Candida albicans uses the surface protein Gpm1 to attach to human endothelial cells and to keratinocytes via the adhesive protein vitronectin.

Lopez CM, Wallich R, Riesbeck K, Skerka C, Zipfel PF (2014) *Candida albicans* uses the surface protein Gpm1 to attach to human endothelial cells and to keratinocytes via the adhesive protein vitronectin. *PLOS One* 9(3), e90796.

Abstract

Candida albicans is a major cause of invasive fungal infections worldwide. Upon infection and when in contact with human plasma as well as body fluids the fungus is challenged by the activated complement system a central part of the human innate immune response. C. albicans controls and evades host complement attack by binding several human complement regulators like Factor H, Factor H-like protein 1 and C4BP to the surface. Gpm1 (Phosphoglycerate mutase 1) is one fungal Factor H/FHL1 -binding protein. As Gpm1 is surface exposed, we asked whether Gpm1 also contributes to host cell attachment. Here, we show by flow cytometry and by laser scanning microscopy that candida Gpm1 binds to human umbilical vein endothelial cells (HUVEC) to keratinocytes (HaCaT), and also to monocytic U937 cells. Wild type candida did bind, but the candida gpm1Δ/Δ knock-out mutant did not bind to these human cells. In addition Gpm1 when attached to latex beads also conferred attachment to human endothelial cells. When analyzing Gpm1-binding to a panel of extracellular matrix proteins, the human glycoprotein vitronectin was

identified as a new Gpm1 ligand. Vitronectin is a component of the extracellular matrix and also a regulator of the terminal complement pathway. Vitronectin is present on the surface of HUVEC and keratinocytes and acts as a surface ligand for fungal Gpm1. Gpm1 and vitronectin colocalize on the surface of HUVEC and HaCaT as revealed by laser scanning microscopy. The Gpm1 vitronectin interaction is inhibited by heparin and the interaction is also ionic strength dependent. Taken together, Gpm1 the candida surface protein binds to vitronectin and mediates fungal adhesion to human endothelial cells. Thus fungal Gpm1 and human vitronectin represent a new set of proteins that are relevant for fungal attachment to human cells interaction. Blockade of the Gpm1 vitronectin interaction might provide a new target for therapy.

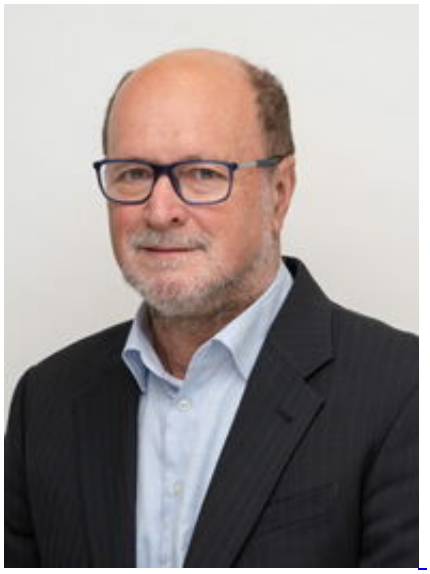
Beteiligte Forschungseinheiten

Infektionsbiologie Peter F. Zipfel Mehr erfahren

Leibniz-HKI-Autor*innen

Christine Skerka

Details



Peter F. Zipfel

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