Microfluidic Chips for Detection of Lung, Breast and Prostate Cancer

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Cancer is one of the most common diseases that has difficulties in diagnosis and treatment field. The number of cancer patients and their mortality rates are increasing day by day. Metastasis should be diagnosed before it spreads to other tissues. Unfortunately, the cancer that has been diagnosed in stages after the metastasis restricts the treatment options. Therefore early diagnosis of cancer is the most important step for the sake of patient's prosperity. Although conventional diagnostic methods such as biopsy, tomography, mammography and MRI play an important role in the diagnosis of cancer, the diagnosis process can take a long time and diagnosis may lead to mistreatment. There is a crucial requirement to develop a simple, quick method for detection of cancerous cells. In this project, we represent a biomarker based microchip technology that can rapidly detect cell presence. The microfluidic diagnostic chip works in two stages. The first stage provides us to distinguish cancerous cell from normal cells by using antigen-antibody reactions. In the second step, we aimed to make a specific diagnosis for breast, prostate and lung cancer. The microfluidic chips showed reliable and rapid capture of cancerous cells in various cell lines such as MCF-7, A549, H69, H69AR, SK-BR-3 and LNCaP with the concentration of 10000, 1000, 100 cells / ml.

Awards Won:
Third Award of $1,000