Detecting Low Levels of Cytochalasin B in 3T3 Fibroblast Cells by Analysis of Electrical Noise Obtained from Cellular Micromotion

DOUGLAS LOVELADY, DAVID RABSON, CHUN-MIN LO, University of South Florida — We performed several micromotion experiments using the electric cell-substrate impedance sensing (ECIS) apparatus on a confluent layer of 3T3 fibroblast cells exposed to differing, low-level amounts of the toxin cytochalasin B. We previously developed a technique to distinguish cancerous from non-cancerous cultures.

Our goal here is to see if the same technique can be used to distinguish toxin levels in a single cell type. The noise of the time series extracted from these experiments is characterized by the power spectrum, Hurst exponent, DFA (detrended fluctuation analysis) exponent, first zero and first $1/e$ crossing of the autocorrelation function. These measures describe the long- and short-term correlations in the signal, which tell us something about the average behavior of these cells in culture. A change in the behavior of these cells is clearly revealed by an examination of these measures. A principal-component analysis shows a separation of the different toxin levels in the multidimensional space. To our knowledge, this is the most sensitive technique for detecting such a low level of cytochalasin B in 3T3 fibroblast cells.

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