

The light-dependent regulator velvet A of *Aspergillus nidulans* acts as a repressor of the penicillin biosynthesis.

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Abstract

The biosynthesis of the beta-lactam antibiotic penicillin in *Aspergillus nidulans* is catalysed by three enzymes that are encoded by the genes *acvA*, *ipnA* and *aatA*. Several studies have indicated that these genes are controlled by a complex regulatory network, including a variety of cis-acting DNA elements and regulatory factors. Until now, however, relatively little information is available on external signals and their transmission influencing the expression of the structural genes. Here, we show that the light-dependent regulator velvet A (VeA) acts as a repressor on the penicillin biosynthesis, mainly via repression of the *acvA* gene. Expression of a regulatable *alcAp-veA* gene fusion in an *A. nidulans* strain carrying, in addition, *acvAp-uidA* and *ipnAp-lacZ* gene fusions indicated that under *alcAp*-inducing conditions, penicillin titres and expression of *acvAp-uidA* were drastically reduced compared with untransformed wild-type strains. The same level of repression was found irrespective of whether the *alcAp-veA* gene fusion was expressed in a *veA1* or *DeltaveA* background, with or without light. The expression of the *ipnAp-lacZ* gene fusion was only moderately affected indicating a less prominent effect. These findings were confirmed by the analysis of a regulatable *niiAp-veA* gene fusion. Under *niiAp*-inducing conditions, penicillin titres

and acvAp-uidA expression were much lower than in untransformed wild-type strains.

Involved units

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