



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> <b>Randall Lin</b>	<b>Project Number</b> <b>S1609</b>
<b>Project Title</b> <b>Adaptive Radiation by Asexuals Driven by Resource Competition in silico</b>	
<b>Objectives/Goals</b> Sympatric speciation faces much controversy in evolutionary biology, whereas allopatric speciation is widely accepted. We demonstrate that sympatric speciation based only on resource competition is possible for certain parameters in computer simulations. Every generation a set number of individuals are killed, followed by asexual reproduction of the remaining organisms based on their fitness, which is dependent on how well they utilize the available resources. Finally, every offspring has a chance of mutating, which changes its affinity to a resource. This simulation results in diversification of genotypes. We confirm speciation through the existence of at least one resource dominance per existing genotype, and run invasion experiments to confirm that negative frequency-dependent selection maintains these species. Our results verify that sympatric speciation is possible through competition for limiting resources alone and that cost decides the resulting equilibrium.	
<b>Summary Statement</b> Our results verify that sympatric speciation is possible through competition for limiting resources alone and that cost decides the resulting equilibrium.	
<b>Help Received</b> NSF REU site grant EEC0552962 and Keck Graduate Institute.	