

# Tick protein helps antibiotics combat MRSA super bug

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A protein derived from ticks enhances the effectiveness of antibiotic treatment for methicillin-resistant *Staphylococcus aureus*, or MRSA, according to a Yale-led study. The strategy of using the protein in combination with existing treatments can help address the growing challenge of antibiotic-resistant MRSA and other staph infections, the

researchers said.

Resistance to [antibiotic treatment](#) is a widespread problem in medicine, and MRSA is prime example of a resistant bacterium that can cause deadly infections. Staph bacteria like MRSA are able to resist treatment in part because they secrete a protective outer layer—a biofilm—that prevents the immune system and antibiotics from gaining access to them.

Researchers have identified a tick [protein](#), IAFGP, that alters the biofilm. In the study, the Yale-led team combined the protein, and a molecule derived from it, with antibiotics currently used to treat MRSA as well as other antibiotics that are not standard treatment.

The researchers tested the combination of agents—IAFGP with three different antibiotics—in culture and also in MRSA-infected mice and flies. They found that in each case, the combination improved the ability of the antibiotic to combat the bacteria.

"If you take this protein and you add it to the current treatment, it makes the treatment much more potent," said Dr. Erol Fikrig, chief of the Infectious Diseases Section at Yale School of Medicine and the study's lead author. "If you take the protein and add it to drugs not used in current treatment, it makes them potent as well."

While the study was not done in humans, it provides a novel strategy for tackling antibiotic-resistance bacterial infections. MRSA, which has become resistant to several different antibiotics, can cause severe infections affecting the skin, lungs, and blood.

"Our hope is it expands the group of antibiotics that can be used to treat methicillin," said Fikrig.

The findings were published in the journal *Antimicrobial Agents and*

*Chemotherapy.*

**More information:** Nabil M. Abraham et al. A tick antivirulence protein potentiates antibiotics against, *Antimicrobial Agents and Chemotherapy* (2017). [DOI: 10.1128/AAC.00113-17](https://doi.org/10.1128/AAC.00113-17)

Provided by Yale University

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