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국문 강연제목: 체외/컴퓨터 통합 전임상 모델 기반 피하 약물 분포 예측 연구

영문 강연제목: Beyond Microphysiological Systems: An In Vitro/In Silico Hybrid System for Predicting Subcutaneous Drug Transport

Abstract(영문):

Although subcutaneous (SubQ) injection is an increasingly common route for administering biopharmaceuticals, predicting the bioavailability and pharmacokinetics of drugs administered subcutaneously remains challenging due to the complex nature of the subQ environment. We here introduce a hybrid system combining microphysiological systems (MPS) and digital twin (DT) technology, referred to as MPS-DT, to predict the biodistribution of peptide drugs in the subQ space and their absorption into systemic circulation. By incorporating these experimental and computational tools, our work provides a novel framework for predicting subQ drug transport and absorption, with implications for optimizing formulation strategies and improving translational relevance to human physiology.

Brief Biosketch (간단한 이력, 연구/대외활동 소개,국문/영문)

KAIST 기계공학과 ('22 Ph.D.) 및 MIT 기계공학과 ('23-'24 PostDoc)에서 미세생리시스템 및 디지털트윈 개발과 전임상모델 적용 연구를 수행하였음. 25 년도 3 월부터 고려대 세종에서 '혁신미세생리시스템 연구실'을 이끌며 전임상모델의 첨단화 연구를 수행하고 있음.

He received his Ph.D. in Mechanical Engineering from KAIST ('22) and conducted postdoctoral research at MIT ('23–'24), focusing on the development and preclinical application of microphysiological systems and digital twin models. Since March 2025, he has been leading his lab at Korea University Sejong Campus, conducting research on advanced preclinical models.