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## Contribution of *KatG* and *inhA* gene mutation in isoniazid drug resistance: A study on clinical isolates of *Mycobacterium tuberculosis* from North India

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From the last five decades, isoniazid (INH) is one of the main first line anti-tubercular drugs used for the treatment of tuberculosis (TB) and the steady increase of resistance against this compound worldwide is alarming. Catalase-peroxidase (*KatG*) is an enzyme required for activation of this drug and their ultimate target is *InhA* enzyme, involved in cell wall synthesis in *Mycobacterium tuberculosis*. Mutations in *KatG* and *inhA* genes are most targeted region for INH resistance. The aim of this study was to determine the frequency of *katG* & *inhA* gene mutations and its correlation with minimal inhibitory concentration (MIC) of INH drug in clinical isolates of Mtb from North India. The conventional proportional method was used to determine drug susceptibility test and level of INH resistance was confirmed by MIC in 71 isolates of *M. tuberculosis*. DNA extraction, *KatG* & *inhA* gene amplification, and DNA sequencing analysis were performed. Of 50 INH resistant isolates, 86% showed change at *katG* codon 315, 80% showing Ser-Thr change, one (2%) each showing Ser-Ile and Ser-Asn change separately. One (2%) isolate had 2 mutations, *katG* 315 (Ser-Thr) with change at codon 94 (Ser-Ala) *inhA*, 6 (12%) isolates did not show any change in studied gene segments. One (2%) isolate with mutation in *katG* codon 299. Conclusively, the *KatG*315 (Ser-Thr) mutation is most frequent and associated with high level of INH resistance. However, extremely low frequency of mutation at codon 94 (Ser-Ala) in structural region of *inhA* gene decreases their contribution in INH drug resistance.

### Biography

Indu Jaiswal did her MSc in Microbiology from Chhatrapati Sahuji Maharaj University, India. She is currently pursuing PhD and appointed as a Research Assistant in the Department of Microbiology at King George's Medical University, India. She was awarded with Best poster award in Bacteriology in Up Microcon, Subharti Medical College, UP, India. Her area of research interest is Molecular Microbiology.

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