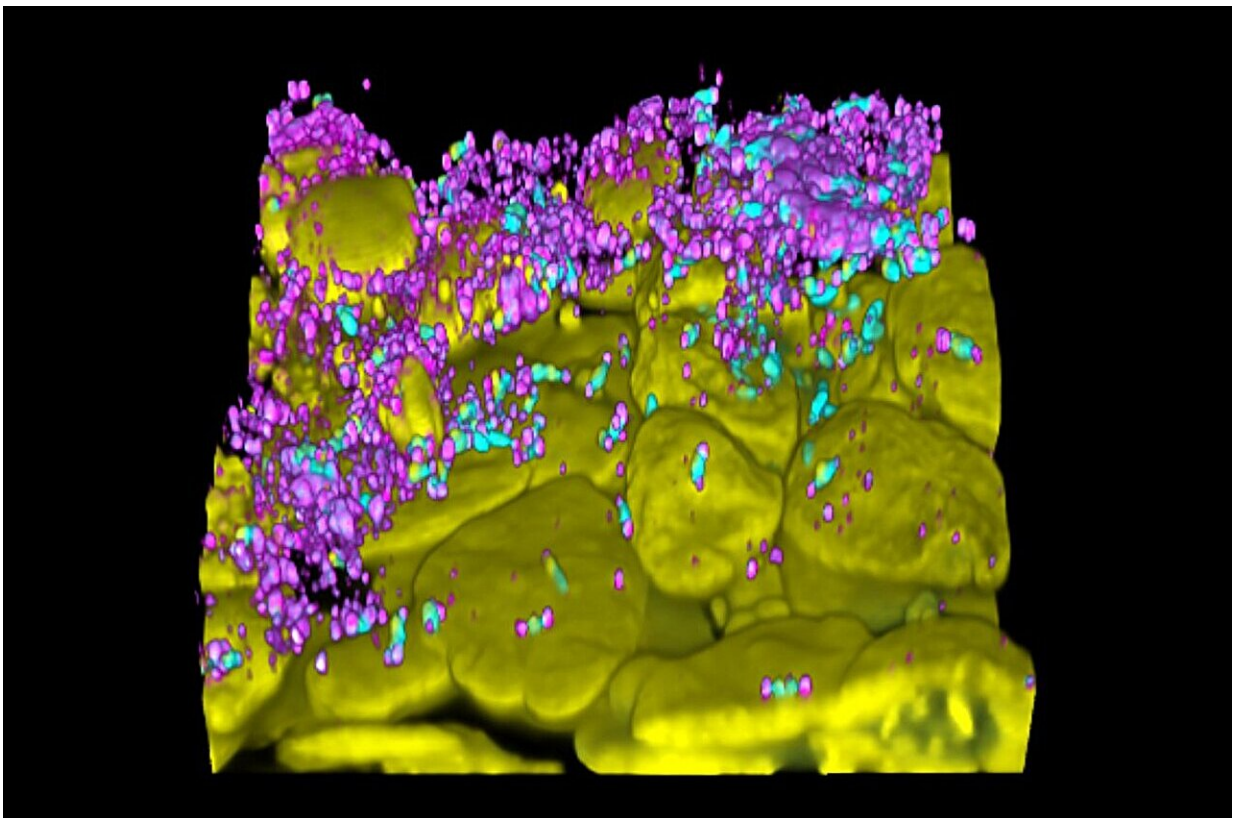


Study suggests host response needs to be studied along with other bacteriophage research

April 26 2024, by Bob Yirka



Bacteriophage (magenta) attack *Pseudomonas aeruginosa* (teal) biofilms grown in association with respiratory epithelial cells (nuclei, yellow). Credit: Paula Zamora, [CC BY](#)

A team of micro- and immunobiologists from the Dartmouth Geisel School of Medicine, Yale University, and the University of Pittsburgh has found evidence suggesting that future research teams planning to use bacteriophages to treat patients with multidrug-resistant bacterial infections need to also consider how cells in the host's body respond to such treatment.

In their paper [published](#) in the open-access journal *PLOS Biology*, the group describes experiments they conducted that involved studying the way epithelial cells in the lungs respond to bacteriophages.

Over the past decade, medical scientists have found that many of the antibiotics used to treat bacterial infections are becoming resistant, making them increasingly useless. Because of this, other scientists have been looking for new ways to treat such infections. One possible approach has involved the use of bacteriophages, which are viruses that parasitize bacteria by infecting and reproducing inside of them, leaving them unable to reproduce.

To date, most of the research involving use of bacteriophages to treat infections has taken place in Eastern Europe, where some are currently undergoing [clinical trials](#). But such trials, the researchers involved in this new study note, do not take into consideration how cells in the body respond to such treatment. Instead, they are focused on determining which phages can be used to fight which types of bacteria, and how well they perform once employed.

The reason so little attention is paid to host cell interaction, they note, is that prior research has shown that phages can only replicate inside of the [bacterial cells](#) they invade; thus, there is little opportunity for them to elicit a response in human cells.

In this new study, the research team suggests such thinking is misguided

because it fails to take into consideration the [immune response](#) in the host. To demonstrate their point, the team conducted a series of experiments involving exposing human epithelial cells from the lungs (which are the ones that become infected as part of lung diseases) to bacteriophages meant to eradicate the bacteria causing an [infection](#).

They found that in many cases, the immune system responded by producing proinflammatory cytokines in the [epithelial cells](#). They noted further that different phages elicited different responses, and there exists the possibility that the unique properties of some phages could be used to improve the results obtained from such therapies. They conclude by suggesting that future [bacteriophage](#) research involve inclusion of host cell response.

More information: Paula F. Zamora et al, Lytic bacteriophages induce the secretion of antiviral and proinflammatory cytokines from human respiratory epithelial cells, *PLOS Biology* (2024). [DOI: 10.1371/journal.pbio.3002566](#)

© 2024 Science X Network

Citation: Study suggests host response needs to be studied along with other bacteriophage research (2024, April 26) retrieved 7 August 2024 from <https://phys.org/news/2024-04-host-response-bacteriophage.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.