Investigation of Phytoestrogens as Treatments for Estrogen Receptor-Negative Breast Cancer

Clyburn , Anna

Twenty-percent of women in the United States are affected by breast cancer. Estrogen-receptor negative cancer treatments for postmenopausal women often worsen symptoms of osteoporosis, resulting in a need for alternative treatment options. This project investigated phytoestrogens as a potential treatment for estrogen-receptor negative breast cancers using the method of steroidogenic enzyme inhibition. A computational study using Molegro Virtual Docker was used to identify promising phytoestrogens and their abilities to bind with steroidogenic enzymes COX-2 and a?romatase. Phytoestrogens were then tested in an ?in vitro cell study using CRL-2116 mouse epithelial breast cancer cells to determine their effects on cell growth. The computational analysis revealed glycitein as a better aromatase and COX-2 inhibitor than some drugs used clinically. The glycitein was assayed in ?in vitro trials and reduced cell growth at 50 mM and 100 mM concentrations and induced cell death at 200 mM and 400 mM concentrations. Thus glycitein has the potential to be considered as a treatment for estrogen-receptor negative breast cancer.

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