Whole Genome Sequence of the Rifamycin B-Producing Strain
Amycolatopsis mediterranei S699

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Amycolatopsis mediterranei S699 is an actinomycete that produces an important antibiotic, rifamycin B. Semisynthetic derivatives of rifamycin B are used for the treatment of tuberculosis, leprosy, and AIDS-related mycobacterial infections. Here, we report the complete genome sequence (10.2 Mb) of A. mediterranei S699, with 9,575 predicted coding sequences.

The complete genome sequence of A. mediterranei S699 contains a single circular 10,236,779-bp chromosome with a GC content of 71.3%. There are 9,575 coding sequences (CDSs) falling into 6,883 functional COGs (clusters of orthologous groups). The coding density is 90%, with an average CDS length of 954 bp. A total of 52 tRNA and 4 rRNA operons are present. Besides the published 90-kb cluster of rif genes, which includes a set of five large open reading frames encoding type I polyketide synthase (PKS) (2, 10), five other PKS clusters were observed. Twelve nonribosomal peptide synthases (NRPSs) and three hybrid NRPS/PKS clusters were also identified. Additionally, 341 CpG islands, 58 transposons, 1,148 tandem repeats, and five CRISPR elements are present. The genome sequence of A. mediterranei S699 is highly similar to that of A. mediterranei U32 with respect to nucleotide identity (>99%) and gene order.

Overproduction of rifamycin in A. mediterranei using traditional approaches of strain improvement appears to have attained a plateau (6). However, the availability of genome sequences of S699 and U32 will further improve our understanding of rifamycin biosynthesis, which in turn may provide new knowledge that will help improve rifamycin production and generate rifamycin analogs to combat rapidly emerging multidrug-resistant microorganisms.

Nucleotide sequence accession number. The genome sequence of Amycolatopsis mediterranei S699 has been deposited in GenBank under accession number CP002896.

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