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기타소속:

강연제목: 글로벌 헬스케어 형평성 개선을 위한 mRNA 백신 전달 플랫폼

Engineering mRNA Vaccine Delivery Platforms for Global Healthcare Equity

Abstract: Over 1.5 million vaccine-preventable deaths occur globally every year, making infectious diseases the leading cause of death for children under five years old. This significantly impacts low/middle-income countries where inadequate healthcare infrastructure often leads to low vaccination coverage. The lipid nanoparticle-based mRNA technology allowed for the rapid development of mRNA vaccines for SARS-CoV-2. Despite numerous benefits, mass mRNA vaccination in certain communities was hampered by several limitations: 1) inadequate cold-chain-compatible infrastructure, 2) inability to accurately identify the immunization status, and 3) poor medical adherence. To address these challenges, first, we developed mRNA vaccine microneedle patches with improved thermostability. Secondly, NIR fluorescent quantum dots were selectively loaded in the vaccine microneedles to intradermally deliver patterns that encode vaccination information. Lastly, the mRNA vaccine was encapsulated in a biodegradable polymer that has programmable degrading kinetics for controlled release of vaccine doses at predetermined time points, eliminating follow-up booster shots. These robust and easy-to-use platforms for safe and effective mRNA vaccination can potentially reduce vaccination disparities and improve global healthcare equity.

Brief Biosketch

2025 – : SNU, Institute of Medical and Biological Engineering |서울대학교 의용생체공학연구소, 기획위원

- 2024 – : SNU, College of Medicine, Biomedical Engineering, Assistant Professor |서울대학교 의과대학 의공학교실, 조교수
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- 2024 – : SNU Hospital, Adjunct Professor |서울대학교 병원, 겸임교수
- 2021 - 2024 : MIT, Langer Lab, Postdoctoral Associate |매사추세츠 공과대학교, 박사 후 연구원
- 2020 – 2021 : Facebook, Oculus AR/VR, Research Intern |페이스북, 연구인턴
- 2016 – 2020 : Carnegie Mellon University, Biomedical Engineering, Ph.D., |카네기멜론 대학교, 공학박사
- 2015 – 2016 : Tools For Surgery (Medical Devices Start-up), Biomedical Engineer |의료기기 스타트업, 바이오메디컬 엔지니어
- 2014 - 2014 : State University of New York, Biomedical Engineering, M.S., |뉴욕주립대학교, 공학석사
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