



SARS-CoV-2 Variant of Concern - Challenge and Solution

Haibo Zhang

Departments of Critical Care Medicine, and Anesthesiology and Pain Medicine, St. Michael's Hospital,
Unity Health Toronto, University of Toronto, Ontario, Canada

There have been more than 241million confirmed cases of COVID-19, including near 5 million deaths, reported to WHO, as of October 20, 2021. The emerging SARS-CoV-2 variant of concern (VOC) is particularly challenging. A recent Canadian study found that with Delta infections, the risks of hospitalization jumped to 108% higher than non-VOC cases, with the risk of admission to ICU 235% higher and the risk of death 133% higher than the original virus. Now, Delta lineage is to blame for 99.4% among VOC in the US. Moreover, they may potentially escape from vaccine-induced immunity. Scientists are testing a number of potential therapeutic solutions against the vaccine breakthrough, based on the viral structure and the mechanisms of its interaction with host cells. The approaches of solution include, but not limited to, using decoy viral particles, decoy host receptors and blockage of host receptor complex, as well as targeting the SARS-CoV-2 conserved non-structured protein regions and interrupting viral genome in addition to vaccines from which VOC with mutative spike proteins may escape. The advanced human organoids, gene editing technique and drug repurposing will facilitate the development of effective prophylactic and treatment capability against breakthrough infections.