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Whole genome analysis of *Mycobacterium tuberculosis* DR, MDR, XDR and XXDR isolates to find signature mutation pattern in drug resistance

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The emergence of resistance to various antibiotics has become a major threat for combating infectious diseases resulting in persistent infection and increased mortality. Whole genome sequencing is a promising tool for finding mutations causing resistance and to distinguish the resistant strains. *Mycobacterium tuberculosis*, a global threat and the recent breakout in Multi-drug resistance strain (MDR-TB) and Extensively Drug resistance (XDR-TB) has challenged researchers in the diagnosis and to provide effective treatment. The study focuses on the analysis of whole genome high-throughput data of *Mycobacterium tuberculosis* over a time period of 1999-2017 including drug-resistant strain, multi-drug resistant strain and the extensively drug-resistant strain from different geographical locations collected from NCBI-SRA. An effective pipeline is developed to analyze and interpret mutations causing antibiotic resistance using bioinformatics and NGS approach. The analysis provides discovery of genetic changes, drug-resistant genes, mutated amino acid and its position in the chromosome. We have characterized 10 DR-TB, 30 MDR-TB, 10 XDR-TB, 5 Pre-XDR-TB and 15 XXDR-TB based on the mutation pattern of resistance. Results provide a determination of anti-tuberculosis drug resistance and identification of resistance strain based on the identified SNP biomarkers.

Biography

Vidya Niranjan received her BSc degree in Chemistry and MSc degree in Biophysics from the University of Madras, Chennai. She obtained her PhD in bioinformatics from Kuvempu University, Shivamogga in the year 2009. She was associated with Indian Institute of Science (IISC), Bengaluru, India from 2010-2011 where she received her Post-Doctoral Fellowship for her work in Computational Biology. She has 10 years of industry experience and 15 years of core teaching experience. She is currently employed at R.V College of Engineering, Bengaluru, India as a Professor and Associate Dean in the Department of Biotechnology.

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