



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

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Project Title In Vitro Evaluation of Cytotoxic and Anti-Angiogenic Cancer Therapies on Human Tumor Cells	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Cancer is one of the leading causes of death among Americans. Treating cancer with chemotherapy involves many harmful side-effects including hair-loss and gastrointestinal disorders. The ultimate goal of this ongoing study is to develop a treatment for cancer using a novel anti-angiogenic cancer therapy, contortrostatin (CN), that could lower the detrimental side-effects of current chemotherapeutic agents when used in combination. The present study evaluates the effects of treating tumor cells in culture with CN alone and in combination with cytotoxic chemotherapy.</p> <p>Methods/Materials Glioma cell lines, LN229 and A172, were grown in culture and treated using CN and a chemotherapeutic drug, Doxorubicin. A proliferation assay was employed to test cell viability. To detect apoptosis, the TUNEL assay was used to qualitatively analyze adherent cells underneath a fluorescent microscope. The Annexin-V-FITC assay was also utilized for apoptosis detection by a quantitative analysis using FACS. Materials included cell lines, LN229 and A172; contortrostatin; Doxorubicin; Non-Radioactive Cell Proliferation Assay; Fluorimetric TUNEL System; Annexin V FITC Apoptosis Detection kit. Tools included a plate reader; fluorescent microscope; FACS machine.</p> <p>Results The proliferation assay revealed that tumor cells treated with CN and Doxorubicin did not have a higher effect compared to tumor cells treated with Doxorubicin alone. Moreover, the apoptosis detections showed that CN does not cause programmed cell death in tumor cells. The results of this study showed that (1) CN in combination with Doxorubicin does not have an overall synergistic effect on tumor cells in vitro and (2) CN does not induce apoptosis and therefore would not be cytotoxic to cells.</p> <p>Conclusions/Discussion Previous studies showed that CN interacted with cell integrins to disrupt tumor growth, angiogenesis, and metastasis. This study further showed that contortrostatin does not induce apoptosis in tumor cells and thus would not have a damaging effect on normal cells. However, CN does not have a synergistic effect in combination with chemotherapy in vitro. This may be due to the dissimilarity of cell cultures to real life organisms. Cell cultures lack blood vessels and vascular endothelial cells which CN has been shown to have an effect on. Future research will include the evaluation of CN in combination with chemotherapy on in vivo models of cancer.</p>	
Summary Statement This project evaluates the effects of combination drug treatments on human tumor cells using cytotoxic chemotherapy and a novel anti-angiogenic agent, contortrostatin.	
Help Received Used lab equipment at the University of Southern California under the supervision of Dr. Steve Swenson and Dr. Francis Markland Jr.; Graduate student, Fritz Costa, provided assistance during experimentation.	