Michigan State University
Science at the Edge
Engineering Seminar

November 9th, 2012
11:30 a.m.
Room 1400 Biomedical and Physical Sciences Building
Refreshments served at 11:15 a.m.

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High-Throughput 3D Cell Culture for Drug Discovery and Human Toxicology

Abstract

The need for increased knowledge of drug candidates at early stages of discovery is driving the development of new, high-throughput, and high-content technologies. Traditional ADME/Tox strategies are often slow and focused on later stage lead compounds and preclinical candidates. However, the pervasiveness of toxicity in highly potent drug candidates necessitates that decisions on drug candidate advancement in the discovery process involve high quality and predictive information on potential toxicological impacts of the candidates. This talk will provide an overview of the various chip-based technologies developed in our group that enable earlier assessment of ADME/Tox in the drug development process. The centerpiece of our approach involves the use of a three-dimensional mammalian cell culture "DataChip" (Data Analysis Toxicology Assay Chip) that consists of 500-1000 individual cell cultures on a microscope size slide "biochip". A broad range of human and animal cells have been used on the DataChip, including primary cells and transformed cell lines from multiple tissues, as well as human and animal stem cells. Together with the MetaChip (Metabolizing Toxicology Assay Chip that consists of a human CYP450 and Phase II enzyme microarray), it is possible to assess both parent and human metabolite toxicity against a wide array of different cell types, and therefore, accelerate toxicity assessment of drug candidates and chemicals at unprecedented speeds.

For further information please contact Prof. Christina Chan, Department of Chemical Engineering and Materials Science at krischan@egr.msu.edu

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