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In Vitro Micro-Physiological Models for Pharmacokinetics and Disease Modelling

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Abstract

Organ-on-a-chip (OOC) is an ambitious emerging technology with a great potential to enable in-depth studies of disease pathogenesis and therapy, hence opening new avenues for drug discovery, toxicology, and personalized medicine and offer a reliable alternative to animal models. In vivo, the organ(s) function is orchestrated by complex cellular structure and physiochemical factors within the Extracellular Matrix and secreted by various cells. Microfabrication and microfluidics technologies provide tools to create advanced cell culture systems, which can be employed to create in vivo-like cellular microenvironments and recapitulate specific tissue structure and physiological parameters. Here we will describe a compartmentalized microfluidic system for OOC that enables co-culturing of several cell types in close proximity with enhanced cell-cell interaction. We will then discuss three immune-competent micro-physiological models, namely the human gastrointestinal tract, the human epidermis, and the adipose tissue, the interaction of immune cells with these tissues, and their role in inflammation. We will emphasize the interaction between the adipocytes and immune cells to highlight the role of immune cell infiltration in the adipose tissue in the pathogenesis of diabetes type 2..

Biography:

Qasem Ramadan received his Ph.D. from Nanyang Technological University (Singapore) in 2006; afterward, he joined the Agency for Science, Technology, and Research (A-STAR) as a senior research scientist. In October 2008, he joined the Swiss Federal Institute of Technology in Lausanne (EPFL), where he worked in developing miniaturized in vitro models of the human gastrointestinal tract to investigate the health-promoting properties of dairy products emphasizing immune-metabolic profiling. In June 2013, he rejoined the A-STAR as a senior research scientist focusing on developing organ-on-a-chip engineering systems. In July 2019, he joined Alfaisal University in Saudi Arabia as an assistant professor of research. His current research focus is centered around developing modular organ-on-a-chip and body-on-a-chip systems for drug discovery and disease modeling

References

1. Prof. Qasem Ramadan et all…Microfabricated system for magnetic field generation and focusing.
2. Prof. Qasem Ramadan et all…On-chip micro-electromagnets for magnetic-based bio-molecules separation.
3. Prof. Qasem Ramadan et all…In vitro micro-physiological immune-competent model of the human skin.

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