Abstract:

Manumycin antibiotics represent an important class of secondary metabolites produced by *Streptomyces* bacteria. They belong to a big class of polyketide metabolites and posses significant antimicrobial, anti-inflammatory, antitumor, and many other biological activities. They are characterized by two short polyketide chains, which are attached to a central subunit. Polyketide chains are synthesized by enzymes of the iterative type II polyketide-synthase. Mechanism of regulation of the polyketide chains length has not been known yet. Understanding mechanism can lead to biosynthesis of novel manumycin antibiotics with predetermined chain lengths what may improve their biological activities in favour of a practical use of these compounds. We prepared a mutant strain of asukamycin producer *Streptomyces nodosus* ssp. *asukaensis* with deletion of genes coding for type I/II β-ketoacylsynthase and protein AsuC14, which is a potential factor affecting lower polyketide chain length, for the identification of the chain length factor in manumycin antibiotics producers. Next, the genes for type I/II β-ketoacylsynthase and potential chain length-affecting factor C14 from strains producing manumycins with variable length of the lower polyketide chains were expressed in this mutant strain. Our results demonstrate that protein C14 realy acts as the chain length-affecting factor. It represents a new type of chain length factor that has not been described in any other type II polyketide-synthase biosynthesised compounds yet.