

蛋白芯片制作与应用（4）—液态芯片

液态芯片原理

编码微球：分别用不同配比的两种荧光染料将直径 $5.6\mu\text{m}$ 的聚苯乙烯微球（Beads）染成不同的荧光色，从而获得多达 100 种经荧光编码的微球。

交联探针、抗体或抗原：把针对不同检测物的核酸探针、抗体或抗原以共价方式结合到特定荧光编码的微球上。

检测反应：先把针对不同检测物的、用不同荧光色编码的微球混合，再加入被检测物（可以是血清中的抗原、抗体或酶等，也可以是 PCR 产物）。悬液中的微球与被检测物特异性结合，结合物被标记上荧光物质。

激光分析：微球成单列通过两束激光，一束判定微球的荧光编码；另一束测定微球上的报告分子的荧光强度。

1) 液态芯片目前仍然处于基础研究方面，虽然已经有部分临床研究，但可能离大规模应用还有一段距离。

2) 常见的应用如肿瘤、内分泌、自身免疫等的检测，也有人将其用于细胞因子谱判断。

3) 下面是一些液态芯片相关经典的文献，有时间参考一下

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6. Iannone MA.Microsphere-based molecular cytometry. Clin Lab Med,2001.21 (4) :731 -742..

7. Joos TO, Stoll D, Tempini MF. Miniaturised multiplexed immunoassays. Curr Opin Chem Biol,2002,6(1) :76 -80..

8. Dunbar SA, Vander zee CA, Oliver KG, et al. Quantitative, multiplexed detection of bacterial pathogens : DNA and protein applications of the Luminex Lab MAP system. J Microbiol Methods,2003,53 (2) :245 - 252..

9. David Opalka, Charles E. Lachman, Stefani A. MacMullen, et al. Simultaneous Quantitation of Antibodies to Neutralizing Epitopes on Virus-Like Particles for Human Papillomavirus Types 6,11,16, and 18 by a Multiplexed Luminex Assay. Clinical and Diagnostic Laboratory Immunology,2003,10(1) :108-115..