The effects of persistent organic pollutants (POP) in weight loss and how their effects may be mitigated

Mobilization of persistent organic pollutants (POPs) from lipid stores during weight loss has been found to result in increased blood concentrations.1 POPs, such as polychlorinated biphenyls (PCBs), volatile solvents, phthalates, parabens and chlorinated pesticides such as hexachlorobenzene (HCB), and p,p'-dichlorophenyldichloroethylene (DDE) are ubiquitous microcontaminants that are lipid soluble and bio-accumulate in stored fat. Storage of these compounds can result in increased concentrations in fat, muscle and other organs. Weight loss can facilitate significant release of these toxicants. This process is especially significant in middle-aged and older adults, since toxins accumulate with age. Though many are banned, POPs continue to be a change in BMI greater than 14 kg/m², when blood concentrations from weight loss has been found to be measured and persistent up until jump sharply. It is therefore advisable to calculate a patient’s anticipated change in BMI. This increase of toxins could contribute to the difficulty of sticking with a weight loss program or help explain why patients may regain weight so quickly.9

Though clinicians may be aware of the possible increase of POPs with weight loss, they may be less familiar with clinical treatments used to mitigate the toxic effects of POPs (or any toxic substance). The first and most significant step, of...
course, is avoiding or minimizing overall exposure to such compounds. Lower body toxin levels have been identified in vegans, vegetarians, and those who eat more vegetables, fruits, whole grains, beans and wild caught young fish. High fat meat and dairy products, such as butter, cheeses, and processed foods are major contributors of PCB, chlorinated pesticides, and dioxin, since POPs are fat soluble and bio-magnify through the food chain.\textsuperscript{10} Volatile solvents, phthalates and parabens are generally found from exposure to household and personal care products. Specific sources of each type of POPs can be found in the CDC report.\textsuperscript{3} Avoiding high fat foods, eating organic foods, and decreasing product usage, may help to lower overall exposure of POPs. Clinicians may also encourage patients to lose weight slowly to reduce their rate of exposure to toxins released from stored fat.

There are many detoxification programs that claim to reduce toxin levels, though most have not been well researched or tested. Programs include saunas, supplements, massages, and dietary inclusions and restrictions. Little research has evaluated the levels of POPs in patients before and after such detoxification programs or compared levels to controls.

Besides avoidance, the second primary aspect of detoxification is increased excretion. Increasing excretion of POPs (fecal and urinary) is a primary target for lowering levels. Increased excretion can be done via binding of the POPs so they are not re-absorbed or increasing detoxification pathways; binding them within the intestines has been shown to decrease the overall level.\textsuperscript{11} Products that can bind POPs in

![Figure 1. Sulfur containing amino acid pathways.](image-url)

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individual SULT isoforms may cause adverse effects on human health. For example, hydroxylated polychlorinated biphenyls (PCB) have been shown to interfere with the transport of thyroid hormones, inhibit estradiol sulfonation, and inhibit thyroid hormone sulfonation, thereby potentially disrupting the thyroid hormone system. Formation of sulfate conjugates of toxic xenobiotics usually decreases their toxicity. On-going research on evaluating these processes is being conducted. Methylation, another phase II detoxification process, is the addition of a methyl group. DNA methylation is an epigenetic mechanism which may be influenced by POPs. Global DNA methylation levels have been reported to be inversely associated with blood levels of POPs. Methylation is biochemically linked to glutathione (GSH) synthesis (see Figure 1). GSH plays an important role in chemical detoxification. Research has found intracellular GSH depletion by PCBs. The trans-sulfuration pathway from S-adenosylmethionine (SAMe) to GSH can become disturbed with the administration of hepatotoxicants. Since SAMe is needed in both methylation and GSH, supplementing with it, or another form of sulfur amino acids such as N-Acetyl-Cysteine (NAC), may help in supporting the detoxification process. There is evidence in patients with liver failure that defects in the SAMe-synthetase enzyme may contribute to a negative nitrogen balance, especially in those with an inadequate supply of sulphur-containing amino acids, though the block may be overcome by SAMe supplementation. Other supplements or specific foods that may support phase II detoxification pathways include glycine, glutamine, and NAC, to support glutathione production; glycine or taurine to support conjugation reactions; and vitamins and minerals used as co-factors.

Though saunas have also been postulated as a way to increase the detoxification of POPs with minimal risk and have been shown to be successful in some cases, research is limited. Research has found repeated sauna sessions resulted in decreases in total cholesterol and LDL-C, so the corollary of reduced POPs that could be stored in these fats may also be drawn. Clinicians should be aware that medical issues such as thyroid dysfunction, fatigue, chemical sensitivity, asthma or infertility may be due to increased POPs from weight loss. Monitoring of symptoms is recommended during weight loss programs. If symptoms increase, weight loss should be slowed, detoxification measures added or levels of POPs tested. Assessing toxin levels prior to beginning a program may also be advised, especially in those with prior significant toxin exposure. The majority of POPs have national reference values established by the CDC from the NHANES report over several decades. Clinicians involved in weight loss should be aware that they can evaluate their patients’ levels of POPs and how these toxic compounds are released during weight loss in order to recommend strategies to mitigate their possible effects.

References


his year’s Pre-FNCE workshop was truly fantastic and well worth the effort of arriving in Philadelphia one day early. The collection of speakers included: Mark Hyman, MD, internationally known speaker, author, founder of the UltraWellness center in Lenox, MA, and chairman of the Institute for Functional Medicine; Laurel Mellin, PhDc, RD, founder of Emotional Brain Training, health psychologist and an associate professor of family and community medicine at the University of California at San Francisco; Kathie Madonna Swift, MS, RD, LDN, senior nutritionist for Kripalu, co-director of Food as Medicine through the Center for Mind Body Medicine and leading educator and author; Coco Newton, MPH, RD, CCN, owner of Lifetime Nutrition, LLC, a functional medicine nutrition private practice in the Plymouth-Ann Arbor, MI area.

