

Functions of BldD Repressor in Teicoplanin Producer *Actinoplanes teichomyceticus*

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Actinoplanes teichomyceticus is a producer of antibiotic, teicoplanin, which acts against multi-resistant G⁺ pathogens. There are few industrial teicoplanin-overproducing strains with increased level of biosynthesis compared to wild-type. These strains were obtained by canonical mutagenesis and selection. Little information is available on global regulation of secondary metabolism and sporulation in *A. teichomyceticus*. One of the key repressors of sporulation and secondary metabolism in *Streptomyces* spp. is a pleiotropic regulator BldD. The aim of our study was to show the presence of possible bldD homolog in *A. teichomyceticus* and to elucidate its functions. Analysis of the *Actinoplanes* genome sequence indicated presence of a homologue of the bldD gene with 68% homology to BldD from *S. griseus*. This gene, bldDAT, was subcloned into integrative vector pSET152 and transferred into *S. coelicolor* and *A. teichomyceticus* via intergeneric conjugation with *E. coli* ET12567 pUZ8002. Obtained *S. coelicolor* and *A. teichomyceticus* strains with overexpression of bldDAT were unable to form visible aerial mycelium on solid media. Detailed morphological analysis, using SEM, indicated that germination of individual hyphae of aerial mycelium of *A. teichomyceticus* is still happening, but sporangia are not forming; in *S. coelicolor* oebldDAT repression had only minor morphological effects with evident spores development in some hyphae of the aerial mycelium. Both strains also produced less antibiotics. We have shown the influence of pleiotropic regulator, bldDAT, overexpression on morphogenesis and repression of antibiotic production. Further studies should involve knockout of bldDAT that possibly will result in teicoplanin-overproducing strains.