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A Low-cost High-throughput Targeted Sequencing for the Accurate Detection of Respiratory Tract Pathogen

Introduction: The current gold standard for SARS-CoV-2 diagnosis by real-time RT-PCR has limitations of gene numbers that can be detected. In this study, we developed a low-cost and high-throughput next-generation sequencing technology that can overcome the limitations of RT-PCR.
Methodology: A targeted sequencing panel (TSP) consisting of approximately 500 amplicons was designed that can simultaneously detect a broad range of gene loci of SARS-CoV-2 and genes for the most common viruses of respiratory infectious viruses in a single run of up to 96 samples. 448 samples and 31 control samples were examined independently with both TSP and RT-PCR, results were compared for accuracy and other indicators.
Results: TSP identified 50 SARS-CoV-2 positive samples with a 99.33% match to RT-PCR results. It is not surprising that TSP also identified multiple viral infections from 96 samples, whereas RT-PCR could not. TSP demonstrated its ability to conclude diagnosis for those undecided from RT-PCR tests.
Conclusion: Our data demonstrated that TSP is a fast and accurate test for detecting multiple pathogen infections of the respiratory tract.