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[Adv. Funct. Mater., 16 September 2024 | https://doi.org/10.1002/adfm.202405340](https://doi.org/10.1002/adfm.202405340)**Advancing SARS-CoV-2 Variant Detection with High Affinity Monoclonal Antibodies and Plasmonic Nanostructure****Authors and Affiliations** ^

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Abstract


A nanoplasmonic biosensor for the precise detection of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by leveraging advances in nanostructured sensing materials and highly selective monoclonal antibodies is presented. The sensor integrates plasmonic Au nanostructures optimized for surface-enhanced Raman scattering (SERS), enhancing sensitivity through unique light interactions at the nanoscale. Coupled with exclusive antibodies that specifically target SARS-CoV-2 and its evolving variants, this sensor demonstrates remarkable selectivity and versatility. Validated with 270 clinical samples, it demonstrates a sensitivity of 98.9% and specificity of 100%. More importantly, the virus in nasopharyngeal swab samples collected over 3 years, marking the long-term, large-scale clinical validation of the nanoplasmonic biosensor for SARS-CoV-2 is been successfully detected. Furthermore, the integration of this sensor with face masks enables the detection of airborne SARS-CoV-2, highlighting its potential for routine management of coronavirus disease 2019 (COVID-19).


논문정보

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