Bacteria-infecting viruses bind mucosal surface and protect from disease

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Helium ion microscope image of bacterial growth. Credit: Gabriel Almeida/University of Jyväskylä

Mucosal surfaces protect organisms from external stressors and disease. Bacteriophages, viruses that infect bacteria, have been shown to preferentially bind to mucosal surfaces. This has been suggested to provide an extra level of immunity against bacterial infections. Researchers at the University of Jyväskylä, Finland tested this idea using fish, phages (viruses) and a fish-infecting bacterium (Flavobacterium columnare). Phages were found to bind to fish mucosa, and maintain there for several days. Phages bound in mucus also protected the fish from diseases, although the pathogenic bacteria had a strong chemotaxis towards mucus, and exposure to mucosal molecules made them more virulent.

However, the mucosal environment made the bacteria more susceptible for phage infections, revealing a new aspect of the tripartite interactions between mucosal surfaces, bacteria and phages.

In conclusion, the mucosal environment influence both bacteria and phages. These interactions are important for understanding disease ecology and has significant impact in preventive phage therapy approaches.


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