Rashmi Kumari et al., J Microb Biochem Technol 2015, 5:4
http://dx.doi.org/10.4172/1948-5948.S1.014

OMICS International
conferenceseries.com

World Congress and Expo on
Applied Microbiology
August 18-20, 2015 Frankfurt, Germany

Comparative genomic analysis of genus *Amycolatopsis*: Revealing their phylogeny, functional attributes and potential to produce variety of secondary metabolites

Rashmi Kumari, Roshan Kumar, Priya Singh, Udita Mukherjee, Utkarsh Sood, Princy Hira and Rup Lal
University of Delhi, India

The genus *Amycolatopsis* comprises a large group of medicinally and commercially important Gram positive filamentous bacteria. They are prolific producers of a large number of biologically active compounds *viz.* antibiotics, anticancer agent, immune suppressant etc. Although genomes of species belonging to genus *Amycolatopsis* have been sequenced but these have not been analyzed. This study focus on the intra and inter-generic comparative genomic analysis of 24 *Amycolatopsis* strains with emphasis on phylogeny, functional attributes and secondary metabolite producing ability. Phylogenetic analysis based on 16S rRNA gene sequence, Average Nucleotide Identity and ribosomal genes were in consensus with each other and these strains clustered in four distinct groups based on the biosynthetic gene clusters they harbour. All strains of *A. mediterranei* were 99.9% similar and cluster together with *A. rifamycinica* (92.51%) and *A. vancoresmycina* (91.52%) as they also harbour the *rif* PKS cluster. Phylogeny revealed a major drawback in classification of four *A. orientalis* strains based on their ANI values and need to be reclassified in order to generate proper phylogenetic assessment of genus *Amycolatopsis*. Functional analysis revealed the two-component system for gene expression was highly abundant in all the strains along with ABC transporters. Detailed analysis led to construction of a novel rifamycin biosynthetic gene cluster in *A. rifamycinica* which differed by 10% at nucleotide level from *rif* biosynthetic gene cluster of Rifamycin B producer *A. mediterranei* S699. In conclusion, this study revealed the genetic key components of genus *Amycolatopsis* and provided an insight into secondary metabolite biosynthetic gene clusters across different species.

Biography

Rashmi Kumari has obtained her Master's Degree in Zoology from Department of Zoology, University of Delhi. Presently she is pursuing her Doctoral degree in Molecular Biology at Department of Zoology, University of Delhi. Her Doctoral research focuses on the Genetic Manipulation of rifamycin biosynthetic gene cluster of *Amycolatopsis mediterranei* S699 for production of rifamycin analogues.

Notes: