May 2018 - Mid-Month Bonus Newsletter

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Learn More About PLMI's 2018 Thought Leaders Consortium

PLMI will be hosting the Sixth Annual Thought Leaders Consortium October 12-13, 2018 in Tucson, Arizona. This year's conference--The Science of Precision: What's Next for Personalized Lifestyle Health Care--is very exciting and we are showcasing our program and speakers at every opportunity. We have created both a conference preview Vimeo channel and an online speaker gallery. You can read Speaker Spotlight articles, review biographies, and listen to PLMI President Dr. Jeffrey Bland tell you more about the conference structure and flow. Here is this month's feature fact: two 2018 TLC presentations have been designated as 'IFM Presents' through a partnership with The Institute for Functional Medicine. Participants in these talks will include Mark Hyman, MD; Patrick Hanaway, MD; David Perlmutter, MD; and Dale Bredesen, MD.

https://vimeo.com/267439190

Are you attending The Institute for Functional Medicine's Annual International Conference in Hollywood, Florida later this month? PLMI will have a booth in the exhibit
Nutrient of the Month: Pantothenic Acid

The Greek root of the word pantothenic means "from all sides" and reflects the ubiquity of small amounts of this nutrient in a wide variety of foods. According to the USDA nutrient database, some of the best sources include meats, sunflower seeds, rice bran, whey powder, eggs, mushrooms, beans, peas, avocado, rice, wheat germ, and molasses, while Dr. Duke’s phytochemical database highlights endives, broccoli and cauliflower leaves, fava beans, cucumber, tomato, strawberries, and lettuce as providing relatively generous amounts. Panthenol is a precursor for pantothenic acid and pantethine is its active, sulfated form.

The primary metabolic role of pantothenic acid is contributing to synthesis of coenzyme A (or CoA), so named because of its importance as a cofactor in acetylation reactions. CoA is needed by many biochemical networks involved in nutrient metabolism and mitochondrial energy production, including fatty acid oxidation, amino acid catabolism, Phase 2 metabolic detoxification, and synthesis of cholesterol, acetylcholine, and heme. Recent research also demonstrates the epigenetic importance of CoA in regulating histone and protein acetylation, marking sections of chromatin for further processing by other epigenetic modifiers in preparation for transcription. This "editing" activity is critical to synaptic plasticity and determining how experiences are encoded and consolidated into memory and may be involved in priming different brain areas in different ways when learning events relate to stress and the fear response. Dysfunction in histone acetylation contributes to cognitive dysfunction in Huntington’s and Alzheimer’s diseases as well as some developmental disorders. CoA’s central role in forming the neurotransmitter acetylcholine further emphasizes its importance in cognition.

CoA is needed for synthesis of essential fats and involved in oxidation of fatty acids, and thus pantothenic acid indirectly contributes to lipid metabolism in multiple ways. Oral pantethine has shown efficacy in significantly lowering total and non-HDL cholesterol in hypercholesterolemic subjects eligible for statin therapy; interestingly, circulating levels of coenzyme Q10 also increased in those receiving pantethine (though not significantly more than in controls), a result not seen with statins. Though the mechanism underlying these effects on cholesterol is not yet known, direct oral delivery of CoA has also attenuated hyperlipidemia, suggesting that greater cellular and/or mitochondrial CoA availability might aid lipoprotein metabolism. Polymorphisms of the pantetheinase enzyme that cause reduced recycling of pantetheine into pantothenic acid for CoA synthesis are not uncommon, and have been associated with lower HDL levels and higher blood pressure in different populations. In animal research, a high-fat diet was shown to lower liver, adrenal, and blood levels of pantothenic acid, and combining exercise with a high-fat diet synergistically increased pantothenic acid need. Though these results need to be confirmed in humans, they suggest that greater pantothenic acid intake may be indicated in those following fitness and ketogenic eating plans.

Because coenzyme A contributes to mitochondrial function at multiple points in the citric acid cycle, pantothenic acid is one of the B vitamins that helps convert food energy into cellular energy. Pantothenic acid also joins other essential nutrients in mitochondrial assembly of heme, and insufficiency of these vitamins or minerals can impair heme synthesis and red blood cell formation, increase mitochondrial oxidative stress, and induce mitochondrial and cellular damage. Preclinical research published in the Journal of Nutrition in the 1950s found that pantothenic acid insufficiency negatively affected the stress response, and animal models of stress or deficiency suggest that supplementation may aid adrenal cortisol metabolism. A clinical study employing pantethine partially confirmed functional adrenal support, though more human research is indicated.
Resource Spotlight: A Crown Jewel of Phytonutrient Research

For decades prior to his recent passing, botanist James Duke tirelessly catalogued thousands of phytochemical constituents in various parts of thousands of plants as well as thousands of their physiological effects and applications in traditional medicine. This wealth of data was eventually gathered into Dr. Duke’s Phytochemical and Ethnobotanical Databases, one of the world’s greatest troves of plant knowledge. If you had never realized that Capsicum annuum peppers are among the richest plant sources of both lutein and zeaxanthin, this database will let you know that, complete with citations (just click on “High PPM” to sort the columns by descending order in parts per million). If you would like to view 415 other phytoconstituents (like rutin and phytosterols) identified in Capsicum annuum in one page rather than navigate through 21 web pages, just click on your choice of PDF, Excel, or CSV media (above the large green “Show All” button) and clear your schedule for a while in order to enjoy the results. You can also identify 38 plants known to contain caffeine, 92 plants traditionally used to deal with back pain, or 1339 plants containing any one of 449 constituents known to affect any one of 19 activities that may impact the feeling of anxiety. Dr. Duke was a rare gem who would cheerfully discuss his research with anyone sending a sincere e-mail enquiry, and his database (now maintained by the US Department of Agriculture) is just one among his many legacies.

Less Mental Focus Better for "Aha!" Moments?

It seems creativity and “Eureka!” may reside on brains’ less-traveled paths. The emerging field of chronobiology examines what daily time periods are most conducive to physical and cognitive activity for individuals, and generally classifies people as primarily morning-type, evening-type, or neither. This “optimal” time of day usually correlates with better memory, decision-making, alertness, attention to instruction, and ability to disregard distractions. However, a study looking at problem-solving ability did not find that “optimal” times correlated with better performance on either 1) linear, rational, analytical problems or 2) non-linear, non-logical insight problems. Finding solutions for linear, logical problems generally requires methodical work involving the posterior cortex of the brain, and in this study, subjects’ performance was slightly but not significantly better at optimal times. Approaching non-linear insight problems, however, necessitates suspending customary mental processes and reinterpreting problems in a new light, which involves more activity in the temporal lobes of the brain. Subjects showed greater success in solving these insight problems during non-optimal times; in fact, they were slightly more apt to solve insight problems during non-optimal times than they were to solve analytical problems during optimal times.
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