

MEMS IMPEDANCE BIOSENSOR FOR ACCURATE AND RAPID DETECTION OF  
E.COLI O157:H7

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ABSTRACT

Two micromachined impedance biosensors based on interdigitated electrode (IDE) arrays were designed, fabricated and tested to detect low concentration *Escherichia coli* O157:H7. Both design of the biosensors have specially fabricated regions to sort, focus and detect the bacteria cells. Principle of positive dielectrophoresis (pDEP) was used to focus cells towards the center of the channel, using specially designed gold microelectrode arrays embedded in a SU-8 microchannel. Bacteria cells were detected using multiple interdigitated electrode (IDE) arrays, which were functionalized with anti-*E.coli* antibody to specifically detect the target bacteria. The lowest detection limit for the first and second design were as low as  $3 \times 10^2$  CFU/mL and 39 CFU/mL, respectively. The total detection time was around 2 hours, which is quite less compared to traditional plating and colony counting techniques.