

# COVID-19: Annual Retrospective Study

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Received: April 06, 2021; Accepted: April 20, 2021; Published: April 27, 2021

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## Editorial Note

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan, Hubei, China. SARS-CoV-2 is a positive-sense group  $\beta$  coronavirus. It is single-stranded with a genome of around 30 kbp. The genome of the virus contains ten open-reading frames (ORFs) that encode Spike, Membrane, Envelope, and the nucleocapsid proteins which are the four structural proteins, and six nonstructural proteins such as ORF1ab, ORF3, ORF6, ORF7, ORF8, and ORF10. It has infected over 150 million people in 212 countries, with at least 3,000,000 deaths. The common symptoms include fever, cough, fatigue, shortness of breath, and loss of smell and taste. It has resulted about a progressing pandemic and now officially declared endemic by WHO (World Health Organization). The virus is primarily spread between individuals during close contact, most often via small droplets produced by coughing, sneezing, and talking.

The recent discoveries of novel human coronaviruses, including the coronavirus causing SARS, and the previously unrecognized human coronaviruses HCoV-NL63 and HCoVHKU1, indicate that the family Coronaviridae harbors more members than was previously assumed. All human coronaviruses characterized at present are associated with respiratory illnesses, ranging from mild common colds to more severe lower respiratory tract infections. But now the virus has changed its genetic structure and the morphology resulting in its asymptomatic condition. Recent research revealed a common mutation in the spike protein of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that enhances the infectivity, replication, and early transmission of the virus. WHO in recent times also suspected that the new strains of the virus could be airborne.

Screening for the presence of novel coronaviruses requires the use of a method that can detect all coronaviruses known at present.

Studies on the structure of Coronavirus led to the fundamental advance in the understanding of virus where a 3D structure of a key enzyme discovered in the COVID-19 virus required for its replication and found a pocket in it that can be targeted to inhibit that enzyme. Like other coronaviruses, SARS-CoV-2 particles are spherical and have proteins called spikes protruding from their surface. These spikes latch onto human cells, then undergo a structural change that allows the viral membrane to fuse with the cell membrane.

In order to put an end to this pandemic, the world is ready to get vaccinated as the vaccine for the COVID-19 is officially out. Let's have a look on the Safety and Efficacy evaluation of COVID-19 Vaccine according to a plethora of documentation prepared by the World Health Organization. The average development cycle for a vaccine is generally between 10 and 15 years. However, contemplating to the scale of the COVID-19 public health crisis, researchers and scientists are working tirelessly to reduce the development cycle to less than a year or two. Due to the accelerated development of the vaccine and the imperfect knowledge of the immune reaction of the vaccine, extra care should be taken when evaluating the effectiveness and safety of the vaccine. Approval for use or authorisation for emergency use might be issued if the vaccine seems to show the necessary safety and efficacy requirements. Continuing post-approval and authorization evaluation of vaccine protection may reveal other adverse effects that may have been overlooked during clinical trials.

Experts can immediately examine any unforeseen adverse effects in order to determine whether it is a genuine safety risk as this level of surveillance is important to ensure that the benefits appear to outweigh the risks for patients getting vaccinations. ACROBiosystems has developed a number of COVID-19-related protein products with its expertise in advanced recombinant protein, including S trimer protein and titer measuring kits to assist vaccine production.