**Mark Hyman, MD: Diabesity: Functional Medicine and Cardiovascular Disease, Metabolic Dysfunctions and Obesity**

Dr. Hyman opened the conference by highlighting the health problems we are facing as a nation. He presented a striking statistic; only 1% of Americans meet the basic criteria for cardiovascular health. Diabesity, a popular term, refers to the clinical association of obesity, diabetes (or insulin resistance) and complications of cardiovascular disease, such as elevated blood pressure and cholesterol. Dr. Hyman challenged us to think about diabesity as not only primarily a disease of lifestyle and poor nutrition, but also as a socially communicable disease. Our communities and the social connections we have in our lives play prominent roles in the development—and reversal—of chronic disease.

We are at a pivotal shift in medicine right now; integrative and functional thinking is moving medicine from treating symptoms to treating the upstream cause of disease. This is essential since diabetes and heart disease are systemic disorders and cannot be treated appropriately on a symptom-by-symptom basis. Proper nutrition is the single most important holistic “treatment” and Dr. Hyman emphasized that food is not simply calories, but also information for the body. Food affects our gene expression; one-third of our DNA codes for enzymes are regulated by nutrients. What we eat determines our microbiome (the community of microorganisms and their genetic elements naturally existing within the human body), regulates mitochondrial function, hormones, detoxification enzymes, cellular communication, and maintains the integrity of cells, tissues and organs.

Insulin is a large part of what is driving the diabesity problem and Dr. Hyman recommended insulin testing to identify both blatant and hidden disease. He referred us to his guide, “How to Work with Your Doctor to Get What You Need,” available on his website (www.DrHyman.com) for a list of specialized lab tests and ranges for underlying causes of diabesity. These include the insulin response test, which includes fasting, 1-hour and 2-hour glucose and insulin levels after consuming 75 grams of glucose. Not commonly known is that glucose levels can be normal while insulin levels are elevated. Another essential test, the NMR lipid profile, determines the particle size and number of LDL, HDL and triglycerides. Smaller, denser particles are most dangerous to blood vessels, even if cholesterol is normal overall. Both elevated insulin levels and small, dense cholesterol particles are important indicators of diabesity.

Where do we go from here? How do we change the defaults in our society that drive people to make decisions that are not good for them? Dr. Hyman calls his plan Lifestyle 2.0. Extremely simple, yet thorough, Lifestyle 2.0 includes guidance such as: get healthy together by partnering with others—get connected; take out the bad stuff and put in the good stuff; eat real food, eat early and eat often, and get moving! Social support is key, as community-based models and interventions with peer support are more effective than any other type of intervention. Dr. Hyman closed with an inspiring example from his practice in which people working on their health together lost twice as much weight as folks attempting weight loss on their own.

**Laurel Mellin, PhDc, RD: Emotional Brain Training: The Power to Rewire Compulsive & Addictive Behavior**

Next, Laurel Mellin led us on a high-energy, fascinating voyage through emotional brain training (EBT), which she described as a new paradigm in healthcare: neuroscience-based integrative medicine, which focuses on rewiring the brain. We now know that emotional plasticity—the ability of neurons in the brain to change in response to new experiences—occurs in humans. Educational techniques can help people change the emotional circuits in
the brain to move them from ineffective to effective self-regulation, which leads to fewer stress symptoms. EBT treats the stress itself in the brain, rather than external factors. In other words, it is not our situation that causes stress, but how our brain processes it.

Mellin described four neuroscience concepts and how they apply to EBT. Concept #1 is, “it’s not us, it’s our wiring.” These wires trigger brain states (concept #2), which tend to become persistent (concept #3). So-called faulty wiring is encoded in the first three years of life with a 70% transmission rate from parent to child. The good news lies within concept #4: “we can create new wiring.”

The optimal state of the brain is low stress arousal with high reward center activation; in a word: joy! The emotional brain changes only through practice; if we are able to attain a brain-state of joy for more minutes during the day, our brains will start to form neural connections that wire us for joy. Alternatively, faulty wiring is encoded during episodes of stress. Stress circuits can be broken with an EBT practitioner’s help. The circuit must first be activated, which involves initiating stress as intense as during the original period when the circuit was encoded. Certain EBT techniques are then applied to extinguish the stress circuit.

With training, EBT can be conducted by physicians, Integrative RDS, mental health professionals and nurse practitioners. Learn more about EBT on www.ebt.org.

Kathie Madonna Swift, MS, RD, LDN: The IFMNT Radial in Practice: A Holistic Approach

Kathie Swift demonstrated how the IFMNT radial can help us examine critical nutrition factors necessary in evaluating cardiometabolic syndrome. The objectives of her session were to:

- Describe the IFMNT Radial in practice
- Outline mechanisms, functional foods and bioactives to support healing
- Examine critical nutrition factors that should be evaluated in cardiometabolic syndrome (CMS)
- Highlight CMS conventional and functional biomarkers
- Describe some dietary supplements for consideration in treating CMS
- Through the use of a case study, Swift allowed us to accompany one patient on her journey towards better health. We were able to see the radial in action as a dynamic, non-linear template for critical thinking that is highly individualized.

When initiating a healing encounter, including key questions such as, “What is getting in the way of your self-care and wellness?” and “Does your life have meaning and purpose?” can help practitioners paint the patient’s narrative and provide an entry point for nutrition and lifestyle recommendations. Swift reminded us to be mindful of the precipitating influences listed around the edges of the radial: pathologies, allergens and intolerances, negative attitudes and beliefs, and environmental exposures. All of these are triggers that impact gene expression.

Swift then highlighted many functional foods, the bioactive components in each, and included the mechanisms and roles these whole foods play in improving the health of patients with cardiometabolic syndrome. Practitioners should never underestimate the information that can be extracted from a carefully reviewed food journal. A recent study demonstrated that patients’ diets closely reflect what will be found during bloodwork in terms of biomarkers. With this in mind, a carefully assessed food history can even replace some laboratory testing.

Swift reviewed conventional and functional biomarkers and lab tests helpful in evaluating patients with cardiometabolic syndrome. For example, elevated serum uric acid is a risk factor for diabetes and is associated with insulin resistance. Oxidative stress markers such as myeloperoxidase and ADMA (oxidized LDL cholesterol) should also be examined. Swift concluded her talk by touching upon several dietary supplements and key considerations when deciding whether or not to incorporate them into a patient’s plan.

