

Free Electron Laser Laboratory Funding Threatened

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Federal funding for an experimental laser program at Duke and other major U.S. universities has been marked for elimination by the Department of Defense despite support from North Carolina members of Congress.

This Defense Department Medical Free-Electron Laser (MFEL) Program also supports centers at Harvard, Stanford, Vanderbilt, and the University of California, Irvine, with similar support from their members of Congress.

Disbursing about \$16 million during the current fiscal year, the federal MFEL program has funded a wide range of basic research with ties to military medicine, including laser surgery, battle injury monitoring and diagnosis, wound closing and healing, and disease containment, according to a research summary by the five free-electron laser center directors.

"We can attest to the excellent research track record and the great promise represented by the research currently supported by the MFEL program," the bipartisan group of eight U.S. Senators wrote last year in a joint letter to Pentagon officials.

Yet "we are particularly concerned by the track record of recent years, where the Department of Defense has been submitting requests for MFEL funding that were roughly half of the funds needed to keep the program solvent," continued the letter, whose signatories included U.S.

Senators Richard Burr and Elizabeth Dole of North Carolina.

The Defense department's budget projections show zero MFEL funding for the next six fiscal years.

Free electron lasers are considered vital tools for basic research because of their ability to be "tuned" to a large variety of different light wavelengths and because of their pulse structures.

Scientists have been using the tunable FEL to find the laser wavelengths and pulse structures that best suit their needs and then, in many cases, design and build a smaller conventional laser for a specific application.

A major role of the MFEL program "is to fund high-risk, potentially high-reward research of military and civilian relevance," said Glenn Edwards, who directs the Duke Free Electron Laser Laboratory and previously headed a similar lab at Vanderbilt University. "Once the research proves promising, the intent is to shift its funding elsewhere," Edwards added.

For example, Edwards' lab is currently developing a desktop-sized laser that could be used for delicate back surgery or other kinds of operations on nerve cells in hospital operating rooms. Work on that laser is currently focused at a suburban Baltimore company and funded by the National Institutes of Health. But the research began years ago using tractor trailer-sized FELs located at Vanderbilt and Duke, with support from the MFEL program. Investigations of wound healing continue at the national MFEL centers, including Duke, with the current support provided by the Department of Defense.

"Sometimes the key contribution of an FEL center is not its novel laser hardware but the broad expertise of the scientists who work there," Edwards added.

For instance, Edwards and other scientists at Duke's FEL lab are lending their expertise to collaborations with researchers in military medicine and the University of North Carolina at Chapel Hill's School of Medicine to test a battlefield device that would speed diagnosis and treatment of collapsed lungs and other combat wounds inflicted in Iraq. Part of that work has also been funded through the MFEL Program.

For John Simon, a Duke chemistry professor and vice provost, MFEL support and Duke's storage-ring FEL are both crucial to continuing his group's early-stage investigations of brain pigments and proteins that have links to Parkinson's Disease.

"I won't be able to continue this program if we lose MFEL," he said. "It is the sole source of support for our work on neurodegenerative disorders."

Source: Duke University

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