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Thank you for subscribing to Dr. Jeffrey Bland's newsletter. Enjoy and share this information, which is for educational purposes only and is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Always consult with a qualified healthcare professional when you are in need of advice regarding a medical condition.

In this issue: How the Brain Perceives Chronic Pain; Research on Vitamin K (video blog); Nutrients and Autism; SNIppets: Atopy in Children; Food Antioxidant and Liver Health

But first, a quote from the FMU Knowledgebase!

"Over the years, as I kept studying the microbes and how they made us sick, I began to appreciate that there was a lot more complexity out there, and that some of the microbes that were dangerous to us also had some benefit."

Microbiome Researcher Martin Blaser, MD
Author of *Missing Microbes*
September 2015 Interview
Functional Medicine Update

Find a link to the September 2015 issue of Functional Medicine Update at the end of this newsletter, and learn more about how to explore Dr. Bland's extraordinary audio archive.

How the Brain Perceives Chronic Pain

Future study of chronic pain conditions may be aided by a brain network stimulus-response observation technique recently borrowed from physics. "Explosive synchronization" has been found among brain networks in those with fibromyalgia, and the degree of abruptness in linking correlated to pain perception experienced by women with the condition. The electroencephalograph-



based technique helped confirm that, in contrast to the gradual linking among brain centers after stimuli that characterizes a normal response, these centers connected in a more unstable and hypersensitive manner in subjects with fibromyalgia.

Researchers feel that this observation method, especially combined with functional magnetic resonance imaging (fMRI) or magnetoencephalography, may help deepen understanding of the etiology of fibromyalgia and other chronic conditions of hypersensitivity to pain signaling, and

could also aid development of [personalized, non-invasive brain therapies](#) for modulating these patterns in affected individuals.

Dr. Bland's Latest Video Blog: Exploring the Research on Vitamin K



Video is one of Dr. Bland's favorite communication tools. Subscribe to his [YouTube channel](#) to never miss an update, and also find many additional videos on the Personalized Lifestyle Medicine Institute [Vimeo page](#).

Meeting Autism Head-on: Nutrients for Managing & Preventing



The benefits of folate supplementation for women who may become pregnant are well known: as a crucial factor influencing the way the body “tags” areas of genes (with carbon-containing methyl groups) that are actively involved in creating proteins and other messengers and building blocks, it strongly affects the creation of new tissues—whether vascular tissues within a woman’s cardiovascular system or nervous tissues within her own body or that of her growing fetus, affecting the child’s risk for spina bifida and neural tube defects.

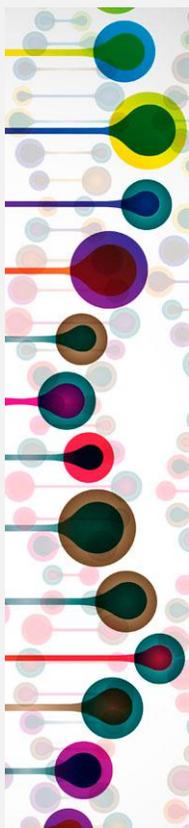
A new study presents convincing evidence that folate supplementation before and during pregnancy also reduces future risk for autism-spectrum disorders (ASD) in children. Children of women receiving folate and/or multi-vitamin supplements solely before becoming pregnant showed a 75-88% reduced chance for developing ASD, while there was a 77-79% reduced risk if folate and/or MVM supplementation was only received during pregnancy, compared to non-supplementation. Longer-term supplementation and supplementation both before and during pregnancy were associated with even greater protection. An interesting outcome was that [decreased](#)

[risk was seen even after adjusting for deficiency](#), indicating folate functionality in health beyond levels deemed “sufficient” for normal function.

But there is more to the study of autism than folate and methyl groups—as sulfur-containing nutrients and antioxidants are also critical for allowing the body to manage the excretion of metabolites after they have done their duty. Homocysteine is a metabolite resulting from methylation function, and build-up of blood levels of homocysteine can negatively affect cognitive and vascular functions as well as the body’s antioxidant status; communication difficulties in autistic children [relate to homocysteine levels](#). A 2016 study of autistic children found that not only were their homocysteine levels raised, but that folate supplementation [improved their verbal and social functions](#), significantly lowered homocysteine levels, and improved measures of glutathione status.

