



Authors : Meega Reji¹, Rupak Kumar^{2*}

¹Indian Institute of Science Education and Research, Thiruvananthapuram,
Kerala, India

²CDSCO, New Delhi, India

*Corresponding and Presenting Author E-mail: rupakraman@gmail.com

Title: Emergence of SARS-CoV-2 Variant of Concern Omicron: Biological Features and Genomic Concern

DOI: <https://doi.org/10.56950/ITRX2370>

Corona virus infection is a worldwide health threat that has infected a substantial portion of the world's population and is caused by SARS-CoV-2. It is the natural tendency of a virus to change the genetic makeup through the point mutation, and such viruses are called the variant of the original virus. SARS-CoV-2 virus also undergoes such mutation (may be one or more and distinct from other) over time, and many genetically diverse variant has risen. Such variants might be of variants of concern (VOC) and variant of interest (VOI) based on the differences in virulence, transmissibility, pathogenicity, and vaccination efficacy. Omicron, a new VOC of SARS-CoV-2, has recently emerged as a global distress to more than 115 countries. The article provides a summary of the evolutionary, biological, and genomic aspects of different SARS-CoV-2 VOC with respect to Omicron and found that amino acid mutation in spike proteins such as A67V, Δ69-70, Q954H, N969K, L981F etc and other structural protein mutations such as D3G, Q19E, A63T in membrane protein, T9I in envelope protein and P13L, Δ31-33, R203K, G204R in nucleocapsid protein results major differences between different VOC/VOI of SARS-CoV-2. Further, effectiveness of the widely used SARS-CoV-2 vaccines has been reviewed specific to Omicron. The existing available COVID-19 vaccines developed and manufactured by Pfizer, AstraZeneca, Johnson & Johnson, Moderna, and Novavax show reduced efficacy against the latest VOC of SARS CoV-2 Omicron. Based on the available literature of preliminary findings, people who get a booster shot or a third vaccine dosage may have better protected against Omicron.

Keywords: SARS-CoV-2, Omicron, Variants of Concern, Variants of Interest, Mutation, Vaccine