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Development of a nanosensor based on the quenching effect of MWCNTs for glucose monitoring in serum

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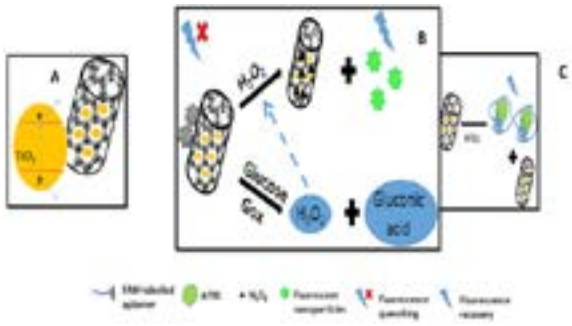
In this work, multi walled carbon nanotubes (MWCNTs) ability to accept and store electrons upon contact with photo-irradiated TiO2 nanoparticles, has been investigated. The stored electrons can be discharged on demand upon addition of electron acceptors to the TiO_2–MWCNTs composite. These unique characteristics enabled us to probe the fluorescence quenching properties of the as synthesized nanocomposite. The alteration in the fluorescence quenching properties upon incubation with hydrogen peroxide (H_2O_2) provided a novel way to monitor glucose level in human blood serum. Excellent analytical performance was obtained with a dynamic range from 5 to 200 µM and low limit of detection (0.5 µM). We have further demonstrated the potential of the developed nanocomposite to design fluorescence based aptasensing platform, with aflatoxin B1 as model analyte. This promising technology can be used in new ways for diverse (bio) sensing applications.



Biography

Amina Rhouati has completed her PhD at the age of 25 years from Perpignan University, France. Currently, she is working as a lecturer in the Higher school of Biotechnology in Algeria. Her research focuses on biosensors and nanomaterials. Akhtar hayat has completed his PhD in Perpignan University and postdoctoral in Potsdam University, New York. Currently, he is working in Interdisciplinary Research Centre in Biomedical Materials, Pakistan as a head group of sensors and biosensors. He has published more than 65 publications. Jean Louis Marty is Professor in Perpignan University. He has been working in biosensing field for more than 30 years. He published more than 250 publications.

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