Reducing homocysteine relies not only on sufficiency of methyl donors (like choline, methylcobalamin, and methionine) but also on availability of organic sulfur sources such as glutathione and cysteine. Supplementation with either [N-acetylcysteine](#) or [methylcobalamin](#) has also shown positive effects on behavior in autistic children.

Autism represents a “canary in a coal mine” condition, and in this FMU interview, nutritional biochemist S. Jill James, PhD (of the [Arkansas Children’s Research Institute](#)) and Dr. Bland discuss nutritional support for these related homocysteine pathways and [reduction of chronic oxidative stress in autism and Down’s](#) syndrome. And in these detailed presentations, Dr. James provides further clues about why autistic children have [reduced antioxidant capacity](#) and why [extra susceptibility to oxidative stress](#) may make autism more common among males.



SNiPpets

How significant to health are certain single nucleotide polymorphisms, also known as SNPs?

SNiPpets is an ongoing exploration of this topic. This column is produced by Jeffrey Bland, PhD and the Personalized Lifestyle Medicine Institute.

These SNPs May Lead Kids' "Atopic March" Towards More Serious Conditions

Genome-wide association survey has identified several SNPs associated with significantly greater risk of childhood [eczema developing into asthma](#), including rs12081541 on chromosome 1, rs9357733 on chromosome 6, rs993226 on chromosome 12, rs17690965 on chromosome 5, rs479844 and rs2155219 on chromosome 11, and rs10445308 on chromosome 17. As the affected genes relate most strongly to intestinal and epithelial barrier integrity, these findings suggest that atopic children with SNPs might benefit from more aggressive application of dietary therapies aimed at restoring normal gut permeability and immune balance.

Food Antioxidant Counters Diet-Induced Liver Damage, Maybe More

Non-alcoholic fatty liver disease (NAFLD) affects around one-third of obese children in

North America. A recent animal study suggests that pyrroloquinoline quinone (PQQ), a redox cofactor found in breast milk and in plant foods, may help prevent fatty liver disease caused by in utero exposure to a Western diet. Offspring of obese mice fed this high-fat, high-sugar diet displayed increased adiposity, liver enzyme induction, inflammation, liver fibrogenesis, and alterations in microbiome composition and intestinal barrier function, but these changes were reduced [if their mothers received PQQ](#) during their weaning period—even if only briefly.

PQQ is known to participate in [mitochondrial biogenesis](#) and can activate sirtuin-1, which is implicated in cellular genomic stability and longevity. In Alzheimer's disease, [reduced levels of brain sirtuin-1](#) correlate with accumulation of toxic beta-amyloid and tau proteins, and brain hypometabolism (partly attributable to loss of mitochondrial efficiency) contributes to cognitive decline. For these reasons, PQQ supplementation is likewise being considered as a therapy for [improving neuronal energy dynamics](#) in Alzheimer's disease.



Where in the World is Dr. Bland?

Every year, Dr. Jeff Bland speaks in front of audiences around the world.

Will this be the year your paths cross?

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With Dr. Bland at the helm, PLMI is growing and expanding its educational outreach. Visit the [PLMI website](#) to learn more about:

- The 2018 Thought Leaders Consortium in Tucson, AZ October 12-13, 2018
- Past video presentations that are free to watch in PLMI's online Education Portal
- Other leadership activities and initiatives

For more than three decades, Dr. Jeff Bland recorded and self-published a monthly audio journal called Functional Medicine Update (FMU). Although he is no longer recording new issues, an archive of content spanning 1997-2016 is free to explore on Dr. Bland's website, and this extraordinary collection is now known as the FMU Knowledgebase. This newsletter began with a quote by Dr. Martin Blaser, who was interviewed in September 2015. To access that issue, click [here](#). To explore the full archive, visit the [FMU Knowledgebase](#).

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