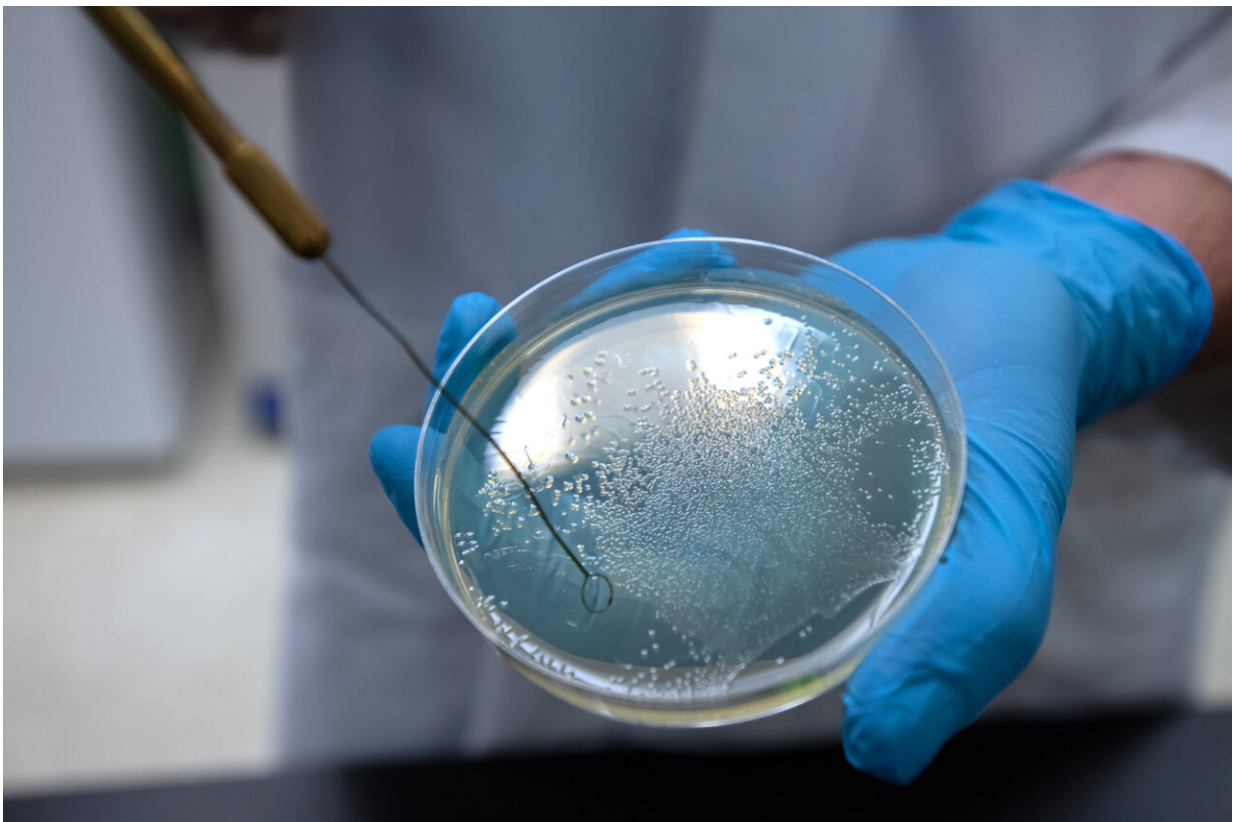


Deadly bacteria show thirst for human blood: Research outlines the phenomenon of bacterial vampirism

April 16 2024, by Josh Babcock



Washington State University researcher Arden Baylink holds a petri dish containing salmonella bacteria. Baylink and Ph.D. student Siena Glenn have published research showing that some of the world's deadliest bacteria seek out and eat serum, the liquid part of human blood, which contains nutrients the bacteria can use as food. Credit: Ted S. Warren, Washington State University College of Veterinary Medicine

