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Abstract

Carbon-dot wrapped ZnO nanoparticle-based photoelectrochemical sensor for selective monitoring of H2O2 released from cancer cells

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Abstract:
This study reports on a simple approach for the fabrication of an electrode modified with biocompatible C-dot wrapped ZnO nanoparticles for selective photoelectrochemical monitoring of H2O2 released from living cells. The biocompatibility of the ZnO nanoparticles was confirmed through in-vitro cellular testing using the MTT as-say on Huh7 cell lines. The ZnO nanoparticles wrapped with dopamine-derived C-dots possess numerous catalyti-cally active sites, excessive surface defects, good electrical conductivity, and efficient separation ability of photo-in-duced electrons and holes. These properties offer highly sensitive and selective non-enzymatic photo-electrochem-ical monitoring of H2O2 released from HeLa cells after stimulation with Nformylmethionyl-leucyl-phenylala-nine. The sensor has a wide linear range (20–800 nM), low detection limit (2.4 nM), and reliable reproducibility, this implying its suitability for biological and biomedical applications.

Biography:

Naeem Akhta, COMSATS University Islamabad, Pakistan. is Submitted her abstract on the Webinar on Pharmaceutical Nanotechnology; September 22, 2020; Paris, France.

Recent Publications:

1. Naeem Akhta, et al; Why Severity Rate of COVID-19 is High in Patients with Diabetic Mellitus: A Brief

Insight It is caused by Severe Acute Respiratory Syndrome-Coronavirus-2 (SARS-CoV-2), 2020.

2. Naeem Akhta, et al; H2O2 Screening from Saliva of Gum Diseased-patient through CN-dot Wrapped Cu2O Nano-frogspawns Ionic Liquid Nanocomposite, 2020.
3. Naeem Akhta, et al; Orange Peel Derived C-dots Decorated CuO Nanorods for the Selective Monitoring of Dopamine from Deboned Chicken, 2019.
4. Naeem Akhta, et al; Facilely green synthesis of 3D nano-pyramids Cu/Carbon hybrid sensor electrode materials for simultaneous monitoring of phenolic compounds, 2018
5. Naeem Akhta, et al; Fabrication of highly stable silver nanoparticles with shape-dependent electrochemical efficacy, 2018.

Webinar on Pharmaceutical Nanotechnology; September 22, 2020; Paris, France

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