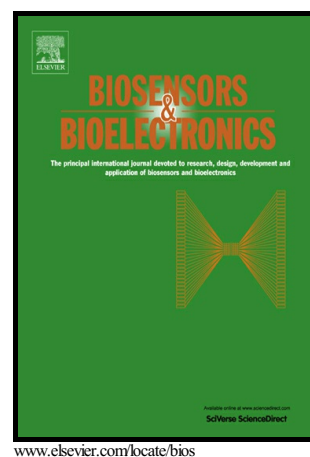


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NANOSTRUCTURED MATERIALS WITH PLASMONIC NANOBIOSENSORS FOR EARLY CANCER DETECTION: A PAST AND FUTURE PROSPECT

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ABSTRACT

Early cancer detection and treatment is an emerging and fascinating field of plasmonic nanobiosensor research. It paves to enrich a life without affecting living cells leading to a possible survival of the patient. This review describes a past and future prospect of an integrated research field on nanostructured metamaterials, microwave transmission, surface plasmonic resonance, nanoantennas, and their manifested versatile properties with nano-biosensors towards early cancer detection to preserve human health. Interestingly, (i) microwave transmission shows more advantages than other electromagnetic radiation in reacting with biological tissues, (ii) nanostructured metamaterial (Au) with special properties like size and shape can stimulate plasmonic effects, (iii) plasmonic based nanobiosensors are to explore the efficacy for early cancer tumour detection or single molecular detection and (iv) nanoantenna wireless communication by using microwave inverse scattering nanomesh (MISN) technique instead of conventional techniques can be adopted to characterize the microwave scattered signals from the biomarkers. It reveals that the nanostructured material with plasmonic nanobiosensor paves a fascinating platform towards early detection of cancer tumour and is anticipated to be exploited as a magnificent field in the future.

Keywords: Nanostructured metamaterial; Nanoantenna; Microwave; Surface Plasmonic Resonance; cancer biomarkers/proteins.

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