

LETTERS

Harnessing the high-throughput extraction-free Advanta Dx SARS-CoV-2 RT-PCR assay for the recommencement of academic duties at the Faculty of Health Sciences of Aristotle University of Thessaloniki

Dear Editor,

Restrictions regarding social distancing measures, in response to the COVID-19 pandemic implemented by the authorities worldwide, disrupted on-campus university education for millions of students that continued training exclusively online. Nevertheless, courses with clinical orientation, such as those of medical and dentistry schools, lagged behind since the clinical encounters could not be simulated appropriately in an online setting, thus limiting their teaching value¹. Therefore, at the end of the second pandemic wave, we implemented a saliva-based method for detecting SARS-CoV-2 as part of a mass screening protocol that would allow the recommencement of academic duties at the Faculty of Health Sciences of Aristotle University of Thessaloniki (AUTH).

The participants were students and employees of the Schools of Medicine, Veterinary Medicine, and Dentistry of AUTH between March and June 2021. All saliva specimens were self-collected at home and admitted to our laboratory for SARS-CoV-2 molecular testing. Participants were advised to avoid eating, drinking, smoking, using nasal sprays and oral hygiene products for 30 minutes before self-collecting their saliva sample by spitting or drooling to an empty sterile urine box.

Saliva specimens were processed using the Advanta TM Dx RT-qPCR Assay, a quantitative nanofluidic assay that introduces Fluidigm microfluidics technology and Biomark TM HD device in SARS-CoV-2 diagnosis. The use of integrated fluidic circuit arrays enables parallel processing of 192 samples using up to 24 independent primer/probe sets. In the present project, we used the 2019-nCoV real-time reverse-transcription polymerase chain reaction (Real-Time RT-PCR) diagnostic panel of primer/probes created by the Centers for Disease Control and Prevention. N1 and N2 primer/probes targeting the N gene enable virus detection while RNaseP primer/probe serves as an internal control. Advanta TM Dx RT-qPCR Assay utilizes an extraction-free protocol. Replacing the missing extraction step, the procedure begins with a heat inactivation step of the pre-diluted samples. Then, reverse transcription, pre-amplification, and qPCR in IFC arrays follow, using the same primer/probes. The exported results are interpreted using Advanta Dx SARS-CoV-2 RT-PCR Assay Interpretive software.

There were 1,150 participants tested once, twice, three, or up to eight times. The total number of saliva samples tested was 2,712. There were no specific inclusion criteria. Participants in the category “students” were born between 1990 and 1999. Participants in the category “personnel” were born between 1953 and 1989. Out of 2,712 samples processed in total, 2,612 were tested negative (96.3 %), 12 were tested positive (0.44 %), five were inconclusive (0.18 %), and 83 samples had no result (unresolved) mainly due to inappropriate transport of sample collector or due to low quality of saliva sample (3.1 %). Inconclusive samples were “marginal positive samples” where the PCR Ct values were very close to the method’s cut-off limit.

Safe recommencement of academic duties requires the presence of a diagnostic test that is easy to use, cost and time effective, and accurate. Although the nasopharyngeal swab (NPS) is deemed the “gold standard” specimen for SARS-CoV-2 detection by Real-Time RT-PCR, saliva specimens possess practical advantages over NPS, such as comfortable specimen retrieval and no need for specialized health care personnel and equipment, thus becoming an attractive tool for mass screening of asymptomatic individuals².

The Fluidigm Advanta Dx RT-PCR assay proved to be a quick and efficient diagnostic tool useful in massive screening procedures. The method contributed to two main goals of our university: to guarantee the safety of all campus members while at the same time providing high-quality ongoing education.

Keywords: COVID-19, SARS-CoV-2, saliva specimens, medical school

Conflict of interest

None.

References

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