

# Greater San Diego Science and Engineering Fair 2015 PROJECT SUMMARY

**Name:** Lynn Lu

**Grade:** 8      **School:** Marshall Middle School      **Teacher:** E. Gillum

**Project Title:** The Anti-cancer Effect of Green Tea and Ashwagandha

(Please note that this project is currently having additional studies done to be completed by city science fair)

## Abstract

### Objectives/Goals

The object of this study is to investigate if there is a therapeutic benefit in combining green tea and ashwagandha, in the form of dietary supplements, to fight against cancer.

### Hypothesis

It is hypothesized that: combination treatment using 19.5 micromoles of EGCG (green tea) and 50 micromoles of ashwagandha leaf extract should produce more than a 74% growth inhibition concentration in prostate, pancreatic, and breast cancer.

### Methods/Materials

Three human cancer cell lines including breast cancer MCF-7, prostate cancer PC3 cells, and pancreatic cancer Hs766t cells were used. Two different concentrations of green tea (44.7 and 89.4 ug/ml) and ashwagandha (2.35 and 4.71 ug/ml) were used to evaluate the effect of the drug concentrations. The drug effect was studied by short-term MTT assay (immediate analysis of drug effect after 48 hour treatment) and long-term clonogenic assay. The experiment was conducted in triplicate to improve the accuracy of the results.

### Results

For MTT assay, when combining green tea (44.7 ug/ml) and ashwagandha (2.35 ug/ml) together, the growth inhibitions are 71.9 %, <1% and 21.1% for MCF7, PC3 and Hs766t cells. When testing separately and combining green tea (89.4 ug/ml) and ashwagandha (4.71 ug/ml) together, the growth inhibitions are 82.7%, 64.0% and 76.6% respectively. For clonogenic assay, when separately testing and combining green tea (89.4 ug/ml) and ashwagandha (4.71 ug/ml) together, the decreases in colony formation are 89%, 99.9% and 83.2% respectively.

### Conclusions/Discussion

The result first verified that green tea and ashwagandha had anticancer effects against three different cancer cells. Breast MCF-7 cancer cell line showed highest sensitivity followed by pancreatic cancer Hs766t cell line and finally the most resistant, the prostate PC3 cancer cell line. There were no synergetic effects observed in breast MCF-7 and PC3 cell line using the combination of the two drugs. The synergetic effects were observed in the pancreatic Hs766t cancer cell line using the combination at low concentrations.

### Summary Statement

My project tests the anti-cancer effect of green tea and ashwagandha on breast MC-7, prostate PC3, and pancreatic Hs766t cell lines.

### Help Received

Dr. Ze Lu PhD, Optimum Therapeutics