

A Physical Approach to Biology



Vernita Gordon
Associate Professor, Physics

CURRENT RESEARCH

Finding ways to fight infections by studying the structural composition of bacteria and super-bugs

As bacteria continue to be treated with antibiotics, we are witnessing the emergence of antibiotic-resistant pathogens capable of forming "biofilms" that further increase its immune system and antibiotic resistance. Dr. Vernita Gordon, Assistant Professor of Physics at The University of Texas at Austin, is using her background training in physics to attack biological problems from a unique perspective. Whereas most scientists studying biofilms have microbiology backgrounds, physics training prompts Dr. Gordon to ask different questions and use unique approaches. Rather than studying individual cells, Dr. Gordon and her team study "biofilms," or many interacting bacteria in a structural grouping, to understand how the structures of infections affect their function and characteristics.

Dr. Gordon's approach to infections' structure is uncovering answers that reveal how many cells of bacteria operate when functioning as a community. Current research focuses on *Pseudomonas aeruginosa*, a bacterium known to infect individuals with compromised immune systems. *Pseudomonas* is the 4th most commonly acquired infection in hospitals and is particularly dangerous, often deadly, in patients suffering from diabetes or cystic fibrosis.

- One aspect of Dr. Gordon's research studies how the structure of bacterial populations contributes to their ability to resist antibiotic treatments. Groups of many bacteria will form structures that maximize their potential to resist antibiotic treatment, and therefore thrive. Dr. Gordon and her team have discovered that manipulating the structure of bacterial populations can increase the effectiveness of antibiotics, and even enable them to eliminate antibiotic-resistant "...

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AFFILIATION



The University of Texas at Austin

EDUCATION

- B.Sc., in Physics and Mathematics, 1997 .Vanderbilt University
- A.M., in Physics, 2001 .Harvard University
- Ph.D., in Physics, 2003 .Harvard University

AWARDS

- Robert S. Hyer Research Award
- Cystic Fibrosis Foundation Postdoctoral Fellow
- Magna Cum Laude & Honors in Physics
- National Merit Scholar
- National Honor Society
- and 1 more...

RESEARCH AREAS

Life Science, Infectious

FUNDING REQUEST

Your contributions will help Dr. Gordon develop an innovative approach to understanding, treating, and preventing bacterial biofilm infections from a physical-science perspective. The process of doing so will train enthusiastic undergraduate students, graduate students, and postdocs interested in the physical approach to microbiology and prepare them to carry forward similar work as independent investigators in their own right.