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Proteolytic enzyme involved in the regulation of BldD act as a transcriptional regulator in Streptomyces coelicolor A3(2)

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BldD is one of a set of morphological differentiation regulators in Streptomyces coelicolor. The bldD coding region was cloned and heterologously expressed in Escherichia coli. Previous analysis showed the splitting appearance of purified BldD. Comparison of the mass spectroscopic data and the amino acid sequence analysis of splitted BldD* suggested that the BldD splitting point is a 79 alanine residue included flexible domain linker region. Using the purified BldD as a substrate, BldD splitting protein was purified from extracts of the surface cultured S. coelicolor. N-terminal sequencing analysis and sequence comparison revealed that BldD-splitting protein (BdsA) was zinc-containing metalloprotease. The purified zinc-containing metalloprotease produced about 8kDa BldD* by split BldD. Gel mobility shift analysis and CD spectroscopy analysis revealed that BldD* contains N-terminal DNA-binding HTH motif and BldD-NTD and CTD slightly interact with each other. To confirm whether the bdsA can be involved in differentiation of S. coelicolor, Gel Mobility Shift analysis of promoter region of bdsA and BldD and BldD* showed that BldD and BldD* binds to PbdsA and remain the availability that BldD repress the expression of bdsA.