



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Jordan B. Robertson	Project Number J1722
Project Title Electrical and Magnetic Flow: Will It Affect How Bacteria Grow?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my science fair project was to discover whether or not either electrical current or an electromagnetic field could stimulate bacteria growth. My hypothesis is that the electrical current will provide stimulus for the bacteria and cause to grow the best, as where the electromagnetic radiation given off by the electromagnetic field will very slightly hinder the bacteria's growth.</p> <p>Methods/Materials I lawned thirty Petri dishes with sheep's blood auger then inoculated them with bacteria grown from a chicken breast swab. The dishes were sealed and ten were placed in each of my three incubators. The incubators are exactly the same, except one has a series of electromagnets running through its bottom, one has an electrical current and one is a control with nothing on its bottom. I used a light source (overhead projector) and a magnifying glass to count the number of cell colonies in each dish after three days.</p> <p>Results After concluding my testing, I observed that the incubators with electrical current posted the highest amounts of bacteria growth, followed by those with electromagnets, then finally, the control. The dishes subjected to the electrical current had an average bacteria colony count of 426 colonies, which was 311 colonies above the control's count of 115 colonies. In addition to the electrical current boosting bacteria growth, the dishes subjected to electromagnets had an average colony count of 190 colonies, which was 75 colonies higher than that of the control.</p> <p>Conclusions/Discussion My experiment proved quite definitively that an electrical current is a substantial growth stimulus to bacteria and also that electromagnets can slightly improve bacterial growth. Throughout my detailed analysis of these results, I have been unable to pinpoint the exact cause of why these variable increase bacteria growth but I am considering that it may have something to do with miniscule amounts of extra heat produced by the electrical current and the electromagnets' electromagnetic radiation. The next step is to revisit this project, except with mammalian cells to help indicate these forces effects on cellular growth and deeply explore the many medical applications of this project.</p>	
Summary Statement In this project, I subjected bacteria to electrical current and electromagnetic radiation to see if either provided any growth stimulation, which could then be used to speed the process of growing transplant organs out of stem cells.	
Help Received Mother helped cut and glue papers for the board; Dr. Miller and Dr. Lubatti assisted in teaching me the proper procedures to grow, count, and safely dispose of bacteria; Mrs. Marcarelli helped come up with the title, edit all papers, and set up experiment; Mrs. Benson helped edit papers and deliver needed materials;	