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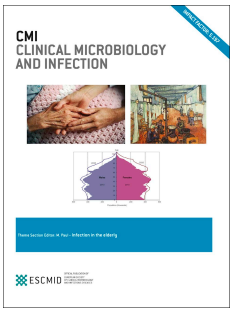

How do bacteriophages promote antibiotic resistance in the environment?

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How do bacteriophages promote antibiotic resistance in the environment?

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Antibiotic resistance has become a major global health concern because the increasing prevalence of this phenomenon is compromising the effectiveness of antimicrobial therapy. Around 700,000 deaths worldwide are attributed annually to antibiotic-resistant infections (http://amr-review.org). Bacteria can acquire antibiotic resistance through chromosomal mutations or acquisition of genetic material from other bacteria or the environment via horizontal gene transfer. This latter process is largely driven by mobile genetic elements (MGEs), such as plasmids, transposons or bacteriophages, which play an essential role in the evolution and ecology of bacterial communities by controlling the intra- and interspecies exchange of genetic information [1]. While the transfer of these MGEs may occur through transformation or transduction, conjugation is considered as the most efficient mechanism to exchange genetic material among bacteria [2]. Because antibiotic resistance genes (ARGs) are acquired and frequently spread by conjugation through conjugative plasmids and transposons, the contribution of these elements to antibiotic resistance has been extensively studied in hospital and community settings [3, 4]. However, little is known about the role of bacteriophages as vehicles for ARGs in