FEMS-0989
Microbial proteomics

THE SMALL PROTEIN SCO2038 CONTROLS STREPTOMYCES COELICOLOR DIFFERENTIATION BY MODULATING TRYPTOPHAN BIOSYNTHESIS

E. Palazzotto[1], *G. Gallo*[2], *P. Fontana*[2], *A. Sutera*[2], *G. Renzone*[3], *A. Giardina*[2], *J. Silva*[2], *C. Vocat*[2], *A. Fabbretti*[1], *A. Scaloni*[3], *A.M. Puglia*[2]
[1]*School of Biosciences and Veterinary Medicine, University of Camerino, Camerino, Italy*
[2]*STEBICEF, University of Palermo, Palermo, Italy*
[3]*ISPAAM, National Research Council, Napoli, Italy*

Background

In *Streptomyces coelicolor* amino acid metabolism is an important clue of the morphological and physiological differentiation program and, differently from other bacteria, the expression of amino acid biosynthetic genes is not subjected to end-product negative regulation. In some amino acid biosynthetic gene clusters, such as tryptophan, histidine and proline, small orfs (about 100-300 nucleotides) were identified. These small orfs, such as sco2038, encode proteins whose cellular role have to be elucidated to highlight possible novel and crucial molecular mechanisms controlling amino acid synthesis and, thus, differentiation program.

Objectives

The aims of this work are:

1. the understanding of the effects exerted by tryptophan on primary metabolism, morphological differentiation and antibiotic production;

2. the study and characterization of the SCO2038 function as modulator of tryptophan biosynthesis.

Methods

- Differential proteomic analysis based on 2D-DIGE and MS procedures.
- SEM analysis.
- Generation and characterization of sco2038 mutants
- Identification of potential SCO2038 interaction partners by pull down assay coupled with MS identification and Bacterial Adenylate Cyclase Two Hybrid System.
- qRT-PCR analysis.

Conclusions

The obtained results revealed that tryptophan controls the expression of metabolic and regulatory proteins and promotes aerial mycelium formation, spores production and actinorhodin antibiotic biosynthesis. Moreover, the small orf sco2038*,* encodes a 7 KDa protein playing a key role in modulating tryptophan biosynthesis and thus, morphological differentiation. In the light of these results we propose to rename sco2038 as *trpM,* the gene encoding the tryptophan biosynthesis Modulator TrpM.