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Looking Back at 2009

As Dr. Bland reflects on *Functional Medicine Update* 2009, he considers each topic he has discussed to be a "node" of understanding with regard to the functional medicine matrix and the systems biology model of medicine. He begins this issue with a summary of his thoughts and chooses to focus first on the subject of toxicity and data gathered from the National Health and Examination Survey (1999-2002) by a group of Korean researchers whose work Dr. Bland has been following. This group, headed by Dr. DH Lee, has been studying low-level exposure to some persistent organic pollutants (POPs) because of their possible link with the risk of diabetes. In 2007, this group investigated possible interactions between serum GGT and body mass index (BMI) and their effects on the risk of prevalent type 2 diabetes and insulin resistance. The findings from this analysis indicated that BMI was not associated with prevalent type 2 diabetes when GGT was low normal, suggesting that obesity itself many not be a sufficient risk factor for type 2 diabetes. REF #1-3

The model Dr. Bland has been describing in *Functional Medicine Update* ties together body burden of various toxins and altered function that ultimately translates into chronic illness. He discusses a recent article published in *PLoS One* titled "Chronic Exposure to the Herbicide, Atrazine, Causes Mitochondrial Dysfunction and Insulin Resistance." According to the authors of this article, there is an apparent overlap between areas in the USA where the herbicide, atrazine (ATZ), is heavily used and obesity-prevalence maps of people with a BMI over 30. This article describes an animal study that aimed to investigate whether chronic exposure to low concentrations of ATZ might cause obesity or insulin resistance by damaging mitochondrial function. The results of this study indicated that chronic administration of ATZ decreased basal metabolic rate, and increased body weight, intra-abdominal fat, and insulin resistance without changing food intake or physical activity level. A high-fat diet further exacerbated insulin resistance and obesity. The researchers state that the results suggest that long-term exposure to ATZ might contribute to the development of insulin resistance and obesity, particularly where a high-fat diet is prevalent. REF #4

Dr. Bland next moves to a recent discussion involving the link between atherosclerotic cardiovascular disease and periodontitis. He refers to the editors' consensus report published in both the *Journal of Cardiology* and the *Journal of Periodontology,* and suggests the collaborative effort between disciplines that is demonstrated in this situation could be used as an example of functional medicine thinking. In introducing this article, the authors state: "The organization of the health professions into specialties and subspecialties according to body organs and systems is often more pragmatic than scientific. The human organism is a single unit composed of a seemingly infinite number of biological processes so intertwined that abnormalities of almost any of its parts or

processes have profound effects on multiple other body areas, exemplified in this document by the common and complex theme of *inflammation*." REF #5

In the August 2009 issue of *Functional Medicine Update*, Dr. Bland focused on the topic of probiotic and prebiotic administration, highlighted by his discussion with Professor Delzenne and Dr. Cani at Université Catholique de Louvain in Belgium. Following on from this discussion, Dr. Bland now talks about a recent article in *Pediatrics* titled "Probiotic Effects on Cold and Influenza-Like Symptom Incidence and Duration in Children." This was a double-blind, placebo-controlled study involving 326 children (3-5 years of age) who were randomly assigned to receive placebo (N=104), *Lactobacillus acidophilus* NCFM (N=110), or *L acidophilus* NCFM in combination with *Bifidobacterium animalis* subsp *lactis* Bi-07 (N=112). The children were treated twice daily for 6 months. The data gather from this study reflected that daily dietary probiotic supplementation for 6 months was a safe effective way to reduce fever, rhinorrhea, and cough incidence and duration and antibiotic prescription incidence, as well as the number of missed school days attributable to illness, for children 3 to 5 years of age. REF #6

Finally, Dr. Bland refers back to a two-part series on celiac disease and gluten sensitivity featured in the June and July 2009 issues. He discusses a recent article written by Dr. Alessio Fasano, Director of the Mucosal Biology Research Center and the Center for Celiac Research at the University of Maryland School of Medicine, which was published in *Scientific American*. Dr. Bland expresses his opinion that looking at celiac disease and gluten (as a triggering agent in susceptible individuals) is timely and relevant to the ongoing discussion about the relationship between autoimmune disease and environmental agents. REF #7

New Connections to Celiac Disease and Gluten Sensitivity

Following his wrap up of previous issues of *Functional Medicine Update*, Dr. Bland discusses an article about celiac disease just recently published in *BMC Immunology*. The title of the article is "Different Levels of Humoral Immunoreactivity to Different Wheat Cultivars Gliadin are Present in Patients with Celiac Disease and in Patients with Multiple Myeloma." REF #8

Modifiable Lifestyle Factors and Lifetime Risk of Heart Failure

The beneficial effect of therapeutic lifestyle changes has been a topic Dr. Bland has often discussed. In July 2009, an article on this subject titled "Relation Between Modifiable Lifestyle Factors and Lifetime Risk of Heart Failure" was published in the *Journal of the American Medical Association*. The authors of this article examined the association between modifiable lifestyle factors and the lifetime risk to heart failure in a large cohort of men (20,900 men who were followed during the Physicians' Health Study, 1982-2008). Six modifiable lifestyle factors were assessed: body weight, smoking, exercise, alcohol intake, consumption of breakfast cereals, and consumption of fruits and vegetables. The authors concluded that in this cohort of apparently healthy men, adherence to healthy lifestyle factors is associated with a lower lifetime risk of heart failure. REF #9

New Research on Epigenomics
Research on the concept of epigenomics has shown that a sub-optimal intrauterine environment can alter the trajectory of fetal development and have profound effects on lifetime health. Altered methylation has been a proposed epigenetic mechanism responsible for these changes. A group of researchers from McGill University in Quebec, Canada and the Southwest Foundation for Biomedical Research in San Antonio, Texas, conducted a study on this mechanism in nonhuman primates by testing the hypothesis that global methylation in fetal baboon demonstrates organ specificity, gestational age specificity, and changes with maternal nutritional status. They measured global DNA methylation in fetuses of control-fed and nutrient-restricted mothers and observed organ and gestation-specific changes that were modified by maternal diet. The researchers concluded that the results of this study demonstrate a potential epigenetic mechanism whereby reduced maternal nutrition has long-term programming effects on fetal organ development. REF #10

Clinician of the Month
Alejandro Junger, MD
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Dr. Alejandro Junger was born in Uruguay and graduated from medical school there. He moved to New York City for postgraduate training, where he completed three years of training in internal medicine at NYU Downtown Hospital and three additional years of fellowship in cardiovascular diseases at Lenox Hill Hospital. As a result of his move and changes in lifestyle, Dr. Junger developed personal health problems, including irritable bowel syndrome and depression. He shares the very personal story of his journey to find solutions for his own health issues—a journey that took him from an ashram in India, to a wellness center in Palm Springs, and, full circle, back to New York City, where he is now practicing medicine at the Eleven Eleven Wellness Center alongside noted functional medicine physician, Dr. Frank Lipman.

Dr. Junger recently authored a book titled *Clean: The Revolutionary Program to Restore the Body's Natural Ability to Heal Itself*. In the book, Dr. Junger describes how he became aware of the toxicity of our planet, and explains how detoxification and cleansing have been around for thousands of years, but knowledge about them has been lost at a time when it is more important than ever. He and Dr. Bland discuss how he developed his program, and Dr. Junger shares some remarkable case histories. REF #11

In Closing: Essential Fatty Acids and Heart Disease
Dr. Bland closes this issue with a discussion of two studies that examined the effects of high-dose supplementation of docosahexaenoic acid (DHA) on risk factors for heart disease. REF #12-13

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