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Abstract

Innovative Surface Designs for Sensing Applications †

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An essential problem in the field of advanced sensing systems is the search for innovative surfaces that can combine an effective immobilization of biomolecules or behave directly as an enzyme mimic with increased analytical performance. Nanomaterials have drawn a lot of interest in recent years for the creation of novel bioplatforms with ideal topologies and adequate structural and electronic characteristics because of their distinctive physicochemical qualities [1]. In addition, conjugated polymers have emerged as the most exciting research material due to their great immobilization architecture for biomolecules, low-cost synthesis procedures, and good conductivity properties [2]. Quick and reliable monitoring of some important analyte levels in the human body or beverages is required in the market due to an increase in the number of important diseases (such as diabetes, Alzheimer, etc.) every year. To provide this reliable control of important diseases, it needs highly sensitive and easy-to-prepare sensor systems.

This presentation will concentrate on a critical discussion of the surface design, characterization, and analytical applications of innovative architectures for sensing. The impact of functionalization of nanostructures, conjugated polymers, and biorecognition/transduction processes on the analytical performance of the resultant architectures will receive particular focus. The quantification of clinical biomarkers and environmental markers using various sensing architectures will be discussed. An overview of the prospects for the development and commercialization of next-generation sensing technology will also be presented together with our findings.

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