



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

<b>Name(s)</b> Nishanth Krishnan	<b>Project Number</b>  36114
<b>Project Title</b> Protein Cages with Antibody Binding Capacity for Targeted Drug Delivery	
<b>Abstract</b> <b>Objectives/Goals</b> The goal of the project is to successfully create viable HBV core-protein nano cages that incorporate new proteins with antibody binding domains to improve the targeting capacity of the cages. <b>Methods/Materials</b> Each cage formation trial will use a ratio of 2 HBV protein variants. The HBV protein and HBV protein with antibody binding domain are made by Sevion Therapeutics using transformed cells. Other essential materials include a Dynamic Light Scattering device (Wyatt Dynapro) for collecting data, UVettes for sample analysis, pipettes, Eppendorf tubes, and standard lab safety protection. <b>Results</b> Cages were not successfully formed with the tested ratios. Rather, the protein formed aggregates in the 100-200 nanometer-radius range. This led to the discovery that antibody binding domains on the new protein can physically obstruct protein movement in the self assembly process. <b>Conclusions/Discussion</b> As of now, the hypothesis has been proven wrong. However, the elimination of these ratios has narrowed down which untested ratios may lead to successful cage formation, meaning hypothesis should not be completely ruled out. The less the antibody binding domains present, the more the aggregates were closer in size to the expected range (20 nanometers).	
<b>Summary Statement</b> I constructed protein nano cages that can deliver drug payloads to specified parts of the body.	
<b>Help Received</b> I worked at Sevion Therapeutics, which provided me with lab space supplies, and instruments. Dr. Jacek Ostrowski of Sevion Therapeutics was my mentor and guide.	