

Pharma & Clinical Pharmacy Congress 2016: Nanotechnology and Microfluidics for Biomedical Application

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Abstract

International Conference on Statement Nanobiotechnology is a novel discipline that indicate the merger of biological and nanotechnology. It is a multidisciplinary subject, which interplay between physics, materials science, synthetic organic chemistry, engineering and biology. To efficiently diagnostic and treat diseases, the understanding of detail mechanism of disease occur would be critical. The qualitative and quantitative analysis at the molecular scope in real time is highly demanded but very challenging to achieve. Nanobiotechnology is to solve the fascinating problems offered by biology through designing and synthesizing of specific nanomaterials and utilize specific techniques. DNA nanotechnology is one important example of nanobiotechnology. As the central genetic molecule in biological systems, DNA possesses many exceptional properties, including its biological function, biocompatibility, molecular recognition ability, and nanoscale controllability. These unique attributes enabled the creation of functional DNA nanostructures, which act as natural bridge between nanotechnology and biotechnology, leading to far-ranging real-world applications. Microfluidic technology is revolutionary for high throughput diagnostics and other biological applications. In Prof. David A. Weitz's group in Harvard University (<http://weitzlab.seas.harvard.edu/>), they have developed the droplet based microfluidic techniques for Single Cell RNA-Sequencing using DNA Barcode Beads; Single-cell Polymerase Chain Reaction for metagenomic studies and Sepsis Diagnosis; Single-cell analysis, screening and sorting; high-throughput culturing of single cells for selection based on extracellular metabolite production or consumption and etc. In addition, microfluidic technology is also powerful in nano/micro-fabrications. All kinds of monodisperse nano/micro-particles can be fabricated in microfluidic channels at high efficiency. Herein, I am planning to utilize different nanobiotechnology tools, especially DNA nanotechnology and microfluidic techniques to investigate the realworld fascinating problems in biology, to understand the detail mechanism of cell signaling, gene expression and to develop nanomachines for disease diagnostics and treatments.

Biography

Hongbo Zhang, (PhD in Pharmacy) is an Assistant Professor in Åbo Akademi University, Finland. In December 2012, he received his PhD from the Faculty of Pharmacy, University of Helsinki. Then Dr. Zhang joined Adj. Prof. Hélder A. Santos' group in University of Helsinki, as a Postdoctoral Fellow in January 2013 and visited Prof. David A. Weitz's group at Harvard University in March 2014 to October 2015. Dr. Zhang is specialized in nanomedicine, controlled drug delivery, microfluidics, imaging, molecular biology and drug metabolism. He has published more than 30 publications (total impact factor > 200). His research focus is to bridge nanotechnology to biology, including utilizing functional nanoparticles on biomedical applications. In addition, Dr. Zhang is an expert in microfluidics techniques. Dr. Zhang is currently leading two research projects, from Jane and Aatos Erkkö Foundation (2015-2018) and Academic of Finland (2016-2019).

This work is partly presented at **4th International Pharma & Clinical Pharmacy Congress**
November 07-09, 2016 Las Vegas, Nevada, USA