

NIH experts call for transformative research approach to end tuberculosis

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This photomicrograph reveals *Mycobacterium tuberculosis* bacteria using acid-fast Ziehl-Neelsen stain; Magnified 1000 X. The acid-fast stains depend on the ability of mycobacteria to retain dye when treated with mineral acid or an acid-alcohol solution such as the Ziehl-Neelsen, or the Kinyoun stains that are carbolfuchsin methods specific for *M. tuberculosis*. Credit: public domain

A more intensive biomedical research approach is necessary to control and ultimately eliminate tuberculosis (TB), according to a perspective published in the March 2018 issue of *The American Journal of Tropical*

Medicine and Hygiene. In the article, authors Anthony S. Fauci, M.D., director of the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, and Robert W. Eisinger, Ph.D., special assistant for scientific projects at NIAID, discuss the need to modernize TB research by applying new diagnostic, therapeutic, and vaccine approaches. The perspective is based on a lecture delivered by Dr. Fauci on Nov. 17, 2017 in Moscow at the first World Health Organization Global Ministerial Conference, "Ending TB in the Sustainable Development Era: A Multisectoral Response."

TB, a bacterial infection that typically infects the lungs, is one of the oldest known human diseases and the leading infectious cause of death worldwide. The authors recall the significant HIV/AIDS research advances made in the nearly 37 years since AIDS was first recognized, and encourage the scientific community to strive for comparable TB milestones.

Specifically, the authors call for systems biology approaches (using large data sets and modeling to understand [complex biological systems](#)) to fill critical knowledge gaps in understanding how *Mycobacterium tuberculosis* (*Mtb*) infection causes [disease](#). Such research could help explain why some people infected with *Mtb* have latent infections and show no signs of disease while others, especially those co-infected with HIV, become sick. The perspective also underscores the need for improved diagnostic tests, including those that can detect *Mtb* in various specimens as well as rapid, inexpensive tests that can detect drug-resistant TB.

Lengthy and complex treatment regimens and an increasing number of multi-drug-resistant TB infections make the disease increasingly difficult to cure. The authors note that the ultimate treatment goal should be drug combinations administered for shorter time periods that can cure people infected with any strain of *Mtb*. Another research goal is a safe

and more broadly effective vaccine, which remains one of the most difficult challenges, according to Drs. Fauci and Eisinger. However, they explain, a vaccine and other significant advances are possible with an innovative and aggressive biomedical research program and rapid translation of results into global control strategies.

More information: Anthony S. Fauci et al, Reimagining the Research Approach to Tuberculosis †, *The American Journal of Tropical Medicine and Hygiene* (2018). [DOI: 10.4269/ajtmh.17-0999](https://doi.org/10.4269/ajtmh.17-0999)

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