Clinical *S. aureus* isolates vary in their virulence to promote adaptation to the host.

Tuchscherr L, Pöllath C, Siegmund A, Deinhardt-Emmer S, Hörr V, Svensson C-M, Figge MT, Monecke S, Löffler B (2019) Clinical *S. aureus* isolates vary in their virulence to promote adaptation to the host. *Toxins* 11(3), 135.

Details

Abstract

Staphylococcus aureus colonizes epithelial surfaces, but it can also cause severe infections. The aim of this work was to investigate whether bacterial virulence correlates with defined types of tissue infections. For this, we collected 10–12 clinical *S. aureus* strains each from nasal colonization, and from patients with endoprosthesis infection, hematogenous osteomyelitis, and sepsis. All strains were characterized by genotypic analysis, and by the expression of virulence factors. The host–pathogen interaction was studied through several functional assays in osteoblast cultures. Additionally, selected strains were tested in a murine sepsis/osteomyelitis model. We did not find characteristic bacterial features for the defined infection types; rather, a wide range in all strain collections regarding cytotoxicity and invasiveness was observed. Interestingly, all strains

were able to persist and to form small colony variants (SCVs). However, the low-cytotoxicity strains survived in higher numbers, and were less efficiently cleared by the host than the highly cytotoxic strains. In summary, our results indicate that not only destructive, but also low-cytotoxicity strains are able to induce infections. The low-cytotoxicity strains can successfully survive, and are less efficiently cleared from the host than the highly cytotoxic strains, which represent a source for chronic infections. The understanding of this interplay/evolution between the host and the pathogen during infection, with specific attention towards low-cytotoxicity isolates, will help to optimize treatment strategies for invasive and therapy-refractory infection courses.

Beteiligte Forschungseinheiten

Angewandte Systembiologie Marc Thilo Figge Mehr erfahren

Leibniz-HKI-Autor*innen

Marc Thilo Figge

Details

Carl-Magnus Svensson

Details

Identifier

doi: 10.3390/toxins11030135

PMID: 30823631