

Fact Sheet *Staphylococcus aureus* – from skin colonization to severe infection

Intervening at the early stages of the Colonization Infection Continuum with Staphefekt / Gladskin

Staphylococcus aureus is very common bacterium, named after its grape-like shape and its golden appearance when cultured in the lab. Many people are frequently colonized with *S. aureus* in the nose or on the skin.¹

S. aureus is the most common cause of skin infections, both at home and in the hospital after surgery.² The types of infection caused by *S. aureus* can be described across a spectrum of stages, the Colonization Infection Continuum, ranging from innocent pustules to life threatening sepsis (figure 1). Every infection with *S. aureus* is preceded by colonization. By evading local barriers, progression to severe systemic infection eventually can occur.

Over the years, *S. aureus* has developed increasing resistance to traditional antibiotics, evolving to the multi-drug resistant superbug MRSA, leading to difficult-to-treat infections with an estimated 11.000 additional deaths every year in the US.⁴ The rise of superbugs like MRSA has come to the point where the WHO has warned for “a post-antibiotic era, in which common infections and minor injuries can kill”.³ It is clear that new strategies are needed, as all traditional antibiotics eventually have led to resistance.

The use of endolysins presents a new strategy. Contrary to antibiotics, endolysins are targeted antibacterial enzymes that are able to kill only a single *unwanted* bacterial species, leaving the beneficial ones intact. They target essential parts of the bacterial cell wall and therefore, resistance is neither observed nor expected.^{5,6,7} These two unique features distinguish endolysins from traditional antibiotics and make them suitable for long-term daily use (suppression therapy), intervening at the early stages of the Continuum, before colonization leads to infection.⁸

Staphefekt SA.100 is an endolysin that kills only *S. aureus*, including MRSA, leaving the beneficial bacteria unharmed.^{6,7} With Staphefekt, the first *targeted* therapy against *S. aureus* is available for long-term daily maintenance therapy, aimed at decreasing the burden of skin colonization and preventing progression to inflammation and infection.

This strategy has proven successful in treating recurrent skin infections and severe boils caused by *S. aureus* in a first case series of three patients, including an 18-year old man suffering from hyper-IgE syndrome, a severe immune deficiency (box).⁸ In patients with *S. aureus* related skin conditions such as eczema, rosacea and acne, the continuous use of Staphefekt to suppress *S. aureus* decreased the inflammatory symptoms related to these conditions, like redness, pustules, pain and itch.⁸

Colonization Infection Continuum – *S. aureus*

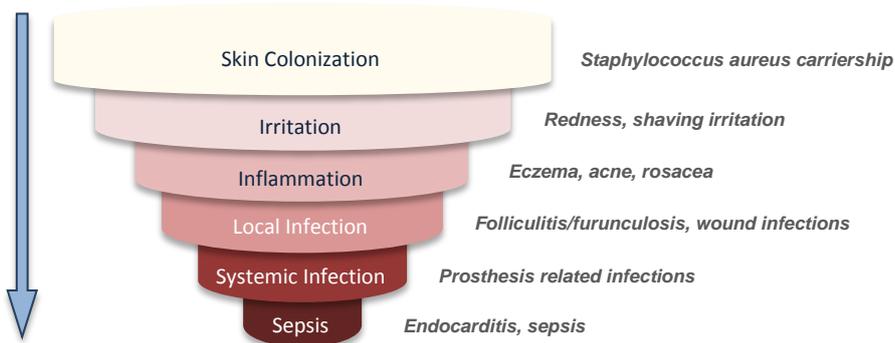


Figure 1. *Staphylococcus aureus* interacts with the human body across a spectrum of stages, the Colonization Infection Continuum. Every infection by the bacterium is preceded by colonization, after which progression to severe infection eventually can occur.





Before Gladskin



After Gladskin

*Impetigo is a superficial skin infection that can spread very fast, especially amongst children. This seven year old boy suffered only from a small spot near the mouth, and symptoms were too mild for his parents to consult their general practitioner. However, since the spot did not resolve after 3 weeks (left), Gladskin was applied twice daily. Within three days, the spot was resolved completely (right). The culture was positive for *S. aureus*.*



Before Gladskin



After Gladskin

*In eczema, the role of *S. aureus* as the causative external trigger has become more and more evident. This one-year old boy suffered from recurrent atopic dermatitis on his neck and arms, leading to extensive scratching and sleeping problems. The culture was positive for *S. aureus*. Gladskin was applied twice daily. Within three days, the symptoms resolved (right) and could be controlled with Gladskin monotherapy on demand.*

References

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