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화학과 Colloquium Seminar



Toward Rapid and Sensitive Point-of-Care Diagnostics for Infectious Diseases Using Nanoplasmonic Sensing Platforms

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○ **일시** : 2025. 05. 08. (목) 16:00

○ **장소** : 5호관 506호

○ **초록**

The SARS-CoV-2 pandemic is causing severe social and economic problems worldwide. RT-PCR has been considered the gold standard for detecting SARS-CoV-2 target genes. However, in RT-PCR, the total diagnostic time, including sample preparation, gene amplification, and detection, takes approximately 3-4 h. Thus, it is critical to shorten the diagnostic time for rapid on-site diagnosis. Various rapid kits for immune diagnosis, using antigen-antibody reactions, have also been developed to shorten the diagnosis time. However, they have not been adopted as the standard diagnostic method due to their poor sensitivity and accuracy. In particular, the "false-negative" problem of commercialized immunodiagnostic kits is recognized as a severe issue that can exacerbate the spread of SARS-CoV-2. To address these issues, we have developed innovative nanoplasmonic assay platforms with a portable Raman reader for rapid and sensitive diagnostics of SARS-CoV-2 in the field. This technique enables the detection of SARS-CoV-2 with a limit of detection (LoD) of less than 5.0 PFU/mL within 15 min. The results of this study demonstrate the possibility of clinical application that can significantly improve the detection limit and accuracy of currently commercialized SARS-CoV-2 immunodiagnostic kits.

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