



# CONVERGENCE

News, Links, and Insights  
by JEFFREY BLAND, PHD



## August 2018

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:** FMT - Getting Ready for Prime Time?; Breastfeeding: Sound Science, Clear Evidence (video blog); Detox: Moving from Bioconcentration to Elimination; SNIppets: Homocysteine; Links Among Oxygen, Insulin, Glucose, and Inflammation; Classic FMU: Dale Bredesen, MD



### FMU KNOWLEDGEBASE

THE AUDIO ARCHIVES OF JEFFREY BLAND, PHD

"When you have apo E4, you're putting more of your resources into the proinflammatory NFkappaB side. Great for walking in the savanna, great for 5 to 7 million years ago, but not good for being over 50 here."

- DALE BREDESEN, MD  
FEBRUARY 2015

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## FMT - Getting Ready for Prime Time?

Research on fecal microbial transplantation (FMT) is still in its early stages, though positive results have been so strong that, [as Dr. Bland informs us](#) in this video, medical research groups in the US and EU are creating "banks" for storing donated FMT materials. FMT involves transfer of fecal material from a healthy donor into a recipient via rectal injection—somewhat like a suppository or colonic treatment. While concerns remain about how to apply this therapy in a consistently safe manner, its benefits in challenging conditions like inflammatory bowel disease, obesity, and *Clostridium difficile* infection (CDI) have been compelling enough to



generate considerable interest among clinicians and patients as well as in veterinary circles. (In the US, however, an Investigational New Drug application may be needed before conducting clinical research with FMT.)

A 2018 study compared the effects of a [single treatment instance of FMT](#) on the fecal microbiome of patients having CDI and/or ulcerative colitis. Prior to FMT, subjects showed increased abundance of Proteobacteria phylum and *Shigella* and *Escherichia* genus members, while butyrogenic species such as *Faecalibacterium prausnitzii* were depleted among all subjects with CDI. FMT was shown to significantly increase overall bacterial diversity and abundance of butyrate-producing bacteria among all with CDI and to reduce abundance of pro-inflammatory *Enterobacteriaceae* members among all study groups. While results were less dramatic for subjects with ulcerative colitis alone, they also showed improvements in their microbiome composition after just one episode of FMT therapy—fairly impressive for this chronic, relapsing condition.

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## Dr. Bland's Latest Video Blog

### Breastfeeding: Sound Science, Clear Evidence

Should the health benefits of breastfeeding really be a matter of political debate and contention? These are strange times. Watch Dr. Bland's latest video blog about a controversial and questionable stance the current US administration is taking on a topic that is vital to global health.



Video Link: <https://www.youtube.com/watch?v=zzcDDXb8cN0>

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](#).

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## Detox: Moving from Bioconcentration to Elimination

Though chemical science developed commercially well in advance of ecological science, modern methods are helping us understand the changes we've made in our



environment over the years. In this video, Dr. Bland relates how [persistent toxins affect gene expression](#) patterns as well as the vitality of our surrounding ecosystems. He also discusses the importance of using detoxification methods to shift away from bioconcentrating these novel compounds and towards eliminating them.

Detoxification engages a complex series of reactions in the body. Ingested toxins must first be bioactivated in the liver—a necessary but inherently pro-oxidative step. Next, they are chemically altered to increase their solubility and ease excretion. Both of these steps require energy, and having adequate bodily stores of a wide variety of antioxidants reduces oxidative stress in cells undertaking this risky work. Solubilization requires organic conjugating molecules like sulfates, glutathione, and methyl groups (received through the diet in the forms of vitamins and phytonutrients) as well as nutrients that support mitochondrial function, such as magnesium, B vitamins, and carnitine. Finally, effective intestinal and renal excretion is facilitated by sufficient intake of dietary fiber, probiotics, and plant constituents like berry proanthocyanidins and green tea catechins.

Air pollution is a special concern because inhalation bypasses the digestive system's barriers, and air pollution has been [linked to 15 million deaths yearly](#). A recent study found that three cellular signaling pathways are particularly central to the body's response to pollution: the Nrf2 master regulator of detoxification and antioxidant enzymes, the aryl hydrocarbon receptor (AhR), and inflammation mediator nuclear factor-kappa B (NFκB). While Nrf2 and AhR help coordinate protective and detoxification functions for neutralizing and removing chemical threats, chronic exposure to toxins and unhealthy lifestyles cause overactivation of NFκB, resulting in chronic inflammation.

However, metabolites produced from digesting Brassica vegetables like broccoli and kale have been shown to [induce the protective functions](#) of Nrf2 and AhR while inhibiting NFκB and slowing enzymes that activate toxins. This combination of beneficial effects may partially explain why increased consumption of these plants is associated with reduced cancer risk not only in the digestive tract but also for hormone-linked and lung cancers.

