



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

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Project Title Nanotechnology in Cancer Therapy: A Proposed Model of Using Thermosensitive Liposomes in Effective Drug Delivery	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective was to create a liposomal model where drug release from the liposomes could be efficiently controlled.</p> <p>Methods/Materials Liposomes encapsulated with ampicillin and gold nanoparticle were created, then centrifuged and separated from the excess ampicillin and fluid. All samples of liposomes were then exposed to lasers for varying times from 0 to 30 seconds. The resulting supernatants were tested on bacteria, and sizes of inhibition zones were measured and recorded. Specialized equipment such as round bottom flasks and blow dryers were used for the creation of liposomes.</p> <p>Results The longer the liposomes were exposed to the laser, the more ampicillin was released. When values were statistically analyzed using the unpaired T-Test, the data was proven to be statistically significant, with a p value of .0008.</p> <p>Conclusions/Discussion Adding gold nanoparticles to liposomes and exposing these to a laser allows drug release to be efficiently manipulated by a human. Heat released by gold nanoparticles after absorption of light caused increased bilayer permeability at the gel-to-liquid crystalline phase transition temperature, resulting in ampicillin release. This model of liposomes will allow doctors to vary the amount of drug release for the most effective treatment regimen.</p>	
Summary Statement Our project proposed a novel method for efficiently controlling the release of drugs from liposomes- a drug carrier used in cancer therapy.	
Help Received Father helped order the materials	