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The study of cell attachment and spreading on polyaniline and gelatin using electric cell-substrate impedance sensing (Article)

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Abstract

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Electrical cell-substrate impedance sensing (ECIS) is a valuable tool for real time monitoring of cell behavior such as attachment, mobility, and growth. This study investigates the correlation between cell attachment and impedance when cells are attached to two different substrates, polyaniline and gelatin, respectively. Colon cancer cell lines, HCT-116 were used as model cell line. The impedance measurements were measured every 8 hours for 104 hours at frequency of 40Hz to 10MHz using impedance analyzer. Polyaniline produced a graph that is in agreement with typical growth curve for mammalian cell culture at lag, and early log phase. However, gelatin graph showed a different trend. This may be due to the high conductivity of the polyaniline which gave better cell attachment and spreading for the HCT-116 cells. The efficiency of the biosensor was measured by cytotoxicity test using 2.5 µg/ml 5-FU and the changes on impedance were analyzed. In conclusion, the cell attachment correlates with impedance depending on the substrate used to culture the cells. To this end, ECIS is proven as an alternative tool to measure cell behavior with an added advantage of ability to monitor the progress in real-time and showed a great potential in drug testing application.

Author keywords

Cell attachment Drug testing ECIS HCT-116 Impedance biosensor

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
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