

细胞计数分析传感器芯片的研究

作者：刘清君, 胡宁, 叶伟伟, 余辉, 季勤勤, 方群, 王平

单位：浙江大学生物医学工程与仪器科学学院

基金项目：国家自然科学基金(30700167)，浙江省自然科学基金(Y2080673)，传感技术联合国家重点实验室基金(Skt0702)

摘要：

细胞计数分析在医疗和科学研究方面有着广泛的应用，本论文叙述了一种有效结合了微流控分析和细胞传感器技术，并能够进行细胞计数分析的传感器芯片。通过微加工技术制备的聚二甲基硅氧烷（polydimethylsiloxane, PDMS）微通道，并将PDMS芯片键合在了光寻址电位传感器（light-addressable potentiometric sensor, LAP S）的芯片表面，使其在硅基底上形成了十字形、100 μm宽、30 μm深的微流控通道，通过LAPS光生电流的传感测量，对重力驱动的大鼠血细胞进行了计数分析。该研究将微流控技术引入细胞传感器的研究，有利于后续通过细胞芯片实现细胞计数分析仪器的微型化和多功能化。

关键词：细胞传感器；光寻址电位传感器；微流控芯片；细胞计数分析

Sensor Chip for Cell Counting and Analyzing

Author's Name:

Institution:

Abstract:

Cell counting and analyzing is widely applied in medical and scientific research fields. This study presents a cell counting and analyzing sensor chip combined with microfluidic analysis and cell-based biosensor technology. Polydimethylsiloxane (PDMS) micro-channel was fabricated by micro fabrication technology, and the PDMS chip was bonded onto the surface of light-addressable potentiometric sensor (LAPS), to form a cross microfluidic channel with the width of 100 μm and depth of 30 μm on the silicon substrate. By measuring the photo-current of LAPS, rat blood cells which driven by gravity system were counted and analyzed. The study with microfluidic technology and cell-based biosensor was conducive to achieve miniaturization and multifunction of cell counting analytical instruments by cell chips.

Keywords: Cell-based biosensor; Light-addressable potentiometric sensor; Microfluidic chip; Cell counting and analyzing

投稿时间：2009-11-11

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