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**Development of biosensor platforms for rapid detection of *Escherichia coli* from clinical isolates**Hatice Nur Halipci Topsakal<sup>1</sup>, Ashabil Aygan<sup>2</sup>, Ahmet Altindal<sup>3</sup>, Cigdem Oruc<sup>3</sup> and Fatma Koksak Cakirlar<sup>4</sup><sup>1</sup>Istanbul Ayvansaray University, Turkey<sup>2</sup>Kahramanmaraş Sutcu Imam University, Turkey<sup>3</sup>Yildiz Technical University, Turkey<sup>4</sup>Cerrahpaşa Faculty of Medicine, Turkey

**Background & Aim:** Today, we face with increasing resistance of pathogenic bacteria that cause infection in the hospital and community. Therefore, there is a growing need for selective recognition of bacteria in clinical samples. Biosensors-based analysis systems used to the diagnosis of bacteria have been one of the most important techniques due to demonstrated low cost, fast response, high sensitivity and high selectivity. DNA aptamers have a promising role and they have inherent advantages in stability and facility of generation and synthesis. In this study, it is aimed to develop ssDNA containing biosensor array which can give rapid results for identification of intended bacteria *Escherichia coli*.

**Methodology & Theoretical Orientation:** Cell-based Systematic Evolution Of Ligands By Exponential Enrichment (SELEX) to isolate an *E. coli*-aptamer that shows strong binding was performed. After selection process one of the ssDNA aptamer was chosen that strongly binds to *E. coli*. The selected aptamer was placed on two different biosensor platforms containing silica and Quartz Crystal Microbalance (QCM) materials. Binding experiments of *E. coli* to biosensor platforms were carried out using impedance spectrometry and frequency analyzer.

**Findings:** The fluorescently labeled aptamer was purchased commercially and it was detected that the aptamer was ligated with *E. coli* using a fluorescent microscope. Whether or not our aptamer ligates to 50 *E. coli* strains isolated from blood cultures of hospitalized bacteraemic patients were examined, for specificity and susceptibility. We showed that our fluorescently labeled aptamer binds to a variety of *E. coli* strains at a certain level.

**Conclusion & Significance:** With biosensor based medical diagnostic system, identification could be done easier and faster thus enable infection control, treatment and surveillance to be done more quickly and easily. In addition, early diagnosis and treatment will reduce mortality, morbidity and high costs.

**Biography**

Hatice Nur H. Topsakal is a PhD candidate. She has been working as lecturer in Istanbul Ayvansaray University Plato Vocational School, Medical Laboratory Department. She works on Microbiology, and interested in DNA technologies. She is a holder of scholarship from the Scientific And Technological Research Council Of Turkey(Tubitak)

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