Could Antidepressants Help Treat Multiple Infectious Illnesses?

Certain drugs for depression also stop bacteria from acquiring the cholesterol they need in order to cause disease.

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A new study published in the journal Life Science Alliance reveals that a certain class of antidepressants may one day be used to treat a large variety of diseases caused by bacteria living within cells, reports Virginia Commonwealth University (VCU) News.

Researchers from VCU and four other universities teamed up to investigate how antidepressant drugs known as FIASMAs—such as desipramine, amitriptyline and nortriptyline—worked to target four disease-causing bacterial species. (The bacteria examined in the study were a strain that causes the tick-borne illness human granulocytic anaplasmosis; one that triggers the debilitating pneumonic disease Q fever; and two that induce chlamydia infections.)

Scientists found that FIASMAs interfered with the ability of the bacteria to use the cholesterol they need to grow and cause disease. As a result, the antidepressant drugs stopped anaplasmosis in tissue culture and mice, destroyed the Q fever agent Coxiella burnetii and partially stopped chlamydial infections in cell culture.

“Antibiotic options for diseases caused by intracellular bacteria are limited because many of these drugs cannot penetrate our cell membranes. In essence, the bacteria are protected,” explained Jason Carlyon, PhD, a professor in the VCU Department of Microbiology and Immunology, who led the study.

Currently, antibiotic therapies to treat diseases caused by intracellular bacteria are limited because a vast majority of these drugs are unable to penetrate cell membranes. But the ability of FIASMAs to influence cholesterol trafficking in the cell makes it unnecessary to directly target the bacteria and likely prevents them from developing resistance to treatment.

According to Carlyon, this is why these drugs are prescribed to treat a wide variety of conditions and diseases.

He suggested that FIASMAs could become an alternative to antibiotics or even be used in conjunction with these meds to treat infections that usually require lengthy antibiotic therapy.

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