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From chemoprevention to identification of potential therapeutic targets and biomarkers for breast cancer

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Over the years, several phyto-compounds have been extensively used in Complementary Alternative Medicine (CAM) studies, individually and often at higher doses to kill cancer cells. Based on the combination and synergism theory, we had previously demonstrated that a combination of Resveratrol and Indole-3-Carbinol synergized and killed a maximum number of Breast Cancer cells. In the present study, we have tested various combinations of 10 well known phytochemicals, used at bioavailable levels, for their effect on cell growth and proliferation of the MDA-MB-231; breast cancer (BC) cell line and MCF-10A; normal breast epithelium as control cell line. The results revealed a super combination of 7 phyto-compounds (7SC), that synergized and induced 100% clearance of the BC cells but did not affect the normal breast epithelial cells. Next, in order to understand the underlying molecular mechanisms of this 'synergism' effect, microarray analysis will be conducted on the RNA collected from the 7SC treated and control cells at 12 and 24 hour time points. Ongoing *in vivo* experiments aim to evaluate the efficacy of the 7SC phyto-compound treatment in preventing tumor growth using xenograft mouse BC model, and further validate the functional relevance of these genes in BC cell growth and survival. The data supports our hypothesis that the 7SC could be used in CAM as a dietary supplement approach against BC, and further identify genes that have the potential to serve as biomarkers and gene candidate to guide the design of appropriate anti-BC therapeutic strategies.

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