

THE BEST OF THE WEEK (19 set – 25 set 2022)

C.B. Jackson et al.

Mechanisms of SARS-CoV-2 entry into cells

Nature Reviews Molecular Cell Biology, October 2021; doi.org/10.1038/s41580-021-00418-x

Abstract The unprecedented public health and economic impact of the COVID-19 pandemic caused by infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has been met with an equally unprecedented scientific response. Much of this response has focused, appropriately, on the mechanisms of SARS-CoV-2 entry into host cells, and in particular the binding of the spike (S) protein to its receptor, angiotensin-converting enzyme 2 (ACE2), and subsequent membrane fusion. This Review provides the structural and cellular foundations for understanding the multistep SARS-CoV-2 entry process, including S protein synthesis, S protein structure, conformational transitions necessary for association of the S protein with ACE2, engagement of the receptor-binding domain of the S protein with ACE2, proteolytic activation of the S protein, endocytosis and membrane fusion.

S. Afkhami et al.

Respiratory mucosal delivery of next-generation COVID-19 vaccine provides robust protection against both ancestral and variant strains of SARS-CoV-2

Cell, March 2022; doi: 10.1016/j.cell.2022.02.005

Abstract

The emerging SARS-CoV-2 variants of concern (VOCs) threaten the effectiveness of current COVID-19 vaccines administered intramuscularly and designed to only target the spike protein. There is a pressing need to develop next-generation vaccine strategies for broader and long-lasting protection. Using adenoviral vectors (Ad) of human and chimpanzee origin, the authors evaluated Ad-vectored trivalent COVID-19 vaccines expressing spike-1, nucleocapsid, and RdRp antigens in murine models. Their findings indicate that respiratory mucosal delivery of Ad-vectored multivalent vaccine represents an effective next-generation COVID-19 vaccine strategy to induce all-around mucosal immunity against current and future VOC.

J. D. Sachs et al.

The Lancet Commission on lessons for the future from the COVID-19 pandemic

Lancet, September 2022; doi: 10.1016/S0140-6736(22)01585-9

Abstract

As of May 31, 2022, there were 6.9 million reported deaths and 17.2 million estimated deaths from COVID-19, as reported by the Institute for Health Metrics and Evaluation. This staggering death toll is both a profound tragedy and a massive global failure at multiple levels. This Commission report aims to contribute to a new era of multilateral cooperation based on strong UN institutions to reduce the dangers of COVID-19, forestall the next pandemic, and enable the world to achieve the agreed goals of sustainable development, human rights, and peace that governments are committed to pursue as members of the UN.