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论文

白血病细胞酶联免疫酶催化银沉积于插指电极阵列电化学免疫分析新方法

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摘要:

建立了一种检测白血病细胞表面抗原的细胞酶联免疫电化学分析新方法. 该方法兼有细胞酶联免疫分析抗原、抗体结合的特异性和插指电极阵列酶催化银沉积电化学分析的灵敏性. 在聚苯乙烯微孔板中包被白血病细胞, 先后加入鼠抗人抗体及碱性磷酸酶(ALP)标记的马抗鼠抗体, ALP催化抗坏血酸磷酸酯(AAP)水解成抗坏血酸(AA), AA使银离子还原成银单质并沉积到插指电极阵列表面, 导致插指电极阵列上相邻两个梳齿导通. 通过对电导率的测定, 可实现对细胞表面抗原的高灵敏分析. 此分析方法灵敏度高(可检测出50个左右的HL-60细胞)、特异性好, 且可用于大量样品的分析, 为白血病等肿瘤疾病的早期诊断和免疫分型提供了新技术. 此外, 该方法也可用于细胞表面分子基因工程抗体活性的检测.

关键词: 电化学免疫分析; 酶催化银沉积; 插指电极阵列; 细胞表面抗原

Leukemic Cell-enzyme-linked Immunosorbent Assay Using Interdigitated Electrodes Array with Enzymatic Silver Deposition

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Abstract:

An cell-based ELISA for cell surface antigen using interdigitated electrode array with enzymatic silver deposition was developed. Cell suspension were added to each well of a 96-well clear plate(poly-*L*-lysine coated).The cells were incubated with mouse-anti-human IgG, and then with HRP-conjugated horse-anti- mouse IgG. The interdigitated electrode array was added, the deposition of silver was dispersed over the microgaps and allows the microgapped interdigitated electrodes to be electrically connected, resulting in an increase in electrical conductance of interdigitated electrode array that is used to quantify the cell surface antigen.The electrical conductance signal showed correlation with cell surface antigen.Our results revealed that the electrochemical immunoassay, which was enabling the large-scale analysis of cell surface antigen, has characteristics(analyte specific, low background and low limit of detection) that provide potential for typing of acute leukemia(AL). This novel electrochemical immunoassay can also be applied in measuring the binding activity of engineering antibodies of cell surface molecules.

Keywords: Electrochemical immunoassay; Enzymatic silver deposition; Interdigitated electrodes array; Cell surface antigen

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