

### **Don't Overlook Micromotion**

An often overlooked aspect of ECIS time-course data is micromotion. This term was coined in a 1991 PNAS paper by Giaever and Keese to describe the fluctuations in impedance observed in confluent cell layers. As was pointed out in that early publication, the source of these variations in the impedance is thought to be due to cell motions. Of interest is the fact that cellular motions that influence impedance are not only in the XY plane but also in the Z direction, as current must flow in the narrow spaces between the basal membrane of the cells and the electrode surface. Since these cellular motions are random in nature, they are most easily seen in a small population of cells and show up with more intensity on 1E arrays than on other arrays where the activities of more cells are averaged.

We have found micromotion is prevalent in all cells examined with ECIS and seems to be especially pronounced in endothelial cell layers. In addition, in dose response toxicology experiments, micromotion can be considerably enhanced at sub lethal dose of some compounds. You may wish to consider measurements of this interesting behavior in your research involving ECIS.