Fall 2021

NANOFANS FORUM

"Bridging Biology & Nanotechnology"

NANOFANS WEBINAR ANNOUNCEMENT

Engineered Brain Microphysiological System for Recapitulating Brain Physiology and Function

Yeoheung Yun, Ph.D.
Professor
Department of Bioengineering
North Carolina A&T State University
Greensboro, NC

Date: October 20, 2021 (Wednesday)
Time: 11:00 AM – 12:00 PM EDT

Abstract: There is a clear need to develop more realistic *in vitro* brain models that simulate brain activities, mechanical environment, and complex physiological responses. This presentation reports on development of a brain microphysiological system (BMPS) that mimics the neurovascular-immune-neuronal environment in brain. This effort to develop better *in vitro* brain models includes brain organoids development, vascularization, microfluidic-based brain on a chip, iPSC-derived differentiation, physiologically based pharmacokinetic (PBPK) modeling model, and extracellular materials. As an example, use of this platform, toxicity screening for organophosphates (OPs) will be presented. We evaluated four OPs for concentration-dependent effects on: 1) overall cell viability/toxicity within the construct, 2) penetration of OPs across the model blood brain barrier (BBB), 3) inhibition of AChE activity in target cells following exposure, and 4) residual OP in endothelial vascular compartment.

Bio: Dr. Yun is the Professor of Chemical, Biological and BioEngineering and Graduate Coordinator of BioEngineering Program at North Carolina A&T State University. He was earlier a research professor at University of Cincinnati. His team investigates stem cell differentiation, brain organoid, vascularization, extracellular matrix (ECM), and microfabrication/microfluidic technology to construct brain tissue to model neurodegenerative diseases such as Alzheimer Disease, and to screen clinically relevant drug or chemical agents such as organophosphate nerve agent. Dr. Yun lab also works on T cell dynamics on antigen presenting cells (APCs) for immunotherapy. Dr. Yun holds a Ph.D. in Mechanical Engineering from the University of Cincinnati and further worked as a post-doc and research professor at University of Cincinnati. He received his bachelors and master's degree at Chonbuk National University, South Korea.

Register to receive meeting URL: https://tinyurl.com/fall2021nanofansflyer