

# A combined approach of MALDI-TOF mass spectrometry and multivariate analysis as a potential tool for the detection of SARS-CoV-2 virus in nasopharyngeal swabs

Rocca, M.F.  
Zintgraff, J.C.  
Dattero, M.E.  
Santos, L.S.  
Ledesma, M.  
Vay, C.  
Prieto, M.  
Benedetti, E.  
Avaro, M.  
Russo, M.  
Nachtigall, F.M.  
Baumeister, E.

## Abstract

Coronavirus disease 2019, known as COVID-19, is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The early, sensitive and specific detection of SARS-CoV-2 virus is widely recognized as the critical point in responding to the ongoing outbreak. Currently, the diagnosis is based on molecular real time RT-PCR techniques, although their implementation is being threatened due to the extraordinary demand for supplies worldwide. That is why the development of alternative and / or complementary tests becomes so relevant. Here, we exploit the potential of mass spectrometry technology combined with machine learning algorithms, for the detection of COVID-19 positive and negative protein profiles directly from nasopharyngeal swabs samples. According to the preliminary results obtained, accuracy = 67.66 %, sensitivity = 61.76 %, specificity = 71.72 %, and although these parameters still need to be improved to be used as a screening technique, mass spectrometry-based methods coupled with multivariate analysis showed that it is an interesting tool that deserves to be explored as a complementary diagnostic approach due to the low cost and fast performance. However, further steps, such as the analysis of a large number of samples, should be taken in consideration to determine the applicability of the method developed.

## Author keywords

COVID-19

Machine learning

MALDI-TOF

Mass spectrometry

SARS-CoV-2