

Multifactorial induction of an orphan PKS-NRPS gene cluster in *Aspergillus terreus*.

Gressler M, Zaehle C, Scherlach K, Hertweck C, Brock M (2011) Multifactorial induction of an orphan PKS-NRPS gene cluster in *Aspergillus terreus*. *Chem Biol* 18(2), 198-209.

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Abstract

Mining the genome of the pathogenic fungus *Aspergillus terreus* revealed the presence of an orphan polyketide-nonribosomal-peptide synthetase (PKS-NRPS) gene cluster. Induced expression of the transcriptional activator gene adjacent to the PKS-NRPS gene was not sufficient for the activation of the silent pathway. Monitoring gene expression, metabolic profiling, and using a *lacZ* reporter strain allowed for the systematic investigation of physiological conditions that eventually led to the discovery of isoflavipucine and dihydroisoflavipucine. Phytotoxin formation is only activated in the presence of certain amino acids, stimulated at alkaline pH, but strictly repressed in the presence of glucose. Global carbon catabolite repression by CreA cannot be abolished by positive-acting factors such as PacC and overrides the pathway activator. Gene inactivation and stable isotope labeling experiments unveiled the molecular basis for flavipucine/fruit rot toxin biosynthesis.

Involved units

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