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## Strong antibiotic production is correlated with an oxidative metabolism in *Streptomyces*

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The *Streptomyces* genus is well known for its outstanding ability to produce secondary metabolites of great interest for human kind such as antibiotics. Antibiotic biosynthesis occurs in the periods of slow or no growth and is triggered by phosphate limitation, a condition known to be correlated with energetic stress. However, the metabolic changes underlying the transition between primary and secondary metabolism remains largely elusive. Comparative physiological and proteomic studies of two closely related model strains, *S. lividans* and *S. coelicolor*, weak and strong producers of the same antibiotics, respectively, were carried out. These studies clarified for the first time the nature of the metabolic transition between primary and secondary metabolism. This switch triggered by energetic stress results from a transition from a glycolytic to an oxidative metabolism in order to restore the energetic balance of the cell. Our results indicate that in condition of energetic stress, the acetyl-CoA generated by glycolysis, rather than being stored as lipids of the triacylglycerol family, is used to fuel the Krebs cycle, more favorable than glycolysis for energy generation. Krebs cycle yields molecules that are direct precursors of amino acids used for peptidyl antibiotic biosynthesis as long as sufficient nitrogen is available. When nitrogen becomes limiting, acetyl-CoA would then be used for direct biosynthesis of polyketide antibiotics. A tool based on these novel principles was conceived and implemented to enhance the expression of the numerous biosynthetic pathways present in the *Streptomyces* genomes.

### Biography

Marie Joelle Virolle is associated with University of Paris-Sud, France. Marie Joelle has published several papers in reputed journals. Marie Joelle is committed to highest standards of excellence and it proves through the authorship of many books. Marie Joelle research interests include Systems Biology, Molecular Biology and Microbiology.

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