

Crowd-sourcing effort to fight antibiotic resistance

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Claudia Lemper, a lecturer of plant pathology and microbiology at Iowa State, is working with her students in a crowd-sourcing effort to fight antibiotic-resistant diseases. Credit: Amy Vinchattle

A class of microbiology students at Iowa State University hopes that the next big discovery in the fight against antibiotic-resistant diseases is right below their feet.

The students will take part in the Small World Initiative, an effort led by Yale University that allows [science students](#) at universities all over the world to seek out novel microorganisms that produce [antimicrobial compounds](#) – or compounds with the potential to kill the pathogens that make humans sick. The 24 students enrolled in the course will collect [soil samples](#) from spots around campus and screen them for the antimicrobial-producing organisms.

This semester will mark the first time ISU students will participate in the initiative as one of more than 60 universities selected for the program worldwide. Students at other institutions last year discovered around 60 new species of bacteria while taking part in the program. One of those species is currently being studied by a pharmaceutical company to determine if it could become the basis for a new antibiotic drug, said Claudia Lemper, a lecturer in plant pathology and microbiology and the instructor of the course at Iowa State.

"This is a chance for students to discover something new, something that no one has ever cataloged before," Lemper said. "And it has the potential to really make a change."

The semester-long project will allow the students to take ownership of their coursework and interact with students and faculty at other academic institutions participating in the project. The student-driven and inquiry-based format of the course creates opportunities for the students to guide the coursework and make decisions themselves.

"The idea is that if they make an impact and take ownership of what they're learning, the students will be more likely to stay in the field and the coursework will be more meaningful," Lemper said.

She said the students will also be able to preserve the organisms they find in their soil samples by freezing them, allowing them to study the

organisms further in more advanced courses.

Antibiotic resistance is a growing concern as more infections develop and propagate genes that make them immune to antibiotic treatments. Developing new antibiotics is a slow and expensive process, so the Small World Initiative seeks to crowd-source some of the necessary research by engaging science students in their first and second years of college.

The majority of antibiotics in use today originated from soil bacteria, so unleashing the energy and creativity of undergraduate [students](#) in biology and chemistry may lead to the next big discovery, Lemper said.

The problem is that the next breakthrough could be virtually anywhere, she said. A soil sample on one side of a sidewalk may contain completely different organisms than a sample taken on the other side of the sidewalk, making the research a very hit-and-miss proposition.

"The financial incentives aren't there for pharmaceutical companies to sift through all those soil samples," Lemper said. "That's why crowd-sourcing is such an attractive option here."

Provided by Iowa State University

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