



Microfluidic Sensors for Resource-limited Areas

An ideal point-of-care device would incorporate the simplicity and reliability of a lateral flow assay with a microfluidic device. Our system consists of self-priming microfluidics with sealed conjugate pads of reagent delivery and an absorbent pad for additional fluid draw. Using poly (methyl methacrylate) (PMMA) as a substrate, we have developed a single-step surface modification method which allows strong capillary flow within a sealed microchannel. Conjugate pads within the device held trapped complex consisting of the magnetic beads and nucleic-acid-probe-conjugated horseradish peroxidase (HRP). Magnetic beads were released when sample entered the chamber and hybridized with the complex. The complex was immobilized over a magnet while a luminol co-reactant stream containing H_2O_2 was merged with the channel. A plate reader was able to quantify the chemiluminescence signal. This new format of biosensor will allow for a smaller and more sensitive biosensor, as well as commercial-scale manufacturing and low materials cost.

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