

Team to study health effects of botanical estrogens

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An ongoing research initiative into the health effects of botanical estrogens will get an \$8 million boost from the National Institutes of Health.

The Botanical Research Center, based at the University of Illinois, will address the many unknowns associated with use of botanical estrogens. These plants and plant-based compounds are often marketed as aids to prevent cancer, promote healthy aging or relieve menopausal symptoms. Researchers from Illinois, the University of Mississippi, Oregon State University and the FDA's National Center for Toxicological Research will contribute to the five-year effort.

This is the second \$8 million grant from the NIH to Illinois to conduct research into the health effects of botanical estrogens. The first five-year initiative focused on soy isoflavones, compounds found in soybean that previous studies indicated had potential as anti-cancer and cholesterol-lowering agents. That grant yielded studies that showed that the positive or negative health consequences of exposure to soy isoflavones depend on the timing of the exposure (whether it occurs in early, mid, or late life), tissue type (breast or brain, for example), and dose.

Many women take plant-based estrogens (also called phytoestrogens) that are advertised as natural - and, they presume, safer - alternatives to hormone-replacement therapy.

Foods, supplements and extracts made from soy, licorice root, wild yam

and dong quai, for example, are believed to reduce the occurrence of hot flashes, improve sex drive, lower the incidence or prevent the recurrence of breast cancer, enhance mental function or treat other health problems.

Today, phytoestrogens are added to teas and [energy drinks](#), used as food additives and marketed as [nutritional supplements](#). The estrogenic components of the plants - such as the isoflavone genistein in soy - are often extracted and used in highly concentrated form.

Research into their efficacy and safety has yielded mixed results. Consumption of some plants or extracts appears to reduce the risk of some cancers or minimize some of the unpleasant symptoms associated with menopause, while others have no effect. Still other studies, some of them conducted at Illinois, have found that certain phytoestrogens may actually induce cognitive problems, increase the recurrence of breast cancer and interfere with breast cancer treatment.

"The types of botanical estrogens that are being marketed are getting more and more potent," said William Helferich, a professor of food science and human nutrition at Illinois and the director of the new center. "We want to see if they really are effective or detrimental."

The new grant supports three projects led by Illinois faculty. The projects will explore whether and how [phytoestrogens](#) from soy, licorice root, dong quai and wild yam affect various tissues, influence gene expression or other cellular processes, increase or decrease the growth and metastasis of breast cancer tumors, influence bone loss or alter the rate of cognitive decline in aging. Two core areas will provide support to the three projects by authenticating and standardizing the botanical samples used in the studies and analyzing how the various compounds are utilized in the body.

Benita Katzenellenbogen, a professor of molecular and integrative

physiology and of cell and developmental biology at Illinois, will lead a project to study the effects of botanical estrogens on gene activation and their interaction with [estrogen](#) receptors and regulatory proteins.

Helferich will lead a project to investigate the effects of botanical estrogens on bone, uterus and mammary glands, and their effects on the growth and progression of [breast cancer](#) and its metastasis to bone, lung or other tissues.

Illinois comparative biosciences professor Susan Schantz will serve as the associate director of the center and together with Illinois psychology professor Donna Korol and Oregon State University professors Russ Turner and Urszula T. Iwaniec will lead a project to study the effects of botanical estrogens on cognitive function and bone health.

Ikhlal Khan, of the University of Mississippi, will authenticate and standardize botanical samples used in the research.

Daniel Doerge, of the FDA's National Center for Toxicological Research, will identify and quantify the samples used in the study and determine appropriate dosing.

Provided by University of Illinois at Urbana-Champaign

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