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SEVENTH ANNUAL
THOUGHT LEADERS CONSORTIUM

PERSONALIZING NUTRITION THERAPY
IN THE AGE OF LIFESTYLE MEDICINE:

Compelling Evidence, Breakthrough Science, and a New Era of Clinical Care

OCTOBER 11 - 12, 2019
Seattle, Washington

Meet Our Speakers! The 2019 Speaker Gallery is Now Online

PLMI is known for bringing together an unique mix of speakers for our Thought Leaders Consortium each year and we consistently receive feedback and praise from attendees who immediately recognize how valuable it is to hear a variety of diverse perspectives. We have now published our 2019 Speaker Gallery on the PLMI website, and we invite you to review biographies and brief articles that we have composed highlighting the backgrounds of our faculty. Seats are now filling quickly and early-bird registration ends next month, so we encourage you to complete your registration as soon as possible. Click HERE to access our conference overview page, where you will find links to additional details.
Transforming a Vulnerable Age into the Opportunity of a Lifespan

We are ever remodeling and redesigning our health and function; intense physical activity tells our muscles, brain, and metabolism to detoxify and build stronger connective tissues, while repeated intake of fatty processed foods warns our liver, immune, and fat cells to prepare for storm. During adolescence, every aspect of function is being overhauled in preparation for adult life and the potential for reproduction, and teens and pre-teens are especially sensitive to social and environmental cues. Adolescence is also a period of heightened 're-wiring' of the brain’s hippocampus, an area crucial to the interpretation of stress and response to stressors, and thus represents a time of great opportunity as well as risk. While lifestyle education and intervention are not always easily swallowed by teens, they come at time when young people are experimenting with various ways of approaching life, and forays into diet and exercise undertaken during these years can lay important foundations for future health.

Food is more than just nutrients, as the way we eat profoundly influences physical, metabolic, behavioral, and cognitive components of health—and the emotional backdrop of eating may be more important for adolescents than previously appreciated. A global study involving over 5000 pre-teens in 12 countries found that a majority engaged in emotional eating at least some of the time, and that it was likely a learned behavior. Emotional eating is consuming food in response to negative feelings, and this study found it directly associated with unhealthy dietary patterns, such as higher intakes of salty, sweet, and/or fatty foods, in these children. In this spirited FMU discussion, Dr. Deanna Minich tells how she became a nutritionist at the tender age of 9 (eating strangely healthy food while her peers ate ‘normal’ food), learned to reframe the relationship between food and emotion, and came to appreciate how food represents emotional as well as physical nourishment. She also shares why, after an undergraduate and graduate education focused on nutrition, she decided not to go to medical school.

Why Antioxidants Come in Gardens

A single perfect red rose sends a targeted message of passion, but a bouquet—or better yet, a well-tended garden—can tell a love story. It is much the same with what we call antioxidants, because the body employs an enormous variety of substances having different tissue, target pro-oxidant, and redox spectrum specificity. Antioxidants have both reductive and oxidative potential and can exist in multiple redox states, and thus are able to work together and buffer one another in successive fashion to protect fatty and watery compartments
Combinations of antioxidants help plants adapt to conditions that challenge their growth, survival, and reproduction: excesses of heat/cold, dry/wet, particular wavelengths of light, oxygenation, pathogenic microbes, overconsumption by animals and insects, and toxins or nutrient imbalances in their growth medium. Plants are the most important outside source of antioxidants for humans, and plants bio-synthesize many of them, both water- and fat-soluble, for their own protection. Like humans, plants have oxidant-sensitive mitochondria, but they additionally have chloroplasts for transducing energy from light, and these and other plant structures need a flexible system of protection.