Coco Newton, MPH, RD, CCN: Body Talk: The Nutrition Physical

Coco Newton addressed key aspects of the nutrition-focused physical exam (NFPE) and how it relates to cardiometabolic syndrome. The objectives of her session were to:

- Explain three purposes of a NFPE from an integrative and functional perspective
- Describe how oxidative stress impacts signs and symptoms in a NFPE
- List five signs from a NFPE that are associated with cardiometabolic disease

Newton pointed out that the primary objective of a NFPE is to inform us about the whole system of the body. Along with biomarkers, the NFPE findings help connect the outer, physical symptoms of disease with what is needed inside the body. The NFPE also has great value in enhancing the therapeutic relationship between patient and practitioner. During her introduction, Newton reminded us of the many stages of nutrient depletion. Diminished nutrient tissue reserves will cause functional changes even before clinical symptoms and anatomical signs appear.

Every part of the body can tell us about nutritional imbalances and deficiencies in the body. Newton covered all major indicators—skin, hair, nails, eyes, mouth and body composition—and related physical examination results of each to cardiometabolic risk and risk of other diseases. For example, emotions may be manifested neurologically through the skin via acne, psoriasis, rosacea, alopecia or vitiligo, while outer eyebrow thinning is a sign of hypothyroidism. In addition, it was both surprising and enlightening to learn how many signs and symptoms may be caused by food allergies and sensitivities.

For more information about this year’s outstanding Pre-FNCE conference and to order your copy of the full presentations (including audio and speaker notes), please go to the DIFM website, www.integrativeRD.org, and click on the Members Services section, then DIFM store. This activity is approved for 6.5 hours of CPEU from the Academy.
Register Now for Series of Free Continuing Education Webinars

**Wednesday, Feb. 13**
**Noon-1 p.m. EST**

*The Importance of Nutrition to Healthy Immune Function*

Presented by Philip Calder, BSc (Hons), PhD, DPhil, RNutr
Professor of Nutritional Immunology, University of Southampton Faculty of Medicine

Join this one-hour webinar to explore the immune system, a complex system of cells and tissues that protects the human body from invading pathogens. Dr. Calder, a leading nutritional immunologist, will highlight the growing body of clinical understanding about the role that good nutrition plays in immune health throughout the lifecycle, and the importance of immune health to overall health and well being. He will share the latest clinical insights on enhancing immune function and conclude with several examples of novel dietary immune interventions.

This session is eligible for 1 CPEU.

To enroll click here.

**Thursday, April 11**
**8-9 p.m. EST**

*Keys to Understanding Studies on Clinical Nutrition of the Immune System*

Presented by Don Cox, Ph.D.
Senior Vice President, Research & Development, Healthcare Group, Biothera, the Immune Health Company

There’s a growing body of clinical evidence to support strengthening the immune system through the use of dietary interventions. Identifying food, beverage and supplement offerings that are credible and clinically relevant can be a challenge. In this one-hour webinar, learn techniques for assessing whether a dietary intervention is based on sound science. Dr. Cox will draw on best practices in clinical research programs for functional ingredients and provide insight into the rigorous four-step process to secure regulatory approval of a nutritional intervention.

This session is eligible for 1 CPEU.

To be notified when the registration link is available, click here: info@integrativerd.org

These continuing education modules are sponsored by Biothera, maker of Wellmune WGP®. Wellmune is a natural immune health ingredient for foods, beverages and supplements.

www.wellmune.com
DIFM Breakfast Meeting:
Linking Evidence-Based Nutrition to Immune Health

Emily Davis Moore, RD, LDN
Emily Davis Moore, RD, LDN is currently pursuing her master’s degree in Human Nutrition and a Health Coaching Certificate at the University of Delaware. Emily is the Copy Editor for The Integrative RD. She can be reached at emilydavismoore@hotmail.com.

The Dietitians in Integrative and Functional Medicine’s (DIFM) member breakfast was generously sponsored this year by Biothera. The delicious, healthy fare was coupled with engaging presentations on advances in nutrition and immunology. Speakers were Dr. Roger Clemens, DrPH, Chief Scientific officer at Horn in La Mirada, CA and Dr. John Blocker, PhD, an assistant vice president of research and development at Biothera.

Dr. Roger Clemens: Fundamentals of Nutrition and Immunology
Dr. Roger Clemens opened with a review of the fundamentals of the immune system. The immune system is a communication system that defends the body against invasion and is comprised of the innate and adaptive components. The skin offers a major defense against infection as a physical barrier. Once the skin is invaded, the innate system is the first line of defense offering a rapid response. It has no memory and is non-specific. Some of the defending cells of the innate immune system are the following white blood cells: macrophages, neutrophils, and natural killer cells. These cells recognize an invading organism and respond with multiple defenses: mechanical and physical barriers (cilia within the cell sweep invading bacteria away), chemical barriers and antimicrobial peptides, microbiological competition, phagocytosis (recognition, digestion, and destruction of invaders), and the complement system (plasma protein flag bacteria for destruction by phagocytes or antibodies). The adaptive immune system, on the other hand, responds more slowly and in a specific manner. Components include antibodies, B cells, helper T cells, killer T cells, and dendritic cells. These cells protect the body with an immediate protective response and also establish “memory cells” in order to establish future defense. Additionally, the adaptive immune system involves cytokines and chemokines in order to command the defense operation.

Dr. Clemens discussed two timelines over the course of his informative and captivating review of immunology. One timeline that Dr. Clemens described included discoveries related to the immune system, from the introduction of vaccines to advances in our understanding of the importance of microbiota in immunology. The other timeline that Dr. Clemens discussed is that of the development of the immune system in the human body. At birth, the human body is equipped with the innate and adaptive immune systems, but the adaptive immune system is not fully developed until around the second year of life. Then, throughout life, immune cell populations change as we age, with a decline in the elderly years.

Dr. Clemens provided an overview of the relationship between gut microbiota and the immune system. Throughout life, the gut microbiota are an important part of the immune system, maintaining balance...
between harmful bacteria and symbiotic organisms. This delicate balance may be diminished by disease and/or aging, resulting in inflammation and other symptoms. Maintaining healthy microbiota may delay this aging process and reduce associated inflammation.

