

Terrein Biosynthesis in *Aspergillus terreus* and Its Impact on Phytotoxicity.

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Abstract

Terrein is a fungal metabolite with ecological, antimicrobial, antiproliferative, and antioxidative activities. Although it is produced by *Aspergillus terreus* as one of its major secondary metabolites, not much is known about its biosynthetic pathway. Here, we describe an unexpected discovery of the terrein biosynthesis gene locus made while we were looking for a PKS gene involved in production of conidia coloration pigments common for *Aspergilli*. The gene, ATEG_00145, here named *terA*, is essential for terrein biosynthesis and heterologous production of TerA in *Aspergillus niger* revealed an unusual plasticity in the products formed, yielding a mixture of 4-hydroxy-6-methylpyranone, orsellinic acid, and 6,7-dihydroxymellein. Biochemical and molecular genetic analyses indicate a low extension cycle specificity of TerA. Furthermore, 6-hydroxymellein was identified as a key intermediate in terrein biosynthesis. We find that terrein production is highly induced on plant-derived media, that terrein has phytotoxic activity on plant growth, and induces lesions on fruit surfaces.

Involved units

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