Mycobacteriophage TM4 Tape-Measure Protein Blocks Entry into Stationary Phase of Tuberculosis

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The treatment of tuberculosis requires a minimum of 6 months of multidrug therapy. Antibiotic efficacy is complicated by a bacterial subpopulation of “persisters”. The persisters are genotypically susceptible, but phenotypically resistant to antibiotics. Currently, persistence is thought to be a result of dormancy by the bacteria. A possible method to eliminate these persister cells lies in utilizing the tape measure protein (TMP) from phages. These TMPs have homology to resuscitation promoting factor (Rpf) proteins found in Micrococcus luteus, Mycobacterium tuberculosis, and other bacteria. Rpfs are used to resuscitate bacteria from a stationary phase to an active growth. Analysis of data shows that the expression of these proteins blocks the bacteria’s ability to enter stationary phase and thus could prove to be a useful tool in blocking the formation of persistent bacteria and dramatically reducing the length of treatment and formation of antibiotic resistant progeny.

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