Dr. Clemens advocated for nutritional support of the immune system at each stage of life and highlighted the importance of registered dietitians in promoting appropriate nutrition for the development of the immune system. Recent research has been conducted on vitamin E, zinc, probiotics, omega-3 fatty acids and caloric restriction, leading to increasing knowledge in the field of nutrition immunology. Research conclusions do not come without confusion, however, as studies can yield inconsistent results. It is important to continue to review new data as it becomes available, so that professionals can consider similarities and differences of subject characteristics and intervention variations. For example, studies of probiotics result in inconsistent conclusions, due to the fact that the strains and combinations of strains in the study vary. This background of immunology and the reminder to remain current on the most recent research evidence led to Dr. Blocher’s review of the most recent studies on beta 1,3/1,6 glucans from yeast.

Dr. John Blocher: Linking Evidence-Based Nutrition to Immune Health

John Blocher, Ph.D. is an assistant vice president of research and development at Biothera, a biotechnology company dedicated to improving immune health.

Dr. Blocher began by describing beta 1,3/1,6 glucans from yeast as natural dietary fibers that also possess immunoenhancing properties. Glucans derived from select strains of baker’s yeast are clinically proven to help strengthen immunity and protect against stress-related health challenges that can suppress the immune system.

Early in 2012, research demonstrating how beta 1,3/1,6 glucans reduced upper respiratory tract infection (URTI) symptoms in fourth year medical students was published in the peer-reviewed journal Nutrition. One hundred fourth-year medical students at Southampton University Medical School, United Kingdom, participated in the randomized, double-blind, placebo-controlled study. The students consumed 250 mgs of a defined source of beta 1,3/1,6 glucans once daily or an identical placebo capsule. The results showed a significant reduction (18%) in the total number of days with self-reported URTI symptoms in the beta 1,3/1,6 glucans group compared to placebo. Another important finding was that beta 1,3/1,6 glucans did not induce inflammatory cytokines. No cytokine change was seen during symptomatic URTI between study groups. Dr. Blocher explained that beta 1,3/1,6 glucans activate innate immune cells, the body’s first line of defense. This helps students become more resilient to health challenges. The results are consistent with the following clinical trials.

A clinical study demonstrating the immune health benefits of beta 1,3/1,6 glucans was presented at the American College of Sports Medicine in May 2012. Marathoners taking a defined source of beta 1,3/1,6 glucans for four weeks experienced an average reduction of 40% in upper respiratory tract infection symptomatic days that commonly afflict long-distance runners. The double-blinded study involved 182 runners who completed the 2011 LiveStrong Marathon in Austin, Texas. The participants included 96 men and 86 women with an average age of 34 and an average finish time of 4:00 hours. The study demonstrates that beta 1,3/1,6 glucans support the immune system under physical stress, applying to both elite athletes as well as recreational athletes.

Beta 1,3/1,6 glucans have been shown to prime neutrophils, the largest population of immune cells that are part of the body’s natural defenses. Unlike other immunity products, specific beta 1,3/1,6 glucans appear to support immune function without over-stimulating the immune system; immune boosters or stimulators may be harmful long term. However, not all beta 1,3/1,6 glucans are created equal. Research has shown that slight differences in molecular structure can affect biological activity. Similar to probiotics, each product must be evaluated upon its own unique attributes and performance.

Please visit the DIFM website to view the speaker notes for these informative presentations, http://www.integrativeRD.org, and visit the links under the section titled DIFM Member Breakfast at FNCE on the home page.

John C. Blocher, PhD
Assistant Vice President, Healthcare Research & Development
Biothera

John Blocher, PhD is a member of the research and development team for Biothera’s Healthcare Group. His responsibilities include designing and managing clinical and preclinical trials that advance the science of the company’s unique immune health ingredients. Dr. Blocher has more than 25 years experience in product development and R&D leadership for Nestle, Quaker Oats, Novartis Medical Nutrition and Quality Ingredients Corp. He has a doctorate in food science from the University of Minnesota.

Roger A. Clemens, MPH, DrPH

Dr. Roger A. Clemens is Chief Scientific Officer of Horn and part-time faculty within the USC Regulatory Science program where he also enjoys an adjunct appointment as Professor of Pharmacology and Pharmaceutical Sciences within the USC School of Pharmacy. Dr. Clemens has served as president of the Institute of Food Technologists (IFT), a spokesperson for the American Society for Nutrition (ASN), and a member of the USDA 2010 Dietary Guidelines Advisory Committee. Dr. Clemens received an AB in Bacteriology, an MPH in Nutrition, and a DrPH in Public Health Nutrition and Biological Chemistry from the University of California, Los Angeles.
IntegrativePractitioner.com recently released a report titled “Important Botanicals for the Prevention and Co-Management of Cancer.” Authored by Lise Alschuler, ND and sponsored by Gaia Herbs, the report is a research-based look at the roles green tea (Camellia sinensis), turmeric (Curcuma longa) and milk thistle (Silybum marianum) play in preventing cancer and contending with the toxicities of conventional cancer therapies. Each botanical is examined thoroughly; the author includes information regarding pharmacology, mode of administration and drug interactions. The report is available on IntegrativePractitioner.com (click on Reports from the homepage) as a free PDF download upon providing your business contact information.

Choline is a nutrient essential for normal functioning of all cells; within the body, choline is primarily found in phospholipids. Dietary sources of choline include eggs, milk, wheat germ and cauliflower. In a recent double-blind, randomized controlled trial, pregnant women (n=140 enrolled, n=99 completed) received either daily supplementation with phosphatidylcholine (750 mg) or corn oil placebo from week 18 of gestation through 90 days postpartum. All women were asked to complete 3-day food records at two points during the study, which were used to calculate an average daily intake of choline for each subject. At ten and twelve months of age, the subjects’ infants (n=99) were tested for short-term and long-term memory, as well as language and global development. Results showed that among women consuming a moderate amount of dietary choline (~65–80% of the recommended intake of choline), phosphatidylcholine supplementation did not enhance infant cognition. Currently, the recommended Adequate Intake for choline is 450 mg/d for pregnant women and 550 mg/d for lactating women. Study authors note that a longer follow-up period may be necessary to determine if positive effects will emerge later in the children’s development.


Diabetes mellitus is a major health problem associated with serious morbidity and mortality related to the development of cardiovascular disease, nephropathy, neuropathy, and retinopathy. Management of the disease remains unsatisfactory, despite numerous preventative strategies and treatments. Some mushrooms appear to be effective for both the control of blood glucose and the modification of the course of diabetic complications without adverse side effects. This review explores promising mushrooms that have demonstrated clinical and/or experimental antidiabetic properties by preventing or slowing the development of diabetes mellitus.

