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(54) **Cloning genes from streptomyces cyaneogriseus subsp.noncyanogenus for biosynthesis of antibiotics and methods of use**

(57) The present invention relates to the complete biosynthetic pathway for the formation of the LL-F28249 compounds and, most importantly, the major component LL-F28249 α . The purified and isolated nucleic acid molecule encoding the proteins of the biosynthetic pathway, which is isolated from a wild-type or mutant *Streptomyces*, is fully described in SEQ ID NO:1. The DNA gene cluster and its expression in a suitable host enable the efficient production of the highly active natural metabolites and semisynthetic derivatives. The invention

further concerns plasmids, vectors and host cells that contain and express the novel nucleic acid molecule. Of particular interest, the entire biosynthetic pathway fits compactly in three plasmids, Cos11, Cos36 and Cos40. The invention also concerns the purified and isolated biosynthesis proteins that are encoded by the whole DNA gene cluster. Additionally, the invention involves a new efficient, biochemical method of preparing moxidectin.

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