

Nanowires Electrophoresis Chips for Biomolecule Analysis

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Abstract

Electrophoresis is a toolbox of biomolecules separation based on size and charge, which allow us to analyze the information by their fragments. However, the procedures of electrophoresis take very long time and consume a high volume of analyte, while the requirements to analyze are still high. Nanobiodevices based on advanced nanotechnology open up a novel research field for biomolecule analysis with the ultrahigh resolution, including a single biomolecule analysis. Nanowire structures offer desirable advantages such as a very small diameter size with a high aspect ratio and a high surface-to-volume ratio without grain boundaries; consequently nanowires are promising tools to study biological systems. Oxide nanowire is the promising candidate for the artificial nanostructures, because of their robust surface properties and fascinating redox surface, which are difficult to obtain from other materials. In this talk, we propose the feasibility of bottom-up nanowire array embedded in microchannels by utilized the vapor-liquid-solid technique (VLS), and demonstrate the biomolecules separation based on a novel nanobiodevices. The biomolecules are clearly separated within a few second, which much faster than the conventional methods.

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