DESIGN AND IMPLEMENTATION OF MODIFIED SURFACES: ELECTROCHEMICAL DETECTION OF CANCER CELLS*

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Cancer diagnosis in early stage is of great importance. Therefore, more detection methods are required to be developed on the one hand, how to detect tumor cells simply, sensitively and rapidly is more and more important on the other. Tumor-associated antigens are those tumor-specific or quantitatively more abundant materials on tumor cells. They can be used as markers of cancer cell, as well as the target of medicine. Folate receptor (FR) is a kind of tumor-associated antigen which will be over-expressed in many human tumors, including ovarian carcinomas, choroidplexus carcinomas, and ependymomas. The high affinity between FR and folic acid (FA) makes them work as a bridge connecting medicine with cancer cell, and an attractive property for tumor therapy [1]. In this work; MCF-7 (human breast adenocarcinoma) and PC-3 (human prostate carcinoma) cells were used as model to observe cell association on the modified surfaces. Our data showed that tumor cells can be simply and conveniently detected through the electrochemical method. Initially, gold electrode surface was modified with FA. Before and after injection of cancer cells into the medium, differences between differential pulse voltammetric (DPV) signals as due to the cell-surface interaction were followed. After optimization studies, the analytical characterization of system were carried out.

Figure 1. Schematic representation of FA modified biosensor to detect cancer cells.

Reference

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