



## **Chemical Warfare and the Rise of Antibiotic Resistance**

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Can you imagine a scratch costing you a limb, or a minor cut killing you? Believe it or not, until recently people lived under the constant threat of lethal bacterial infections. Before antibiotics, minor accidents and routine medical procedures could turn deadly. After Alexander Fleming's serendipitous discovery of penicillin, however, we aggressively waged a war against pathogenic bacteria and won. Or so we thought. The emergence of hard-to-treat multi-drug resistant bacterial infections is challenging even our antibiotics of last-resort. With our antibiotic arsenal running out, we must ask ourselves: What should we do to control the spread of antibiotic resistance? This is the question that my AP Chemistry students will try to answer. In this curriculum unit, the problem of antibiotic resistance will provide a meaningful context for learning scientific concepts relating to the structure and function of enzymes. They will investigate the role of enzymes in structure-based antibiotic design and in the bacterial modes of resistance. Students will consider the controversy surrounding the proposed ban on the use of antibiotics in food-producing animals for growth promotion and routine prevention, weigh the costs and benefits, and create an evidence-based argument for or against this ban.

(Developed for AP Chemistry, grades 11-12; recommended for AP Biology, grades 10-12, and Biology, grades 9-10)

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