



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2019 PROJECT SUMMARY**

<b>Name(s)</b> <b>Joshua Rangel</b>	<b>Project Number</b> <b>J2117</b>
<b>Project Title</b> <b>Effects of Radiation on Plants</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The objective of this experiment was to determine the effects of electromagnetic radiation on seed germination and plant growth.</p> <p><b>Methods</b> I planted groups of radish seed that were radiated with several different amounts of electromagnetic radiation using a medical x-ray machine. I also planted a control group of seeds that were not exposed to radiation. Seeds were exposed to the same environmental elements and observed for 14 days. Observations and measurements were recorded.</p> <p><b>Results</b> Plants in the control group and experimental group all sprouted and grew at about the same rate.</p> <p><b>Conclusions</b> The radiation exposure did not cause the plants to grow or develop any differently in the experimental group compared to the control group.</p>	
<b>Summary Statement</b> Exposing seeds to electromagnetic radiation does not have an effect on plant germination and growth.	
<b>Help Received</b> I performed the research and experiment. Sandra, an X-Ray technician radiated the seeds. Rangel Chiropractic allowed access to the X-Ray machine.	