

THE WALL STREET JOURNAL

RESEARCH REPORT | NEW MEDICAL FINDINGS
JANUARY 17, 2012

A New Weapon in the Fight Against Superbugs

By ANN LUKITS

Researchers in Israel have developed a novel method of restoring antibiotic sensitivity to resistant bacteria, according to a study in the journal *Applied and Environmental Microbiology*. The process could eventually be used to fight hospital superbugs, researchers said. An estimated 70% of hospital-acquired infections in the U.S. involve bacteria that are resistant to at least one antibiotic.

Using a process called lysogenization, scientists used bacteriophages, viruses that can infect bacteria, to invade resistant bacterial cells and restore their sensitivity to antibiotics. Initial experiments involved *E. coli* bacteria and the antibiotics streptomycin and nalidixic acid. Genes from mutant or antibiotic-resistant *E. coli* bacteria were isolated in laboratory cultures and genetically engineered to reverse the resistance mechanism. Researchers then targeted the resistant genes using phages loaded with the engineered genes. This rendered resistant *E. coli* significantly more sensitive to the antibiotics than control phages carrying mock genes.

Researchers said they expect genetically altered phages can be developed for any bacterium and used in hospital settings to reverse antibiotic resistance in bacteria that cause hospital-acquired infections. Once bacteria are lysogenized, they are less likely to infect humans and perpetuate the cycle of antibiotic-resistance, they said.

Resistance experiments also were conducted with Tellurite, a compound toxic to bacteria. Further treatment with Tellurite would kill bacteria missed by the phages.

Caveat: Bacteriophages have yet to be tested on hospital superbugs such as methicillin-resistant *Staphylococcus aureus* (MRSA).