Structural and conformational study of the O-antigenic portion of the Lipopolysaccharide isolated from *Burkholderia gladioli* pv. cocovenenans.

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Details

Abstract

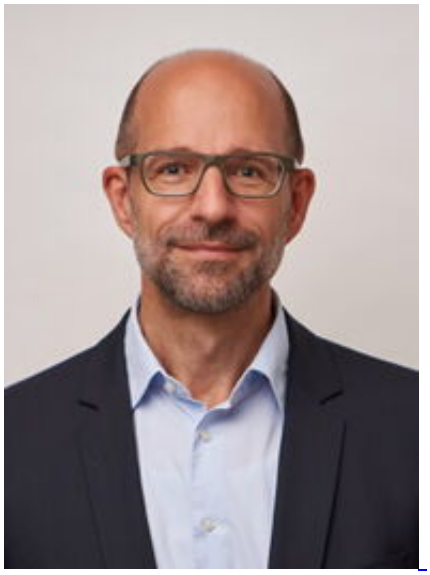
Lipopolysaccharides (LPSs) are virulence factors thatare expressed on the cell surface of Gram-negative bacteria.They represent one of the main traits of bacterial virulence. Inthis paper, we report the primary structure and the conforma-tional features of the O-chain from the lipopolysaccharide (LPS)produced by Burkholderia gladioli pv. cocovenenans, a bacte-rium often associated with the mucoralean fungus Rhizopusmicrosporus var. oligosporus, which is traditionally used in foodfermentations. With the aim of understanding the organizationof bacterial cell-surface components, we isolated and character-ized the following O-antigenic portions of the LPS from B. gladi-IntroductionBurkholderia sp. are ubiquitous Gram-negative motile obligateaerobic rod-shaped bacteria that have the unique ability toadapt to and survive in many different environments. Burkhold-eria gladioli pv. cocovenenans (BGC), which has been isolatedfrom cultures of the mucoralean fungus Rhizopus microsporusvar. oligosporus, plays a key role in the context of plant disease,agriculture, and food processing. The Rhizopus microsporusgroup consists of various taxa, which are responsible for toxinproduction and

pathogenesis,[1,2]and which have caused sev-eral lethal poisonings.[3]R. microsporus var. oligosporus is tradi-tionally used to prepare fermented foods such as tempe, a typi-cal Indonesian dish. However, its consumption has occasionallyled to severe poisoning due to the presence of bacterial con-taminants in the fungal starter culture.[4]BGC,[5]one such bac-terial contaminant, is responsible for producing the polyketidebongkrekic acid,[6]a respiratory toxin that causes hyperglycae-mia followed by hypoglycaemia, and may cause the death ofthe consumer.[7,8]Bongkrekic acid is an unsaturated tricarbox-[a] Dipartimento di Chimica Organica e Biochimica, Università di NapoliFederico II, Complesso Universitario Monte S. Angelo,Via Cintia 4, 80126 Napoli, ItalyE-mail: silipo@unina.ithttp://chemicalsciences.unina.it/[b] Leibniz Institute for Natural Product Research and Infection Biology, HansKnöll Institute,07745 Jena, GermanySupporting information for this article is available on the WWW underhttp://dx.doi.org/10.1002/ejoc.201501308.Eur. J. Org. Chem. 2016, 748–755 © 2016 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim748oli pv. cocovenenans:[→2)-α-Rha-(1→2)-α-Aco-(1→2)-α-Rha-(1→4)-β-Gal2Me-(1→]nand [→2)-α-Rha-(1→2)-α-Aco-(1→2)-α-Rha-(1→4)-β-Gal-(1→]n. A distinctive feature of the O-chain isthe presence of methylated sugar residues. This contributes tothe creation of a hydrophobic shield. The experimental datawere confirmed by conformational studies, which showedthree-dimensional shapes with different packings and exten-sions. Such features determine the physicochemical propertiesof the bacterial envelope, and might contribute to the abilityto adapt the membrane surface to the host.

Beteiligte Forschungseinheiten

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