Title: The Antiproliferative Effects of Pterostilbene in Leptin-Stimulated Breast Cancer *In Vitro* are via Apoptosis and Inhibition of JAK/STAT3 signaling

Overexpression of the hormone leptin has been implicated in breast carcinogenesis in obese women. Leptin stimulates breast cancer cell proliferation and inhibits apoptosis through JAK/STAT3 transcription signaling and dysregulation of apoptosis. Conversely, Pterostilbene (3,5-dimethoxy-4-hydroxystilbene), a compound found in blueberries, inhibits proliferation and induces apoptosis in breast cancer cells. The aim of this study was to evaluate the effect of Pterostilbene on apoptosis, cell proliferation and JAK/STAT3 signaling in leptin-stimulated breast cancer cells. Two breast cancer cell lines were treated with either leptin alone or in combination with Pterostilbene for 48 hours at various concentrations. Detection of apoptosis, cell proliferation and JAK/STAT3 signaling were performed using ELISA protocols. One way ANOVA and Tukey post-hoc analysis were used for statistical analysis. The results of this study show that breast cancer cells treated with leptin alone had a statistically significant increase in cell proliferation. Treatment with Pterostilbene produced statistically significant inhibition of leptin-induced proliferation. Pterostilbene treatment also suppressed leptin-induced inhibition of apoptosis and produced a statistically significant reduction in both constitutive and leptin-induced JAK/STAT3 transcription signaling. The results of this study indicate that Pterostilbene has an anti-carcinogenic effect on leptin-stimulated breast cancer *in vitro* through apoptosis and inhibition of JAK/STAT3 signaling, a key regulatory component of unregulated tumorigenesis in obesity-related breast cancer.