Mushrooms have been defined as “a macro fungus with distinctive fruiting bodies that could be hypogeous or epigeous, large enough to be seen by naked eyes and to be picked by hands.” Numerous species of mushrooms exist in nature; however, only a few are used as edibles. Mushrooms are not only sources of nutrients, but also have been reported as being useful in preventing diseases such as hypertension, diabetes, hypercholesterolemia, and cancer, and to possess antitumor, antiviral, antithrombotic, and immunomodulating properties. These functional characteristics are mainly due to the presence of dietary fiber and, in particular, chitin and beta-glucans.

*Tremella fuciformis,* known by the common names snow fungus or silver ear fungus, is used for its gelatinous texture in Chinese cuisine, particularly in sweet dishes. Animal studies have supported a dose-dependent hypoglycemic activity of glucuronoxylomannan from the fruiting bodies of snow fungus and the antidiabetic activities of the expolysaccharides produced by a submerged mycelial culture of the fungus. "These results indicated that Tremella fuciformis has potential oral hypoglycemic effect as a functional food for the management of DM [diabetes mellitus]," write the authors.

*Wolfiporia extensa* (formerly known as *Wolfiporia cocos* syn. *Poria cocos*), a rotten pine-tree fungus, is often used alone or combined with other herbs to treat diabetes as well as other disorders. Evidence suggests that *Wolfiporia extensa* extract and its triterpenes reduce postprandial blood glucose levels in mice via enhanced insulin sensitivity irrespective of the transcription factor peroxisome proliferator-activated receptor-γ (PPAR-γ).5

*Reishi* (*Ganoderma lucidum*) is known in China as the herb of longevity. Its polysaccharides have produced a hypoglycemic effect in normal mice.6 Results of a study on rats with diabetes demonstrated the potential of artist’s conk (*Ganoderma applanatum*) exopolymer and clustered toughshank (*Collybia confluens*) exopolymer in combating diabetes.7 The hypoglycemic effect of water-soluble polysaccharides from fruiting bodies of Jew’s ear (*Auricularia auricula-judae*) was investigated on mice that were genetically diabetic and showed a hypoglycemic effect.8

*Agaricus subrufescens,* also known as “almond mushroom,” a popular complementary and alternative medicine used by cancer patients, is useful as a health-promoting food. Its compounds, beta-glucans and oligosaccharides, showed antihyperglycemic, antihyperglyceremic, antihypercholesterolemic, and antiartherosclerotic activity, indicating an overall antidiabetic effect, in rats with diabetes.9 These effects may be due to an increase in adiponectin.

The young mushrooms of shaggy mane or shaggy ink cap (*Coprinus comatus*) are edible. Rich in vanadium, this mushroom may be used as a hypoglycemic food or medicine for hyperglycemic people.10

*Cordyceps* (*Cordyceps sinensis*), also known as caterpillar fungus, is considered a medicinal mushroom in traditional Chinese medicine. An isolated polysaccharide from the mushroom, named CSP-1, produced a significant...
Review of Potential Obesity-fighting Ingredients and Functional Foods


Overweight and obesity are worldwide epidemics helping drive increases in cancer, diabetes, cardiovascular disease, and other comorbidities. Obesity comes from an energy imbalance when too many calories are consumed and too few used. A myriad of products, diets, and special foods have been and continue to be developed to affect 1 or more aspects of this imbalance: energy intake, expenditure, or storage. One approach is to combine or add beneficial nutrients in what are broadly called “functional foods.” These authors discuss several types of mechanisms that functional foods employ to combat obesity, as well as a new, unnamed functional food in the fight against obesity.

One likely avenue to reducing food energy intake is through increased networking partner of DIFM.
satiety. Feeling full prompts individuals to stop eating. Satiety may be increased by modifying dietary energy density, macronutrient content, and/or glycemic index (GI). Foods with high non-caloric content, mainly water, have less energy density, as do high-fiber foods. Both add food mass, prompting satiety. The ratio of fats, proteins, and carbohydrates in foods also affects satiety. Fat is more energy-dense than protein or carbohydrates. However, too little dietary fat leads to poor compliance due to lack of satiety. It has been suggested that diets with high polyunsaturated fatty acids (PUFAs) stimulate fat oxidation more than those with high saturated fatty acids, but this is not proven. Foods with higher GIs stimulate insulin, in turn stimulating appetite and disease processes linked to insulin. Whether modifying dietary GI is ultimately helpful in reducing obesity is unknown. If it is, the authors postulate, a good target would be development of tastier low-GI foods.

Increasing energy expenditure is also a potential path to combat obesity. Little data support the efficacy of many products that claim this effect. Of the few supported by clinical data, combined caffeine and ephedrine have been found effective in long-term weight management; however, “there has... been recent concern about the long-term safety of ephedrine.” Ephedrine and ephedra (Ephedra sinica) have been banned in the US since April 2004 due to this “recent concern.” Caffeine, used in many diet products and “energy drinks,” has many plant sources, e.g., coffee (Coffea spp.), gotu kola (Centella asiatica), guarana (Paullinia cupana), cocoa (Theobroma cacao), and tea (Camellia sinensis), and is readily synthesized. Only tea is discussed, with green and oolong tea each treated separately, although with some sentences seemingly transposed, and no explanation of how they differ. In both, polyphenolic catechins, especially epigallocatechin-3-gallate (EGCG), are thought to operate synergistically with caffeine to stimulate fat oxidation. Both EGCG and caffeine affect norepinephrine, prolonging its effect. EGCG is found in appreciable amounts only in tea.

Capsaicin from peppers (Piper spp.) and calcium (Ca) may each increase energy expenditure. A feasible, effective dose for capsaicin has not been found. A causal relationship between high Ca diets and low body mass index (BMI) has not been shown. Serotonin, a brain neurotransmitter, inhibits appetite. It becomes available as tryptophan is converted to 5-hydroxytryptophan (5-HTP). 5-HTP supplementation has shown weight loss benefits. Dietary chromium is vital to glucose tolerance, insulin resistance, and blood glucose levels. While chromium picolinate does not promote weight loss, at 200-400 g/d, it seems to shift weight that is lost to fat rather than lean muscle mass.

