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ABSTRACT BOOK



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**Physiology / Biochemistry / Molecular Microbiology - Part III**

**THE SMALL PROTEIN TRPM MODULATES MORPHO-PHYSIOLOGICAL DIFFERENTIATION IN THE MODEL ACTINOMYCETE STREPTOMYCES COELICOLOR A3(2)**

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**Backgrounds**

TrpM, a small protein of 63 amino acids, modulates tryptophan (Trp) metabolism and morpho-physiological differentiation in the filamentous bacterium *Streptomyces coelicolor* A3(2), a model organism for antibiotic production and cell differentiation. Indeed, the *trpM* knock-out mutant strain is characterized by a delayed growth on minimal medium, smaller aerial hyphae, and reduction of both spore and antibiotic actinorhodin production in comparison with the wild-type strain. These observations were in agreement with proteomic analyses which highlighted a role for TrpM in controlling i) Trp production through Trp precursor availability and, thus ii) bacterial growth and morpho-physiological differentiation.

**Objectives**

Construction and morpho-physiological characterization of a *S. coelicolor* A3(2) *trpM* knock-in mutant.

**Methods**

- Construction of a *trpM* knock-in mutant by *E. coli*-*S. coelicolor* interspecific conjugation using the pIJ8600/*trpM* integrative plasmid.
- Scanning Electron Microscope (SEM) analysis.
- Spectrophotometric analysis and microbiological assays for evaluating antibiotic production.

**Conclusions**

A *trpM* knock-in mutant strain of *S. coelicolor* A3(2) was constructed and showed an increased production of actinorhodin and spores: moreover, SEM analysis revealed an earlier formation of septa in aerial hyphae and confirmed that TrpM has a role in controlling the morpho-physiological differentiation of *S. coelicolor* A3(2).