**Epigenetic influence on *Streptomyces coelicolor* morphological and physiological differentiation**

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DNA methylation is an epigenetic modification regulating many aspects of biological processes; for instance, in bacteria adenine methylation is well known to be associated with DNA repair and coordination of replication, while the role of cytosine methylation has been elucidated only in a few examples.

*Streptomyces* *coelicolor* is a mycelial soil microorganism, producer of several antibiotics, with a complex life cycle that includes three different cell types: unigenomic spores, a compartmentalized mycelium (MI) and a multinucleated mycelium (MII).

The main objective of this study was to investigate the role of DNA cytosine methylation along the morphological and physiological differentiation of *S. coelicolor*.

Liquid and solid cultures of *S. coelicolor* were treated with 5-aza-2'-deoxycytidine (aza-dC, a cytidine analogous that inhibits DNA-methyltransferase activity) demonstrating that methylation influences spore germination, aerial mycelium formation and antibiotic production. Sporulation on solid culture was also affected.

To further demonstrate the role of cytosine methylation, knock out mutants in putative methyltransferase genes were generated. Interestingly, disruption of a methyltransferase gene caused a delay in physiological and morphological differentiation similarly to what was obtained treating the cultures with aza-dC.

Altogether these results demonstrate the involvement of DNA cytosine methylation on both morphological and physiological differentiation of *S. coelicolor*.