Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Editorial

COVID-19 biosensing technologies

COVID-19 has become a worldwide pandemic. Despite dramatic advances in diagnostic technologies, all countries continue to face an unmet need in achieving decentralised biosensor technologies that will, in a rapid, sensitive, selective, and reliable way, tackle the global and urgent problem. In this context, the great potential of using biosensors together with Internet of Things (IoT) opens up tremendous opportunities for the biosensing community to develop novel strategies not only for diagnosis but also for aiding in the prevention and treatment of COVID-19.

Everyone from clinical doctors to citizens staying at home still needs COVID-19 diagnostics devices that fulfil the requisites established by the World Health Organization as ASSURED: affordable, sensitive, specific, user-friendly, rapid and robust, equipment free, and deliverable to end-users. Biosensors are at the heart of various rapid and essential diagnostic tools for providing accurate and timely guidance for case identification, prevention of the spread of infectious diseases, and appropriate treatment administration. Moreover, it is expected that biosensor technologies will be employed not only for rapid coronavirus infection diagnosis in humans but also as a global screening tool for surveillance, prevention, and preparedness in the event of future outbreaks. This special issue dedicated to COVID-19 biosensing technologies showcases the noble efforts of scientists and engineers working on new technologies capable of detecting COVID-19 related biomarkers in clinical and/or environmental samples.

Included are several important reviews related to the impact of biosensing in the COVID-19 pandemic outbreak (The impact of biosensing, 2020), the potential application of electrochemical biosensors (The potential application, 2020) or other types of biosensors (Developments in biosensor, 2021), (D-19 diagnosis —A rev, 2021), (Garg et al., 2021), (Xu et al., 2020), (Ji et al., 2020), (Ravi et al., 2020), (Feiyun Cui, 2020), clinically tested and commercially available devices (Clinically practiced and, 2020), and the use of graphene-based approaches (Zbořila and Otyepka, 2020) for virus detection. In addition to review papers, this special issue includes a broad range of biosensor technologies applied to COVID-19 diagnostics. Several applications using lateral flow devices are published, demonstrating the advantages of paper-based platforms in terms of cost and efficiency (Roda et al., 2021), (Lee et al., 2021), (Xiao et al., 2020), (Zhu et al., 2020). Furthermore, this issue includes research articles related to new strategies for COVID-19 biosensors by integration of the CRISPR-Cas system, which is expected to foster a new generation of biosensors for point of care testing (POCT) (opvCRISPR et al., 2021), (van Dongen et al., 2020), (Huang et al., 2020). This issue includes several research articles covering various electrochemical techniques combined also with nanosystems and magnetic particles engineered to detect COVID19 biomarkers (Hashemi et al., 2021), (Rashed et al., 2021), (Fabiani et al., 2021), (Miripour et al., 2020).

This special issue also includes several highly sensitive optical methods for SARS-CoV-2 detection using techniques based on nanoplasmonics (Huang et al., 2021), optomicrofluidics (Funari et al., 2020), quenching (Jiao et al., 2020), magnetooptics (Tian et al., 2020) and even a hybrid opto/electrochemical method (Xi et al., 2020). Finally, given the importance of real-time monitoring of COVID-19 studies, this issue also reports a computational simulation platform (Shahbazi et al., 2021) as well as detection of airborne coronavirus and influenza virus (Kim et al., 2020).

According to WHO reports, in the last 10 years, we have witnessed more than 5 world-wide epidemic diseases, namely severe acute respiratory syndrome (SARS), swine flu, Ebola, Middle East respiratory syndrome (MERS), Zika, and coronavirus disease 2019 (COVID-19). Consequently, POCT biosensor devices will play more and more critical roles not only in rapid “on-site” detection but also in preventing the transmission of infectious diseases. Research and development efforts will continue to support these POCT devices through the technological developments in biosensors and IoT, seeking to achieve wireless based operation and connectivity with health experts and health care facilities.

Considering the high demand as well as the tremendous ongoing research for high throughput and rapid COVID-19 testing, the editorial board of the journal of Biosensor and Bioelectronics, has decided to extend this special issue on COVID biosensing to a 2nd edition focusing on original research of innovative integrated biosensing systems for COVID-19 prevention, diagnosis, and prognosis.

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