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Title: Electrochemical Nano-biosensors as Novel Approach for the Detection of Lung Cancer-related MicroRNAs

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Abstract: Lung cancer is the principal cause of cancer-related death in both men and women (after breast cancer) around the world. Therefore, early detection of the disease is a cardinal step in improving prognosis and survival of patients. Today, the newly-defined microRNAs regulate about 30 to 60 percent of the gene expression. Changes in microRNA Profiles are linked to numerous health conditions, making them sophisticated biomarkers for timely, if not early, detection of cancer. Though evaluation of microRNAs in real samples has proved to be rather challenging, which is largely attributable to the unique characteristics of these molecules. Short length, sequence similarity, and low concentration stand among the factors that define microRNAs. Recently, diagnostic technologies with a focus on wide-scale point of care have recently garnered attention as great candidates for early diagnosis of cancer. Electrochemical nano-biosensors have recently garnered much attention as a molecular method, showcasing great potential in terms of sensitivity, specificity and reproducibility, and last but not least, adaptability to point-of-care Testing. Application of nanoscale materials in electrochemical devices as promising as it is, brings multiplexing potential for conducting simultaneous evaluations on multiple cancer biomarkers. Thanks to their enthralling properties, these materials can be used to improve the efficiency of cancer diagnostics, offer more accurate predictions of prognosis, and monitor response to therapy in a more efficacious way. This article presents a concise overview of recent advances in the expeditiously evolving area of electrochemical biosensors for microRNA detection in lung cancer.

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