



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

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<b>Project Title</b> <b>The Role of Tetraspanins in the Uptake of the Fungus <i>Candida albicans</i> by Host Cells</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My hypothesis is that specific endothelial cell membrane proteins called tetraspanins are necessary for <i>C. albicans</i> to invade endothelial cells, and my goal was to discover which tetraspanins were important for invasion. <b>Methods/Materials</b> The HUVEC-TERT endothelial cell line was grown in tissue culture. The tetraspanins, CD9, CD63, and CD151 were detected by indirect immunofluorescence using specific mouse monoclonal antibodies. Each mouse antibody was detected with a fluorescent labeled goat-anti mouse antibody. Internalized organisms were identified by staining the endothelial cells with Alexafluor-labeled phalloidin which labels the endothelial cell actin microfilaments that are responsible for the endocytosis of the organism. The cells were imaged by confocal microscopy. The capacity of the anti-tetraspanin antibodies to inhibit the uptake of <i>C. albicans</i> by endothelial cells was determined using a differential fluorescence assay. <b>Results</b> By confocal microscopy, it was found that all three tetraspanins, CD9, CD63, and CD151, accumulated around <i>C. albicans</i> hyphae that were invading endothelial cells. Using blocking monoclonal antibodies, it was determined that only CD9 and CD63, but not CD151 were required for <i>C. albicans</i> to invade endothelial cells. <b>Conclusions/Discussion</b> The results indicate that the tetraspanins, CD9 and CD63 are required for <i>C. albicans</i> to invade endothelial cells, thus supporting my hypothesis. Blocking CD9 or CD63 is a potential approach to prevent <i>C. albicans</i> infections in patients.	
<b>Summary Statement</b> I found that the tetraspanins CD9 and CD63 were required for endothelial cells to endocytose <i>Candida albicans</i> .	
<b>Help Received</b> Dr. Hong Liu helped me design the experiments and taught me the experimental techniques. I performed all the experiments by myself.	