New discovery stops bacterial virus contamination

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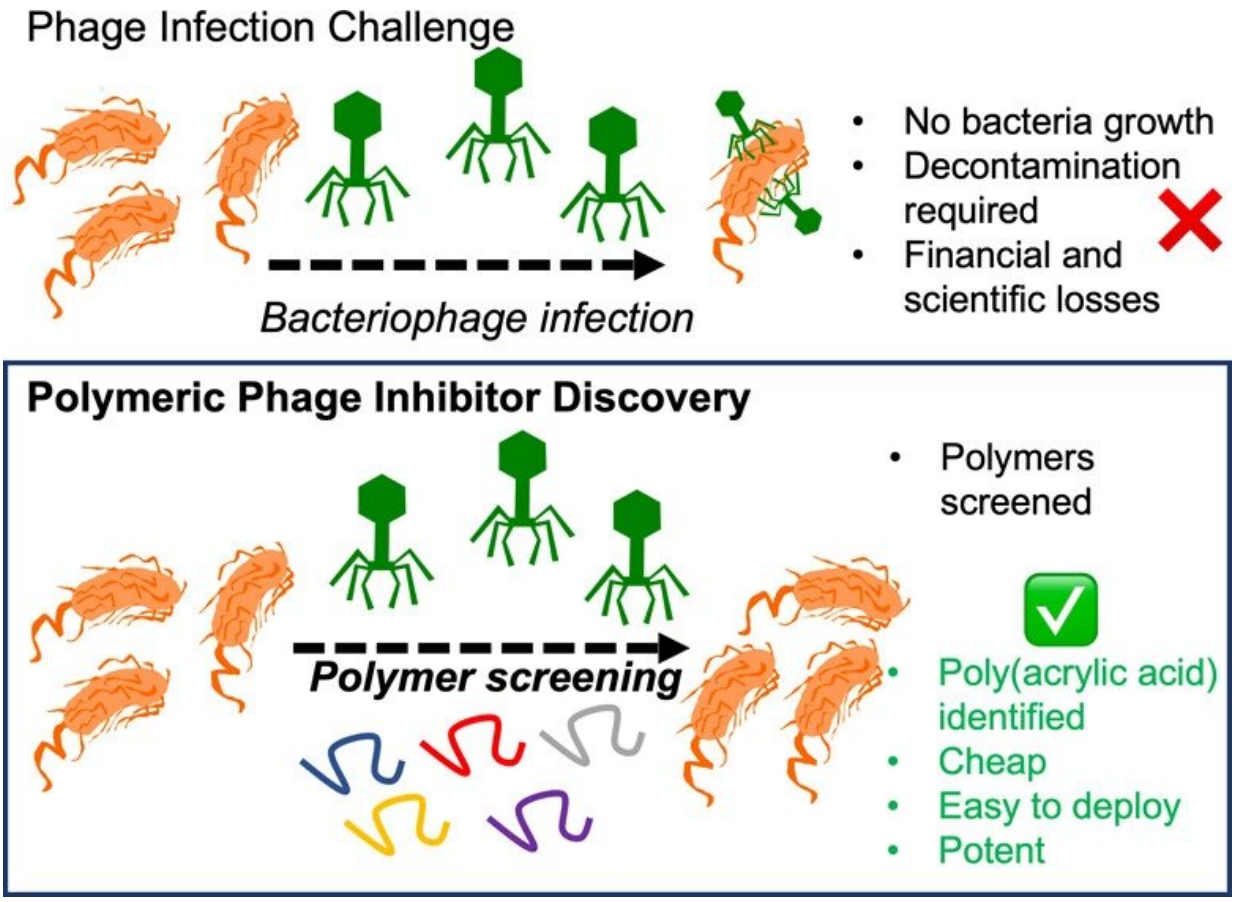

Abstract. Credit: *Journal of the American Chemical Society* (2023). DOI: 10.1021/jacs.3c01874

A new discovery by researchers at the University of Warwick could help

stop bacteria being contaminated with viruses, reducing disruption and decreasing costs in industry and research.

Bacteria are routinely used in biological and biomedical research. They are crucial in food production and emerging industrial biotechnologies, where bacterial 'factories' can be used to produce new materials, medicines and chemicals. Industrial biotechnology uses microorganisms as alternatives to traditional industrial processes, and is crucial for sustainable development. However, these microorganisms, like us, are subject to getting an infection.

Bacteria-targeting viruses, 'phage' infections can easily contaminate laboratories and microbial factories. This leads to significant down-time in research and industrial processes, costing money, plus stringent and slow disinfectant protocols to rectify.

The research, published today in the *Journal of the American Chemical Society* shows how a simple material added to bacteria can prevent infection. This new discovery, emerging from the University of Warwick's Chemistry, Medical School and Life Sciences departments, in collaboration with bioscience company Cytiva Ltd, aims to develop the next-generation industrial biotechnologies and remove a bottleneck in fundamental research.

Professor Matthew Gibson, Department of Chemistry and Warwick Medical School at the University of Warwick, said, "Our cross-disciplinary team has been looking at how we can deploy biomaterials to address healthcare and biotechnological challenges, and the phage-contamination issue is a big one. We screened a large number of polymers (big molecules) and found one which was particularly active, preventing the phage from killing bacteria, and stopping their replication."

"What is very exciting, is that the polymer we discovered is already produced at industrial scale and is easy to use by simply adding into the liquids already used for bacterial growth. Our discovery may help the sustainable manufacture of chemicals, materials and medicines using bacteria, by preventing contamination and loss of bacterial factories due to infection."

Dr. Antonia Sagona, Associate Professor at the University of Warwick's School of Life Sciences, added, "We have been collaborating with Professor Matthew Gibson and his team to combine our expertise in phage technologies, with their biomaterials and chemistry skills. Combining our expertise has enabled us to discover this exciting material to control phage infections. We are continuing to explore this together, as well as investigating materials for the storage of phage for other applications."

Dr. Peter Kilbride, Senior Scientist at Cytiva, comments, "Cytiva and the team at the University of Warwick have an established collaboration, where we have been using their biomaterials expertise to address biotechnological problems including how to store and transport biologics. This latest discovery shows how polymer materials can make a large impact in the biotechnological space, controlling the huge issue of phage contamination. We are exploring more aspects of this with the University of Warwick."

More information: Huba L. Marton et al, Anionic Synthetic Polymers Prevent Bacteriophage Infection, *Journal of the American Chemical Society* (2023). DOI: 10.1021/jacs.3c01874

Provided by University of Warwick