



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>David E. Lluncor</b>	<b>Project Number</b> <b>S1009</b>
<b>Project Title</b> <b>Maintaining Correct Balance: Spatial Coding and Its Dependence on Natural Stimuli</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The vestibular system in the inner ear decodes motion and acceleration. The utricle otoconia deflect hair-like protrusions in ascending order, called the morphological polarization vector (MPV). MPVs are essential for spatial coding. The project examined what effect natural stimuli have upon MPV maintenance and development. <b>Methods/Materials</b> Otoconia deficient HET/HET, and otoconia producing HET/+ mice utricles were used. Thus, otoconia was the sole variable. The tissue was prepared with phalloidin fluorescence and was imaged with a confocal microscope. The angle was calculated using the kinocilium center and hair cell center. <b>Results</b> In data quantification, three similar utricle areas that were compared yielded a HET/+ to HET/HET average angle of 93.3 degrees to 105.5 degrees, 114 degrees to 137.5 degrees, and 91 degrees to 100 degrees respectively. <b>Conclusions/Discussion</b> The compared MPV angles showed similarity, which suggests that spatial coding is not stimuli dependent. This experiment deductively narrows the factors contributing to MPV maintenance, so that non-stimuli factors can be explored.	
<b>Summary Statement</b> The focus of the project is to determine whether morphological polarization vectors in utricle hair cells depend on natural stimuli for its development and maintenance.	
<b>Help Received</b> Used lab equipment at University of Los Angeles California under the supervision of Dr. Hoffman.	