

# Simultaneous Detection of SARS-CoV-2 and Six Other Human Coronaviruses by Multiplex PCR and MALDI-TOF MS

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## Abstract

The outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is challenging the health systems worldwide, and large population testing is a vital step to control this pandemic. Here, we developed a new method (named HCoV-MS), which combines multiplex PCR with matrix-assisted laser desorption/ionization-time of flight mass spectrometry to simultaneously detect and differentiate seven human coronaviruses (HCoVs). The HCoV-MS method had good specificity and sensitivity, with a detection limit of 1-5 copies/reaction. To validate the HCoV-MS method, we tested 151 clinical samples, and the results showed good concordance with real-time PCR. In addition, 41 D614G variants were identified, which were consistent with the sequencing results. This method was also used in EQAE-SARS-COV in 2020, and all the samples were accurately identified. Taken together, HCoV-MS could be used as an effective method for large-scale detection. It was also capable of detecting key single nucleotide polymorphism about variants.

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