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American Association for Cancer Research

Studies show preventive value of food supplements

PHOENIX – Common spices and herbs contain ingredients that may prevent the formation of major tumors, such as intestinal and prostate cancers, according to research presented today at the American Association for Cancer Research's Second Annual International Conference on Frontiers in Cancer Prevention Research. In particular, recent studies are showing notable cancer prevention potential for the use of ginger extract and a traditional Chinese medicinal herb.

"These studies are extremely important and must be continued to help us understand better ways of preventing cancer which do not require extraordinary measures," said Raymond DuBois, M.D., Ph.D., of Vanderbilt University, and program chairperson of the meeting. "We're hoping that, armed with this information, individuals will become more proactive about their health on a daily basis, in consultation with their doctors."

Ginger is an Effective Inhibitor of HCT116 Human Colorectal Carcinoma (Abstract 1345)

The ginger family has been used for thousands of years in the treatment and prevention of various illnesses, and has been hypothesized to have anti-cancer and therapeutic properties. Ann M. Bode, Ph.D. and Zigang Dong, Ph.D., researchers at the Hormel Institute, University of Minnesota, recently determined that ginger compounds may be effective in preventing and potentially treating colorectal cancer. The theory was tested on human colorectal carcinoma cells (HCT116) in athymic nude mice, that are incapable of rejecting implanted human tumor cells. Prior to tumor cell injection, mice were fed either 500 micrograms of [6]-gingerol (the source of ginger's spiciness) or .001 percent ethanol in water (control) three times per week for two weeks. Following injection, the mice were fed the same ratios. Mice were weighed and tumors were measured by calipers twice each week.

Overall results showed that tumor development was significantly slower in those mice fed [6]-gingerol. The first measurable tumors were observed in both groups on day 15 after injection. However, the control group experienced 13 measurable tumors whereas the [6]-gingerol group reported only four measurable tumors. All mice in the control group developed tumors by day 28, as compared to day 38 for the [6]-gingerol group. Results showed that mice fed [6]-gingerol survived significantly longer than those receiving the control, implying that the tumors grew much slower in the first group. By day 49, all control mice contained tumors at least one cubic centimeter in size. By comparison, 11 mice in the [6]-gingerol group still had not developed tumors of that size.

Preliminary results also suggest that many of the tumors in the control group were invasive into the abdominal cavity, whereas the [6]-gingerol group appeared to be less invasive.

"These results strongly suggest that our hypothesis on the value of ginger is correct," said Dr. Bode, lead author of the study. "As we continue to study the spice in other tumor areas, we hope it will translate into significant anti-cancer properties for humans."

Chinese Medicinal Herb, "Scutellaria Barbata," Modulates Apoptosis in TRAMP-C1 Prostate Cancer Cells and Tumor Development in TRAMP Mice (Abstract 1253)

The Chinese herb *Scutellaria barbata* (SB), a species related to mint of the Labiate family, has been used in traditional Chinese medicine to treat several illnesses, including cancers of the liver, lung and rectum. In this study, presented by researchers from Union College in Nebraska, SB was found to slow the progression of prostate tumors in mice, suggesting potential chemopreventive effects. Prostate cancer is the second leading cause of cancer deaths among American men. Transgenic adenocarcinoma of the mouse prostate (TRAMP) mimics tumor progression in human prostate cancer, and thus provides a relevant pre-clinical model for determining treatments and prevention techniques.

"We are finding that, in this case, the therapeutic value of natural herbs is presenting itself as clinically valid," said Brian Wong, Ph.D., of Union College, and lead author of the study.

"As we further study *Scutellaria barbata*, we hope to find the same benefits against prostate cancer in human models," he added. In the study, researchers determined the extent of apoptosis (cell death) and necrosis (tissue death), as well as palpable tumor formation. Results of culturing the cancer cells with SB for two hours suggested that two hours is the optimal incubation time for SB to induce apoptosis in TRAMP-C1 cells.

Mice were fed daily in random groups, either receiving sterile water as placebo or experimental doses of 8 milligrams and 16 milligrams of sterile SB aqueous extracts. In the placebo group, palpable tumors developed at 19 weeks of age, and by 32 weeks, all of the mice had palpable tumors. By comparison, 20 percent and 30 percent of the mice in the 8 mg and 16 mg SB groups, respectively, were free of tumors. At 27 weeks, fewer than 30 percent of the placebo animals were free of palpable tumors; in the low- and high-dose groups, there were 50 percent and 70 percent of the mice were tumor-free.

The data demonstrates that SB contains phytochemicals that modulate apoptosis of the TRAMP mouse prostate cancer cells in vitro (in an artificial environment), and delay tumor development in vivo (in the living body). The most recent research data demonstrated that SB has a similar effect in the induction of apoptosis in a human prostate cancer cell line, LNCaP (lymph node carcinoma of the prostate), and also modulates the PARP (Poly ADP-Ribose Polymerase, an enzyme required for the detection of DNA strand interruptions) of the same cell line.

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Founded in 1907, the American Association for Cancer Research is a professional society of more than 21,000 laboratory, translational, and clinical scientists engaged in cancer research in the United States and in more than 60 other countries. AACR's mission is to accelerate the prevention and cure of cancer through research, education, communication, and advocacy. Its principal activities include the publication of five major peer-reviewed scientific journals: *Cancer Research*; *Clinical Cancer Research*; *Molecular Cancer Therapeutics*; *Molecular Cancer Research*; and *Cancer Epidemiology, Biomarkers & Prevention*. AACR's annual meetings - next year in Orlando, Fla., March 27-31 - attract more than 15,000 participants who share new and significant discoveries in the cancer field. Specialty meetings like this one, held throughout the year, focus on the latest developments in all areas of cancer research.