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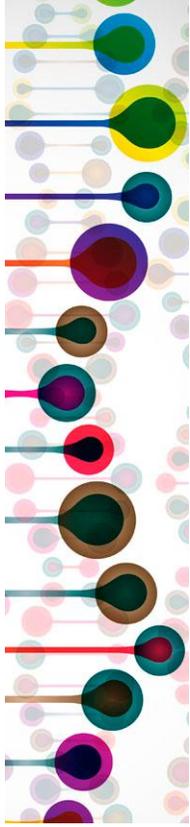
## SNiPpets

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.

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### **In Those with Only 0-1 "Servings" of this SNP, Extra Folate Could Reduce Stroke Risk**

In the US, folate fortification of foods has reduced incidences of conditions such as heart attacks and strokes as well as billions of dollars in associated medical costs, and Japan now also enjoys lower health care costs by [fortifying rice with folate](#). It is interesting that the methylenetetrahydrofolate reductase (MTHFR) enzyme, well-known for modulating gene expression, itself has several SNPs affecting its gene regulatory functions. One such polymorphism (the rs1801133 SNP substituting T for C) affects blood levels of homocysteine, which increase risk for stroke when elevated—especially in those with high blood pressure. Among hypertensive individuals with either the major CC or the minor variant CT genotype (indicating zero or one “doses” of



the polymorphism) at the MTHFR gene, [supplementation with 800 mcg of folic acid](#) significantly reduced stroke risk, an effect not seen in those with the minor variant TT genotype (a “double dose” of the SNP), whose stroke risk was not related to homocysteine levels.

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## Links Among Oxygen, Insulin, Glucose, and Inflammation

Cellular hypoxia is thought to contribute to inflammation in the adipose tissue of obese individuals, and [oxygen therapy is known to improve](#) glucose tolerance in type 2 diabetics. A recent study provides insight into how oxygen therapy normalizes insulin and glucose control and proposes an electrical brain-stimulation method for achieving similar benefits. The carotid body is a nerve bundle that senses oxygen levels, pH, and other crucial blood parameters, and it interacts with the central nervous system to maintain blood composition. However, some research suggests that chronic inflammation may interfere with the carotid body’s chemo-sensing functions. In diabetic rats, removal of the carotid sinus nerve (thereby disconnecting the carotid body’s oxygen-sensing input to the brain) restored insulin sensitivity and normal glucose tolerance, and the work showed that reversible [electrical modulation of carotid sinus nerve activity](#) may similarly aid glucose homeostasis. This research team previously discovered that hyperinsulinemia heightens sympathetic nervous tone, which overstimulates the carotid body and thereby perpetuates insulin resistance.

Strategic diet and lifestyle programs, however, may more directly address the metabolic dysfunctions in dysglycemia, obesity, and inflammation. Omega-3 fatty acid supplementation has been shown to [reduce gene expression related to hypoxia and inflammation](#) as well as circulating levels of mediators of inflammation in severely obese patients, and a rigorous recent meta-analysis concluded that increased intake of [isolated soluble dietary fibers](#) can effect significant improvements in body mass index, fasting glucose, fasting insulin, and insulin resistance in overweight and obese individuals.

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## 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?

[View Appearances Calendar](#)

## FMU KNOWLEDGEBASE

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.

To access the February 2015 issue, which is featured at the start of this newsletter, click [here](#). That issue features an interview with Dale Bredesen, MD, noted neurologist and author of the best-selling book *The End of Alzheimer's*.



SIXTH ANNUAL  
THOUGHT LEADERS CONSORTIUM

The **SCIENCE**  
of **PRECISION:**  
What's Next for Personalized  
Lifestyle Health Care

**OCTOBER  
12-13, 2018**  
The Westin La Paloma  
Resort & Spa  
Tucson, Arizona

**SPEAKER SPOTLIGHT**

Dale Bredesen, MD  
UCLA and Buck Institute

David Perlmutter, MD  
Perlmutter Health Center

Dr. Bredesen will be speaking at the Personalized Lifestyle Medicine Institute's Sixth Annual Thought Leaders Consortium in Tucson, AZ this October. He will participate in an onstage dialogue with Dr. David Perlmutter that will be moderated by Dr. Jeff Bland.

Limited seating for this conference is still available, but filling fast. More information about this event can be found here:

[www.plminstitute.org](http://www.plminstitute.org)

Dates: October 12-13, 2018

Location: Tucson, Arizona

Connect with Dr. Jeffrey Bland



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