DARPA selects A&M to research microbe storage

Government agency seeks enhanced microbe viability technology

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News Writer

Texas A&M has been selected by the Defense Advanced Research Projects Agency, or DARPA, to develop a new method for preserving microbial samples. The initiative aims to enhance the long-term viability of microbial specimens, a crucial advancement for fields like medical research, biodefense and space exploration.

The project positions A&M at the forefront of biological preservation innovation, with the potential to transform how biological materials are stored and utilized in high-stakes environments. "This collaboration presents an exciting challenge for us," Arum Han, a professor of electrical engineering, said. "We believe our work can provide a much-needed solution to current limitations in microbial preservation."

A&M's selection highlights its ongoing efforts to push the boundaries of scientific research. DARPA, known for funding high-risk, high-reward projects, identified microbial preservation as a critical area of need, as preserving microbial samples over extended periods of time is crucial for research in extreme environments, including space and remote regions of Earth. Specifically, A&M seeks to address issues related to sample degradation and storage.

"Being part of this project gives us a unique opportunity to contribute to real-world problems," Courtney Gibson, biomedical engineering graduate student, said. "This research could change how we approach everything — from disease studies to environmental monitoring."

Collaboration between the university and DARPA is expected to intensify as the research gains momentum. A&M's team, composed of students and faculty from various disciplines, is working to refine the preservation method.

"The interdisciplinary nature of this project is one of its greatest strengths," Han said. "We're bringing together experts from engineering, biology and chemistry to tackle a problem that requires multiple perspectives."

Gibson agreed and said the collaboration has been invaluable.

"It's given us a deeper understanding of how diverse fields can contribute to solving complex problems like microbial preservation," Gibson said.

The existing preservation techniques are unreliable for maintaining microbial integrity in the long term, Han said.

"By collaborating with DARPA, we are aiming to develop a solution that works under harsh conditions, potentially expanding the use of microbial samples in environments like Mars or the deep ocean," Han said.

This project could have implications beyond academic research, as well, as improved microbial preservation could benefit biotechnology, healthcare and environmental research. In healthcare, preserved microbial samples are essential for studying pathogens and developing treatments. For NASA and other space agencies, enhanced storage techniques could play a key role in future space missions that require biological samples.

Over the coming months and years, the Aggie researchers will be required to deliver results acceptable to the government agency.

"DARPA challenges us to think quickly and effectively," Han said. "Their high standards push us to innovate faster and ensure the solutions we develop are practical and scalable."

The project also provides educational opportunities for A&M students, who will participate in the research under faculty supervision. Students will engage in interdisciplinary work, combining elements of bioengineering, microbiology and materials science.

"Our students aren't just learning theory," Han said. "They're applying it to critical, high-impact problems."

A&M's last fiscal year saw $1.278 billion in research funding expenditures and is only one of 24 universities to be a land-, sea- and space-grant institution, a government grant giving it access to more research opportunities.

With DARPA's support, A&M is well-positioned to lead the way in transforming microbial preservation, with potential impacts across multiple industries.

As the project progresses, the university will collaborate with other researchers to refine and implement its preservation technique. The results could establish a new standard for microbial storage and unlock new possibilities in science and exploration.

"This is an opportunity for us to make a lasting impact," Han said. "We're optimistic about the outcomes and excited about the potential applications that will emerge from this research."

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