Inhibitory Effects of (-)-epigallocatechin-3-gallate (EGCG) and Pterostilbene on Pancreatic Cancer Growth *in vitro*.

Pancreatic cancer is a devastating disease, affecting 40,000 U.S. citizens annually, with over 90% succumbing within one year of diagnosis. Currently, radical surgery is the only chance for cure, but less than 25% of patients are candidates at the time of diagnosis. Herein, we hypothesize that the naturally occurring antioxidant (-)-epigallocatechin-3-gallate (EGCG), found in green tea, will inhibit pancreatic cancer cell growth in vitro. We studied EGCG alone and in conjunction with Pterostilbene, a naturally occurring stilbenoid derived from blueberries. Using the pancreatic cancer cell lines MIA PaCa-2 and PANC-1, efficacy and synergism will be evaluated using cell proliferation assay, cell death detection ELISA, cell cycle analysis, caspase-3/7 activity assay, general caspase inhibition, cytochrome C immunoassay, and mitochondrial depolarization analysis.

Results: Cell proliferation assays revealed significant additive anti-proliferative effects with Pterostilbene and EGCG in both cell lines ($P < 0.001$) .Cell Death ELISA results demonstrate combination treatment reduction of apoptosis in both cell lines, as compared to EGCG alone. Cell cycle analysis revealed that combination treatment increases the percentage of cells in S-Phase arrest in the MIA PaCa-2 cell line. Additionally, combination treatment led to an increase in the pro-apoptotic mediators Caspase-3/7 activity in the MIA PaCA-2 cells. It is hypothesized that increases in cytochrome C production and a concomitant increase in mitochondrial depolarization will be discovered, both indicators of mitochondrially derived apoptosis.

Our preliminary *in vitro* results are encouraging regarding the future use of the natural compounds, EGCG and Pterostilbene, to improve traditional pancreatic cancer therapies. Additionally, their usage may allow a decrease in dosage of conventional chemotherapies, which may decrease toxicity and expense, while enabling cancer patients to increase the quality of their lives while combating this devastating disease. Future research is planned in *in vivo* models to stimulate eventual human trials of ECGC and Pterostilbene.