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# NUTRITION FRONTIERS

A newsletter of the Nutritional Science Research Group

Fall 2013

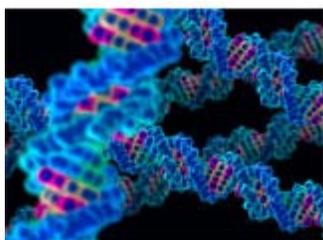
Volume 4, Issue 4

Dear Colleague,

Welcome to the Fall 2013 issue of the *Nutrition Frontiers*, a quarterly newsletter from the Nutritional Science Research Group (NSRG), Division of Cancer Prevention, NCI. In this issue, you will learn about the effects of benzyl isothiocyanate on breast cancer cells, ellagic acid on the effects of estrogen oncogenic and tumor suppressor miRNA expression, a potential gene-diet interaction that affects colon cancer risk, and much more.

## RESEARCH UPDATE: ON THE CLINICAL FRONT

### Gene Diet Interactions



Folate, an essential component of the folate-mediated one-carbon metabolism (FOCM), and other B vitamins have been found to be inversely associated with colon cancer risk; epidemiological studies report

high dietary folate intake associated with a decreased colorectal cancer risk. Further, polymorphisms in FOCM related genes have been associated with colon cancer risk. In a case-control population, [Liu and colleagues](#), evaluated ten candidate polymorphisms for evidence of functional impact on colon cancer risk and interactions of these polymorphisms with folate, methionine, vitamin B<sub>2</sub>, vitamin B<sub>6</sub>, and vitamin B<sub>12</sub>. No polymorphism was significantly associated with overall colon cancer risk, however, several polymorphisms modified the risk of colon cancer in interacting with dietary intakes of folate, methionine, vitamin B<sub>2</sub>, vitamin B<sub>6</sub>, vitamin B<sub>12</sub>. The variants DNMT1 1311V and MTRR 122M showed multiple significant diet interactions. These findings support a potential gene-diet interaction in colon cancer risk.



### Announcements

Applications are being accepted for the 2014 *Nutrition and Cancer Prevention Research Practicum*, which will be held March 17-21 at the NCI/NIH. To learn more about the practicum and how to apply, click [here](#).

### Upcoming Events

December 04, 2013  
Frontiers in Nutrition and Cancer Prevention: Online CME Series presents [Can Nutrition Simultaneously Affect Cancer and Aging?](#) To register for this free webinar or view afterwards, click [here](#).

December 04, 2014  
Opportunities and Challenges in Nutrition Research, ASN, Longworth House Office Building, Washington, DC  
12:00-1:00 pm  
RSVP [tom@vanarsdall.com](mailto:tom@vanarsdall.com)

December 05-07, 2014  
[Advances & Controversies in Clinical Nutrition Conference](#), ASN, Capital Hilton Washington, DC

January 07, 2014  
IOM Roundtable on Obesity Solutions workshop, [The Current](#)

## RESEARCH UPDATE: WHAT'S NEW IN BASIC SCIENCE

### Ellagic Acid, Estrogen and microRNA in Breast Cancer

Ellagic acid, a plant polyphenol abundant in raspberries, pomegranates, Indian blackberry 'Jamun' (*Syzygium cumini*) and walnuts, decreases the incidence of chemically-induced carcinogenesis in animal models. MicroRNA (miRNA) dysregulation is increasingly recognized as a hallmark for the development and progression of cancers, including breast cancer. In a recent report by [Munagala and colleagues](#), ellagic acid feeding reversed the oncogenic effects and dysregulated miRNA expression in estrogen-treated rat mammary gland carcinogenesis. Several miRNAs were altered as early as 3 weeks after initial estrogen treatment and persisted throughout the carcinogenesis process. Ellagic acid decreased the expression of several oncogenic miRNAs and increased the expression of down-regulated tumor-suppressor miRNAs. This study provides insight into the mechanism by which ellagic acid may prevent breast cancer in humans.