A functional food was devised consisting of a beverage and a tablet, both to be taken as a snack twice daily. The beverage has 3 g of fructose, 1.8 g of psyllium (Plantago ovata), 1 g of barley (Hordeum vulgare), and 1 g of other low-GI carbohydrate and/or fiber source; in 2 g of whey protein and 1 g of cotton (Gossypium herbaceum) seed and soy (Glycine max) bean oils; with 0.1 g of other high-value biological protein. Each serving of the beverage has 45 calories. The tablet has 75 mg of caffeine and 135 mg of EGCG in a green tea extract, 10 mg of 5-HTP, and 100 μg of chromium picolinate. All nutrients are said to be food-grade. The product is intended as part of a healthy diet rich in vegetables, fruits, and legumes, with moderate protein and healthful fats, and more low-GI carbohydrates than high-GI ones, with low intake of refined grains, potatoes, and concentrated sugars.

Psyllium and barley have low GIs. Psyllium is rich in dietary fiber. The sweetener in the beverage, fructose, a sugar in fruit, is sweeter than sucrose with a lower GI. Another common sugar, corn (Zea mays) syrup, also sucrose, is not mentioned. The article seems to say that all ingredients are present in amounts that have aided weight loss, but later states that the dose of 5-HTP is significantly lower than that found effective. For 100 μg/d chromium picolinate, the low end of a demonstrated efficacious dose, an assumption was made that those using the functional food would obtain 200 μg/d from other, unspecified dietary sources to reach the upper end. No information is provided on tests of this anti-obesity functional food.

—Mariann Garner-Wizard

Referenced article can be found at http://functionalfoodscenter.net/files/52677786.pdf.

Reprinted with permission from American Botanical Council, HerbalGram at www.herbalgram.org, a networking partner of DIFM.
Cancer patients and survivors frequently become very concerned about nutrition, some for the first time in their lives. They know what they eat can make a difference in their treatment and survival, but often, their cooking skills are lacking, they are too ill to think about cooking, or they are not familiar with many of the recommended foods.

Cook for Your Life (CFYL) is a non-profit organization founded 6 years ago with a mission to teach healthy cooking to people touched by cancer. CFYL RD, Esther Trepal, helps this community to eat more healthfully, enjoy what they are eating and feel confident in the kitchen. Ann Ogden Gaffney, founder and CEO of CFYL, is a two-time cancer survivor with a life-long passion for food. She used food throughout her cancer ordeals to ease her way through, and decided to bring that knowledge to others in the cancer community. She started out in 2007 by providing hands-on cooking classes and free programs to patients from local New York City hospitals and community cancer organizations. CFYL continues to provide free classes in partnership with the American Cancer Society’s Hope Lodge in NYC.

As of today, CFYL classes and programs have served over 1200 patients, survivors and caregivers, and has received funding for their work from the Aetna Foundation and Susan G. Komen for the Cure Greater New York City. CFYL has just completed an NIH/NCI-funded study in collaboration with researchers at the Mailman School of Public Health, Department of Epidemiology, Columbia University, exploring ways to successfully make sustainable healthy changes to the diets of Latina breast cancer survivors. Results will be published in Spring 2013.

Since cooking classes can only reach a limited number of patients, CFYL has launched a comprehensive cooking web site in an attempt to reach a national audience. The website, www.cookforyourlife.org, provides a wealth of recipes that meet basic healthful guidelines. Emphasis is on whole foods, antioxidant-rich fruits and vegetables, lean protein and whole grains. Recipes are kept simple and incorporate ingredients that are familiar to most people. The site is unique in that it not only provides healthy recipes but also has search categories relevant to people with cancer. A patient undergoing chemo or radiation therapy or suffering with nausea, taste changes, or fatigue can find recipes that meet their needs. For example, a search under “fatigue,” finds Chicken Tenders, Simple Poached White Fish, and Simmered Chicken with Daikon Radish, plus a number of soups, sides and desserts. There are also more general categories related to food preferences (e.g., dairy free, vegetarian, gluten free) and the type of food (e.g., protein, vegetables, fruits, grains).

The website is user friendly, especially for people with limited cooking skills, because it provides easily understood videos of cooking techniques and knife skills. For example, one video demonstrates how to julienne, fine dice or large dice a carrot. Many of the recipes are accompanied by a video demonstrating how to make the dish. Without being dogmatic or judgmental, the website entices the viewer into sampling wholesome foods.

There are also general articles covering food and cancer, or cooking. Some are personal testimonies or presentations by guest chefs. Also included are articles by registered dietitian Esther Trepal. She has written on the health of red meat, exploring supplement use, a “how to” on reading articles on food and cancer, and controversies over fat.

CFYL is continually updating its library of healthy recipes. Plans are in the works to provide more nutrition analysis and to build the video base.

Cook for Your Life is a great entrée into the world of healthful eating for cancer patients, survivors and caregivers.

Reviewed by Jacqueline Santora Zimmerman MS, RD
DIFM Newsletter Editor Associate
Dear Members,

Wishing you and yours a healthy, happy, joyous, wonderful 2013. We are excited about the strategic initiative we have outlined for the years ahead for The Integrative RD.

This year, 2013, is a brand new page for DIFM. We are awaiting the news about our petition for the Certified Specialist in Integrative and Functional Nutrition–CSIFN. As of this writing we have received feedback on the proposal and have been asked for additional information for the February meeting.

Our website is currently under construction with a new look and new features. It will be unveiled shortly. We hope to launch in the next couple of months and will keep you informed about the launch date!

As DIFM moves forward we compel our members more than ever to be actively involved. We are looking for member volunteers with expertise in grant writing, branding, webmaster experience, marketing, and program development. Please keep us in mind when looking for volunteer opportunities and let us know your areas of interest. To find out more about volunteer opportunities, contact Member Services Chair, Lea Russell, MBA, RD, LDN at LRusselldifm@gmail.com or info@integrativeRD.org.

There is strength in numbers and our numbers are growing! The bigger our membership roster, the more impact we have. For DIFM to continue to thrive and expand our creative education programs, we need to increase our membership. So, I invite you to take part in a unique membership drive. The first segment of the drive, “FIND ONE”, asks each of you to find one colleague, student, or RD friend, to join DIFM. Integrative Nutrition fits into every aspect of the nutrition care process and we welcome members from all practice areas.

