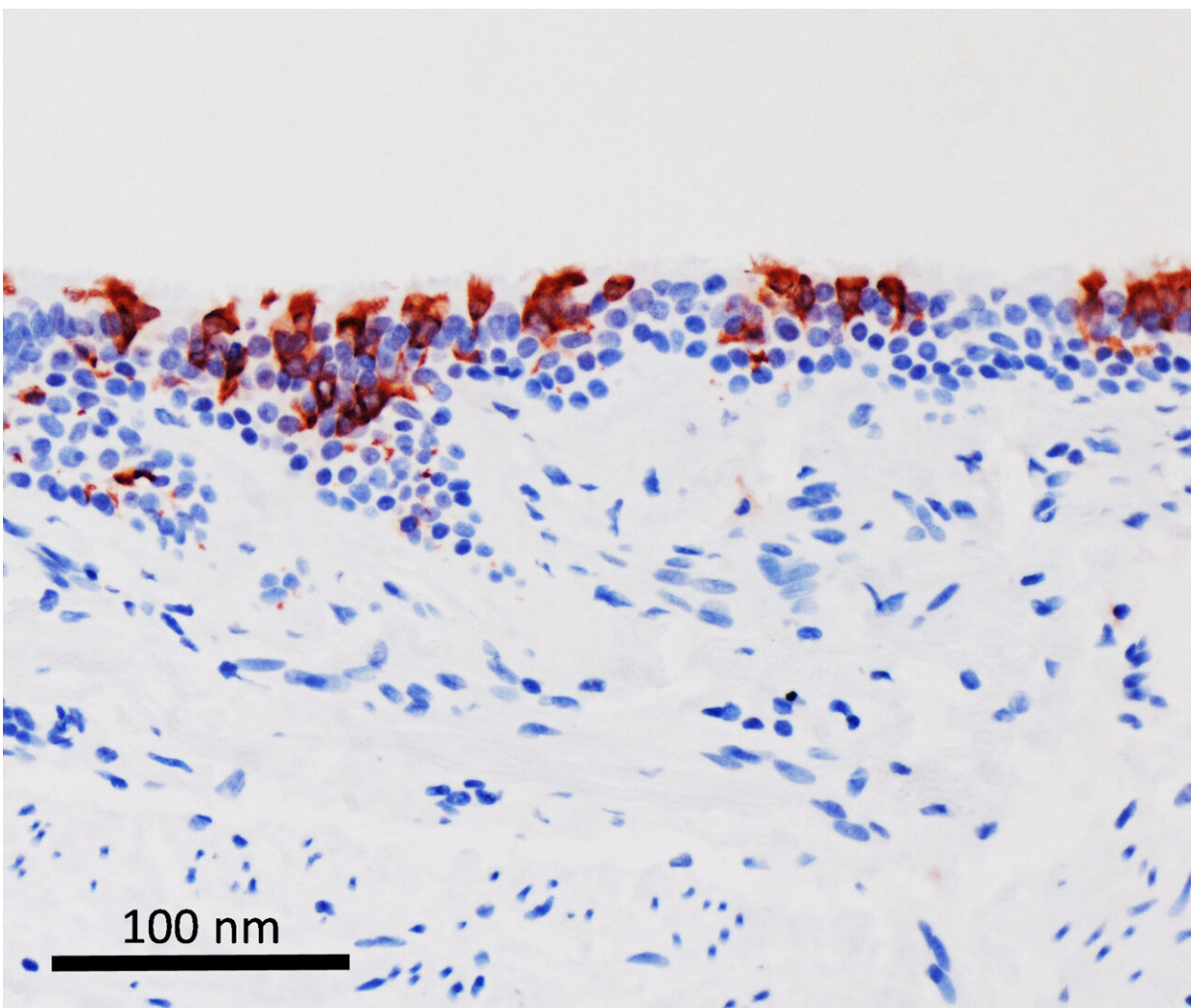


# Omicron SARS-CoV-2 can infect faster and better than delta in human bronchus, but with less severe lung infection

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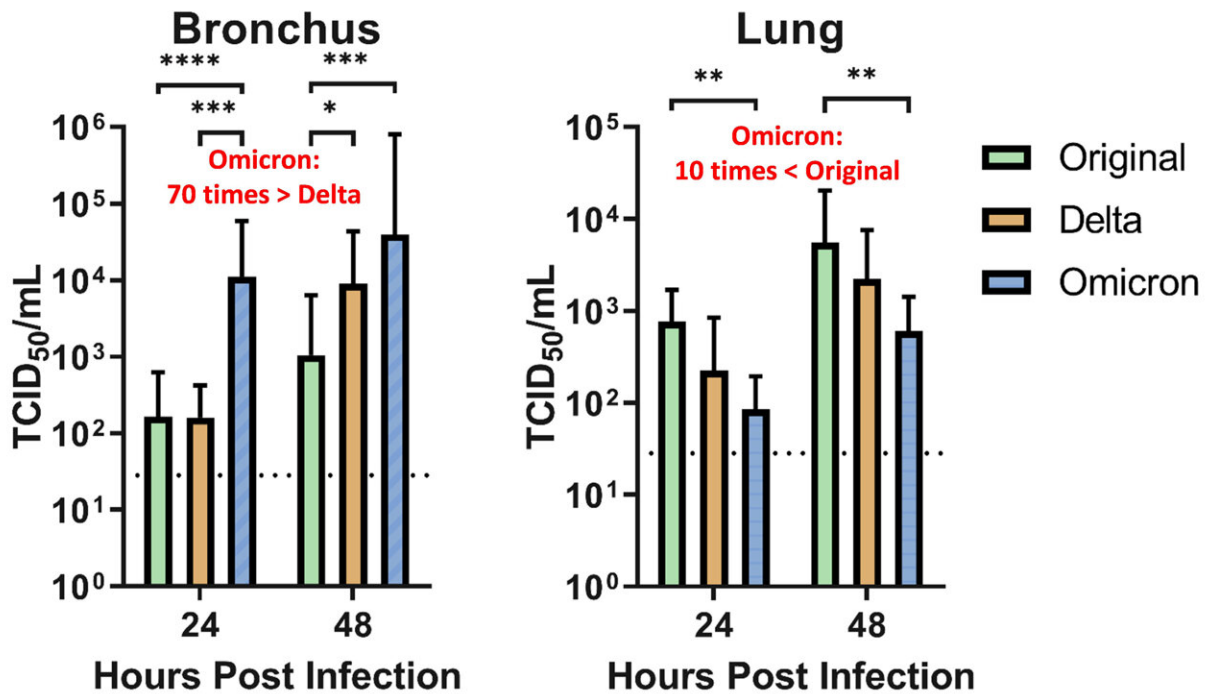
Omicron variant of SARS-CoV-2 (in red) infected human bronchus tissues.  
Credit: The University of Hong Kong

A study led by researchers from the LKS Faculty of Medicine at The University of Hong Kong (HKUMed) provides the first information on how the novel Variant of Concern (VOC) of SARS-CoV-2, the omicron SARS-CoV-2 infect human respiratory tract. The researchers found that omicron SARS-CoV-2 infects and multiplies 70 times faster than the delta variant and original SARS-CoV-2 in human bronchus, which may explain why omicron may transmit faster between humans than previous variants. Their study also showed that the omicron infection in the lung is significantly lower than the original SARS-CoV-2, which may be an indicator of lower disease severity. This research is currently under peer review for publication.

Dr. Michael Chan Chi-wai, Associate Professor of School of Public Health and Principal Investigator, Centre for Immunology and Infection (C2i), Hong Kong Science and Technology Park (HKSTP) and Professor John Nicholls, Professor of Department of Pathology, HKUMed have pioneered the use of ex vivo cultures of the respiratory tract for investigating many emerging [virus infections](#) since 2007, such as avian influenza, coronavirus of the Middle East Respiratory Syndrome (MERS). Now this technique has been applied to understand why the omicron variant may differ in transmission and disease severity from other SARS-CoV-2 variants.

This method uses lung tissue removed for treatment of the lung, which is normally discarded, for investigating virus diseases of the respiratory tract. Dr. Chan and his team successfully isolated the omicron SARS-CoV-2 variant and used this experimental model to compare infection with the original SARS-CoV-2 from 2020, the [delta variant](#) and the recent omicron variant. They found that the novel omicron variant replicates faster than the original SARS-CoV-2 virus and delta variant in the human bronchus. At 24 hours after infection, the omicron variant

