

Dynamics of Streptomyces genome architecture and genomic island expression

Streptomyces are characterized by a large linear chromosome divided into a central region harboring core genes and two extremities enriched in poorly conserved sequences including genomic islands (GIs) encoding notably specialized metabolite biosynthetic gene clusters (SMBGCs) or prophages. The majority of these GIs remain transcriptionally silent over growth under lab conditions. We previously demonstrated in *Streptomyces ambofaciens* ATCC 23877 that this genetic compartmentalization correlates with chromosome architecture and gene expression during vegetative growth: The distal ribosomal RNA (*rrn*) operons delimit a highly structured and expressed region termed 'central compartment', presenting structural features distinct from those of the terminal compartments which are almost transcriptionally quiescent. This architecture is dynamic during cell growth. We thus further explored the link between chromosome architecture dynamics and GI expression. First, we analyzed chromosome dynamics in a stress condition associated with prophage and other mobile genetic elements activation. Second, we explored the impact of relocating an SMBGC from the terminal to the central compartments. Altogether, these results highlight the extent of chromosome architecture dynamics and its links with GI expression and *Streptomyces* physiology.

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