



# CALIFORNIA STATE SCIENCE FAIR 2005 PROJECT SUMMARY

<b>Name(s)</b> <b>Da Eun Im</b>	<b>Project Number</b> <b>S1311</b>
<b>Project Title</b> <b>Roles of Auxotrophic Markers in Candida albicans Virulence</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Candida albicans is the most common human opportunistic fungal pathogen that causes disseminated and mucosal infections. This dimorphic fungus, which exists as oval, single yeast cell but forms hyphae under favorable conditions, is the most common cause of yeast infections. The virulence factors, which determine the ability of C. albicans to damage its host cells, will serve as promising targets for therapies against Candida infections. Therefore, we examined the nutrient auxotrophy as a potential modifier of virulence in C. albicans. <b>Methods/Materials</b> In order to determine the effects of auxotrophy for uracil, arginine, and histidine on essential virulence traits of C. albicans, BWP17 (Ura-Arg-His-) was used as a parental strain to construct Ura+Arg-His- strains, Ura+Arg+His- strains, and Ura+Arg+His+ prototrophic strains. Polymerase Chain Reaction, gel electrophoresis, and growth test on different selection media were performed to check the auxotrophic characteristics of each strain. To examine the ability of each newly created strain to express virulence related traits, hyphal formation test and endothelial cell damage assay were also performed. <b>Results</b> Ura+Arg-His-, Ura+Arg+His-, and prototrophic strains formed hyphae while BWP17 did not. The abilities of the newly constructed strains, which all were prototrophic for uracil, to cause damage to endothelial cells were significantly higher than that of BWP17. <b>Conclusions/Discussion</b> Therefore, prototrophy for uracil is essential for the full virulence traits of C. albicans. On the other hand, auxotrophy for arginine and histidine did not affect the virulence traits. In conclusion, inhibiting the production of uracil may be used to develop therapeutic agents that specifically target Candida infections.	
<b>Summary Statement</b> Since prototrophy for uracil is essential for the full virulence traits of Candida albicans, the most common human opportunistic fungal pathogen, inhibiting the production of uracil may be used to develop therapeutic agents.	
<b>Help Received</b> Used lab equipment in Division of Infectious Diseases at Los Angeles Biomedical Research Institute under the supervision of Dr. Hyunsook Park and Dr. Scott G. Filler; Norma Solis did the portions of damage assay that required using radioactive materials; Southern California Academy of Sciences (SCAS)	