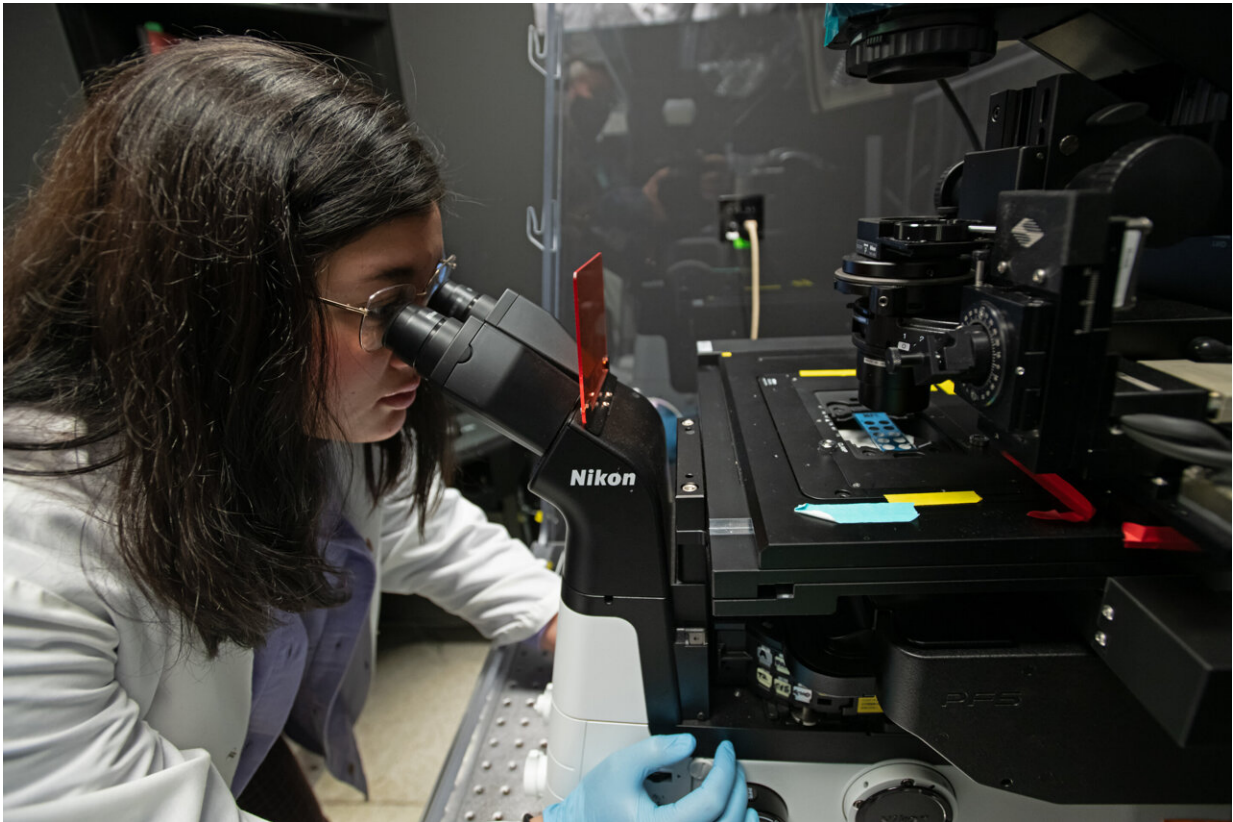
Some of the world's deadliest bacteria seek out and feed on human blood, a newly-discovered phenomenon researchers are calling "bacterial vampirism."

A team led by Washington State University researchers has found the bacteria are attracted to the liquid part of blood, or serum, which contains nutrients the bacteria can use as food. One of the chemicals the bacteria seemed particularly drawn to was serine, an amino acid found in human blood that is also a common ingredient in protein drinks.

The research [finding](#), published in the journal *eLife*, provides new insights into how bloodstream infections occur and could potentially be treated.

"Bacteria infecting the bloodstream can be lethal," said Arden Baylink, a professor at WSU's College of Veterinary Medicine and corresponding author for the research. "We learned some of the bacteria that most commonly cause bloodstream infections actually sense a chemical in [human blood](#) and swim toward it."

Baylink and the lead author on the study, WSU Ph.D. student Siena Glenn, found at least three types of bacteria, *Salmonella enterica*, *Escherichia coli* and *Citrobacter koseri*, are attracted to human serum. These bacteria are a leading cause of death for people who have inflammatory bowel diseases (IBD), about 1% of the population. These patients often have intestinal bleeding that can be entry points for the bacteria into the bloodstream.



Siena Glenn, a Washington State University Ph.D. student uses a high-powered microscope. Glenn, working with Assistant Professor Arden Baylink and colleagues, has published research showing that some of the world's deadliest bacteria seek out and eat serum, the liquid part of human blood. Credit: Ted S. Warren, Washington State University College of Veterinary Medicine

Using a high-powered microscope system designed by Baylink called the Chemosensory Injection Rig Assay, the researchers simulated intestinal bleeding by injecting microscopic amounts of human serum and watching as the bacteria navigated toward the source. The response is rapid—it takes less than a minute for the disease-causing bacteria to find the serum.

As part of the study, the researchers determined Salmonella has a special

protein receptor called Tsr that enables bacteria to sense and swim toward serum. Using a technique called protein crystallography, they were able to view the atoms of the protein interacting with serine. The scientists believe serine is one of the chemicals from blood that the bacteria sense and consume.

"By learning how these bacteria are able to detect sources of blood, in the future we could develop new drugs that block this ability. These medicines could improve the lives and health of people with IBD who are at high risk for [bloodstream infections](#)," Glenn said.

Scientists Zealon Gentry-Lear, Michael Shavlik, and Michael Harms of the University of Oregon, and Tom Asaki, a mathematician at WSU, contributed to the research.

More information: Siena J. Glenn et al, Bacterial vampirism mediated through taxis to serum, *eLife* (2024). [DOI: 10.7554/eLife.93178.2](https://doi.org/10.7554/eLife.93178.2)

Provided by Washington State University

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