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강연제목: Microfluidic High-throughput 3D Cell Culture From Lab to Life

Abstract:

In December 2022, the FDA Modernization Act 2.0 eliminated the requirement for animal testing in drug, food, and cosmetic development, creating the need for alternative methods to ensure product safety and efficacy. This presentation introduces microfluidic high-throughput 3D cell culture systems, a scalable and accurate alternative to conventional in vitro assay as well as animal models. By utilizing advanced fabrication technologies such as 3D printing, laser processing, and injection molding, customizable microphysiological systems (MPS) can replicate human physiology more effectively. The platform's use of patient-derived samples enhances its clinical relevance, supporting personalized medicine and improving product development. This presentation will highlight these clinical applications, examining how MPS technology bridges the gap between lab research and real-world use.

Brief Biosketch

Jihoon Ko is an Assistant Professor at the Department of BioNano Technology, Gachon University. His research focuses on the development of microfluidic systems, microphysiological systems (MPS), 3D cell culture, and biofabrication for applications in drug screening and disease modeling.

He holds a Ph.D. in Mechanical Engineering from Seoul National University, where he developed vascularized micro-tissue models for disease and drug screening, earning the Outstanding Doctoral Dissertation Award. Dr. Ko has held a research professor position at Sungkyunkwan University and a postdoctoral researcher at Samsung Medical Center, contributing significantly to the fields of organ-on-a-chip technology and personalized medicine.

His work, which integrates advanced fabrication techniques like 3D printing and laser processing, has led to the creation of innovative MPS platforms that closely replicate human physiology. He has authored numerous high-impact publications in leading journals such as *Nature Materials* and *Biomaterials* and has been recognized with multiple awards for his contributions to bioengineering and nanotechnology. Dr. Ko's research is driving the next generation of drug discovery and precision medicine through high-throughput, patient-specific MPS platforms.