[1]
Optical Waveguide Lightmode Spectroscopy	Competitive and indirect immunoassays based on the immobilization of antibodies onto a sensor chip, which is used in a flow-injection analyzer system		0.5 -10	[2]
Electrochemical detection	Two indirect competitive enzyme-linked immunosorbent assay strategies developed by using ALP and HRP as enzyme labels	0.3 , 0.7	0.7 - 138	[3]
Electrochemical detection	Free OTA competed with labeled alkaline phosphatase–OTA for the binding to the DNA aptamer immobilized on magnetic beads	0.11	0.11–15	[4]
Colorimetric Detection	Direct competition between free OTA and OTA-HRP conjugate for the immobilized aptamer	1	1-80	[5]
Electrochemical detection	Paramagnetic microparticle beads functionalized with an aptamer specific to OTA, were allowed to compete with a solution of mycotoxin conjugated to HRP (OTA–HRP) and free OTA.	0.07±0.01	0.78–8.74	[6]
Electrochemical detection	Automated flow-based electrochemical aptasensor based on magnetic beads as immobilization support for OTA detection. The OTA beads were immobilized on a screen printed carbon electrode surface	0.05		[7]
Electrochemical detection	Thiolated aptamers specific to OTA immobilized by chemisorption to a gold electrode surface; addition of target analyte changed the electron transfer resistance.	0.052	0.043-43	[8]
Electrochemical Detection	Competition between free and nanoceria labeled OTA on an aptamer GO coated screen printed carbon electrode	0.043	0.065 - 78	<b><i>This work</i></b>

## References

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