



CALIFORNIA STATE SCIENCE FAIR 2013 PROJECT SUMMARY

Name(s) Akhil V. Kasibhatla	Project Number 33785
Project Title Effects of Tumor Microenvironment and Anticancer Agents on Colon Cancer	
Objectives/Goals The purpose of this experiment was to determine what effects a tumor microenvironment can have on the growth of colon cancer cells.	Abstract HCT116 and HCT15 colon cancer cell lines were cultured in McCoy 5A media and soft agar. Two cell lines were used since cancers differ among each patient and we wanted to show the results as continuous through multiple cell lines. The culture medias differed in that in the soft agar medium, the cells would form a microenvironment. Anticancer agents targeting RAF, MEK, MET, EGFR, and IGF1R were applied to cells in both environments and IC ₅₀ , or the concentration of a compound at 50% confluence, was recorded. Standard of care, or chemotherapeutic compounds, were also used as toxic agents. Confluence, or percentage of healthy cells covering well plate, was calculated from images taken with Celigo Cytometer.
Results Cells with microenvironment had lower confluence levels than cells in plain media. Standard of care compounds killed cells with and without microenvironment equally. Combinations of different compounds had lower confluences as concentration increased than independent compounds. HCT116 cells had an overall lower confluence than HCT15 cells when both had the same compounds applied to them.	
Conclusions/Discussion From the results, several conclusions could be made. First, the effect of compounds changed significantly in the presence of a microenvironment. Second, HCT116 cells are more sensitive to different anticancer agents than HCT15 cells. Third, combinations of compounds proved more effective in killing cells than compounds applied individually. Finally, standard of care compounds proved nonspecific as they killed cancerous cells in the tumor and healthy cells in the microenvironment.	
Summary Statement To study why compounds which are successful in a lab setting aren't as effective in the human body.	
Help Received Used lab equipment at GNF under supervision of Tim Smith.	