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How do bacteriophages promote antibiotic resistance in the environment?

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1 **How do bacteriophages promote antibiotic resistance in the environment?**

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

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