Medical Xpress

Consuming soy peptide may reduce colon cancer metastasis

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After a recent University of Illinois study showed that injection of the soy peptide lunasin dramatically reduced colon cancer metastasis in mice, the researchers were eager to see how making lunasin part of the animals' daily diet would affect the spread of the disease.

"In this new study, we find that giving lunasin orally at 20 mg/kg of body weight reduced the number of metastatic tumors by 94 percent—we went from 18 tumors to only one. And that was done using lunasin alone; no other type of therapy was used," said Elvira de Mejia, a U of I professor of food chemistry and food toxicology.

In the first study, injections of lunasin were used in concert with the chemotherapy drug oxaliplatin, yielding impressive results: a sixfold reduction in metastatic tumors to the liver.

"We learned in that study that lunasin can penetrate the cancer cell, cause cell death, and interact with at least one type of receptor in a cell that is ready to metastasize," said Vermont Dia, a postdoctoral associate in the de Mejia laboratory.

That led the scientists to do this study in which they experimented with oral doses of the peptide. "After all, soy is a food, and we wanted the animals to consume it as a food. Because this lunasin would be digested, we needed to figure out how much should be fed to achieve the desired concentration in the bloodstream," de Mejia said.

Using mice that had been injected with human colon cancer cells, the scientists began by feeding the animals 8 mg/kg of lunasin daily, which reduced the number of new tumors in the liver by 55 percent. They increased the dose five times, at last achieving a 94 percent reduction in tumors at 20 mg/kg of lunasin.

"We were very impressed by the reduction, but the results were short of statistical significance from the control group. More animals are needed to strengthen the power of the analysis. It's a small study but very promising," de Mejia said.

The scientists plan to repeat the study again using 30 mg/kg of lunasin as soon as they can obtain funding. "One tumor is still too many. We'd like to see no tumors," she said.

The scientists said that consuming the equivalent of 20 to 30 mg/kg of lunasin in soy foods would be daunting in terms of number of servings per day. "But it would certainly be possible if food companies began to offer lunasin-enriched soy milk or yogurt," she said, noting that lunasin-enriched flour is already on the market.

De Mejia said that chronic daily exposure to lunasin could make an even bigger difference in terms of cancer development and metastasis. "These animals were acutely exposed to the peptide for only 28 days, and we still achieved these results."

There is evidence that lunasin accumulates in the body tissues, most notably the livers, of animals that have experienced chronic exposure to this bioactive component of soy. "Consuming soy protein regularly in the diet could be important not only for nutrition but also for cancer prevention," she said.

The researchers also plan to begin a year-long study that would model

lifetime exposure to lunasin in transgenic mice programmed to develop colon cancer in contrast to a group that did not receive any lunasin, she said.

Human studies are needed to validate the pre-clinical studies, de Mejia added.

More information: Potential of lunasin orally administered in comparison to intraperitoneal injection to inhibit colon cancer metastasis in vivo is available online in the *Journal of Cancer Therapy* 2013, 4, 34-43, at www.scirp.org/journal/jct

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