



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Sydney R. Shaw	Project Number J2422
Project Title How Does Hydra littoralis Regenerate?	
Abstract Objectives/Goals The objective was to pinpoint the gene for hydra regeneration by dissecting Hydra littoralis in four different orientations, then observing regrowth. It was hypothesized that a certain part of the hydra would show more rapid growth than the others, indicating that it housed this gene. The locating of this gene has potential for application to human limb or organ regeneration. Methods/Materials Hydrae were dissected horizontally in four different orientations; in half, in thirds, with base removed, and with head removed. Trials were repeated three times. Hydrae were kept separately in petri dishes and fed brine shrimp, cultivated separately. Hydrae were observed daily under a microscope for 15 days to monitor progress of regeneration. Results All hydrae were able to regrow at the end of the 15 day period, the bases taking an average of three days longer than the heads. In the hydrae cut into thirds, the center pieces grew at about the same rate as the bases. Size proved to be a factor; larger pieces were able to regrow more quickly. These results would indicate that the gene is spread throughout the hydra, though it is perhaps more abundant in the heads. Conclusions/Discussion It makes sense that size should influence regrowth; the process of morphallaxis, which hydrae use, does not involve the regrowth of new cells, but instead relies on existing cells to take the place of those which were lost. As for the specific gene which controls morphallaxis, it is likely distributed evenly throughout the hydra. The identity of this exact gene is unknown; it may be Msx, or cnx-2. If this gene is identified, it could be applied to humans and used to regrow organs and cure many diseases.	
Summary Statement The purpose is to locate the gene for hydra regeneration in order for potential human application.	
Help Received LAUSD science center provided microscope, pipettors dissection tools; Carolina Biological provided hydra and shrimp; father supervised dissection; mother helped type	