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ASIA EDITION

Singapore unravels molecular and serological evidence for SARS-COV-2 origin

February 9, 2021 | News | By Hithaishi C Bhaskar

The first study to indicate that SARS-CoV-2-related coronaviruses circulate in bats and pangolins in Southeast Asia



While the World Health Organization (WHO) continues its mission to Wuhan investigating the origin and early transmission of SARS-CoV-2, a new study led by scientists from Duke-NUS Medical School, Singapore, and Chulalongkorn University, Thailand, shows that SARS-CoV-2-related coronaviruses (SC2r-CoVs) are circulating in animals as far away as Thailand. The study, published in *Nature Communications* today, reported that high levels of neutralising antibodies against the virus were present in both bats and pangolins found in the Southeast Asian country. The study further indicates that more SC2r-CoVs are likely to be discovered in the region. Southeast Asia with its large and diverse bat populations may be a more likely hotspot for such viruses.

“This is an important discovery in the search for the origin of SARS-CoV-2, which was made possible by rapid application of cutting-edge technology through transparent international collaboration,” said Dr Supaporn Wacharapluesadee, from Thai Red Cross Emerging Infectious Diseases Health Science Centre, Faculty of Medicine, Chulalongkorn University, Bangkok Thailand.

In the study, the team examined *Rhinolophus bats* in a Thai cave. SARS-CoV-2 neutralising antibodies were detected in bats of the same colony and in a pangolin at a wildlife checkpoint in Southern Thailand.

“Our study extended the geographic distribution of genetically diverse SARS-CoV-2-related coronaviruses from Japan and China to Thailand over a 4,800-km range. Cross-border surveillance is urgently needed to find the immediate progenitor virus of SARS-CoV-2,” said Dr Chee Wah Tan, Senior Research Fellow with Duke-NUS’ Emerging Infectious Diseases (EID) programme and coauthor of this study.

The team conducted serological investigations using the SARS-CoV-2 surrogate virus neutralisation test (sVNT) developed at Duke-NUS in early 2020.

“Our study demonstrates that our SARS-CoV-2 surrogate virus neutralisation test, developed mainly for determining neutralising antibodies in humans to monitor vaccine efficacy and detect past infections, can also be critical for tracing the animal origin and animal-human spillover events,” said Professor Wang Linfa from Duke-NUS’ EID programme and corresponding author of this study. Prof Wang’s team invented the sVNT assay, trade named cPass, which has been granted Emergency Use Authorisation by the US FDA to determine SARS-CoV-2-neutralising antibodies in human sera, due to its good performance concordance with live virus-based assays.