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Rapid screening for antimicrobial genes in novel nocardiophages

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ABSTRACT

There has been an increase in number of human infections by mycobacteria and opportunistic pathogens of the closely related nocardioform bacteria. Frequent multiple drug resistance in these organisms makes it desirable to identify novel targets for antimicrobial agents. Bacteriophages offer one way to do this as analysis of their DNA reveals great diversity in their genetic makeup, suggesting variety in the way they interfere with host cells. Four novel nocardiophages were therefore isolated from soil and characterized. Libraries of their nucleic acid were constructed and screened for clones inhibitory to a nocardioform of the genus *Rhodococcus*. Nine clones were characterized, and minimum necessary DNA for inhibitory activity sequenced. Of 18 ORFs predicted on these DNAs, 13 could not be assigned a function. Genes similar to ones in databases apparently interfered with DNA metabolism, protein synthesis, or integrity of plasma membrane. This genetic approach may be an efficient and effective way to discover novel targets for antibiotics.