

## 基于四通道丝网印刷碳电极的禽流感(H5N1)抗体电化学免疫传感器的研制

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摘要:

研制了快速检测禽流感(H5N1)抗体的四通道丝网印刷碳电极电化学免疫传感器。采用循环伏安法表征免疫电极和监测酶促反应, 利用还原电流的变化率来测定禽流感抗体。在优化的实验条件下, 设定判定标准如下:  $K < 20\%$  为阴性;  $20\% < K < 30\%$  为可疑样品;  $K \geq 30\%$  为阳性。该免疫传感器具有较好的选择性、重现性、稳定性和准确性。采用4-SPCE提高了免疫电极的精确性。因此, 该免疫传感器有望用于禽类的宰前检疫, 为禽流感的有效防控提供新方法。

关键词: 电流型免疫传感器; 快速检测禽流感(H5N1)抗体; 循环伏安法; 四通道丝网印刷碳电极

## Electrochemical Immunosensor for Rapid Detection of Anti-AIV H5N1 Based on Four Channels Screen-printed Carbon Electrode

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**Abstract:**

A novel electrochemical immunosensor for detection of antibodies against avian influenza virus H5N1 (anti-AIV H5N1) based on the four channels screen-printed carbon electrode (4-SPCE) coated with chitosan Au colloid membrane and AIV has been developed in the experiment. Then the immunosensor was characterized by cyclic voltammetry (CV). Whether anti-AIV H5N1 could be detected according to the shift of reduction current while CV was used as electrochemical means to detect the products of the enzymatic reaction. Under the optimum experimental conditions, the value of the response current increase percentage (K) was used to distinguish samples:  $K < 20\%$ , negative samples;  $20\% < K < 30\%$ , suspicious samples;  $K \geq 30\%$ , positive samples. The immunosensor had acceptable specificity, reproducibility, stability and accuracy. Furthermore, the 4-SPCE showed much more consistent compared with the classical electrodes. Therefore, effective prevention and control of avian influenza could be supplied by the immunosensor.

**Keywords:** Amperometric immunosensor; Rapid detection of antibodies against avian influenza virus; Cyclic voltammetry; Four channels screen-printed carbon electrode

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