

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Detecting Low Levels of Cytochalasin B in 3T3 Fibroblast Cells  
by Analysis of Electrical Noise Obtained from Cellular Micromotion<sup>1</sup>**

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.<sup>2</sup> 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.

<sup>1</sup>This work supported in part by NIH/NCI 1R03CA123621-01A1.

<sup>2</sup>D.C. Lovelady *et alia*, *Phys. Rev. E* **76**, 041908 (2007)

Douglas Lovelady  
University of South Florida

Date submitted: 27 Nov 2007

Electronic form version 1.4