



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <b>Moriah K. Nachbaur</b>	<b>Project Number</b> <b>S1611</b>
<b>Project Title</b> <b>Translatability of Gene Function between Plant Species: From Arabidopsis thaliana to Nicotiana tabacum</b>	
<b>Abstract</b> <b>Objectives/Goals</b> To investigate the conservation of gene function among plant species, the translatability of two, morphology-governing genes, BREVIPEDICELLUS LIKE (BPL) and NO APICAL DOMINANCE (NAD), was examined. Transgenic Arabidopsis thaliana lines overexpressing the BPL gene exhibit dwarfism and short flower pedicles; lines overexpressing the NAD gene display reduced apical dominance. <b>Methods/Materials</b> From a published method, a new, in-vitro transformation protocol was developed and used to introduce the overexpressed Arabidopsis BPL and NAD genes into Nicotiana tabacum. The phenotypes of these T1 generation transformants were examined, and transgene expression was verified through RT-PCR analysis. The expected, Mendelian inheritance of these transgenes was confirmed through Chi-square assessment of T2 generation seedlings. <b>Results</b> Overexpressing the Arabidopsis BPL and NAD genes in Nicotiana tabacum produces stable, heritable, architectural effects similar to those found in the analogous Arabidopsis thaliana overexpression lines. <b>Conclusions/Discussion</b> Such translatability suggests that comparable genetic mechanisms regulate plant morphology in evolutionarily divergent species. The preliminary results of this project contribute to the growing evidence that Arabidopsis phenotypes are translatable to other flowering plants, validate the specific use of Arabidopsis thaliana as a model species, and demonstrate that Nicotiana tabacum may be a useful second species in which to investigate other Arabidopsis lead genes.	
<b>Summary Statement</b> Overexpressing the Arabidopsis BPL and NAD genes in Nicotiana tabacum produces stable, heritable, architectural effects similar to those found in the analogous Arabidopsis thaliana overexpression lines.	
<b>Help Received</b> All work was conducted in the laboratories of Mendel Biotechnology, Inc. Dr. Oliver Ratcliffe and Mr. Roderick Kumimoto supervised my research.	