

Cleveland takes new steps to tackle 'superbugs'

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Since the discovery of penicillin in 1928, antibiotics have made the world a much safer and healthier place. But Shakespeare was onto something when he asked if it's possible to have too much of a good thing. In the case of antibiotics, the answer is increasingly "yes."

As a result, Case Western Reserve University School of Medicine and Louis Stokes Cleveland VA Medical Center are teaming up to take on the rising problem of [antibiotic resistance](#).

A new entity, Case VA CARES, will combine firepower from both organizations in the battle against antibiotic resistance. Staff will carry out new research, work to modify existing antibiotics, try and discover new ones, and use decoys to trick uncooperative bacteria.

The Problem

More and more, bacteria and other microorganisms are developing resistance to antibiotics which used to kill them off. This resistance, which evolves via natural selection through random mutation, is usually caused by excessive use of antibiotics, including in livestock animals raised as human food. In turn, infections which used to yield to antibiotics can persist and even worsen, putting patients in danger. Not only does antibiotic resistance imperil health, it also adds to healthcare costs as doctors try different medicines to find ones bacteria haven't become resistant to. Sometimes the stronger substitute antibiotics cause

serious side effects such as kidney damage.

More than two million people develop antibiotic-resistant infections in the U.S. every year, leading to more than 23,000 deaths. Some experts say that without new inroads, the death toll could top that from cancer by mid-century. The financial costs are already enormous: as much as \$20 billion in extra healthcare costs annually.

Case VA CARES

Case VA CARES (CWRU-Cleveland VAMC Center for Antimicrobial Resistance and Epidemiology) will be located in the CWRU School of Medicine and Cleveland VA with collaborating partner laboratories located around the world. "An immediate goal of this initiative is to boost research into multidrug-resistant Gram negative organisms such as *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, *Klebsiella pneumoniae* and mycobacteria, which can cause tuberculosis and many other infections," said Pamela B. Davis, MD, PhD, dean of CWRU School of Medicine. "Understanding the mechanistic and molecular bases of resistance is crucial to properly treating patients with serious infections."

In addition to research and drug discovery, experts at the center will work with scientists throughout the world to track outbreaks of resistant organisms, discover new drugs, and develop training for physicians, medical students, and residents to recognize and prevent overuse of antibiotics.

The director of the center will be Robert A. Bonomo, MD, medicine service chief at the Louis Stokes Cleveland VA Medical Center. Faculty members of the new center will come from throughout both organizations including experts in infectious diseases, microbiology, molecular biology, biochemistry, pharmacology, proteomics, and

bioinformatics. Experienced scientists with expertise in bacterial genome sequencing and bioinformatics analyses will be recruited to augment experts from the CWRU Department of Genetics.

"In the search for new [antibiotics](#) and fresh strategies for existing ones, Case VA CARES will play a prominent role in leading and conducting research needed to design and conduct clinical trials, which will take place at the VA , University Hospitals, MetroHealth, and the Cleveland Clinic Foundation," said Dr. Bonomo, who is a member of the NIH-funded Antimicrobial Resistance Leadership Group (ARLG). The latter group is addressing national priorities for clinical research on antibiotic resistance.

Case VA CARES will also benefit from strong working relationships with industry partners of both the School of Medicine, University Hospitals of Cleveland, MetroHealth, the Cleveland Clinic and the VA Medical Center.

Provided by Case Western Reserve University

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