



Immunological and molecular approaches for COVID-19 and Long-COVID-19, Diagnosis and Research

Guest Editor

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Message from the Guest Editor

Dear Colleagues,

The severe acute respiratory syndrome (SARS)–CoV-2 RNA virus causes Coronavirus Disease 2019 (COVID-19), a current worldwide epidemic. Furthermore, recent evidence shows that many patients, who have had Covid-19, experience a range of symptoms that last long after the acute infection has gone, a condition called as chronic or Long COVID. Both Sensitive COVID and Long COVID diagnostic tests are urgently needed to successfully isolate, diagnose, and treat infected subjects, as well as to stop the virus from spreading.

Failure to do so will ultimately result in an increase in cases, overcrowding, and the eventual collapse of healthcare facilities. Furthermore, understanding the pathophysiology of this new virus and especially its interaction with the human immune system requires further investigation. The findings of such studies will help to shape public health policies and methods for identifying vulnerable people, as well as diagnostic, prognostic, and therapeutic techniques for patients.

Established virologic processes, such as nucleic acid hybridization techniques and recombinase polymerase amplification, as well as immunologic approaches, such as antibodies' tests, are used in most current diagnostic approaches. Notably, immunologic tests are quick and need little equipment, although they are ineffective in the early stages of SARS-CoV-2 infections. Enzyme-linked immunosorbent assays (ELISAs), flow cytometry, total lab automation and mass cytometry are some of the immunological techniques used in research (CyTOF).

Each of these approaches is utilized to examine the COVID-19 pathophysiology from a different perspective, and each has its own set of benefits and drawbacks. In addition, the combination of these techniques helped us learn more about COVID-19.

Finally, the comprehension of the mechanisms that drive the severity of the infection, pathology, and the immune response is essential to better characterize disease progression and get to improving quality of life and widening the spectrum of innovative therapeutic strategies

We will cover contemporary and innovative approaches in COVID-19 and prospective methods in Long COVID 19 diagnosis and research in this special issue, with an emphasis on immunological and molecular methodologies, which are becoming more acknowledged as important components of the disease process. Notably, the know-how and the novelty of these new diagnostic/prognostic approaches could be exploited also for future epidemics by new virus.

Prof. Amedeo Amedei and Prof. Dr. Masayuki Fujita

Guest Editors



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