



Presentation Overview

Event

Danish 3R Center - Symposium

Speaker

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Session

Beyond Animal Testing: Development of Organs-on-Chips to Emulate Human Biology

Abstract

The reliance on animal models doesn't always provide actionable insights into human biology. In this presentation, we will highlight, our latest advancements as illustrated by studies conducted with academic, clinical, and pharmaceutical industry collaborators, that demonstrate the utility of our Organs-on-Chips technology as a more predictive, human-relevant alternative for efficacy and safety testing of new chemical entities.

Human "Organs-on-Chips" use microscale engineering technologies that when combined with cultured living human cells create microengineered systems that recreate the physiological and mechanical microenvironment of whole living organs. We have developed the microenvironment of a variety of organs, including, the liver, kidney, lung, intestine, and brain. Each Organ-Chip, which is composed of a clear flexible polymer, is about the size of a AA battery and contains tiny fluidic channels that are lined with living cells. Cells cultured under continuously perfused, engineered 3D microenvironments go beyond conventional 3D *in vitro* models by recreating *in vivo* intercellular interactions, spatiotemporal gradients, vascular perfusion, and mechanical microenvironments. Integrating cells within Organ-on-Chips, enables the study of normal physiology and pathophysiology in an organ-specific context. Cellular/molecular level resolution is enhanced and demonstrates key insights into the mechanisms of action of drug induced toxicity. Implementation of Organs-on-Chips technology aims to improve the probability of success of drugs by generating pre-clinical models that are more human-relevant and enable mechanistic understanding of human diseases and drug action.

We will also explore the future, one in which Organ-Chips personalized with your own living cells has the potential to transform your medical care and how you manage your health. Let's imagine You-on-a-Chip.