

Detection of SARS-CoV-2 in Environment: Current Surveillance and Effective Data Management of COVID-19

Abstract

Since diagnostic laboratories handle large COVID-19 samples, researchers have established laboratory-based assays and developed biosensor prototypes. Both share the same purpose; to ascertain the occurrence of air and surface contaminations by the SARS-CoV-2 virus. However, the biosensors further utilize internet-of-things (IoT) technology to monitor COVID-19 virus contamination, specifically in the diagnostic laboratory setting. The IoT-capable biosensors have great potential to monitor for possible virus contamination. Numerous studies have been done on COVID-19 virus air and surface contamination in the hospital setting. Through reviews, there are abundant reports on the viral transmission of SARS-CoV-2 through droplet infections, person-to-person close contact and fecal-oral transmission. However, studies on environmental conditions need to be better reported. Therefore, this review covers the detection of SARS-CoV-2 in airborne and wastewater samples using biosensors with comprehensive studies in methods and techniques of sampling and sensing (2020 until 2023). Furthermore, the review exposes sensing cases in public health settings. Then, the integration of data management together with biosensors is well explained. Last, the review ended with challenges to having a practical COVID-19 biosensor applied for environmental surveillance samples.

Keywords

Airborne; COVID-19 Biosensor; Data Management; Environmental Surveillance; Hospital Setting; Wastewater