



## Mechanisms of Drug Resistance in *Mycobacterium tuberculosis*

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Despite the availability of chemotherapy and BCG vaccine, tuberculosis (TB) remains a leading infectious disease worldwide. Increasing emergence of drug-resistant TB (MDR-TB and XDR-TB) poses particular threat to the treatment and control of TB. In this presentation, the problem of drug-resistant TB and its causes will be briefly reviewed, and the current treatment principle will be discussed in the context of drug resistance and persistence. The mechanisms by which TB bacteria become resistant to antibiotics will be examined. The fitness and virulence of drug-resistant TB strains will be briefly discussed. The implications of understanding the molecular basis of drug resistance on rapid detection of drug-resistant TB along with different molecular tests will be discussed. The importance of rapid detection of MDR/XDR-TB for more effective treatment will be emphasized by the example of a rifampin-dependent/enhanced MDR-TB. Finally, new promising TB drug candidates in clinical trials will be briefly reviewed along with their advantages and limitations. It is proposed that a multi-pronged, systems approach, combining rapid diagnosis of drug-resistant TB, more effective new TB drugs and vaccines, conducive socioeconomic, nutritional and immune factors, and political commitment, is required for more effective control of TB and drug-resistant TB.