Individual antioxidants may be characterized by the conditions under which they function and what kinds of substances they can interact with—which is determined to a great extent by their molecular structure. This specialization means that particular antioxidants may be more active in either fatty or watery environments or against particular reactive species, though molecular “tweaks” (such as adding a glycoside sugar to a hydrophobic flavonoid) can change its solubility and allow it to function in a different environment. As each organ, tissue, cell, and organelle has a particular purpose and builds up particular metabolites and toxins (like oxidized lipids, lactate, organic acids, heavy metals, and glycated proteins), different antioxidants deliver specialized protection for the heart, liver, blood vessels, gut, nerves, cell membranes, or mitochondria. For example, chlorophyll’s planar structure allows it to bind petrochemical toxins and carotenoids can signal at numerous human receptors, whereas the wide variety of flavonoid structures enable different ones to interact with free radicals, hormone receptors, or even to chelate metals. It is interesting to note that, in plants and humans alike, metabolites may be more active than the original antioxidants themselves; examples include sulforaphane (a Brassica family metabolite), flavonoid or stilbene glycosides, alkaloids, terpenoids, and carotenoids.

Fruits, vegetables, herbs, and spices contain complex mixtures of many antioxidant classes as well as different chemical forms of particular compounds. For example, tomato contains vitamins C and E, organic acids like caffeic, ferulic, and fumaric, flavonoids like kaempferol and quercetin, and carotenoids like lutein, lycopene, zeaxanthin, and lycoxanthin—yet it additionally has multiple forms of many of these, such as ferulic acid beta-glucose, quercetin rhamnoside, rutinoside, lutein epoxides, and neolycopene—which in combination convey a spectrum of redox potential rather than a single point of protection. This curious blend of variety with similarity provides the growing plant with a tightly-knit umbrella of protection against pro-oxidants, which are progressively neutralized by a succession of complementary antioxidants. Pro-oxidants trigger genetic expression of protective antioxidant enzymes, and balance among reduced and oxidized forms of antioxidants (like GSH and GSSG forms of glutathione) can influence cell life, growth, rejuvenation, and death as well as iron metabolism and the inflammatory response, all of which influence health, aging, and disease.

Supplementing with antioxidants is generally recommendable, but rather than take over-large doses of one or two antioxidants, a better strategy may be to use blends, like the old-time combination of vitamin C in multiple ascorbate forms along with citrus flavonoids, mixed phytonutrient complexes, plant extracts with a variety of phytonutrients, or herbal tea blends containing numerous plants. And because different plant parts (especially peels, leaves, and seeds) concentrate different antioxidants to serve their particular needs, eating more of the less popular parts (like some of the white inner peels of citrus fruits, broccoli leaves and stalks, bell pepper seeds, kiwi fruit peels, eating a few green tea leaves) will also expand your body’s stores of antioxidants—though this makes it all the more important to eat organic in order to avoid undesirable residues.

An important component in overall resilience is the Nrf2/ARE system that, when activated, upregulates the gene transcription and production of many of the body’s detoxification and antioxidant proteins. Pro-oxidants also activate Nrf2/ARE and are, in fact, the reason this system exists, but while Nrf2-activating antioxidants upregulate protective enzymes, pro-oxidants additionally mount the immune response and encourage inflammation. Among phytonutrients that have shown Nrf2/ARE-activating properties, glucosinolates (from Brassica sprouts and vegetables) and their metabolites are remarkably potent, but others include lycopene, curcumin, capsaicinoids (in peppers), oleanolic acid (in olives and rosemary), isothiocyanates (in celery and
watercress), flavonoids like quercetin, epicatechins, mangiferin, xanthohumol, baicalein, naringenin, and falcarindiol (in tomato seeds, carrots, and ginseng). Especially beneficial nutrients that have been shown to upregulate DNA repair enzymes in addition to activating Nrf2/ARE include chlorophyllin, ellagic acid (found in berries and strawberries), astaxanthin (in some algae and seafoods), blueberry polyphenols, and tea polyphenols.

