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Polysilicon nanowire fabrication as a transducer for fast reaction assays in nano lab-on-chip domain

Abstract

The difficulty with the treatment of cancer is caused by lack of ability to detect the tumor associated with the disease at the early stage. Often, cancer is detected in its later stages, when it has compromised the function of one or more vital organ systems and is widespread throughout the body. Thus, methods for the early detection of cancer are of utmost importance and are an active area of current research. In this work we propsed a Polysilicon Nano Laboratory on a single chip for very fast and reliable detection of low concentrated biological species that lead to cancer and other related diseases. The device comprises of four sensing elements: 1 nanometer, 2 nanometer, 3 nanometer, and 5 nanometer width poly-silicon wire. However, presented here is two wires of size between 400-500 nm which were developed as prototype to ascertain the feasibilities of proposed device. The device was tested for sensitivity and selectivity with low concentrated Clinical samples. Hence, the studies clearly demonstrate the potential capability of proposed device to be able to detect biomolecules present in the sample in the real sample.

Keywords

Nano Lab-on-Chip Domain; Polysilicon Nanowire Fabrication