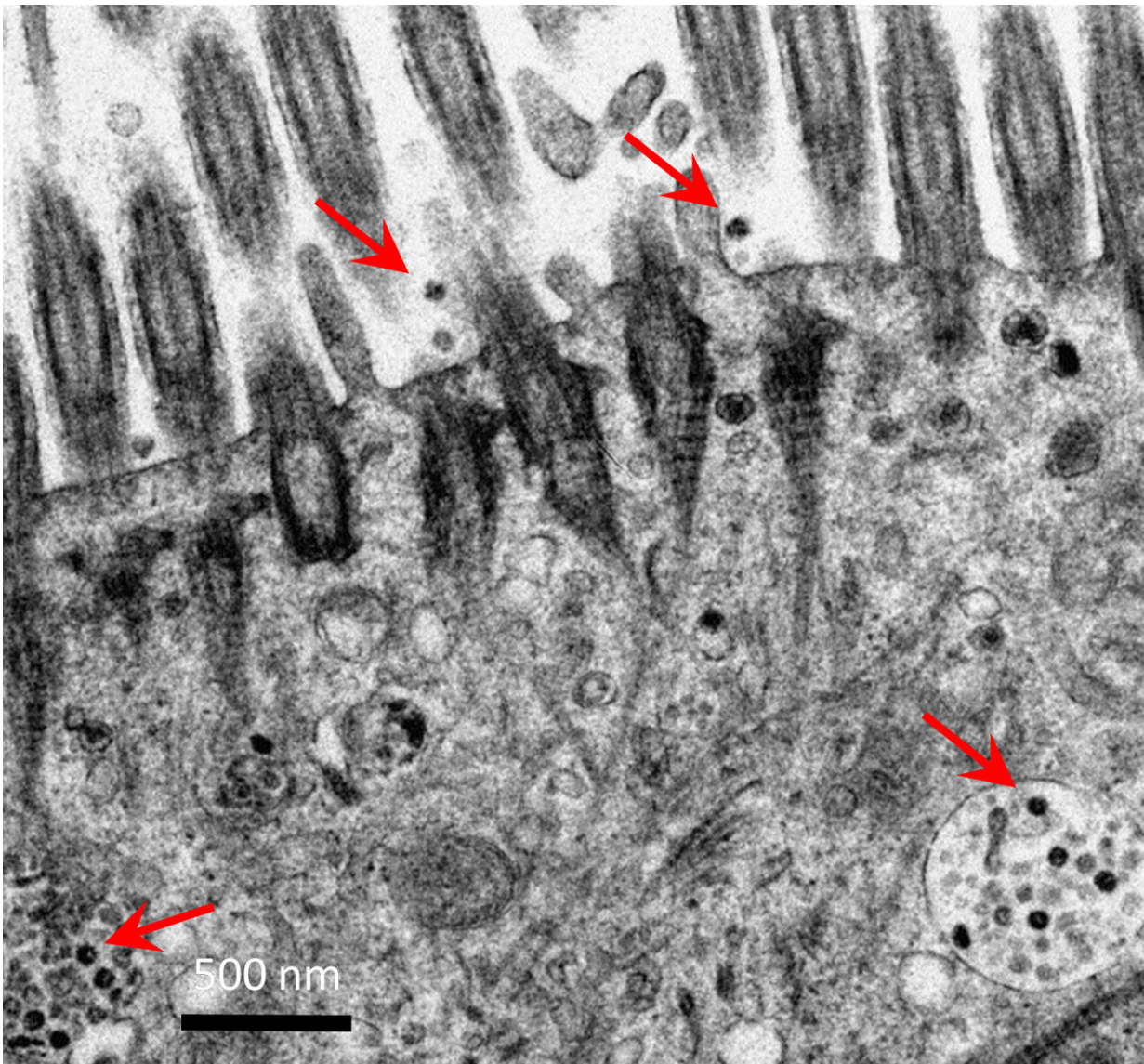
replicated around 70 times higher than the delta variant and the original SARS-CoV-2 virus. In contrast, the omicron variant replicated less efficiently (more than 10 times lower) in the human [lung tissue](#) than the original SARS-CoV-2 virus, which may suggest lower severity of disease.



Credit: The University of Hong Kong

"It is important to note that the severity of disease in humans is not determined only by virus replication but also by the host [immune response](#) to the infection, which may lead to dysregulation of the innate immune system, i.e. "cytokine storm,"" said Dr. Chan. "It is also noted that, by infecting many more people, a very infectious virus may cause more severe disease and death even though the virus itself may be less

pathogenic. Therefore, taken together with our recent studies showing that the omicron variant can partially escape immunity from vaccines and past infection, the overall threat from [omicron variant](#) is likely to be very significant."



Electron micrograph of the human bronchus tissues after infection with SARS-CoV-2. Red arrows showing viral particles. Credit: The University of Hong Kong

Provided by The University of Hong Kong

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