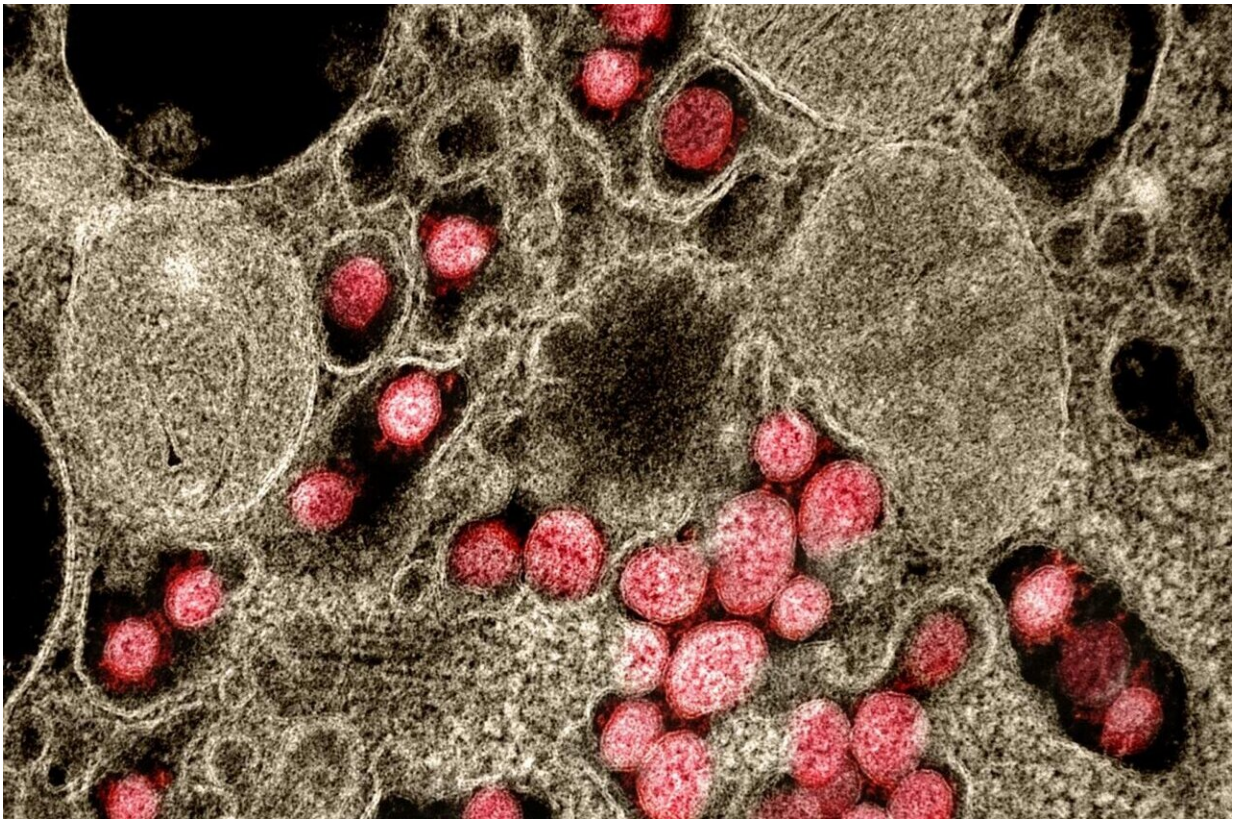
Medical Xpress

In-depth look at immune responses to SARS-COV-2

May 13 2021, by Marcus Wolf



Transmission electron micrograph of SARS-CoV-2 virus particles isolated from a patient. Credit: NIAID

Specific receptors in the immune cells detect and generate responses to defend against the virus that causes COVID-19—SARS-COV-2—when

it infects the body, according to University of Maine immunology expert Mumtaz Yaseen Balkhi.

Using several recent studies involving human samples, cell line and nonhuman primate models, Yaseen Balkhi, an assistant research professor with the UMaine Department of Molecular and Biomedical Sciences, wrote a review article and model detailing innate, or frontline, and adaptive immune responses to the virus that spurred a global pandemic.

The article, published in *Molecular Immunology*, particularly focuses on the mechanisms leading to excessive proinflammatory cytokine release and attenuation of type-I-Interferons seen in SARS-CoV-2 infected severe cases of COVID-19 patients.

Yaseen Balkhi also explains the mechanism leading to an increase in the expression of the cell receptor that allows the virus to attach to and infect human cells, angiotensin converting enzyme 2 (ACE2). His review article provides new data about how T-cell responses in SARS-COV-2, and elaborates "on adaptive and memory responses generated against" the virus.

Using a heat-inactivated version of SARS-COV-2, its total RNA genome and its expression vectors in primary human epithelial or innate immune cells can reveal how the immune system detects the virus and signals infected and other immune cells to create the necessary antiviral proteins to defend against it, Yaseen Balkhi says. They can also help researchers explore additional mechanisms that regulate the expression of ACE2 in airway epithelial cells.

"This article presents several new ideas based on understanding gained over the course of the pandemic about how the human immune system responds to SARS-CoV-2 in COVID-19 patients," Yaseen Balkhi says.

"These ideas can potentially help further understanding about our ability to defend against SARS-CoV-2."

More information: Mumtaz Y. Balkhi. Mechanistic understanding of innate and adaptive immune responses in SARS-CoV-2 infection, *Molecular Immunology* (2021). DOI: 10.1016/j.molimm.2021.04.021

Provided by University of Maine

Citation: In-depth look at immune responses to SARS-COV-2 (2021, May 13) retrieved 18 September 2024 from
https://medicalxpress.com/news/2021-05-in-depth-immune-responses-sars-cov-.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.