As always, we welcome your ideas, feedback, and involvement in DIFM DPG!

Healthfully Yours,
Alicia

Alicia Trocker, MS, RD

Award recipients at the DIFM breakfast meeting left to right: Rita Kashi Batheja, MS, RD, CDN; Ane Marie Kis, MS, RD, LDN; Mary Beth Augustine, CN, RD; Kathy Madonna Swift, MS, RD, LDN and Diana Noland, MPH, RD, CCN

Those of you who would like to contribute an article or have topics that you would like to see in future issues, please feel free to drop the editor an email or give her a call—peaknut70@gmail.com or 970-216-2356—or contact any one of the capable DIFM leaders listed in this newsletter.
hope this issue of The Integrative RD finds you and yours well, and without illness. It seems as this winter is a breeding ground for all sorts of bugs from the flu to Norwalk Virus. Everywhere I turn I find my self confronted with signs warning me to wash my hands to protect myself, and patients, from lurking illness. Stress, temperature changes, and poor immune systems all contribute to our susceptibility to infection and disease.

This issue provides a variety of topics that will help you as an Integrative RD to address a number of issues you or your clients confront. Given the current epidemic of colds and flu, I encourage you to read the recap of the DIFM FNCE breakfast as you may find the information on immunity interesting, if not helpful. For additional information on the presentation, you may go to the DIFM website http://www.integrativerd.org and click on DIFM Member Breakfast at FNCE to view the speaker notes for the informative presentations and for links to the presenter’s website. Also, please take the time to read the review of the Pre-FNCE workshop and consider ordering the CD of the presentations. You will find the information well worth the time and cost.

One new column being offered is titled News You Can Use. In this column we want to highlight recent studies or presentations that may be of interest and use to our members. We would also welcome information from you, our members, on practices or information that you have found helpful. To contribute or request more information please contact the column editor, Jacqueline Santora Zimmerman at jacq.zimmerman@gmail.com.

With the New Year there seems to always be a plethora of resolutions that involve weight loss. Integrative RDs have become familiar with the problem created by rapid weight loss among our obese clients—the release of organic pollutants that are stored in body fat that can result in toxicity. The review provided on this topic is very insightful and helpful for those of us working with overweight and obese populations.

Stay warm and drink plenty of fluids to ward off any of the bugs that are out there! Being warm may be a challenge if your part of the country is like ours—bitterly cold with record breaking temperatures. It seems like the past year has been a challenge with either drought or unpredictable weather. Even the West is experiencing unseasonable cold that I understand as you may find the information interesting, if not helpful. For additional information on the presentation, you may go to the DIFM website http://www.integrativerd.org and click on DIFM Member Breakfast at FNCE to view the speaker notes for the informative presentations and for links to the presenter’s website. Also, please take the time to read the review of the Pre-FNCE workshop and consider ordering the CD of the presentations. You will find the information well worth the time and cost.

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DIFM Awards and Stipends

DIFM Visionary Leadership Award: Kathie Madonna Swift, MS, RD, LDN
We were honored to present Kathie Madonna Swift, MS, RD, LDN, DIFM Member and former DIFM chair, with the first ever DIFM Visionary Leadership Award.

The prestigious Visionary Leadership Award was created to be bestowed only to those who have truly been trailblazers in the field of Integrative and Functional Medicine Nutrition. DIFM is pleased to award the honor to Kathie for her great contributions to the field of nutrition and congratulate her on her distinguished career.

DIFM DPG Visionary Leader Award:
The following requirements are considered for someone to be awarded the DIFM Visionary Leader Award:

1. Has been an active member in DIFM for a minimum of 5 years.
2. Has served in a leadership capacity for DIFM, currently or in the past.
3. Has made a significant contribution to the advancement of integrative nutrition.
4. Practices the integrative medicine and nutrition model in practice and education.
5. Promotes the advancement of The Integrative RD as a trusted source for integrative nutrition.
6. Has conducted revolutionary work related to advancements in research, clinical practice, or education.
8. Is a pioneer in clinical research related to integrative nutrition.
9. Shows dedication, leadership and advocacy in creating, practicing, and teaching integrative nutrition.
10. Has initiated innovative clinical advances in integrative nutrition.
11. Shows dedication to advancing the integrative nutrition paradigm through research, advocacy and writings.
12. Demonstrates leadership and advocacy in the clinical practice of integrative nutrition.
13. Shows exceptional creativity, dedication, leadership, and brilliance in developing and advancing the principles and practice of integrative nutrition.
14. Is a catalyst for change in advancing the field of integrative nutrition.
15. Has demonstrated positive influence among colleagues and those they serve.
16. Embodies and advances the principles of Nutritional Medicine. Has a history of collaboration across disciplines and healing philosophies.
17. Has a compelling vision for the future of nutritional medicine practice that inspires and encourages others.
18. Is a resilient change agent and role model in the nutrition community, influencing peers and institutions to effect long-term change.

Kathie Swift truly embodies these characteristics and we are grateful to her for all she has done for the field of integrative nutrition.

Excellence in Practice Award: Mary Beth Augustine, RD, CDN
Mary Beth has been a pioneer in the field of Integrative Nutrition Practice. Mary Beth serves as credentialing Co-Chair along with Kathie Swift, of the DIFM Credentialing Task Force. She works tirelessly and is generous with her mentoring and internship opportunities.

Excellence in Service Award: Colleen Fogarty Draper, MS, RD, LDN
Colleen was the Nutritional Genomics Chair for DIFM and continues to act as an advisor. Colleen introduced DIFM to the Genomics world and continues to support DIFM from her international post; she is a recognized leader in this emerging field.

Student Stipend Award: Monique Richard
DIFM was proud to honor Monique with this award. She had the opportunity to attend a conference and write about it for the DIFM Newsletter. We are fortunate to have bright, passionate students carry the profession forward, and support Monique’s leadership.
The purpose of the *NetWorkings* column is to highlight our networking alliances and inform members of timely resources and educational opportunities in the area of Integrative and Functional Nutrition.

**American Botanical Council**

We are pleased to offer a network relationship with ABC: American Botanical Council. ABC is an independent resource and information clearinghouse on the topic of herbal medicine. ABC’s mission is to provide education using science-based and traditional information to promote responsible use of herbal medicine to consumers, health care professionals, government agencies, the herbal products industry, and the media. Our relationship with ABC will help to educate our members about the use of herbs and beneficial botanicals.

