

## Pathogen detection by fiber optic microfluidic biosensor

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Pathogens that usually associated with pathogenesis affect human health with massive diseases including chronic infections or immune system disorders. Although numerous vaccinations have been introduced to protect against diseases, some pathogens continues to threaten living life. The current pathogen detection method which based on molecular culture and PCR techniques are essentially slow and time consuming. In recent time, several researchers have attempted to develop rapid detecting tool. Despite advanced engineering, there is still need for an accurate and rapid pathogen detection tool. Thus, this research was carried out to highlight on detection of pathogens using optical biosensor. An optical biosensor (microchannel) is relatively an accurate method of early detection of pathogen. Optical microchannel was fabricated with fiber optics by using photolithography method. Fiber optic biosensor is light scattering, absorption and optical properties of the microorganisms. The chemical composition, energy, the total nucleotides and photo pigments will define the absorption properties of each microorganism. *E. coli* was detected at region of 280 nm to 285 nm by using the microchannel while, *S. cerevisiae* identified at visible region of 570 nm to 580 nm. The entire detection can be done in less than 10 minutes with minimum required cells of  $1 \times 10^2$  cells per mL with total volume of 6  $\mu$ l. These detection regions for each sample were compared with spectrophotometer measurement plus theoretical calculations by using Beer Lambert law of absorption.

### Biography

Zurina Zainal Abidin has received her BEng in Chemical Engineering from Loughborough University, UK in 1997, Masters in Biotechnology at University of Manchester Institute of Science and Technology, UK and PhD in 2006 from University of Manchester, UK in Biochemical Engineering. Earlier, she developed her career as a Process Engineer in Elektrisola (M) Sdn Bhd in 1998. Later in 1999, she joined Universiti Putra Malaysia (UPM) and currently working as an Associate Professor at Department of Chemical and Environmental Engineering. Her research areas focus on biochemical engineering application on bioseparation using electrokinetics/microarray technology, extraction of bioproducts membrane filtration, biosensor and also wastewater treatment. She has successfully supervised many postgraduate in similar disciplines and also published more than 30 articles in relation to biochemical engineering area.

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