

## Nanomaterial approach for treatment of COVID 19

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The global impact of the 2019 novel coronavirus (Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)) that emerged in Wuhan, China is alarming due to its rapid spread to 203 countries and territories by April 2020. To date, 14,909,279 individuals have been infected which has claimed 614471 lives. Although originating in animals, the virus has adapted a human-to-human mode of transmission presently which has challenged all existing antiviral therapies. Unfortunately, no drug or vaccine has yet been approved to treat COVID-19 because available therapeutics like monoclonal antibodies, oligonucleotide-based therapies, peptides, interferon therapies and small-molecule drugs might not effectively target the virus and take too long to develop. Hence, it is likely that it will take at least a year before treatment (e.g., a vaccine) becomes available, which is distressing. Herein, we present the first nanoscale alternatives (including one of the most successful nanomedicines developed by Moderna) for the effective control and containment of COVID-19 considering the urgency of the SARS-CoV-2 outbreak. The emergence of the 2019 novel coronavirus, designated as severe acute respiratory syndrome corona-

virus 2 (SARS-CoV-2), is responsible for the severe disease now denoted as COVID-19. Its rapid cross border transmission has led to its quick spread into 203 countries and territories which prompted the World Health Organization (WHO) to declare COVID-19 a global pandemic on March 11, 2020. As of July 21, 2020 there were at least 23,676,599 patients diagnosed with COVID-19 worldwide among which 813,789 have died. Further, it is widely known that there are under reported cases and deaths due to the wide disparity in how they are reported around the world. Among the affected countries, USA has the largest population of confirmed cases (3,964,361) followed by Brazil (2,121,645) and India (1,171,356). The highest death toll (177,284) has been recorded in USA which has surpassed its place of origin in China