Impact of the Fibronectin-binding protein cell surface density on adhesion of Livestock associated MRSA

Philipp Jung[1], Britta Ballhausen[2,4], Christian Spengler[3], Karsten Becker[2], Karin Jacobs[3], Mathias Herrmann[1] and Markus Bischoff[1]

[1]Institute of Medical Microbiology and Hygiene, Saarland University, Homburg, Germany
[2]University Hospital Münster, Institute of Medical Microbiology, Münster, Germany
[3]Experimental Physics, Saarland University, Saarbrücken, Germany
4 Federal Institute for Risk Assessment (BfR), Berlin, Germany

Livestock-associated methicillin-resistant *Staphylococcus aureus* (LA-MRSA) is able to overcome the species barrier between Livestock and humans. Especially in regions with a high density of pig farming LA-MRSA is increasingly found in clinical settings, causing severe infections in humans. In 2014, we had described the enhanced adhesive potential of the common LA-MRSA sublineage "*spa* Type t108"to human epithelial and endothelial cells and plasma fibronectin, compared to other common LA-MRSA sublineages (*spa* Type t011 and t034)[1]. Here, this enhanced adhesive potential is confirmed by atomic force spectroscopy with fibronectin functionalized cantilevers on living bacterial cells of eight different LA-MRSA isolates.

As the gene expression levels of the fibronectin-binding proteins FnbA and FnbB of *spa* type t108 isolates clearly exceeded those of *spa* Type t011 and t034 (factor 5-50), the different adhesive capacities are most probably attributed to a higher density of FnbA and B on the bacterial cell surface of LA-MRSA *spa* type t108 isolates.

1. Ballhausen B, Jung P, Kriegeskorte A, Makgotlho PE, Ruffing U, et al. 2014. LA-MRSA CC398 differ from classical community acquired-MRSA and hospital acquired-MRSA lineages: functional analysis of infection and colonization processes. *Int J Med Microbiol* 304:777-86