

Abstract Submitted
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The population dynamics of bacteria, phage and RM Systems.

CALIN GUET, Institute of Science and Technology Austria, BRUCE LEVIN, Emory University, MAROS PLESKA, Institute of Science and Technology Austria — Viruses drive and mediate bacterial evolution as parasites and vectors of horizontal gene transfer, respectively. Temperate bacteriophages, defined by the ability to lysogenize a fraction of hosts and to transmit horizontally as well as vertically in the form of prophages, frequently carry genes that increase fitness or contribute to bacterial pathogenicity. Restriction-modification (RM) systems, which are widely diverse and ubiquitous among bacteria, can prevent infections leading to lysis, but their effect on lysogeny is not clear. We show that RM systems prevent lytic and lysogenic infections to the same extent and therefore represent a molecular barrier to prophage acquisition. Surprisingly, we find that this negative effect can be overcome and even reversed at the population level, as a consequence of dynamic interactions between viruses, hosts and RM systems. Thus the population dynamics of bacteria carrying RM systems impacts bacterial genome-wide evolution. .

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