Cranberry Health News

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Phytochemical Effects Beyond Antioxidation

Dr. David Heber, a member of the Cranberry Institute's Scientific Advisory Board, recently presented at the National Cancer Institute's Division of Cancer Prevention's conference on free radicals last month. The conference, titled "Free Radicals: the Pros and Cons of Antioxidants," sought to summarize current understanding of – and identify major gaps in – the scientific community's knowledge about the role of antioxidants in cancer prevention and tumor biology, and their interactions with conventional chemotherapy and radiotherapy.

Dr. Heber's presentation, "Phytochemical Effects Beyond Antioxidation," examined non-antioxidation benefits of phytochemicals that may affect various steps in the carcinogenesis pathway. Dr. Heber stated that many phytochemicals have antioxidant properties *in vitro*, but these effects are not always directly related to their many other effects on cellular signaling pathways, gap junctions and metabolic enzymes. High-capacity, low-affinity intracellular receptors interact with the phytochemicals *in vivo*. Additionally, Dr. Heber pointed out that phytochemicals often appear in nature in families of related compounds. These families may behave synergistically when they interact with cells, and the phytochemicals may also activate metabolic enzymes. In many cases, combinations of antioxidants found in phytochemical mixtures act as a network. Dr. Heber stressed that research on antioxidants in cancer prevention must consider these actions and interactions in appropriate experimental models of carcinogenesis. He also cautioned that minimum requirements of antioxidant vitamins for avoidance of deficiency diseases are not necessarily relevant to a consideration of cancer-preventative effects. Dr. Heber is a professor of medicine and the director of the Center for Human Nutrition at the University of California at Los Angeles.

Additional presentations included a discussion of dietary antioxidants' role in radiation therapy for cancer patients, by Dr. Carmia Borek of the Community Health and Family Medicine/Nutrition Infection Unit at the Tufts School of Medicine. Dr. Borek noted that, while intake of antioxidant-rich foods correlates with reduced cancer risk, the role of antioxidant intake in patients receiving cancer therapy that relies on free radical cell killing (*i.e.*, radiation therapy) remains unresolved. According to Dr. Borek, one school of thought holds that antioxidants may reduce the efficacy of radiotherapy by protecting both normal and tumor cells from free radical damage; however, other studies show that antioxidants may increase tumor response to radiation and potentially enhance the efficacy of radiation therapy. This would be achieved by modifying cellular homeostatis and inducing apoptosis in the tumor cells, while protecting normal cells from apoptotic death, preventing oxidative stress, preventing DNA damage and in some cases, enhancing DNA repair.

Also of note, Dr. Cheryl Rock of the University of California at San Diego's Department of Family and Preventive Medicine and Cancer Prevention and Control Program illustrated a picture of who consumes antioxidants in the form of dietary supplements in the United States. First examining a population sample of women diagnosed with early stage breast cancer, 10 percent of the sample report antioxidant mixture usage. Looking at single supplement products, 46 percent of the sample state usage of vitamin E, 42 percent take vitamin C and 11 percent report vitamin A/carotenoid. In a sample of the general population, Dr. Rock noted that 43 percent consume supplemental vitamin E, 46 percent take vitamin C and 35 percent report beta-carotene usage. For more information about the conference, please visit: http://www3.cancer.gov/prevention/frpca2003/

Water Purification with Cranberry: A Novel Use

Australian researchers investigated antibacterial activity of several berry fruits, including cranberry. Cavanagh et al found that cranberry inhibited the growth of the bacterium known as Mycobacterium phlei, as did raspberry, blackberry and black currant.

Interestingly, the authors suggest that the antibacterial activity of these berries may be of benefit as a means of water purification for suspect water supplies or to enhance shelf life when incorporated into commercial food products.

[1] *J Med Food*, 2003 Spring; 6(1): 57-61.

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Calendar of Events

Natural Products Expo East, September 4-7, 2003, Washington, DC. For more information, visit: www.expoeast.com

National Nutritional Foods Association. Annual meetings of most regional sections take place from September to December. For more information, visit: www.nnfa.org

American Urological Association. Annual meetings of most regional sections take place from September to November. For more information, visit: auanet@org

American College of Nutrition, Annual Meeting, October 9-12, 2003, Nashville, TN. For more information, visit: www.am-coll-nutr.org

American Dietetic Association 2003 Food & Nutrition Conference & Expo, October 25-28, 2003, San Antonio, TX. For more information, visit: www.eatright.org/fnce/2003.html

American Heart Association, Scientific Sessions, November 9-12, 2003, Orlando, FL. For more information, visit: www.scientificsessions.org

American Public Health Association, Annual Meeting, November 15-19, 2003, San Francisco, CA. For more information, visit: www.apha.org

New Contribution to Cranberry Antioxidant Literature

Researchers from the U.S. Department of Agriculture's Agriculture Research Service[1] examined the antioxidant constituents of numerous berries, including cranberry. Zheng et al determined that each berry had different phenolics providing primary antioxidant activity. In cranberry, the most important antioxidant was peonidin 3-galactoside; queretin glycosides were also present in relatively high concentrations. These results contribute knowledge regarding how cranberry exerts its antioxidant capabilities, and also makes the case for including a variety of berries in a healthy diet to reap the benefits of each.

[1] *J Agric Food Chem*, 2003 Jan 15; 51(2):502-9.

Cranberry Researched for Type-2 Diabetes Management

Belinda Chambers, M.S., and Dr. Mary Ellen Camire of the University of Maine's Department of Food Science and Human Nutrition studied whether cranberry may benefit adults suffering from Type-2 diabetes. Based on *in vitro* results, they hypothesized that cranberry juice may decrease side effects of diabetes and improve quality of life for persons with the disease.

Study participants consumed six capsules filled with either cranberry juice concentrate powder or a placebo. Six capsules of cranberry juice concentrate powder are equivalent to a 240-mL serving of cranberry juice cocktail (just over eight ounces). All participants recruited controlled their Type-2 diabetes by diet alone. The researchers asked participants to discontinue use of dietary supplements, but requested no other diet or lifestyle changes during the study.

More than half the subjects had good control of blood glucose levels at the beginning of the study (<7.0 mmol/l), and the researchers found no differences between the treatment groups in fasting serum glucose, HbA_{1c}, fructosamine, triglyceride, HDL or LDL levels after six and 12 weeks. Placebo subjects demonstrated higher insulin values throughout the study (160 ± 167 vs. 86 ± 51 pmol/l at week 12, $P < 0.05$). The authors posit that different effects might emerge when studying persons with poor glucose control, Type-1 diabetes or those who use medications in addition to diet to control their Type-2 diabetes.

The article will appear in an upcoming issue of *Diabetes Care.* The authors wish to acknowledge that their study was supported in part by the Cranberry Institute, the Wisconsin Cranberry Board and the University of Maine Agricultural and Forest Experiment Station.