A BIOSENSOR BASED ON ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY FOR ANALYSIS OF VASCULAR ENDOTHELIAL GROWTH FACTOR: VEGF-RECEPTOR IMMOBILIZATION BY PAMAM DENDRIMERS

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Recently, breast cancer is one of the most common types of cancer among women. Because of the specific types of malignant breast cancer and the importance of early detection of breast cancer, large numbers of diagnostic and therapeutic studies have been developed [1]. Vascular endothelial growth factor (VEGF), which is a signaling protein, has an important role in cell growth, angiogenesis. Excessive amounts of VEGF stimulate metastasis and tumor growth and angiogenesis [2]. As a result of the biomarker binds to its receptor on endothelial cells in tissue and is secreted the excitation function with cascade mechanism and rapid proliferation of tumor cells to increased amount of VEGF production [3-5].

In this study, a new immunosensor system is developed for detection of VEGF electrochemically. For this purpose, VEGF-receptor (VEGF-R1) was chosen as a bio-recognition element which was immobilized onto gold electrodes. To immobilize VEGF-R1, PAMAM dendrimers were utilized successively. A scheme summarizing the immobilization procedure is given in Figure 1. Principle of the immunosensor was based on the electrochemical impedance spectroscopy (EIS). Current optimization and characterization studies have been completed in detailed. A wide linear detection range in ng/mL levels was obtained. The results showed that the developed immunosensor allowed analyzing VEGF successfully.

![Image of AuE/Cysteamine/PAMAM/VEGFR modified electrode for VEGF detection.](image)

References