

## The Newly Identified Proteins Involved in the Chromosome Segregation in Mycobacteria- the Functional Analysis

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### Abstract

**Chromosome Segregation:** Chromosome segregation in bacteria is an active process involving a number of proteins. In most of the bacteria, it depends on the presence of ParABS system. ParB segregation protein binds to the parS sequence and forms segregation complexes. ParA segregation protein interacts with ParB complexes being responsible for their distribution. ParA homologs: *C. crescentus* MipZ, *C. glutamicum* PldP. MipZ exhibited nonspecific DNA binding activity similar to ParA-like proteins. **Characteristic Features of Mycobacteria:** Rod shaped, Slow growing, Gram positive bacteria with high ( G + C ) content (61 - 71% ), Lipid rich cell wall, Resistant to many environmental factors: drying, high and low temperature, high and low pH. **Unique chromosome organisation and segregation in Mycobacteria:**Chromosome is positioned asymmetrically in *M. smegmatis* cells. oriC is in the off-centre position after oriC duplication, new pole segrosome migrates faster than old pole segrosome. Mycobacterial cell elongate asymmetrically – the old pole extends faster. **ParA in *M. smegmatis*:** ParA is responsible for the localisation of the ParB complexes in the cell. parA deletion strain is characterized by slow growth. parA deletion results in formation 30% of anucleate cells. **MSMEG\_3743 (Soj) role in *M. smegmatis*:**MSMEG\_3743 interacts with ParB segregation protein in bacterial two hybrid system. Deletion of msmeG\_3743 gene results in: Slower growth rate, Division disorders and occurrence of very long cells (over 6,6  $\mu\text{m}$ ), Disorders in chromosome segregation (19,8 % of anucleate cells). **The aim of Msc project:** Localisation of MSMEG\_3743 (Soj) in wild type *M. smegmatis* background. Localisation of MSMEG\_3743 (Soj) in parB deletion background – elucidation of ParB influence on Soj localisation. Colocalisation of MSMEG\_3743 (Soj) with ParB-mNeon. **Strategies:** Exchange of the msmeG\_3743 to msmeG\_3743-dendra fusion in the native chromosomal locus. Introduction of mcherry-msmeG\_3743 in the integrative plasmid

### Biography

Rudra Suresh is an Assistant Professor at University of Wrocław, Poland. He has two and half years teaching and research experience in the University. He has also involved in the different research projects at University level and presented work at

globally. He published 5 research articles and attended many workshop and conferences in India. He belong from a small village of Rajasthan in India and is passionate about teaching and research.