

Screening Techniques for SARS-CoV-2 Respiratory Illness

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ABOUT THE STUDY

The easiest way to detect and prevent the spread of a new VOC is through variant screening. In the current situation, SGTF, like the Alpha variant, can be used as a proxy to suspect an Omicron infection. Based on the spike sequence differences between these viruses, the combination of different mutation-specific tests can reveal the presence of the Delta (still prevalent worldwide) or Omicron variants. Some mutation-specific tests, such as E484K/Q, L452R, and N501Y detection, are already available, allowing for the rapid implementation of an Omicron-appropriate screening strategy. Furthermore, sequencing all suspect infections is critical for monitoring this new variant globally. This is made possible by the collection of sequences on databases such as GISAID. This monitoring also allows for the observation of possible evolution and sublineage emergences.

Most antigen detection tests are rapid tests based on the detection of the Nucleocapsid (N) antigen to avoid invalidation due to spike protein variations. It is worth noting that some mutations have been discovered in the Omicron Nucleocapsid sequence. Although it is unclear whether these mutations will affect the ability of rapid tests to detect the Omicron variant, some companies have already stated in a press release that their antigen tests will be unaffected. However, antigen tests are known to be less accurate in general. Due to the well-documented waning of vaccine-induced immunity, it is critical to obtain a booster dose in order to deal with the already ongoing and possibly accelerating increase in cases, whatever the circulating variant is. The high frequency of mutations in the Omicron variant's spike sequence raises concerns about this variant's potential immune escape. Indeed, it collects amino-acid substitutions at positions known to be involved in immune escape, such as E484 (E484A for Omicron variant, E484K for Beta and Gamma variants). Most antigen detection tests are rapid

tests based on the detection of the Nucleocapsid (N) antigen to avoid invalidation due to spike protein variations. It is worth noting that some mutations have been found in the Omicron nucleocapsid sequence. Although it is unclear whether these mutations will affect the ability of rapid tests to detect the Omicron variant, some companies have already stated in a press release that their antigen tests will be unaffected. However, antigen tests are known to be less sensitive than RT-PCR tests in general. Negative antigen test results in the presence of a high suspicion of infection must, as is customary, be confirmed with an RT-PCR test. When an Omicron infection is suspected, it is recommended that RT-PCR tests be used. Due to the well-documented waning of vaccine-induced immunity, it is critical to obtain a booster dose in order to face the already ongoing and possibly accelerating increase in cases. The high frequency of mutations in the Omicron variant's spike sequence raises concerns about this variant's potential immune escape. Indeed, it collects amino-acid substitutions at positions known to be involved in immune escape, such as E484 (E484A for Omicron variant, E484K for Beta and Gamma variants).

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