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**CONCLUSIONS**

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Our study supports the hypothesis that soy has the potential to suppress the rate of breast cancer cell proliferation. The results indicated that the higher concentrations of soy protein led to lower rates of cell proliferation. Diadzein, an isoflavone, appears to be an active ingredient in soyís ability to inhibit proliferation in breast cancer cells with estrogen receptors. Higher concentrations of diadzein led to lower rates of cell proliferation. In addition, MCF-7 cells treated with soy or diadzein showed a trend of increasing percent proliferation between 24 to 48 hours and 72 to 96 hours, but decreasing percent proliferation between 48 to 72 hours, suggesting that soy and diadzein degrade within 24 hours.

Because our study showed that soy and diadzein significantly affected estrogen-positive MCF-7 cells, but not estrogen negative MDA-MB-231 cells, we conclude that soy and diadzein suppress breast cancer cell proliferation through the estrogen receptor. In addition, conclude that soy and isoflavones competitively inhibit estradiol from binding to estrogen receptors and stimulating growth.

The experiment was designed so that the soy protein concentrations would contain approximately the same amount diadzein as in the diadzein concentrations. Yet, the results for the two treatments were very different. The discrepancy between the diadzein treatment and the soy treatment may be due to other substances and chemicals in the soy protein. These chemicals could stimulate growth or counteract the isoflavonesí inhibiting effect.

Overall, from this study, we can draw certain conclusions:

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| 1. Soy has the ability to inhibit or decrease proliferation of cancer cells.  2. Diadzein, and isoflavone, is an active ingredient in soy’s ability to suppress cancer cell proliferation.  3. Soy and diadzein suppress cell proliferation by competitively inhibiting estradiol from binding to estrogen receptors and stimulating cell proliferation.  4. Soy and diadzein degrade within 24 hours. |

This experiment is not conclusive because of the limited data set. However, our study suggests that soy and isoflavones have the potential to suppress cancer growth, and further studies should be conducted to evaluate this potential. Higher concentrations of estradiol could be used for the control. Radioactive markers could be used in vitro to trace the actual metabolic path of soy and isoflavones to better understand the mechanism on cancer cells. More concentrations of soy and diadzein should be tested to get a more comprehensive growth curve. To confirm the idea of degradation, cells could be plated and treated after 24 hours so an initial proliferation measurement before treatment can be observed; this would allow a better understanding of how the proliferation rate is affected by the addition of soy and diadzein.

Indeed, if scientists discover further research suggesting that soy and isoflavones have the ability to suppress cancer without harmful or negative effects on healthy tissue, soy could become an adjunct treatment for cancer. Women could benefit from a soy or isoflavone treatment, which could become a means of breast cancer treatment or a preventative measure. As studies have shown that the people of Okinawa consume an average of 100 grams of soy per day, and exhibit very low rates of prostate cancer, 100 grams per day of soy would likely show beneficial results towards inhibiting cancer cell growth. Moreover, soy concentration 0.6 µg/mL was observed to be most beneficial among the soy treatments; this means that an average human would have to consume approximately 900 grams of soy protein per day to achieve the same effect. Therefore, consuming more than 100 grams of soy would be likely to show even greater results, but it is probably not advisable to consume such large amounts of soy per day.

In broader speculation, soy could possibly be one aspect of the American lifestyle to improve on. If Americans relied more on soy proteins than the proteins in meat, perhaps the rates of cancer will decrease to the rates that are observed in Asian countries. In addition, the decreased dependence on meat could mean less grazing, thus preserving the natural habitat and environment. We believe that scientists should seriously consider research in the direction of soy as a possible adjunct treatment or even a means of cancer prevention. With more research in this direction, possible animal and human studies could be conducted in the future for further evaluation on the effectiveness of soy in treating or preventing cancer.

Soy has many benefits toward diet and nutrition. Not only does it exhibit properties that decrease the rate of cancer growth, but it also reduces cholesterol, and its high calcium level helps prevent osteoporosis. Although there is much more research to be done on the effects of soy, our study provides the preliminary data supporting the claim that soy can inhibit cancer. With further research, we believe that soy and diadzein have the potential of being adjunct treatments for cancer.

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