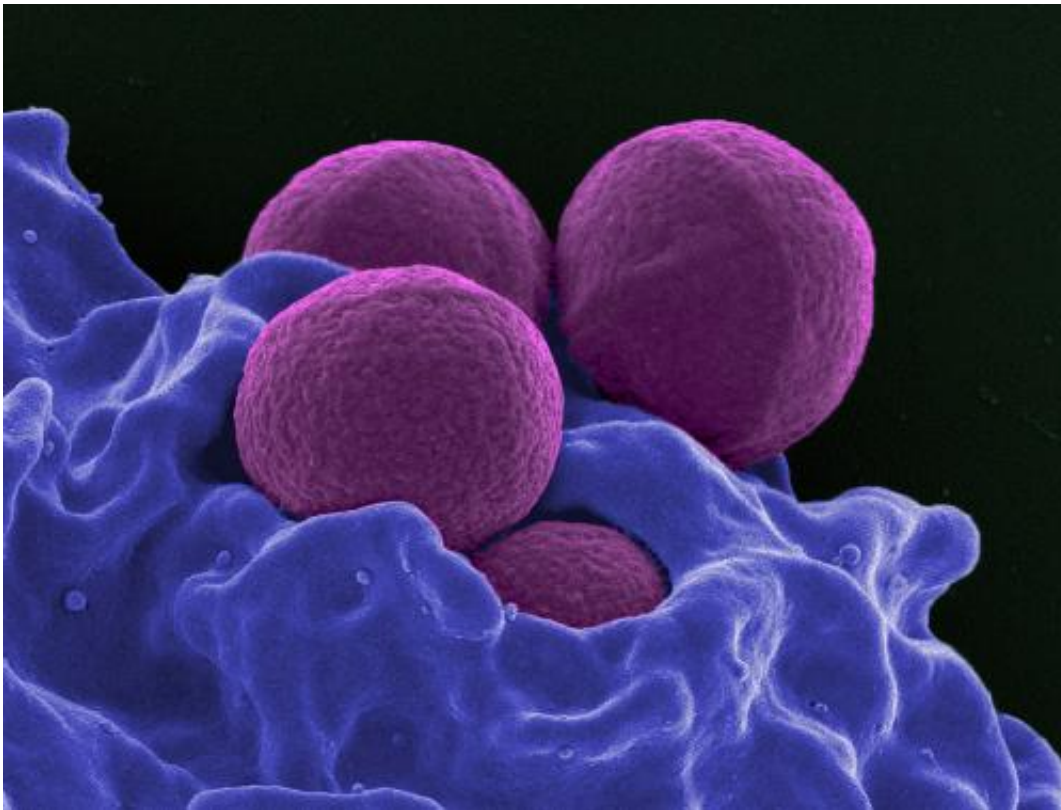


## Fauci: Robust research efforts needed to address challenge of antimicrobial resistance

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This is an electron micrograph of a human neutrophil ingesting methicillin-resistant *Staphylococcus aureus* (purple), a key form of antimicrobial resistance research NIAID is pursuing. Credit: NIAID

Given the evolutionary ability of microbes to rapidly adapt, the threat of antimicrobial resistance likely will never be eliminated. Today, many factors compound the problem, including the inappropriate use of

antibiotics and a dwindling supply of new medicines, leading to a global crisis of antimicrobial resistance. This crisis must be addressed with a multi-faceted approach that includes a strong base of basic, clinical and translational research, according to a new commentary in the journal *JAMA* from Anthony S. Fauci, M.D., director of the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, and colleague Hilary D. Marston, M.D., M.P.H.

In the United States alone, drug-resistant bacterial infections cause an estimated 23,000 deaths each year. These infections also are a hefty economic burden to the U.S. health care system: \$20 billion annually in direct costs with an additional estimated \$35 billion in lost productivity, according to the Centers for Disease Control and Prevention.

As discussed in a new report [\*NIAID's Antimicrobial Resistance Program: Current Status and Future Directions, 2014\*](#), NIAID recently refocused its [antimicrobial resistance](#) research efforts to address key scientific challenges. Among the innovative complementary approaches NIAID is pursuing: examining the comprehensive biology and genetic makeup of specific microbes to understand how bacteria become resistant and to identify new targets for point-of-care diagnostics, drugs and vaccines; and developing vaccines to prevent infection with such drug-resistant microbes as *Staphylococcus aureus* and *Neisseria gonorrhoeae*.

Additionally, NIAID is working to harness healthy bacteria in the human body to combat future infection; target the mechanisms by which bacteria cause disease; and design new antibiotics that are less likely to generate resistance, while also repurposing existing treatments and using natural predators, such as bacteriophages—viruses that infect and destroy specific bacteria. To further clinical research, NIAID also recently established a Leadership Group to design, implement, and manage the clinical research agenda for a new antibacterial resistance research network.

Such research efforts, combined with improved surveillance, prevention efforts, diagnostics and industry incentives to drive development of new antimicrobial medicines are essential to meeting the continual threat of antimicrobial resistance, the authors write.

**More information:** AS Fauci and HD Marston. The Perpetual Challenge of Antimicrobial Resistance. *Journal of the American Medical Association* [DOI: 10.1001/jama.2014.2465](https://doi.org/10.1001/jama.2014.2465).

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