

## 基于聚硫堇的一次性O型口蹄疫抗原酶免疫传感器的研制

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摘要:

将O型口蹄疫酶标抗体掺杂于有机-无机溶胶凝胶中, 并修饰于聚硫堇的丝网印刷碳电极表面, 从而制备一次性口蹄疫病毒抗原(FMDV-Ag)酶免疫传感器。试验中采用直接免疫分析法检测口蹄疫病毒抗原。根据免疫反应前后还原峰电流下降的百分率K值的大小实现对抗原的检测。用循环伏安法对免疫电极进行表征并进行对O型口蹄疫抗原样品进行定性检测。在优化的实验条件下, 设定判定标准如下:  $K < 20\%$  为阴性;  $20\% \leq K < 30\%$  为可疑;  $K \geq 30\%$  为阳性。该免疫电极具有较好的特异性、重现性(RSD=5.6%)、稳定性(10天后电流响应为初始值的89.5%)和准确性(与AGP符合率为95%)。因此, 该免疫传感器有望用于O型口蹄疫抗原的快速检测。

关键词: O型口蹄疫抗原, 免疫传感器, 丝网印刷碳电极, 聚硫堇

## Fabrication of Enzyme Immunosensor for Detection of typeO FMDVAg Based On Poly( thionine) modified Screen-printed Carbon Electrode

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**Abstract:**

A disposable electrochemical immunosensor for detection of FMDV based on the poly( thionine) modified screen-printed electrode coated with Chitosan-silica sol-gel doped with HRP-anti-FMDV has been developed in the experiment. Then the immunosensor was characterized by cyclic voltammetry (CV).. Under the optimum conditions of immunoreaction and electrochemical detection, a response current decrease percentage (K) more than 30% was determined to be a statistical cut-off positive criterion to distinguish samples, namely  $K < 20\%$ , negative;  $20\% \leq K < 30\%$ , suspicious;  $K \geq 30\%$ , positive. The immunosensor had acceptable specificity, reproducibility (RSD=5.6%), stability (the amperometric response was 89.5% of the initial response after 10 d) and accuracy (95% of the results obtained by the immunosensor were in agreement with those obtained by AGP). Therefore, the immunosensor could be hopefully used to rapidly detect typeO FMDVAg.

**Keywords:** antigen of foot and mouth disease virus; immunsensor; screen-printed carbon electrode ; polymerization of thionine

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