### Dietary BITC inhibits Breast Cancer Stem Cells In Vitro and In Vivo



Benzyl isothiocyanate (BITC), a naturally occurring phytochemical found in cruciferous vegetables such as garden cress has been shown to cause tumor cell apoptosis in MMTV-neu mice. Breast cancer stem cells (bCSCs) are intrinsically resistant to therapy and characterized by self-renewal; bCSC are implicated in tumor recurrence. [Kim and colleagues](#) fed mice BITC for 29 weeks and found that

BITC treatment inhibited bCSCs self-renewal, demonstrated by the significant decrease in mammosphere formation, ALDH1 activity, and cell surface expression of cancer stem cell markers CD44 and ESA, both *in vitro* and *in vivo*. Overexpression of Ron receptor tyrosine kinase blocked the response to BITC. These findings support the potential role of dietary BITC in breast cancer prevention.

## SPOTLIGHT: NANJOO SUH

**Nanjoo Suh, PhD**, is an Associate Professor of Chemical Biology at the

### [State of Obesity Solutions in the United States](#)

Washington, DC

March 18, 2014

#### [Stars in Nutrition and Cancer](#)

lecture series, Chi Van Dang, MD, PhD presents *Links Between Metabolism and Cancer?*

NIH Main Campus

Bethesda, MD

April 05-09, 2014

#### [American Association for Cancer Research Annual Meeting](#)

San Diego, CA

April 26-30, 2014

#### [Experimental Biology](#)

San Diego, CA

May 02-03, 2014

#### [Oncology Nutrition Symposium](#),

Oncology Nutrition Dietetic Practice Group of the Academy of Nutrition and Dietetics  
Orlando, FL

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### Quick Links

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- [Funding Opportunities](#)
- [Nutrition Fact Sheets](#)
- [Nutritional Science Research Group](#)
- [Division of Cancer Prevention](#)
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Ernest Mario School of Pharmacy, Rutgers, and The State University of New Jersey. She is a full member of Rutgers Cancer Institute of New Jersey, where she is affiliated with the Carcinogenesis and Chemoprevention Program. Dr. Suh

received a BS from Ewha University and a MS Seoul National University, Korea. She earned her PhD at the University of Illinois at Chicago and did postdoctoral work at Dartmouth Medical School. Dr. Suh's scientific contributions include breast and colon cancer prevention with natural and synthetic triterpenoids, stilbenoids, vitamin D, vitamin E, and non-steroidal anti-inflammatory drugs. Her current research focuses on the role of the chemopreventive agents, vitamin D and triterpenoids, in delaying the transition from early stage to late stage breast carcinogenesis. She was recently awarded an R01 entitled, [\*Prevention of Estrogen-Mediated Mammary Carcinogenesis by Mixtures of Tocopherols.\*](#)

[Read More »](#)

## DID YOU KNOW?

### Cinnamon, the *Powerful* Spice



In the middle ages, cinnamon was served at banquets to represent the wealth and power of the host. The dried inner bark of the genus *Cinnamomum*, native to China, India, and Southeast Asia was one of the first spices known. The Egyptians used it in embalming

around 500 BC, Chinese in herbal preparations, Indians in cooking, and the Dutch were the first to cultivate cinnamon and considered it their most prized spice. Cinnamon's power is steeped in "ancient" traditional medicine and has been used for bronchitis, gastrointestinal problems and loss of appetite. Today's modern day cinnamon spice is a combination of common varieties, Ceylon and Cassia; Cassia is being studied for its potential blood glucose lowering effects. Remember, the finer the grind the more flavor and aroma to be enjoyed!

*This holiday season gently simmer mulling spices for 30-minutes in your potion of choice; red wine, apple cider, cranberry juice, white wine, or ale and be sure to include the stellar ingredient, cinnamon, along with cloves and additions such as orange slices, lemon zest, fresh ginger, nutmeg, mace, cardamom pods, and/or allspice berries.*

### References

- <http://www.botanical.com/botanical/mgmh/c/cinnam69.html>
- <http://naturaldatabase.therapeuticresearch.com/nd/Search.aspx>
- <http://nccam.nih.gov/health/cinnamon>
- <http://www.allrecipes.com/howto/cinnamon>
- <http://www.squidoo.com/herbs-of-the-gods>

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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