



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Sara J. Miles	Project Number 22140
Project Title A Novel Cancer Killing Strategy: Direct Protein Delivery of Caspase-3	
Objectives/Goals The present project was undertaken to test the feasibility of a novel strategy- direct delivery of functionally active proteins to kill tumor cells. The commercially available protein delivery reagents Profect P-1 and Profect P-2 (Targeting Systems, Ca) were used in delivering Alexa-488 conjugated Histone H-1, b galactosidase and activated caspase-3. Caspases are enzymes, which in their active form can induce cell death by a mechanism termed as apoptosis- a fundamental biochemical pathway for normal tissue homeostasis, cellular differentiation, and development within a multi-cellular organism (Simizu, 1998). The direct delivery of Alexa-488 conjugated Histone H-1 was delivered using Profect P-2. A bright yellow color was observed under fluorescent light. The yellow is a nuclear localization signal activated once the protein had efficiently entered the cells nucleus. The delivery of b galactosidase was confirmed by a blue color, which stained the nucleus once the protein had entered the cells nucleus. Once the efficient delivery of Alexa-488 conjugated Histone H-1 and b galactosidase was successfully achieved the delivery of activated caspase-3 into 80% confluent cells was achieved using Profect P-2 (Targeting Systems, Ca).	
Summary Statement Using protein delivery reagents in order to introduce active caspase-3 into an MCF-7 cell line, in order to kill the targeted cells in the form of apoptosis.	
Help Received Dr. R. Walia at Targeting Systems, Ca	