UNDERSTANDING THE NATURE OF GLYCYRRHIZIC ACID IN BREAST CANCER TREATMENT

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Breast cancer (BC) is the second most common cancer in women with 1 in 8 women in the United States developing BC within their lifetimes. Of the numerous types of breast cancer, invasive ductal carcinoma (IDC) is the most common accounting for 80% of all breast cancers.

The use of chemotherapeutic drugs such as doxorubicin (DOX) improves the prognosis and survival of patients diagnosed with BC. Yet, many BC cells form a drug resistance leading to relapse and worsening of prognosis for the patient. We hypothesize that the alternative medicine, glycyrrhizic acid (GA) will lead to the induction of apoptosis in BC cells while sensitizing the cells in combination with first-line chemotherapeutic, DOX. The effects of treatment on BC cell growth was assessed and measured using TACS MTT Cell Proliferation Assay, Trypan Blue Dye Exclusion, DeadEnd™ Fluorometric TUNEL System, Annexin-V/PI-double staining, Western Blot, cellular production of reactive oxygen species (ROS) and the detection of mitochondrial membrane potential to determine mitochondrial function. In the current study, treatment with GA led to decreases in cell proliferation and viability in addition to the induction of apoptosis. Our results also show that exposure to GA leads to increased ROS generation. Furthermore, we demonstrated that GA may be effective when used as co-treatment with DOX for BC treatment. Recommendations for further study involves illustrating
the role and mechanism of hyaluronic acid (HA) on each cell line, investigating the usefulness of co-treatment with GA and DOX, examine the effects of ROS inhibitors on ROS generation and transition studies to focus on 3-D BC cell models.