OMICS Group Conferences
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2nd International Conference on
Tissue Science & Regenerative Medicine

August 26-28, 2013 DoubleTree by Hilton, Raleigh, NC, USA

Using BioFETs to study of local cellular adhesions

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The regulation of cell substratum adhesion is central to cell migration butthere is no real measure of the strengths of local adhesion bonds to the substratum at different points under the cell. Weare testing the use of micron scale Bio-Field Effect Transistors (BioFET) to sense the presence of cell adhesionsunder individual migrating cells. Feasibility tests have begun with charged beads and extracellular matrix proteins. Charges from the bead or ECM protein coating juxtaposed to the BioFET gate will modulate the source to drain current. In live cell adhesion experiments, the attachment of the cell to the gate produces a significant signal change which can be partially restored using Trypsin/EDTA. The signal change is based on the charge density of the cell surface and its proximity to the gate interface. Further studies will establish the feasibility of this method to detect local cell adhesion and then the use of it as a basis to estimate adhesion forces using spatially resolved mechanical methods provided by, for example, AFM.

Biography

Zaozao Chen obtained his Ph.D. degree from the Department of Biology & Physiology at the University of North Carolina at Chapel Hill in December 2012. His research includes Cell adhesion, Cell migration, RhoGTPases, Microfabircation of Bio-Field Effect Transistors (Bio-FETs). He got outstanding graduates awards in the No.1 ranking Biomedical Engineering Program in China (Southeast University) for both Bachelor's and Master's degrees. He is currently working as a Postdoc fellow in Lineberger Comprehensive Cancer Center at UNC-School of Medicine in collaboration with Prof. Claire Doerschuk, Prof. Keith Burridge and Prof. Ken Jacobson. He has published 15 papers in peer-reviewed journals.

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