SARS-CoV-2: A new song recalls an old melody

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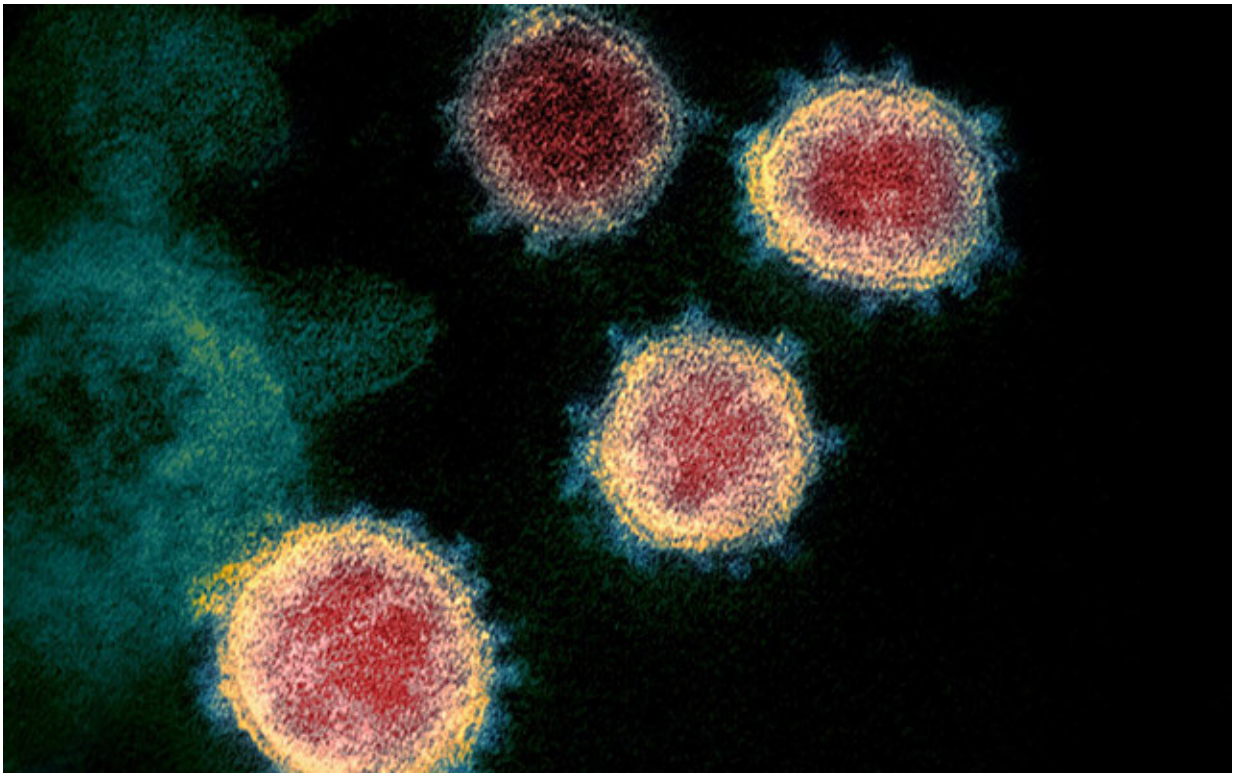

A colorized scanning electron micrograph of the SARS-CoV-2 virus. Credit: NIAID

In an article published today in *Cell Host and Microbe*, Professor Kanta Subbarao, director of the WHO Centre for Reference and Research on Influenza at the Doherty Institute, stressed the importance of detecting a

neutralizing antibody response in recovered COVID-19 patients, and of studies of COVID-19 vaccines in animal models.

Neutralising antibodies prevent infection by binding to a virus and blocking their ability to infect. After an infection, a host can produce neutralizing antibodies to protect against future infection.

"The speed with which SARS-CoV-2, the virus that causes COVID-19, has spread around the world and its toll in numbers of cases, severe illness, and death has been staggering," she said.

"However, technological advances have made rapid vaccine development possible. We have to ask ourselves what the new vaccines should aim to achieve—prevent all infection or prevent severe disease and death? In which age group(s)? What effect will vaccines that address these choices have on subsequent epidemics?"

Professor Subbarao was the Chief of the Emerging Respiratory Viruses Section of the Laboratory of Infectious Diseases at the National Institute for Allergy and Infectious Disease at the US National Institutes of Health during the SARS outbreak in 2002-2003, and was central to an important discovery of how neutralizing antibodies protect from infection.

"We used mouse experiments to establish the very important principle that neutralizing antibodies alone were sufficient to protect them from SARS-CoV infection," Professor Subbarao described.

She also explained the crucial discovery that the 'spike' protein of the virus induced neutralizing antibodies, and the importance of animal trials of several SARS vaccine candidates.

Coronavirus particles have a corona (crown) of spike proteins that allow

the virus to attach and enter cells.

"The 'spike' proteins of both SARS-CoV and SARS-CoV-2 are related and they attach to the same molecule called ACE 2 on human cells to infect people. We now also know through animal experiments with SARS-CoV-2 that neutralizing antibodies protect from reinfection," Professor Subbarao said.

"Two SARS vaccines were evaluated in humans, and a number of promising candidates were tested in pre-clinical studies, but they weren't pursued because SARS didn't re-emerge.

"However, the work on SARS is relevant to the COVID-19 pandemic because the two viruses share several features and many of the principles and experience with SARS vaccines will apply to SARS-CoV-2."

More information: Kanta Subbarao. SARS-CoV-2: A New Song Recalls an Old Melody, *Cell Host & Microbe* (2020). DOI: 10.1016/j.chom.2020.04.019

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