



Tamoxifen and Soybean Isoflavones and Soyfoods: Are There Clinically Relevant Interactions?

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The anticancer effects of soybean isoflavones have been intensely investigated since 1990.¹ There is particular interest in the role that soyfoods may play in reducing risk of breast cancer. A particularly intriguing hypothesis is that soy intake early in life markedly reduces breast cancer risk in adulthood.^{2,3} Isoflavones are considered to be phytoestrogens and exert both antiestrogenic and estrogen-like effects under some experimental conditions.⁴ However, the effects of isoflavones on breast tissue in adult women are not clearly understood. Importantly, isoflavones preferentially bind to estrogen-receptor beta, and partly for this reason, are viewed as selective estrogen receptor modulators (SERMs).⁵ Isoflavones, especially genistein, also have important non-hormonal properties that are likely to contribute to their physiologic and possibly hypothesized anticancer effects.⁴ Despite the potential anticancer effects of isoflavones and their SERM-like properties, there is concern that the estrogen-like effects of isoflavones might adversely affect the efficacy of the breast cancer drug tamoxifen. Therefore, some oncologists recommend that their breast cancer patients on tamoxifen avoid soyfoods. Somewhat paradoxically, *in vitro* studies show that isoflavones both inhibit and enhance the ability of tamoxifen to inhibit breast cancer cell growth.^{6,7,8} Similarly, animal work has found that genistein inhibits the ability of tamoxifen to inhibit the growth of estrogen-receptor positive breast cancer cells implanted in ovariectomized mice, whereas other research shows that in rats, soy works in an additive and even in a synergistic manner to prevent the development of chemically induced tumors and even the growth of existing tumors.^{9,10,11} These latter findings suggest that soy consumption by breast cancer patients holds the potential to enhance the efficacy of tamoxifen and perhaps other antiestrogenic chemotherapeutic agents. Human research examining the effects of the combination of soy and antiestrogenic breast cancer drugs on markers of breast cancer risk such as breast tissue density is urgently needed.^{12,13}

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