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基于纳米金探针和蛋白芯片高灵敏检测肺癌CEA和CYFRA21-1标志物

Title: Highly sensitive detection of tumor markers CEA and CYFRA21-1 for lung cancer based on gold nanoparticle probes and protein chip

作者: 王文涛; 贾春平; 金庆辉; 赵建龙; 张国俊
郑州大学第一附属医院呼吸内科；中国科学院上海微系统与信息技术研究所

Author(s): Wang Wentao; Jia Chunping; Jin Qinghui; Zhao Jianlong; Zhang Guojun
Department of Respiratory Medicine, First Affiliated Hospital, Zhengzhou University, Zhengzhou, Henan Province, 450052; Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Science, Shanghai, 200050, China

摘要: 目的 构建基于纳米金探针和蛋白芯片的快速、多肿瘤标志物高灵敏检测体系。 方法 将待检测的肿瘤标志物捕获抗体（捕获待测抗原）结合在醛基化修饰的玻片上；用检测抗体制备纳米金探针；经过免疫反应形成三明治夹心结构（蛋白芯片-目标蛋白-纳米金探针）。利用纳米金沉积的方法进行染色，通过肉眼或显微镜观察显色结果。 结果 该蛋白检测体系在1 h内可检测两种肿瘤标志物，其中CEA可检测到最低浓度为45 pg/mL，CYFRA21-1可检测到90 pg/mL，与传统的酶联免疫吸附法(ELISA)相比，检测灵敏度大大提高。并利用此体系，检测肺癌患者及正常人血清，结果与临床所用电化学分析方法一致。 结论 该检测体系操作简单、方便、快速，同时具有高灵敏度、多指标联合检测等优点，在临床蛋白检测中具有重要的价值和应用前景。

Abstract: Objective To construct a rapid and highly sensitive detection system based on gold nanoparticle probes and protein chip. Methods The capture antibody (capture for target antigen) was combined to the aldehyde modified glass, and the nanoparticle probes were prepared using detection antibody. Then, the sandwich structures (protein chip-the target protein-gold nanoparticle probes) were created through the interaction between the antibody and antigen, and dyed by the gold deposition solution. The results were observed with the naked eye or by microscopy. Results For this protein detection system, CEA and CYFRA21-1 could be detected as low as 45 pg/mL and 90 pg/mL respectively in 1 h. The sensitivity was improved greatly, compared with the traditional ELISA method. Using this system, the lung cancer patients and normal people detection results were consistent with clinical used method (electrochemical analysis). Conclusion This system for CEA and CYFRA21-1 detection is an easy, rapid, convenient method with high sensitivity and multiple detection, which might have an important value and great application prospect in the clinical protein detection.

参考文献/REFERENCES

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