

Oral Contributions

[MS9-02] Crystal structures of fungal velvet regulators reveal an unexpected similarity to NF- κ B Ralf Ficner

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The morphological development of fungi and their production of secondary metabolites are mainly coordinated by *velvet* proteins containing a yet functionally and structurally uncharacterized *velvet* domain. We determined the crystal structure of the *velvet* domain of VosA from *Aspergillus nidulans* by means of SAD using a crystal soaked with potassium iodine. The structure was refined at a resolution of 1.8 Å and revealed an unforeseen structural similarity with the Rel homology domain (RHD) of the mammalian transcription factor NF- κ B. Based on this structural similarity several conserved amino acid residues present in all *velvet* domains were identified, and we demonstrate that these residues are essential for the DNA binding activity of VosA. The velvet domain also contains the dimerization interface of the VosA homo-dimer. *Velvet* proteins have been known to form also hetero-dimers. Therefore we crystallized the VosA-VelB hetero-dimer, and its crystal structure was refined at 2.2 Å resolution. The fold of the VelB *velvet* domain closely resembles that of VosA. However, the subunit arrangement is different with respect to the VosA homo-dimer, which has a significant impact on the DNA-binding surface. The structural similarity of the *velvet* domains and NF- κ B suggests that defense mechanisms of both fungi and animals might be controlled by structurally related DNA-binding transcription factors.

Keywords: Transcription factor; DNA-binding domain