Tulane researcher awarded $2.7 million NIH grant to improve diagnosis of mycobacterial infections

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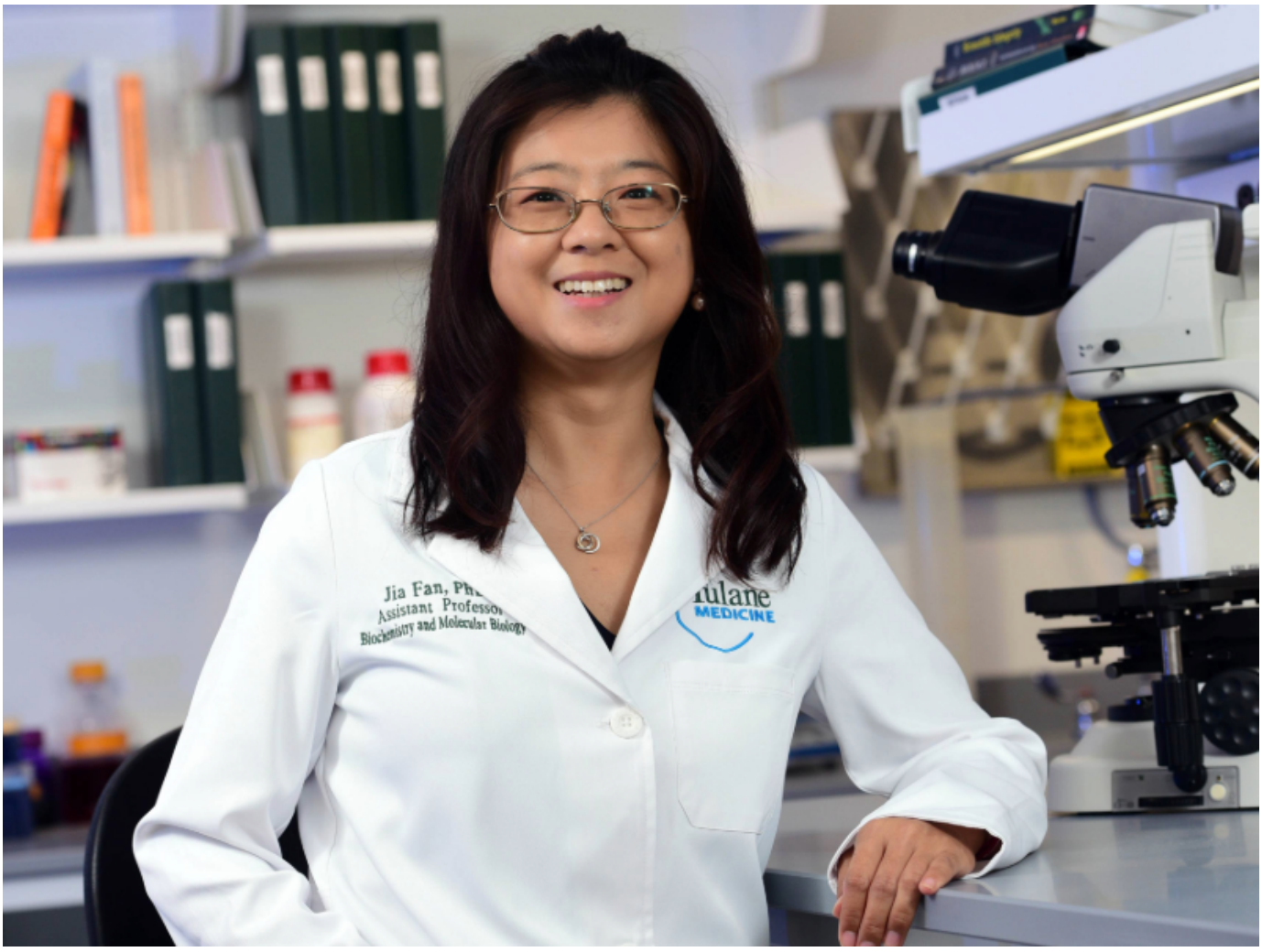

Jia Fan, PhD, is an assistant professor in the Department of Biochemistry and Molecular Biology and director of the Tulane Proteomics Core Facility.

Tulane University School of Medicine researcher Jia Fan, PhD, has been awarded a $2.7 million U01 grant from the National Institutes of Health (NIH) to improve how doctors identify and treat infections caused by nontuberculous mycobacteria (NTM), a growing public health concern worldwide.

NTM infections, which can cause serious lung and soft-tissue diseases, are notoriously difficult to diagnose and treat. Treatment varies by species, and delays or inaccuracies in diagnosis can lead to ineffective therapies, drug toxicity, or the emergence of drug-resistant strains.

Fan's lab is developing an advanced diagnostic platform called MycoID, which uses mass spectrometry and machine learning to identify NTM species and predict how they'll respond to antibiotics. The technology analyzes tiny differences in the proteins secreted by bacteria, known as peptide sequence variants, to distinguish between closely related species and even subspecies.

"Rapid, precise identification is essential for treating patients effectively and slowing the spread of drug-resistant infections," Fan said. "Our approach combines computational power with advanced mass spectrometry to deliver that level of precision."

As part of the NIH-funded project, Fan's team will enhance and expand the MycoID platform through three major goals:

- Improving the diagnostic pipeline by developing a custom peptide library to increase accuracy and speed of identification.
- Validating performance on a range of mass spectrometry instruments and in a large cohort of NTM samples.
- Integrating machine learning to predict antibiotic resistance—particularly to macrolides, a critical treatment class for Mycobacterium abscessus infections.

If successful, the refined MycoID platform could dramatically shorten the time it takes to diagnose NTM infections and determine appropriate treatments, offering a new level of precision in both clinical and research settings.

About the grant

The project, titled "Peptidome-Driven Algorithms for Faster and More Precise Mycobacterial Detection", is funded by the National Institute of Allergy and Infectious Diseases under grant number U01AI185864.