Phage-Inducible Chromosomal Islands

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Abstract
Bacteria are successful as commensal organisms or pathogens in part because they adapt rapidly to selective pressures. Mobile genetic elements (MGEs) play a central role in this adaptation process and are a means to transfer genetic information (DNA) among and within bacterial species.

During the last years, we and others have characterized a novel family of mobile staphylococcal pathogenicity islands, the SaPIs, which are the only source of several important superantigens, including toxic shock syndrome toxin-1 and enterotoxins B and C, as well as the source of other virulence factors related to host adaptation. In this talk we will report that similar elements occur widely in bacteria, comprising a unique class of mobile genetic elements, the phage-inducible chromosomal islands (PICIs).

Remarkably, PICIs have an unprecedented dual role in gene transfer: they not only mediate their own transfer, but they independently direct the transfer of unlinked chromosomal segments containing virulence genes. These findings represent the discovery of a novel agency of horizontal dissemination of virulence and other important accessory genes among bacteria.

Recommended Reading


