BBA70 of *Borrelia burgdorferi* is a novel plasminogen-binding protein.

Koenigs A, Hammerschmidt C, Jutras BL, Pogoryelov D, Barthel D, Skerka C, Kugelstadt D, Wallich R, Stevenson B, Zipfel PF, Kraiczy P (2013) BBA70 of *Borrelia burgdorferi* is a novel plasminogen-binding protein. *J Biol Chem* 288(35), 25229-25243.

Abstract

The Lyme disease spirochete Borrelia burgdorferi lacks endogenous, surface-exposed proteases. In order to efficiently disseminate throughout the host and penetrate tissue barriers, borreliae rely on recruitment of host proteases, such as plasmin(ogen). Here we report the identification of a novel plasminogen-binding protein, BBA70. Binding of plasminogen is dose-dependent and is affected by ionic strength. The BBA70-plasminogen interaction is mediated by lysine residues, primarily located in a putative C-terminal α-helix of BBA70. These lysine residues appear to interact with the lysine-binding sites in plasminogen kringle domain 4 because a deletion mutant of plasminogen lacking that domain was unable to bind to BBA70. Bound to BBA70, plasminogen activated by urokinase-type plasminogen activator was able to degrade both a synthetic chromogenic substrate and the natural substrate fibrinogen. Furthermore, BBA70-bound plasmin was able to degrade the central complement proteins C3b and C5 and inhibited the bacteriolytic effects of complement. Consistent with these functional activities, BBA70 is located on the borrelial outer surface. Additionally, serological evidence demonstrated that BBA70 is produced during

mammalian infection. Taken together, recruitment and activation of plasminogen could play a beneficial role in dissemination of B. burgdorferi in the human host and may possibly aid the spirochete in escaping the defense mechanisms of innate immunity.

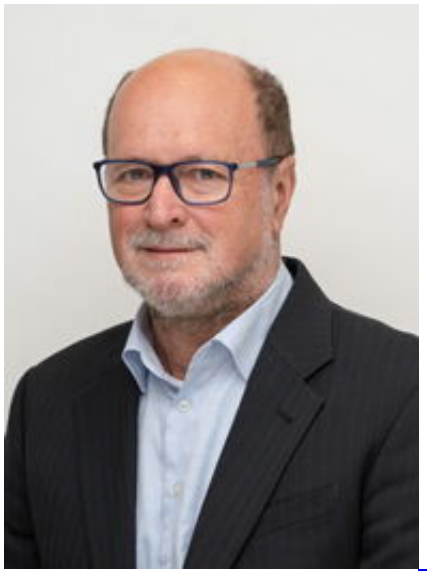
Beteiligte Forschungseinheiten

Infektionsbiologie Peter F. Zipfel Mehr erfahren

Leibniz-HKI-Autor*innen

Christine Skerka

Details



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Details

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