Name Class Date

Research Antibiotics: Bacteria's Worst Enemy

In high school, it isn't uncommon to hear of someone being diagnosed with strep throat, pneumonia, or even food poisoning. You may have even been the unfortunate victim of one of these illnesses caused by a bacterial infection. Depending on the type of infection, you may have one of the following types of bacteria to thank for your illness: *Streptococcus, Staphylococcus, Salmonella, Escherichia coli, Listeria, or Clostridium perfringens.*

Bacteria are one-celled organisms, called prokaryotes, which have a chromosome of double-stranded DNA in the shape of a ring. While most bacteria are helpful to humans and animals, some can cause illness. They do this by entering the body through the air, food, or water. Once inside their host, bacteria invade a cell and begin to reproduce, using the host body for its food and energy. Bacteria can destroy living cells or damage tissue when they provoke an immune response from the host, or when they release chemicals that can interfere with host's cells normal function. Some of the symptoms often associated with bacterial infections such as a fever, chills, and a headache are caused in response to your immune system fighting off and killing the bacteria causing the infection.

Your body's immune system may try to fight off the bacteria, but sometimes it needs a little assistance. When a person gets sick from bacteria, doctors will often prescribe antibiotics. Antibiotics are medications that kill the bacteria without harming the host. There are several categories of antibiotics: aminoglycosides, carbapenems, cephalosporins, macrolides, penicillins, quinolones, sulfonamides, and tetracyclines. These antibiotics work in different ways by disrupting the bacteria's cell processes and are only effective on certain types of bacteria. When choosing an antibiotic, doctors must consider what the type of bacteria is that is most likely causing the infection. So although strep throat, pneumonia, and food poisoning are all illnesses caused by bacterial infections, they may need to be treated differently.

Research It

Research one category of antibiotics to learn how they work against certain types of bacteria. Identify the types of bacteria and the common illnesses that are treated with this type of antibiotic. Describe what essential cell processes the antibiotics disrupt, how they do it, and the result of that disruption. In addition, research how the antibiotic may affect healthy cells around the bacteria. Create an informational pamphlet profiling the category of antibiotics you choose.