



toxins



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Toxin-Antitoxin Systems in Pathogenic Bacteria

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Message from the Guest Editor

Bacterial toxin–antitoxin (TA) systems, which are ubiquitously present in bacterial genomes, are not essential for normal cell proliferation. The TAs regulate fundamental cellular processes, facilitate survival under stress conditions, have essential roles in persistence and virulence, and represent potential therapeutic targets. These genetic TA loci are also shown to be involved in the maintenance of successful multidrug-resistant mobile genetic elements. TA systems encode a labile antitoxin and its stable toxin; degradation of the antitoxin renders a free toxin, which is bacteriostatic by nature. A free toxin generates a reversible state with low metabolic activity (quiescence) by affecting important functions of bacterial cells such as transcription, translation, DNA replication, replication and cell–wall synthesis, biofilm formation, phage predation, the regulation of nucleotide pool, etc., whereas antitoxins are toxin inhibitors.



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