CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
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Project Number
S1305

Project Title
What Is the Effect of Exposure to an Electrical Current on the Growth of Escherichia coli?

Abstract

Objectives/Goals
This experiment is designed to test a theory of Dr. Hulda Regehr Clark, Ph.D., N. D., who believes that a battery may be used to destroy parasites within the human body. She states that by eliminating these parasites, a person can be rid of such ailments as the common cold, chicken pox, HIV, and even cancer. Her seemingly elementary invention, "The Zapper," is constructed mainly from a shoebox, wires, some capacitors, and a 9-volt battery. The procedure in this experiment challenges Dr. Clark's zapper in a more controlled environment.

Methods/Materials
Colonies of Escherichia coli will be incubated in sterilized agar plates. Groups of four plates will be "zapped" for one, four, seven, and ten minutes. ("Zapping" constitutes connecting alligator clips from the zapper's bolts to the steel grids in each plate and turning the apparatus "on" for the allotted time. This frees the flow of electricity through the circuit, including the bacteria.) A control group will not be zapped. The experiment employs steel grids as conductors to ensure that the current flows through as many bacteria as possible.

Results
Partial success of the zapper is supported by retardation in colonial growth in size and number after the zapping period.

Conclusions/Discussion
The voltage "kills" the bacteria, it is hypothesized, by breaking the hydrogen bonds in the bacterial chromosome. Gel electrophoresis will be used to support or refute this idea. A second conjecture is that the electrical current breaks up the proteins of the plasma membrane, causing the bacteria to lyse and expire. Observations will be made under a microscope to determine if this is or is not the case.

Summary Statement
The effects of the voltage of a 9-volt battery are observed on growth of Escherichia coli.

Help Received
Mother very supportive in editing abstract drafts, helping build zapper. Mrs. Houseman KEY in giving advice, providing classroom, materials, knowledge. Mr. Beach expert in physics, gave counsel, made plates. Hoping to obtain enzymes from La Sierra University. Mrs. Bera also helpful in board design. Dr.