Protein kinase C (PkcA) of *Aspergillus nidulans* is involved in penicillin production.

Herrmann M, Spröte P, Brakhage AA (2006) Protein kinase C (PkcA) of *Aspergillus nidulans* is involved in penicillin production. *Appl Environ Microbiol* 72(4), 2957-2970.

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PubMed

Abstract

The biosynthesis of the beta-lactam antibiotic penicillin in the filamentous fungus Aspergillus nidulans is catalyzed by three enzymes that are encoded by the acvA, ipnA, and aatA genes. A variety of cis-acting DNA elements and regulatory factors form a complex regulatory network controlling these beta-lactam biosynthesis genes. Regulators involved include the CCAAT-binding complex AnCF and AnBH1. AnBH1 acts as a repressor of the penicillin biosynthesis gene aatA. Until now, however, little information has been available on the signal transduction cascades leading to the transcription factors. Here we show that inhibition of protein kinase C (Pkc) activity in A. nidulans led to cytoplasmic localization of an AnBH1-enhanced green fluorescent protein (EGFP) fusion protein. Computer analysis of the genome and screening of an A. nidulans gene library revealed that the fungus possesses two putative Pkc-encoding genes, which we designated pkcA and pkcB. Only PkcA showed all the characteristic features of fungal Pkc's. Production of pkcA antisense RNA in A. nidulans led to reduced growth and conidiation in Aspergillus minimal medium, while in fermentation medium it led to enhanced expression of an aatAp-lacZ gene fusion, reduced pencillin production, and predominantly cytoplasmic localization of AnBH1. These data

agree with the finding that inhibition of Pkc activity prevented nuclear localization of AnBH1-EGFP. As a result, repression of aatA expression was relieved. The involvement of Pkc in penicillin biosynthesis is also interesting in light of the fact that in the yeast Saccharomyces cerevisiae, Pkc plays a major role in maintaining cell integrity.

Beteiligte Forschungseinheiten

Molekulare und Angewandte Mikrobiologie Axel Brakhage Mehr erfahren

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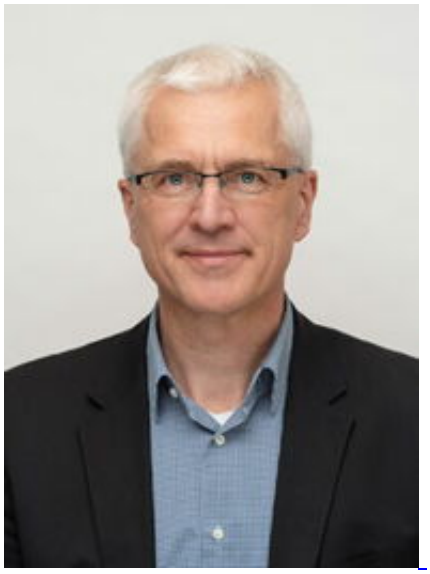

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PMID: 16598003