**Arizona Center for Integrative Medicine**

The Arizona Center for Integrative Medicine (AzCIM), founded in 1994 by Dr. Andrew Weil at the University of Arizona, is the world leader in integrative medical education.

AzCIM Mission: to lead the transformation of health care by creating, educating and actively supporting a community that embodies the philosophy and practice of healing-oriented medicine, addressing mind, body and spirit.

The AzCIM presents the annual Nutrition & Health Conference, a continuing education course that assembles internationally-recognized researchers, clinicians, educators, and chefs whose work focuses on the interface between nutrition and healthful living.

**Integrative Healthcare Symposium 2013**

**Integrative Healthcare Symposium**  
February 27, 2013 - March 02, 2013

Integrative Healthcare Symposium  
Conference: February 28 – March 2, 2013  
Pre-Conference: February 27, 2013  
Hilton New York, NY

Join us at the 2013 Integrative Healthcare Symposium where forward thinking practitioners and like-minded professionals gather seeking a multi-disciplinary approach to patient care. Healthcare professionals are invited to join the integrative healthcare community to hear from nationally recognized practitioners and experts. Tracks for 2013 include: Nutrition, Mind Body Spirit, Hormones/Women’s Health, Integrative Approaches (to include: Cardiology, Allergy, Oncology, Pediatrics, and more), Integrative Nurses, and World Medicine. CME credit certified by Beth Israel Medical Center and St. Luke’s & Roosevelt Hospitals.

Register online at [www.ihsymposium.com](http://www.ihsymposium.com) and use:  
Priority Code: 105431 for your 15% Dietitians in Integrative and Functional Medicine (DIFM) discount.  
Remember, if you have attended in the past, you receive a 25% discount.

**Omega-3 Learning**

The Omega-3 Learning and Education Consortium for Health and Medicine

Established in December 2007, the International Omega-3 Learning and Education Consortium for Health and Medicine is comprised of scientists and educators from around the world who are striving to improve human health through nutrition education. Formed to facilitate learning by consumers and healthcare professionals about omega-3 fatty acids in food, nutrition, and medicine; disseminate educational materials about omega-3 fatty acids for improving consumer health and nutrition; and advance education concerning technologies for broadening the food applications for these nutrients that benefit humans, the Consortium is making an effort to bring this information to all parts of the globe.

Throughout the educational website, you can find answers to basic questions about omega-3 fatty acids such as what they do, why you need them, where to find them, and how to assess if you are getting the right amount; as well as having access to a variety of materials that includes: articles, newsletters, product databases and research findings. Tailored to the needs of teachers and their curriculums, we also provide exercises, lectures, CD-ROMS and fact sheets.

With the global population eager for information on how to improve the quality of life for their families, the Consortium is a beneficial instrument in this pursuit for nutrition information.
Omega-3 learning provides vital, unbiased and reliable information in an effort to be the leading global authority for discovery, learning and engagement in omega-3 fatty acids aimed at improving health and advancing the use of omega-3 fatty acids in food, nutrition and medicine.

**The Institute for Functional Medicine**

IFM Benefits for Dietitians in Integrative and Functional Medicine Members include:

**Discounts:**
IFM members will receive $100 off membership for a rate of $195.

IFM members must place orders over the phone with Debbie at 800.228.0622 ext. 281.

Please have your Academy membership number available, so we can confirm your DIFM membership.

**IFM Membership**

DIFM members receive special pricing on membership.

Regular Membership = $295
DIFM members = $195

IFM Membership connects you to a robust intellectual and clinical lineage and invites your participation in changing medical education and practice. Your membership benefits include an electronic library of tools, educational resources and interactive platforms for enhancing and streamlining your clinical practice and connecting with clinicians in disciplines spanning the healthcare field.

Unlock access to the Functional Medicine Toolkit, Natural Standard Database, IFM Forum, discounts and more by beginning your IFM membership today.

**ISNN: Int’l Society Nutrigenomics/Nutrigenetics**

International Society of Nutrigenetics and Nutrigenomics (ISNN)

http://www.isnn.info/

Mission: To serve as a focus for communication among interested scientists working in several disciplines (including nutrition, genetics, cellular and molecular biology, physiology, pathology, biochemistry, clinical medicine, and public health) studying the role of genetic variation and dietary response and the role of nutrients in gene expression.

The ISNN was established in 2005 under the Presidency of Artemis P. Simopoulos, MD (USA) to increase the understanding of the role of genetic variation and dietary response and the role of nutrients in gene expression. This purpose is pursued through research and education of professionals and the general public.

ISNN offers the following benefits to DIFM members:

- A 20% discount for all DPG members on ISNN membership, which includes:
  - on-line access to the *Journal of Nutrigenetics and Nutrigenomics*
  - recordings of the most recent annual conference
- Free access to the www.nutrigenetics.net database
- ISNN provides nutritional genomics content for DPGs’ websites and newsletters
- Webinar offerings in collaboration with ISNN and the Research DPG

**DIFM 2012-2013 Executive Committee.**

From the left: Jacqueline Santora Zimmerman, MS, RD; Emily D. Moore, RD, LDN; Erica Kasuli, MS, RD; Mary Purdy, MS, RD; Julie Starkel, MS, MBA, RD; Lea Russell, MBA, RD, LDN; Sarah Harding Laidlaw, MS, RD, MPA, CDE; Ane Marie Kis, MS, RD, LDN; Monique M Richard; Christine Doolittle MS, RD, CSSD, LDN, CLT; Diana Noland, MPH, RD, CCN; Alicia Trocker, MS, RD; Robin Foroutan, MS, RD, HHC; Ann M Sukany-Suls, MEd, RD, LD; Kathy Moore, RD, LD, CCN; Rita Kashi Batheja, MS, RD, CDN; L Kathleen Mahan, RD, Maryelaine Sotos, RD, LD; Kathie Madonna Swift, MS, RD, LDN; Lisa Powell, MS, RD; Mary Beth Augustine, CDN, RD; Elizabeth Redmond, PhD, MS, RD, LD; Melinda Dennis, MS, RD, LDN; Amy Jarck.
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