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국문 강연제목: 96-퍼들 페이퍼 플레이트(96-PPP): 고처리량 아밀로이드 감지 및 현장  
진단용 종이 플랫폼

영문 강연제목: 96-Puddle Paper Plate (96-PPP): A High-Throughput Paper-Based  
Platform for Amyloid Detection and On-Site Biosensing

**Abstract(영문):** We developed the 96-Puddle Paper Plate (96-PPP), a microplate-formatted lab-on-paper platform that enables high-throughput colorimetric and fluorescence analysis using conventional microplate readers. Each of the 96 hydrophobically confined puddles was patterned by PDMS coating on cellulose paper, providing uniform droplet retention and preventing cross-contamination. The 96-PPP allows quantitative analysis of multiple analytes, including  $Mg^{2+}$ , ascorbic acid, acetone, and ketone, with distinct colorimetric responses visible to the naked eye and precisely measurable by optical readout. Beyond chemical assays, Thioflavin T fluorescence measurements on the same platform enabled successful detection of amyloid fibril concentration, degradation, and secondary nucleation, which were further corroborated by morphological characterization of the fibril structures. The fluorescence intensity showed a concentration-dependent increase and high reproducibility with a coefficient of variation below 5%. The entire 96-well array produced spatially uniform signals, demonstrating its statistical robustness for multi-sample screening. With its compatibility with standard readers, minimal reagent use (10  $\mu$ L per well), and potential integration with nucleic acid amplification assays such as LAMP, the 96-PPP establishes a versatile and scalable lab-on-paper system for on-site biomedical sensing and high-throughput diagnostics.

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

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|--------------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------|---------------------|
| <b>Postdoc.</b>                                                                            | <b>Korea University</b><br>SIBT                             | Sejong, Korea | Sep 2025 – Present  |
| <b>Ph.D.</b>                                                                               | <b>Korea University</b><br>Biotechnology and Bioinformatics | Sejong, Korea | Mar 2021 – Aug 2025 |
| <b>BS</b>                                                                                  | <b>Korea University</b><br>Biotechnology and Bioinformatics | Sejong, Korea | Mar 2015 – Feb 2021 |
| <b>25 publications (12 first author, 12 co-author, 1 corresponding author); h-index: 8</b> |                                                             |               |                     |
| Total citations: 289 (as of Oct 17, 2025)                                                  |                                                             |               |                     |