

Clemson students name novel *Legionella* strain: *Clemsonensis*

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Working with the CDC, Clemson undergraduates have named a novel strain of the *Legionella* virus. Credit: Ken Scar/Clemson University

The Clemson family has gained a new namesake: *Legionella clemsonensis*, a novel strain of the *Legionella* bacteria, the most common

cause of waterborne bacterial outbreaks in the United States.

The Centers for Disease Control and Prevention (CDC) gave the honor of naming *L. clemsonensis* to students in a collaborative research group called CU and the CDC, which includes students from Clemson's Creative Inquiry (CI) program for undergraduate students and officials in the CDC *Legionella* lab.

The newly named strain of *Legionella* was part of a batch of 68 strains the CDC sent to Clemson students to analyze. "While we knew they were *Legionella*, they didn't match up to anything in the current database of bacterial species. It's like knowing their last name but not their first names," said Tamara McNealy, an associate professor of [biological sciences](#) who forged the collaboration with Claressa Lucas, director of the CDC *Legionella* lab, to characterize unknown *Legionella* strains.

Undergraduate students in the CU and the CDC—Joseph Painter, Kyle Toth, Kasey Remillard, Rayphael Hardy and Scott Howard—sequenced two genes at the Clemson University Genomics Institute to identify the species or to find out if they were novel. "One of the strains Joseph was assigned turned out to be novel, or not significantly matching anything in the database," McNealy said.

A second wave of students, including Hayley Hassler, now a junior; Allie Palmer, a master's student in McNealy's lab; along with Vince Richards, an assistant professor in the biological sciences department, worked to validate that *L. clemsonensis* does indeed fall separately from the other known *Legionella* strains.

"My experience in this CI has really allowed me to explore areas of microbiology that I wouldn't have been exposed to otherwise," Hassler said. "Thanks to Dr. McNealy and Dr. Richards I now have a real passion for studying infectious diseases and microbial genomics."

Palmer, now a doctoral student at the University of Virginia, said, "It was exciting to know that the work I was doing in lab on a day-to day basis would be adding to the knowledge base of the *Legionella* genus. It took so much hard work by all of the authors on the paper to get the full story on *L. clemsonensis* and I am proud to have been a part of that team."

According to the CDC, *Legionella clemsonensis* was originally isolated from a patient in Ohio. Preliminary analysis that showed it was not *L. pneumophila*, the most commonly identified pathogen in the group, and that it didn't fall into any known grouping, McNealy said.

Another feature that set this strain apart: When hit with ultraviolet light, many *Legionella* strains fluoresce blue, red or yellow, but *L. clemsonensis* fluoresced green. (Fluorescing orange would have been too perfect.)

If *Legionella* is inhaled by someone who is elderly or immunocompromised it could lead to a treatable form of pneumonia. The bacteria live in biofilms of all manmade water systems and are found in freshwater lakes, streams and rivers. Around 4,000 to 5,000 cases are reported annually in the U.S., an estimate that is probably low, McNealy said.

Provided by Clemson University

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