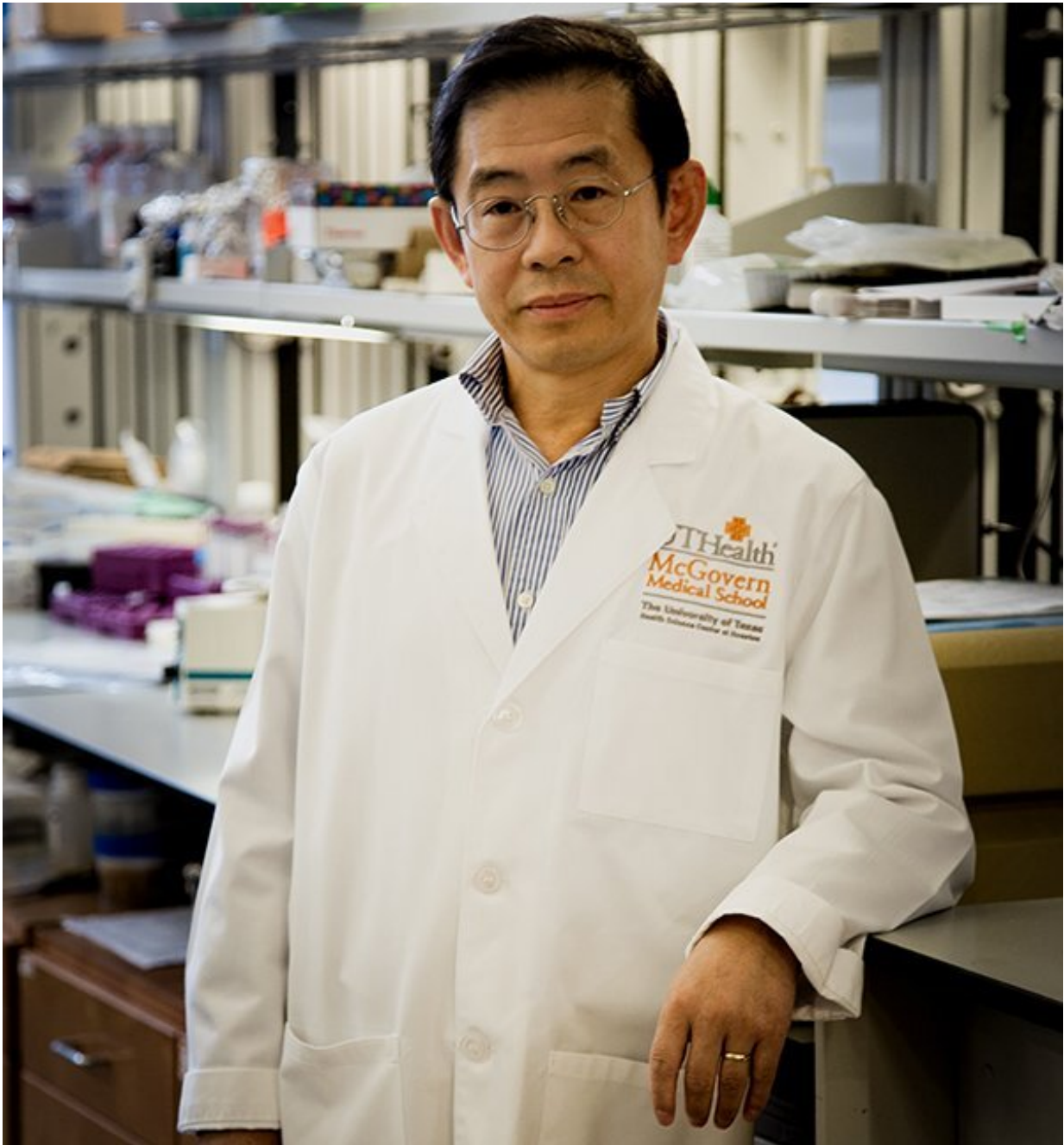# Research reveals new IgM antibodies to fight COVID-19 more potent than commonly used ones

June 3 2021, by Jeannette Sanchez

Zhiqiang An, PhD, was one of the lead authors of a study that revealed engineered IgM antibodies were more potent than standard ones against COVID-19. Credit: UTHealth

A nasal therapy, built upon on the application of a new engineered IgM antibody therapy for COVID-19, was more effective than commonly used IgG antibodies at neutralizing the COVID-19 virus in animal models, according to research recently published by The University of Texas Health Science Center at Houston (UTHealth), The University of Texas Medical Branch at Galveston (UTMB Health), the University of Houston, and IGM Biosciences, Inc. The study was published today in *Nature*.

Researchers engineered IgM [antibodies](#) and found that in all cases, these antibodies were significantly more potent than standard IgG antibodies in neutralizing the COVID-19 virus. One of the engineered IgM antibodies, IGM-6268, demonstrated a significantly increased potency against the original SARS-CoV-2 and emerging variants such as the current U.K., South African, and Brazilian variants of concern (VOC) and variants of interest (VOI), as well as the antibody escape mutants for the current Emergency Use Authorization antibodies. Additionally, IGM-6268 was shown to be highly effective for prophylaxis and treatment in mouse models when administered intranasally.

"High viral load in the respiratory tract correlates with severe illness and mortality in patients with COVID-19," said Zhiqiang An, Ph.D., director of UTHealth Texas Therapeutics Institute, professor and Robert A. Welch Distinguished University Chair in Chemistry at McGovern Medical School at UTHealth, and faculty member at MD Anderson Cancer Center UTHealth Graduate School of Biomedical Sciences and one of the corresponding authors on the study. "Respiratory mucosal antibodies are key to clearing SARS-CoV-2 infection and reducing viral transmission and IgM antibodies are nature's first line of defense against pathogens such as viruses."

The current government-approved antibodies, which are all IgG antibodies, are administered intravenously at high doses and don't

directly target the main sites of viral infection.

"SARS-CoV-2 has evolved mutations that severely compromise the neutralizing activities of multiple IgG monoclonal antibodies, including those under clinical trials and authorized for emergency use. Therefore, developing new antibody therapies that can overcome these challenges is an urgent unmet need, and we are pleased with the data published today," An said.

"Synergizing the strengths of multiple institutions from academia and industry is the key to the rapid translation from ideas to therapeutic candidates. This is another example of such success. The cross-institutional and academic-industry collaborations should be expanded to other disease indications," said Pei-Yong Shi, Ph.D., professor and co-senior author of the study from the Department of Biochemistry and Molecular Biology at UTMB Health.

This antibody has been licensed to biotech partner IGM Biosciences for drug development.

"The ability to use potently neutralizing IgM antibodies against SARS-CoV-2 with broad coverage of VOCs, VOIs, and viral escape mutants, is a very exciting application of the IGM platform," said Fred Schwarzer, CEO of IGM Biosciences. "We are grateful to our collaborators at UTHealth, UTMB Health, and our scientists at IGM for the exceptional work described in *Nature* today."

More information: Zhiqiang Ku et al, Nasal delivery of an IgM offers broad protection from SARS-CoV-2 variants, *Nature* (2021). [DOI: 10.1038/s41586-021-03673-2](#)

Provided by University of Texas Health Science Center at Houston