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## IRMBE Proceedings

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Screen printed impedance biosensor for cytotoxicity studies of lung carcinoma cells (Conference Paper)Mansor, A.F.<sup>1</sup>, Ibrahim, I.<sup>2</sup>, Voiculescu, I.<sup>3</sup>, Nordin, A.N.<sup>4</sup> [ORCID](#)<sup>1</sup>Department of Electrical and Computer Engineering, Faculty of Engineering, IUM, Kuala Lumpur, Malaysia<sup>2</sup>Department of Biotechnology Engineering, Faculty of Engineering, IUM, Kuala Lumpur, Malaysia<sup>3</sup>Department of Mechanical Engineering, School of Engineering, City College of New York, NY, United States

## Abstract

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Electrical Cell-Substrate Impedance Sensing is a powerful tool for monitoring real time cells properties such as adhesion, mobility and cytotoxicity. In this study, a silver/silver chloride screen-printed impedance biosensor was developed to characterize A549 lung carcinoma cells growth in the presence of collagen I. Bovine Collagen acts as an extracellular matrix (ECM) for A549 and promotes cell attachment. The sensor was incorporated with a culture well which was fabricated from polydimethylsiloxane (PDMS). A549 cells were cultured in the chambers and impedance measurements were taken at 12 hours intervals for 120 hours. Cell Index (CI) were calculated from the impedance data and plotted in comparison with growth profile of the cells in T-flasks for validation of the sensor's functionality. A549 cells were also treated with anti-tumor drug Paclitaxel and its response were monitored over 5 days. Experimental results show significant change in CI during growth and death after exposure to Taxol, indicating that tumor growth was inhibited in the presence of Taxol. © International Federation for Medical and Biological Engineering 2016.

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