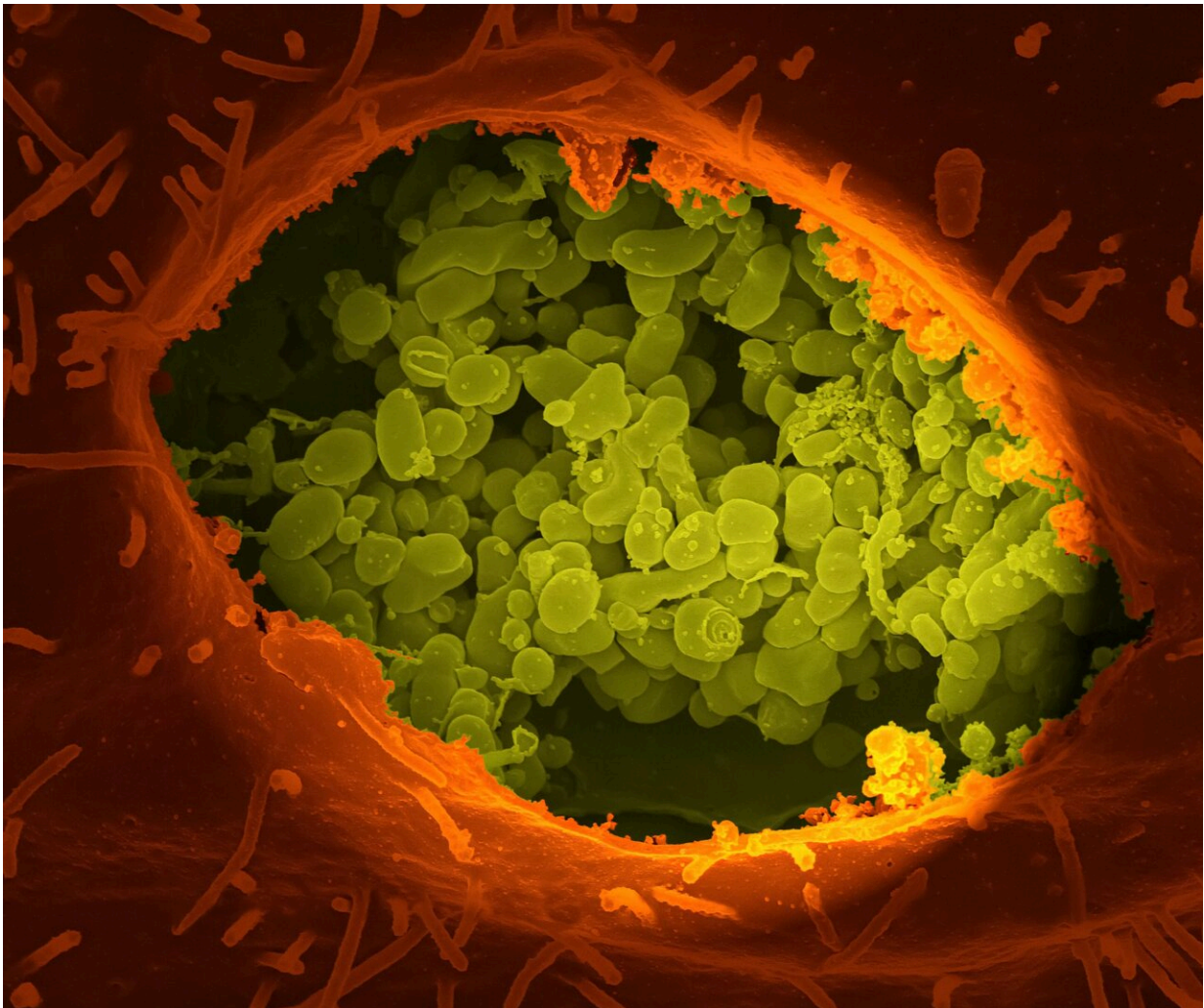


# Study finds *S. aureus* can offset the effect of cancer therapy for Sezary syndrome

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The bacteria *Staphylococcus aureus* (*S. aureus*) can worsen the condition of patients with the lymphoma type Sezary syndrome. A Danish research team has found an underlying mechanism. The improved understanding gives reason to hope that a more efficient treatment for this type of cancer can be found.

"Consequently, an efficient treatment must address both the [bacteria](#) and the cancer itself," says the head of the research team, Niels Ødum, Professor at the Department of Immunology and Microbiology, University of Copenhagen.

## **Germ**s are part of a vicious circle

Sezary syndrome affects three people per million citizens in the Western populations. Many patients are caught in a vicious circle. Both the cancer itself and the anti-cancer treatment weaken the immune system. This provides bacteria such as *S. aureus* with ample conditions for growth. The bacteria settle in [skin lesions](#) that are associated with the disease. Here, they produce toxins that make it harder to treat the cancer.

"According to our results, the [cancer cells](#) can be made more susceptible to [anti-cancer drugs](#) by eliminating *S. aureus* and its toxins. If the effect can be shown to be equally good in patients, the perspective is that cancer activity can be dampened by taking out *S. aureus* and mitigate renewed colonization in the skin," says Chella Krishna Vadivel.

While the focus of the article is the mechanism behind the ability of *S. aureus* to worsen Sezary syndrome, the research team also takes an interest in ways to improve future treatment.

According to the researchers, it should be possible to combat *S. aureus* with the enzyme type endolysins. The enzymes originate from bacteriophages which are viruses able to kill specific bacteria. In this

manner, it is possible to target just *S. aureus*, while other bacteria that are beneficial to the patient will not be affected.

## The dawn of a new research field

Endolysin treatment would be both a specific and mild method, explains Terkild B. Buus, "Antibiotic treatments for *S. aureus* infections already exist, but they come with certain drawbacks. Firstly, these are rather harsh treatments which may cause serious unwanted side-effects."

"Secondly, *S. aureus* will typically reappear as soon as the treatment is stopped. And thirdly, there is a risk of the bacteria becoming resistant to antibiotics. Therefore, antibiotic treatment is currently reserved for severe infections. Endolysins will be a non-antibiotic alternative, and it seems likely that it could be administered at an early stage, thus mitigating serious infections."

The implication would be a double advantage. The patient will not suffer from the wounds caused by the [bacterial growth](#), and the bacteria will not offset the effect of the cancer therapy.

Besides the benefits for patients with Sezary syndrome, the discovery may have wider implications, according to Niels Ødum, "We are looking at a new understanding of the way toxins produced by bacteria can trigger resistance in cancer cells to treatment. It may be, that other bacteria can play similar roles in relation to other types of cancer. For instance, something similar has been shown in a colon [cancer](#) study."

"Since that was an animal study, further research will be required before we can state that this is also relevant in relation to humans. Nevertheless, we are seeing the dawn of an interesting new field of research."

The findings are [published](#) in the *Blood Journal*.

**More information:** Chella Krishna Vadivel et al, Staphylococcus aureus induce drug resistance in cancer T cells in Sézary Syndrome, *Blood Journal* (2024). [DOI: 10.1182/blood.2023021671](https://doi.org/10.1182/blood.2023021671)

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