제 90회
ORGAN ON A CHIP
기술교류회

한림대학교

2022.11.10 목 오후 4시 30분

한림대학교 중개의과학연구원 포스터홀

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1. Education

박사: Max Planck Institute of Experimental medicine & Georg-August-University Göttingen, (2008)
석사: 서울대학교 (2005)
학사: 고려대학교 (2002)

2. Experience

2021 ~ 현재 연세대학교 생명공학과, 부교수
2015 ~ 2021 아산융합의학원(울산의대/서울아산병원), 조, 부교수
2012 ~ 2015 Agency for Science, Technology and Research, PI
2010 ~ 2012 LG전자, 선임연구원
2009 ~ 2010 University of Massachusetts Medical School, Post-doc

제목

바이오 소재를 이용한 분자진단 플랫폼 개발
(Development of Molecular Diagnostics (MDx) Platform using Bio-materials)

초록

Medical device, especially molecular diagnostic, is defined to make immediate and informed decisions about patient for earlier diagnosis and disease management in primary care, which leads potentially to improved patient's management and outcome, cost-effectiveness, and reducing health inequalities. Diagnostic devices incorporate emerging techniques including silicon bio- photonic sensors, electrodes, and solid phase reagents that enable rapid assay reaction, reducing sample and reagent volumes, ease of use, and less technical skill. Recently, we have developed two novel techniques; a versatile dimethyl pimelimidate/thin film based sample processing (DTS) procedure as a isolation technique for nucleic acids and protein simultaneously without centrifugation step and an isothermal nucleic acids amplification/detection (iNAD) technique for the detection of biomarkers in human diseases. The DTS is useful for simultaneous isolation of nucleic acids and protein from a variety of sources, including cells, bacteria, and cancer tissues. Specifically, the DTS procedure does not require a centrifuge and has improved time efficiency (30 min), affordability, and sensitivity. We confirmed that the quality and quantity of the isolated nucleic acids and protein were sufficient to allow robust detection of biomarkers in downstream analysis. In addition, the iNAD can be performed without labeling in real-time by utilizing both silicon microring-based solid-phase amplification and isothermal recombinase polymerase amplification (RPA) within 20 min. We demonstrated that the sensitivity of the iNAD technique was 100-times higher than those of RPA and conventional PCR methods. Therefore, an integrated device of the novel techniques will be useful for diagnosis of various human diseases with simplicity, rapidity, and low-cost.

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