

제 62회

ORGAN ON A CHIP

기술교류회

2020.10.15 **목** 오후 4시 30분

한림대학교 SmartLEAD 온라인 강연



조한상 교수

성균관대학교 생명물리학과

1. Education

박사: Univ. California, Berkeley, Bioengineering (2010)

석사: 서울대학교, 기계공학부 (1998)

학사: 서울대학교, 기계공학부 (1996)

2. Experience

2019 ~ 현재 성균관대, 조교수

2014 ~ 현재 Univ. North Carolina at Charlotte, 조교수

2010 ~ 2014 Harvard Medical School, Post-Doc.

2003 ~ 2005 KIST, 연구원

제
목

미세유체형 3차원 인간뇌 모델의 개발 및 뇌질환 연구에의 적용

3D Human Brain models in Microfluidics for the Study of Neurological Disorders

초
록

With hundreds of billions of neurons and thousands of trillions of synaptic connections between them, the human brain is the most complex system on earth. However, there are no well-developed human brain models to study the brain activities in either laboratory environments or in animal bodies. Here, I present micro-scaled 3D environments that reconstruct a 3D human brain in Alzheimer's disease (AD) by recapitulating AD signature of elevated levels of amyloid-beta (A-beta), tau proteins, and consequent activation of microglia, immune cells resident in a central nervous system (CNS). Also, I present a brain vessel model of a 3D blood-brain barrier (BBB) for study of neurovascular diseases. The tightness of our BBB was validated by observing localized membrane proteins of VE-cadherin and ZO-1 along cellular boundary and blocking transmigration of innate immune cells through our BBB. To better understand the roles of the BBB in various diseases and for screening CNS-targeting drugs, our BBB disruption was demonstrated under neuroinflammatory and hypoxic pathologies.

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