



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) David E. Lluncor	Project Number S1010
Project Title Factors Affecting Balance and PCP Disorders: The Influence of Natural Stimuli in Mice Utricles, Year 2	
Abstract Objectives/Goals How the tissues that form several organs maintain their proper planar cell polarity (PCP) organization is an important question in the vestibular system. One otolithic organ, the utricle, has otoconia which acts upon the hair cells distinct polarization of cilia, called the morphological polarization vector (MPV). This project examines the effect of otoconia as stimuli upon the MPV orientation. Methods/Materials The het/het and tlt/tlt mutation inhibits otoconia formation. When compared to the wild type and het/+ mice, otoconia is the experimental variable. The tissue was prepared and imaged for confocal microscopy. A highly analytical and unique methodology was created to assess precise MPV orientation and its distribution along the utricle using the polar coordinate method. Results The data was collected from twelve mice utricles, totaling 5837 traced MPV angles. Using the independent variable two sample t-test, 78.5% of the 28 het/het and het/+ regions and 68.5% of the 35 tlt/tlt and wild type regions had equal MPVs. Conclusions/Discussion The majority of angle distributions were equal, suggesting MPV organization is stimuli independent. This experiment is one of the largest analyses of quantified hair cells, which might have specified a class of factors contributing to MPV maintenance.	
Summary Statement I documented the affect that otoconia had upon the sensory epithelial cells, or hair cells, in one of the balance organs, the utricle.	
Help Received Used lab equipment at University of Los Angeles, California under supervision of Dr. Hoffman; Participant in Victor Goodhill Research Fellowship	