

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

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Abstract

Lipopolysaccharides (LPSs) are virulence factors that are expressed on the cell surface of Gram-negative bacteria. They represent one of the main traits of bacterial virulence. In this paper, we report the primary structure and the conformational features of the O-chain from the lipopolysaccharide (LPS) produced by *Burkholderia gladioli* pv. *cocovenenans*, a bacterium often associated with the mucoralean fungus *Rhizopus microsporus* var. *oligosporus*, which is traditionally used in food fermentations. With the aim of understanding the organization of bacterial cell-surface components, we isolated and characterized the following O-antigenic portions of the LPS from *B. gladioli*. Introduction *Burkholderia* sp. are ubiquitous Gram-negative motile obligate aerobic rod-shaped bacteria that have the unique ability to adapt to and survive in many different environments. *Burkholderia gladioli* pv. *cocovenenans* (BGC), which has been isolated from cultures of the mucoralean fungus *Rhizopus microsporus* var. *oligosporus*, plays a key role in the context of plant disease, agriculture, and food processing. The *Rhizopus microsporus* group consists of various taxa, which are responsible for toxin production 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 polyketidebongkreikic acid,[6]a respiratory toxin that causes hyperglycae-mia followed by hypoglycaemia, and may cause the death ofthe consumer.[7,8]Bongkreikic 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 extensions. 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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