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|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | A constant dilemma in the world of medicine and science is resistance against disease. Usually, the main cause of a disease is from another living organism. In humans' case, these organisms are bacteria. Bacteria are prokaryotic microscopic agents which contain DNA, cell membrane, and internal cytoplasm. All bacteria are not harmful, however. Every living person has within them a multitude of bacteria, both harmful and beneficial. But when diseases occur, it is a result of an inflammation, or rapid increase, in the population size of pathogenic bacteria within the host. This illness will prolong until the body's immune system kills off the foreign bacteria and homeostasis within the host's body is regained.  Most bacteria are divided into one of two categories. These categories being Gram negative and Gram positive. Gram positive bacteria contain a special pigment called gram stain. This stain, under a microscope, makes the bacteria show up with a purple haze. Gram positive bacteria also contain a single and thick cell covering. Gram negative, on the other hand, contain an extra layer, called the outer membrane in addition to the peptidoglycan, or the primary cell covering. The peptidoglycan is present in both forms of bacteria, but do not be mislead. The thickness of the outer-membrane and the peptidoglycan (as a whole) in the gram-negative bacteria are relatively the same as the thickness of the peptidoglcan in the gram positive bacteria. The outer membrane on the gram negative form of bacteria is composed of chain of sugars (polysaccharide chain) with an overlay of lipids. This phenomena is known as a lipopolysaccharide. The differences in the make-up of the two bacteria lead to some interesting questions. Certain forms of bacteria are more resistant to different types of anti-biotics, but which ones? Are there certain forms of these bacteria that can evolve to become resistant to all types of anti-biotics? These are logical questions with difficult answers. I took the first question and contrived an experiment to test, and hopefully answer, my question.  In my experiment, I choose four over-the-counter anti-biotics and tested them between both a gram-positive and a gram-negative species of bacteria. This experiment may be somewhat elementary, but it would finally reveal the truth to me about which anti-biotics I should buy in the future for my own well-being. So this experiment not only had scientific and experience value, but a personal level of value as well.  The four anti-biotics that I chose were Neosporin, Polysporin, Bacitrin, and a general triple-antibiotic ointment. Being that these were all over-the-counter products they were easily attainable and relatively inexpensive. For my test subjects, I chose Streptococcus Lactis (Gram-positive) and Rhibzonium Legusarium (Gram-negative). The main reason that I chose these subjects was that they are non-pathogenic. In addition to this, they are typical examples of general bacteria, and they react very much like most of the bacteria within their families. Consequently, I ordered some pre-made agar dishes to culture my bacteria, one sample of Streptococcus lactis, and one sample of Rhibozonium Legusarium. With all of the materials in place, the only thing left to do was to concoct an experiment to test my burning question. |

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*For More Information about Creekwatch, please contact Eric Thiel at* [*ethiel@pleasanton.k12.ca.us*](mailto:ethiel@pleasanton.k12.ca.us)