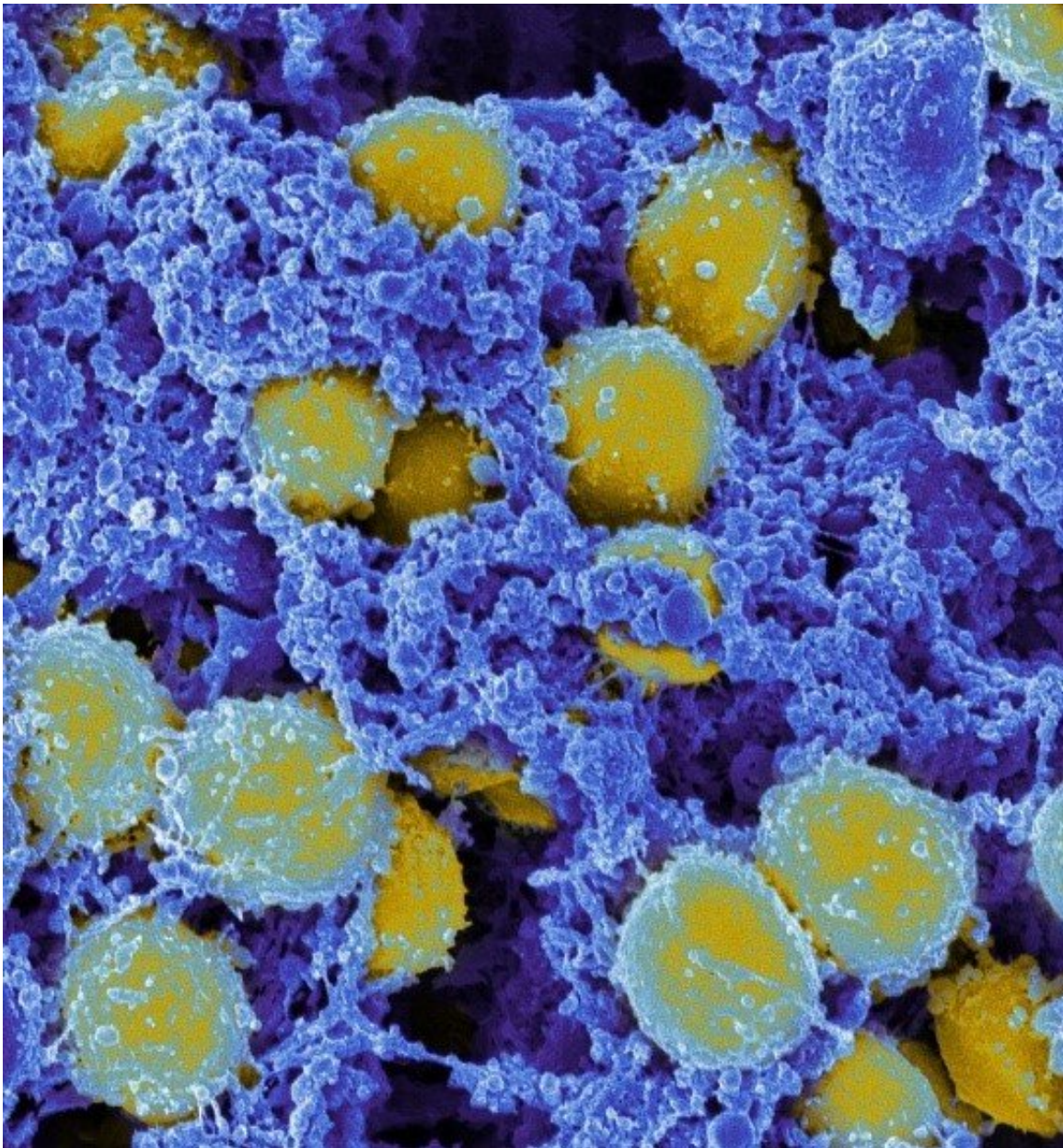


# Vaccine that harnesses antifungal immunity protects mice from staph infection

August 20 2020

---



Scanning electromicrograph of *Staphylococcus aureus* bacteria. Credit: NIAID

Immunization of mice with a new vaccine consisting of fungal particles loaded with *Staphylococcus aureus* (*S. aureus*) proteins protects mice against *S. aureus* infection, according to a study published August 20 2020 in the open-access journal *PLOS Pathogens* by David Underhill of Cedars-Sinai Medical Center, and colleagues.

*S. aureus* is one of the most common bacterial infections worldwide, and [antibiotic-resistant strains](#) such as methicillin-resistant *S. aureus* (MRSA) are a major threat and burden to public health. MRSA not only infects immunocompromised patients but also healthy individuals, and has rapidly spread from the healthcare setting to the outside community. Vaccines aimed at targeting *S. aureus* have failed in clinical trials, and the reason for this lack of success remains unclear. As this pathogen continues to rapidly spread on a global scale, it is vital that new approaches to *S. aureus* vaccination are developed.

Immunocompromised individuals such as patients with HIV are highly susceptible to *S. aureus* infections, and they are also at increased risk of developing [fungal infections](#). Based on this evidence, Underhill and colleagues tested whether stimulation of antifungal immunity would promote the type of immune responses needed for effective host defense against *S. aureus*.

The researchers developed a new vaccine called 4X-SA-GP, which consists of fungal  $\beta$ -glucan particles loaded with four *S. aureus* proteins. Mice were vaccinated once a week for three weeks with 4X-SA-GP, and then injected with *S. aureus* either four or eight weeks later. Vaccination induced protective T cell and antibody responses, and the T cell responses in particular were essential for vaccine-induced protection from *S. aureus* infection. Moreover, the mice had detectable antibody

levels and reduced *S. aureus* levels in the spleen and kidneys eight weeks after immunization. According to the authors, this work potentially broadens the use of the  $\beta$ -glucan particle vaccine system for a much-needed vaccine targeting *S. aureus*.

The authors conclude, "We need some creative new approaches to explore towards developing a *S. aureus* [vaccine](#), and we are excited to share our recent experiences with antigen-loaded fungal particles".

**More information:** Paterson MJ, Caldera J, Nguyen C, Sharma P, Castro AM, Kolar SL, et al. (2020) Harnessing antifungal immunity in pursuit of a *Staphylococcus aureus* vaccine strategy. *PLoS Pathog* 16(8): e1008733. [doi.org/10.1371/journal.ppat.1008733](https://doi.org/10.1371/journal.ppat.1008733)

Provided by Public Library of Science

Citation: Vaccine that harnesses antifungal immunity protects mice from staph infection (2020, August 20) retrieved 2 February 2024 from <https://medicalxpress.com/news/2020-08-vaccine-harnesses-antifungal-immunity-mice.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--