



Winter 2012

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Dear Colleague,

Welcome to the Winter 2012 issue of the *Nutrition Frontiers*, a quarterly newsletter from the Nutritional Science Research Group (NSRG), Division of Cancer Prevention, NCI. In this issue, we highlight a potential inflammatory biomarker, folate status and prostate cancer cell proliferation, plant RNAs found in mammals, and more.

RESEARCH UPDATE: ON THE CLINICAL FRONT

Folate Status Linked to Cancer Cell Proliferation



While folate is essential for one-carbon metabolism and biological methylation reactions, some evidence suggests that folic acid supplementation may increase cancer risk. In a cross-sectional analysis, [Tomaszewski and colleagues](#) investigated serum and tissue folate in prostate cancer patients and cancer-free controls. Interestingly, serum and tissue folate levels were higher in men with prostate cancer versus levels of cancer-free controls. Unlike the controls, the cancer patients' serum folate positively correlated with prostate tissue folate content. In patients with Gleason 7 disease, those with the highest serum folate also had the highest level of proliferation markers in cancer tissue. These findings suggest a positive relationship between folate status and the proliferation of prostate tumors, although it is unclear how dietary and supplemental folic acid and folate metabolism are involved.

RESEARCH UPDATE: WHAT'S NEW IN BASIC SCIENCE

Improved Assay: Potential Biomarker for Anti-Inflammatory Intervention

Broccoli and other cruciferous vegetables are rich sources of isothiocyanates, among which sulforaphane may be especially potent in fighting inflammation. Macrophage migration inhibitory factor (MIF), a proinflammatory cytokine with keto-enol tautomerase activity, is inactivated by isothiocyanates, including sulforaphane. MIF activity is elevated in tissues and bodily fluids during acute inflammation and chronic diseases and may be a useful inflammatory biomarker. [Healy and](#)



Plant RNAs Found in Mammals



MicroRNAs (miRNAs) are a class of 19-24 nucleotide non-coding RNAs that bind to target messenger RNAs to inhibit protein translation. [Zhang and colleagues](#) report the surprising finding that exogenous plant miRNAs are present in the sera and tissues of various animals and humans and that these exogenous plant miRNAs are primarily acquired orally, through food intake. These findings demonstrate that exogenous plant miRNAs in food can regulate the expression of target genes in mammals.

Upcoming Events

February 22-23, 2012

[A Workshop on the Human Microbiome, Diet, and Health, Institute of Medicine](#)
Washington, DC

March 12-16, 2012

[Nutrition and Cancer Prevention Research Practicum](#)

[colleagues](#) have developed an improved enzymatic assay which results in an 8-to-10 fold increased sensitivity in the detection of urinary MIF tautomerase activity. They found the most potent isothiocyanates for inactivation of MIF enzymatic activity were sulforaphane, benzyl, n-hexyl and phenethyl. This assay may hold promise for assessing inflammatory severity and effectiveness of anti-inflammatory intervention and lead to the discovery of new pioneering anti-inflammatory agents.

SPOTLIGHT: ANDREW J. DANNENBERG



Andrew J. Dannenberg, MD, the Henry R. Erle, MD-Roberts Family Professor of Medicine, is Director of the Weill Cornell Cancer Center. Dr. Dannenberg received his MD from Washington University in St. Louis and served as a medical resident and fellow at The New York Hospital-Cornell Medical Center. His laboratory is focused on elucidating the mechanisms underlying the inflammation-cancer connection in multiple organs with an

emphasis on prostaglandin biology. His major focus is hormone receptor-positive breast cancer. His newly awarded R01, [Targeting the Obesity-Inflammation-COX-Aromatase Axis to Lower Breast Cancer Risk](#), will investigate pharmacological and dietary risk reduction strategies.

[Read more »](#)

SPOTLIGHT: ROBERT S. CHAPKIN

Robert S. Chapkin, PhD is a Regents Professor and University Faculty Fellow at the Program in Integrative Nutrition & Complex Diseases, Center for Environmental & Rural Health, Texas A&M University. He received his BS and MS from the University of Guelph, Ontario, Canada, and his PhD in Nutrition and Physiological Chemistry from the University of California-Davis, where he also completed his postdoctoral fellowship. During the past 25 years, Dr. Chapkin published over 200 peer-reviewed articles in cancer biology, chemoprevention, nutrition and immunology. He was awarded a R01 for his project titled, [Chemoprotective Effects of Natural Products on Colonic Adult Stem Cells](#).



[Read more »](#)

DID YOU KNOW?

Dark Hot Chocolate is not the same as Dark Chocolate



2000 years ago the Mayan Indians of Mexico and Central America discovered the cocoa bean, and created the *first hot chocolate drink*. Most of us appreciate that the delectable indulgence of 70% dark chocolate is rich in flavanols and procyanidins, and loaded with health benefits. But, once we add milk, we may not be getting as much of those flavonoids. When chocolate is combined with milk, flavonoid

Rockville, MD

March 13, 2012

[Stars in Nutrition & Cancer Lecture](#), "Novel Omega-3 Mediators & Mechanisms in the Resolution of Inflammation: What Can they Tell us About Preventative and Therapeutic Approaches"

Dr. Charles Serhan
NIH Main Campus
Bethesda, MD

April 21-25, 2012

[Experimental Biology](#)
San Diego, CA

April 27-28, 2012

[New Frontiers in Oncology Nutrition](#)
Dallas, TX

June 25-28, 2012

[2012 International Conference of the Metabolomics Society](#)
Washington, DC

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absorption decreases.

A nibble of dark chocolate anyone?

References:

[J Agric Food Chem](#). 2011 Aug 10;59(15):8435-41. Epub 2011 Jul 11

[Am J Clin Nutr](#). 2009 Jun;89(6):1784-91. Epub 2009 Apr 29.

<http://www.squidoo.com/fun-chocolate-facts>

Sincerely,

Your friends at the Nutritional Science Research Group

Division of Cancer Prevention
National Cancer Institute
National Institutes of Health
U.S. Department of Health & Human Services

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