

Hybrid Two-Dimensional Nanomaterials for Early Cancer Diagnosis Applications

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Abstract

The high demand for low cost, the reusable device with short-time the process subsequently able to standard electrochemical biosensing has accelerated the phenomenon. An ambitious development on cancer diagnosis and food science, the consumable gold transducer ensures the fast response, high selective detection, and measurement of various analytes in complicated samples. We exposed that self-assembled monolayer functionalized on hybrids two-dimensional nanomaterials the gold transducer. Due to the advantages of nanostructures, the layer-by-layer assembled with gold nanoparticles (AuNPs) decorating the lower generation (G1-G3) reduced graphene oxide (rGO) core poly(amidoamine) dendrimer (PD) nanohybrids thin film characterized by the spectroscopy techniques. Their morphologies, structures, electrochemical properties, and gene nano biosensing performances characterized and evaluated. AuNPs/GG2PDbased probe displayed the best excellent structural stability, lowest mobility on Au electrode surface with the increasing charge resistance, and the lowest limit of detection (1.87 aM) in comparison with both AuNPs/GG1PD-based and AuNPs/GG3PD-based probes. This work will provide a new candidate for the development of metal nanoparticles functionalized PD with inorganic non-metallic nanomaterials as cores with 3D fractal nanoarchitecture and promising

electrochemical gene nano biosensing platforms based on dendrimer-nano inorganic hybrids with 3D nano architectures and LBL assembly for fast and ultra-trace detection of label-free DNA hybridization with potential application in bioanalysis and early cancer diagnosis of genetic diseases.

Biography

I would like to introduce myself as Dr. Kumarasamy Jayakumar, Post-doctoral researcher, Bilkent University – National Nanotechnology Research Centre of Turkey, Institute of Materials Science and Nanotechnology in Turkey(2021). Moreover, I had completed my M.Sc. degree at Annamalai University, India in 2007. During, M.Phil., Chemistry from Madurai Kamaraj University, Madurai, Tamil Nadu, India in 2008 and a Ph.D. degree from the Alagappa University, Karaikudi, Tamil Nadu, India in 2015. He received his post-doctoral researcher position at Pusan National University, Busan in South Korea between March 2015 to August 2015 followed by Post-doctoral appointments from Department of Chemistry, Nanjing University, Nanjing, China(2017 to 2019). He also reviewed high repeated national and international journals and participated in oral presentations for national and international conferences in India, Europe, and China. Currently, He has contributed to published more than eight research articles for high repeated and international journals over the last five years. Although, the electrochemical DNA biosensing articles reached 150 citations and h-index 8 and one book chapter.