UNIVERSITY OF ILLINOIS
College of Agricultural, Consumer and Environmental Sciences

Fighting Cancer and Obesity

Tiny bioactive soy proteins called peptides may have a number of different health benefits, and Elvira de Mejia, a University of Illinois professor of food science and human nutrition, may soon be able to predict each peptide's biological activity.

So far, she has identified peptides that lower blood pressure and cholesterol and others that may aid in preventing cancer. She has even identified an "anti-obesity" peptide that causes a feeling of fullness and slows the rate of stomach emptying to impede weight gain.

Peptides can occur naturally in soybeans, they can be a product of human digestion of soy, or they can be obtained in the lab through enzymatic hydrolysis. "We expect to identify at least 10 peptides that can be used to prevent or manage heart disease and cancer," de Mejia said.

De Mejia believes that soy protein, often overlooked in the fuss over soy isoflavones, is responsible for many of soy's health benefits.

"We know that the peptide lunasin is effective against skin cancer in mice, and we've also seen promising results against prostate and breast cancer. Lunasin seems to inhibit the malignant progress of these cells. And, although proteins are not generally absorbed by the body, this peptide is absorbed in the intestine, so the human body can use it," de Mejia said.
De Mejia's lab has analyzed 144 soybean varieties for their lunasin levels, using the USDA soybean germplasm collection at the U of I. Her findings have been published in the *Journal of Agricultural and Food Chemistry*.

This analysis will be useful in developing lunasin-enriched cultivars and soy products, she said. And the wide range of lunasin concentrations in soybean tells the researcher that the peptide can probably be genetically manipulated, making it a potential source of bioactive ingredients for functional foods.
De Mejia is analyzing commercially available soy protein products, including soy isolates, concentrates, and texturized soy protein, for their lunasin content and has found interestingly high levels. Dietary supplements that are very high in isoflavones do not contain lunasin, she said.

She also wants to study fermented soy products for the new peptides that may be found in them. "In the United States, we're not used to fermented foods from soybeans, although we do eat fermented foods from milk, such as yogurt. Fermented foods are really better for you because the process creates certain compounds, such as peptides, that have health benefit," she said.

Soy is processed using different technologies, producing leftovers now used as animal feed. "One of our projects is to try to recall lunasin from these waste materials," she said.

"We know that soy products lower the risk of developing age-related chronic diseases, such as cancer and heart disease," de Mejia said. "But we're still trying to understand what components in soy are responsible for its health benefits. This research is exciting because we're learning that bioactive peptides may be the reason soybeans are such a healthful food."

Other researchers involved in the study were Miguel Vasconez, Ben O. de Lumen, and Randall Nelson.

The study was funded by the Midwest Advanced Food Manufacturing Alliance (MAFMA), FilGen Biosciences, Inc., and the Research Board at the University of Illinois.

College of Agricultural, Consumer and Environmental Sciences
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Source: Elvira de Mejia, (217-244-3196, edemejia@uiuc.edu)