



# CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

<b>Name(s)</b> <b>Jennifer A. Ocín</b>	<b>Project Number</b> <b>S2208</b>
<b>Project Title</b> <b>The Effects of Magnetism on the Semi-Immortal Planaria</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of my project was to determine whether magnets and their various magnetic field intensities exert an effect on the rates of regeneration in the flatworm, <i>Dugesia tigrina</i>, or more commonly known as planaria. My hypothesis tests that magnets can increase the rate of regeneration in planaria with increasingly strong magnetic field intensities.</p> <p><b>Methods/Materials</b> Rare earth magnets called neodymium magnets, all the same size and shape, are mounted onto 12 circular steel sheets. On top of the magnets and steel sheets are 12 plastic, see-through containers, which hold the planaria and their spring water. Half of the 40 planaria are cut into half and the other 20 are left whole. The measurements of the head, (anterior), segments and the tail, (posterior), segments of each of the bisected worms are recorded and measured over a period of 5 days. The total number of groups, including bisected head and tail groups, is 12, with the first 4 groups having the head and tail segment subgroups. The first four (bisected) groups and the next 4 (whole) groups are all mounted onto circular steel sheet metal pieces according to the magnetic field intensities. The first one has no magnets, thus being the control, (groups 1 and 5). Then, magnetic field intensity 1 includes 2 magnets, intensity 2 includes 4 magnets, and lastly, intensity 3 has 8 magnets.</p> <p><b>Results</b> The results expected were that the planaria would be higher in growth with the effects of magnetism, rather than without the magnets. However, there were a lot of unprecedented complications that could have possibly disrupted the experiment. The results indicated that the magnets did indeed have an effect on the growth of the cut planaria, especially as the magnetic field was increasingly stronger.</p> <p><b>Conclusions/Discussion</b> Every group had a wide variety of results due to unavoidable and measuring errors. Spontaneous tail dropping, binary fission, and other random events of asexual reproduction occurred. This increased the number of head and tail parts, especially in the tail groups. The planaria were also very active, contracting and expanding, deceiving of their real sizes. Further research can test whether magnets can have an effect in the stem cell biology of humans, as they do in the planaria, whether the short-term and long-term effects are positive or negative.</p>	
<b>Summary Statement</b> The focus of this project was to test whether magnets can increase the rate of regeneration in planaria since the regeneration process is distinctive of their stem cell biology and can be applied to research in human stem cells.	
<b>Help Received</b> Parents bought materials; my aunt and mom cut out the steel sheet circles; my 3 sisters for support; my Science, Technology, and Research teacher Ms. De La Cruz for giving advice	