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Engineer Receives NSF Award to Help Develop Better Immunotherapies

Lou Tyson

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Engineer Receives NSF Award to Help Develop Better Immunotherapies

Prestigious award for Thomas Werfel supports studies into targeted vaccines and cancer treatments

APRIL 13, 2022 BY LOU TYSON



Thomas Werfel, assistant professor of biomedical engineering, has received a five-year grant to fund his efforts to create innovative biomaterials that will help human immune systems respond better to illnesses. Photo by Thomas Graning/Ole Miss Digital Imaging Services

OXFORD, Miss. – Thomas Werfel, assistant professor of **biomedical engineering** at the **University of Mississippi**, has received a Faculty Early Career Development, or CAREER, award from the **National Science Foundation**.

The CAREER award, a five-year grant for \$597,638, will fund Werfel's efforts to create innovative biomaterials that will help human immune systems respond better to illnesses.

The immune system is one of the most complex systems in the body: molecules, cells and organs work together to keep a person healthy. It responds to all types of challenges – such as infections, cancers and toxins – with great precision in terms of timing and location.

Immunotherapies – drugs that harness the power of the immune system – are typically given all at once as single therapies. That means they often lack the level of precision needed in terms of where, how much and how long the drug is administered.

Werfel's research seeks to radically improve the ability to program immune responses by developing biomaterials that can recruit, train and sustain relevant immune cells with greater accuracy.

Ultimately, this could result in vaccines and cancer treatments that maximize the effectiveness of the immune response.

"We think our approach has great potential because it is based on the way the body naturally responds to infection, as opposed to traditional approaches to drug-making," said Werfel.

"To achieve this, it is necessary to pursue new technologies that can perform in this novel manner. I'm truly honored to receive the NSF CAREER award, as it allows me the time and resources to hopefully discover a way to improve health care for many Americans."

Werfel also has received a **nearly \$800,000 grant from the American Cancer Society** in a complementary area: research into new treatments for metastatic breast cancer.

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Campus Briefs

Students Learn 'Real Politics' in Washington, D.C., Winter Session

OXFORD, Miss. – Eleven University of Mississippi students spent their winter break learning about the people who work behind the scenes of the American government in Washington, D.C. Lead by Jonathan Klingler, assistant professor of political science, the students of Pol 391: Applied Politics met not with candidates, but with the people who make candidates'

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Young Alumna Gives Back to School of Accountancy

OXFORD, Miss. – Stephanie Jennings Teague, of Chicago, sees her commitment of \$100,000 to the Patterson School of Accountancy's new building at the University of Mississippi as a means of saying "thank you." "It is a way to show a small token of my appreciation to Ole Miss, the faculty and staff, and the accounting

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Ole Miss In the News

Reuters: Keep an Eye on the Money Supply

U.S. inflation roller coaster prompts fresh look at long-ignored money supply By Michael S. Derby NEW YORK – The amount of money sloshing around the U.S. economy shrank last year for the first time on record, a development that some economists believe bolsters the case for U.S. inflation pressures continuing to abate. The Federal Reserve's

As part of his CAREER grant, Werfel plans to set up a Nanoengineering Research Experience for Undergraduates, with particular focus on underrepresented students from Mississippi and nearby. The summer program would provide research and professional development opportunities.

He also wants to establish a STEM Excursion program, where north Mississippi high school students can learn about nanobiotechnology from Ole Miss undergraduate researchers.

Werfel explained that “these outreach efforts provide a great opportunity for students of all backgrounds to learn about this exciting new field. And, this gives our young academics the possibility to share their passion and gain mentoring skills.”

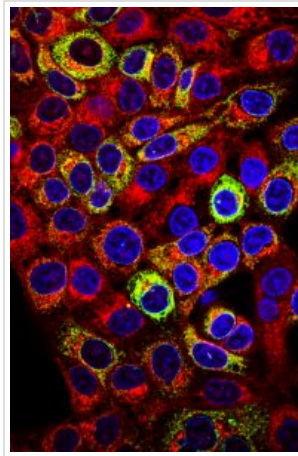
The NSF’s Faculty Early Career Development program supports early-career faculty who have the potential to serve as academic role models in research and education and to lead advances in the mission of their department or organization.

This prestigious award is designed to help early-career faculty build a firm foundation for a lifetime of leadership in integrating education and research.

Several UM researchers have received NSF CAREER Awards, but this is the first for the School of Engineering.

“I am pleased that Thomas’ work has been recognized with this great honor,” said Dave Puleo, dean of the School of Engineering. “This is an excellent moment for the school and it demonstrates our efforts to give cutting-edge research opportunities to our students.”

The project, titled “**Multimodal biomaterials for sequential delivery of diverse immunotherapeutic cargos**,” is jointly funded by the NSF’s Biomaterials program and the Established Program to Stimulate Competitive Research. EPSCoR works to enhance the research competitiveness of certain jurisdictions, such as underfunded states, by strengthening STEM capacity and capability.



In this image, cancer cells are being used to test investigational drugs. The green is staining a target in the cells that causes cancer cells to grow, and the drug shows up as red. Biomedical engineer Thomas Werfel is working to develop biomaterials that can harness human immune cells to improve the accuracy and effectiveness of vaccines and cancer treatments. Submitted photo

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