Perhaps the best way to receive bountiful amounts and varieties of antioxidants is to eat bountiful amounts and varieties of plants. But remember also that, throughout human history, physical exertion, periodic fasting, and dietary intake have served as extremely significant sources of antioxidative influence—just another reason to stretch diet and lifestyle to include these “traditional” health practices.

SNiPpets

How significant to health are particular single nucleotide polymorphisms, also known as SNPs? SNiPpets is a ongoing exploration of this topic. This column is produced by Jeffrey Bland, PhD and the Personalized Lifestyle Medicine Institute.

Choline Merits Greater Respect—Especially With These SNPs

Though humans can produce small amounts of choline, the body uses it for numerous critical functions in fetal development and in the brain, nerves, blood, liver, muscles, mitochondria, and cell membranes. Diet is thus the primary source of choline—yet most diets provide insufficient amounts to sustain healthy function, and many people experience changes in liver or muscle function as a result. Best dietary sources of choline include eggs, flesh foods, soy, milk/whey, cruciferous vegetables, and split peas.

Different body tissues employ different enzyme systems for utilizing choline, and variations in the genes coding for these enzymes can further amplify nutritional shortfalls. Single-nucleotide polymorphisms involving choline metabolism include:

- At the rs12325817 locus of the PEMT gene, a G-to-C substitution can increase the likelihood of experiencing early symptoms of dysfunction by 25 times
- At the rs4646343 locus of the same PEMT gene, a T allele increases risk for dysfunction
- At the rs2236225 locus of the MTHFD1 gene (which actually relates to folate), a G-to-A switch in those with choline deficiency heightens risk of dysfunction by 7 times
- At the rs12676 locus of the CHDH gene, a C or A allele may increase risk for dysfunction
- At either rs7873937 or rs3199966 loci of the SLC44A1 gene, G alleles may increase risk of muscle damage
- Among individuals with the common folate-related C-to-T polymorphism at the rs1801133 locus of the MTHFR gene, those with an additional G-to-A SNP at the rs7946 locus of the PEMT gene are increasingly dependent on generous intakes of choline, folate, riboflavin, and other methylation nutrients for healthy liver function, homocysteine metabolism, and normal methylation
- Women with any of the following may benefit from increased choline intake, particularly if pregnant, nursing, or trying to conceive: a common folate-related C-to-T polymorphism at the rs1801133 locus of the MTHFR gene, the normal AA genotype at the rs1805087 locus of the MTR gene, or a G-to-A polymorphism at the rs2236225 locus of the MTHFD1 gene
- Those with any of the following SNPs may benefit from increased
choline intake, as they influence how choline is partitioned among various bodily needs: an A allele at the rs10791957 locus of the CHKA gene, a T allele at either rs4646343 or rs7946 loci of the PEMT gene, a C or A allele at the rs12676 locus of the CHDH gene, or a G allele at the rs2266782 locus of the FMO3 gene.

- At the rs9001 locus of the CHDH gene, an A-to-C switch may enhance conversion of choline into the methyl donor betaine, with some protective effect.
- At the rs10791957 locus of the CHKA gene, a CC genotype may reduce risk for organ dysfunction despite low choline intake.

It has been estimated that around 90 percent of us are choline-deficient, even by standards that do not take into account these SNPs. As choline and other methylation nutrients cooperate extensively in fetal development, DNA methylation, and homocysteine detoxification, those who are pregnant, trying to conceive, or may have methylation-related health concerns may wish to discuss personalized nutritional strategies with a Functional Medicine practitioner.

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Metagenics Institute is Hosting an Educational Event in Seattle
May 11, 2019 - There's Still Time to Register!

Sara Gottfried, MD is a successful clinician, a recognized Functional Medicine expert, and an award-winning author. This month—on May 11th—Metagenics Institute will be sponsoring a half-day seminar in Seattle. Dr. Gottfried, who is President of Metagenics Institute, will present: "Brain Body: Personalized Lifestyle Medicine for the Gut-Brain Axis."

Register today! bit.do/bb-seattle
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