

Interference between *Staphylococcus aureus* showing skin colonization in atopic dermatitis patients and healthy skin bacteria

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Staphylococcus aureus has been reported to overgrow in the skin of patients with atopic dermatitis. It has been reported that some bacteria in normal human skin have the ability to suppress the growth of *S. aureus* and contribute to the barrier function of the skin. However, the effect of *Corynebacterium* spp., which has a high occupancy in the human skin flora, on the growth and expression of virulence factors of *S. aureus* are unclear. In this study, the effects of *Corynebacterium* spp. on the growth and expression of virulence factors of *S. aureus* were examined. Furthermore, the inhibitory effect of cell free culture medium (CFCM) of *Corynebacterium* spp. on *S. aureus*-induced inflammation was evaluated.

CFCM of *Corynebacterium* isolates ⑥-3 (Cory ⑥-3) significantly suppressed the growth of *S. aureus* in the early stage of culture and the expression of virulence factors RNAlII, *hla* and *spa*. When *S. aureus* MVs were added to RBL-2H3 cells, the release rate of β -hexosaminidase was significantly increased. On the other hand, CFCM of Cory ⑥-3 significantly reduced the release of β -hexosaminidase induced by *S. aureus* MVs. *S. aureus* MVs enhanced the expression of normal human epidermal keratinocytes (NHEK) inflammation-inducing genes, and Cory ⑥-3 CFCM significantly suppressed the expression of these genes. Our studies are the first to demonstrate the effect of *Corynebacterium* isolates on the inflammatory responses induced by *S. aureus* MVs in cultured keratinocytes.