Biosynthesis of the respiratory toxin bongkrekic acid in the pathogenic bacterium Burkholderia gladioli.

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Abstract

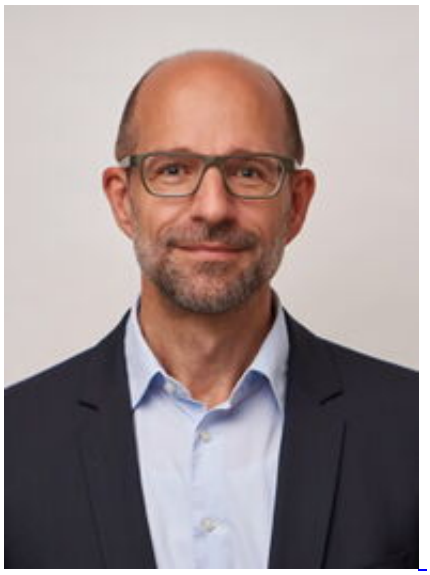
Bongkrekic acid (BA), an infamous respiratory toxin of the pathogenic bacterium Burkholderia gladioli, causes lethal intoxications when tempe bongkrek is produced with contaminated Rhizopus oligosporus cultures. Genome sequencing of B. gladioli pathovar cocovenenans unveiled the genetic basis for BA biosynthesis, and pointed to a homologous bon gene cluster in a B. gladioli strain from an infected rice plant. For functional genetics in B. gladioli λ Red recombination was established. Dissection of the modular type I polyketide synthase (a trans-AT PKS) provided insights into complex polyketide assembly. Isoprenoid-like β-branching events and a six-electron oxidation of a methyl group to a carboxylic acid give rise to the unique branched tricarboxylic fatty acid. The role of the cytochrome P450 monooxygenase, BonL, was proven by structural elucidation of deoxybongkrekic acid from a mutant.

Involved units

Biomolecular Chemistry Christian Hertweck Read more

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Identifier

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