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This year, we are proud to be collectively celebrating our 25th anniversary: a quarter of a century spent promoting and expanding the ideas, philosophies, and central tenets of personalized and functional medicine.

Throughout this exciting and dynamic event in Hollywood, you will have the opportunity to participate in extensive and interactive discussions, connect with like-minded professionals, and–most importantly–experience and internalize the evidence-based research presented by experts and thought-leaders in preventative medicine. We are proud to offer an event that represents an elite medical education platform: a conference during which multidisciplinary health practitioners are collaboratively redefining and reshaping medicine. It is our hope that you leave this conference armed with new clinical protocols and skills, and the arsenal of tools necessary to immediately and effectively implement them into your practice, while simultaneously improving patient care and maximizing the potential of your practice.

Our medical approach is rooted in cutting-edge science and personalized care, both utilized to prevent and reverse the effects of age-related diseases. We believe that when healthcare practitioners view the patient holistically, and do not solely focus on surface-level symptoms, the benefits are enormous.

As this brand of medicine continues to grow, we hope you will also reaffirm your support of this specialty. Your attendance at this event is all a part of the transformation necessary for the future of medicine, and we applaud you for helping to lead the evolution of healthcare.

With warm regards,

Ronald Klatz,
MD, DO
President, A4M

Robert Goldman,
MD, PhD, DO, FAASP
Chairman, A4M

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A4M MMI | SPRING CONGRESS 2017

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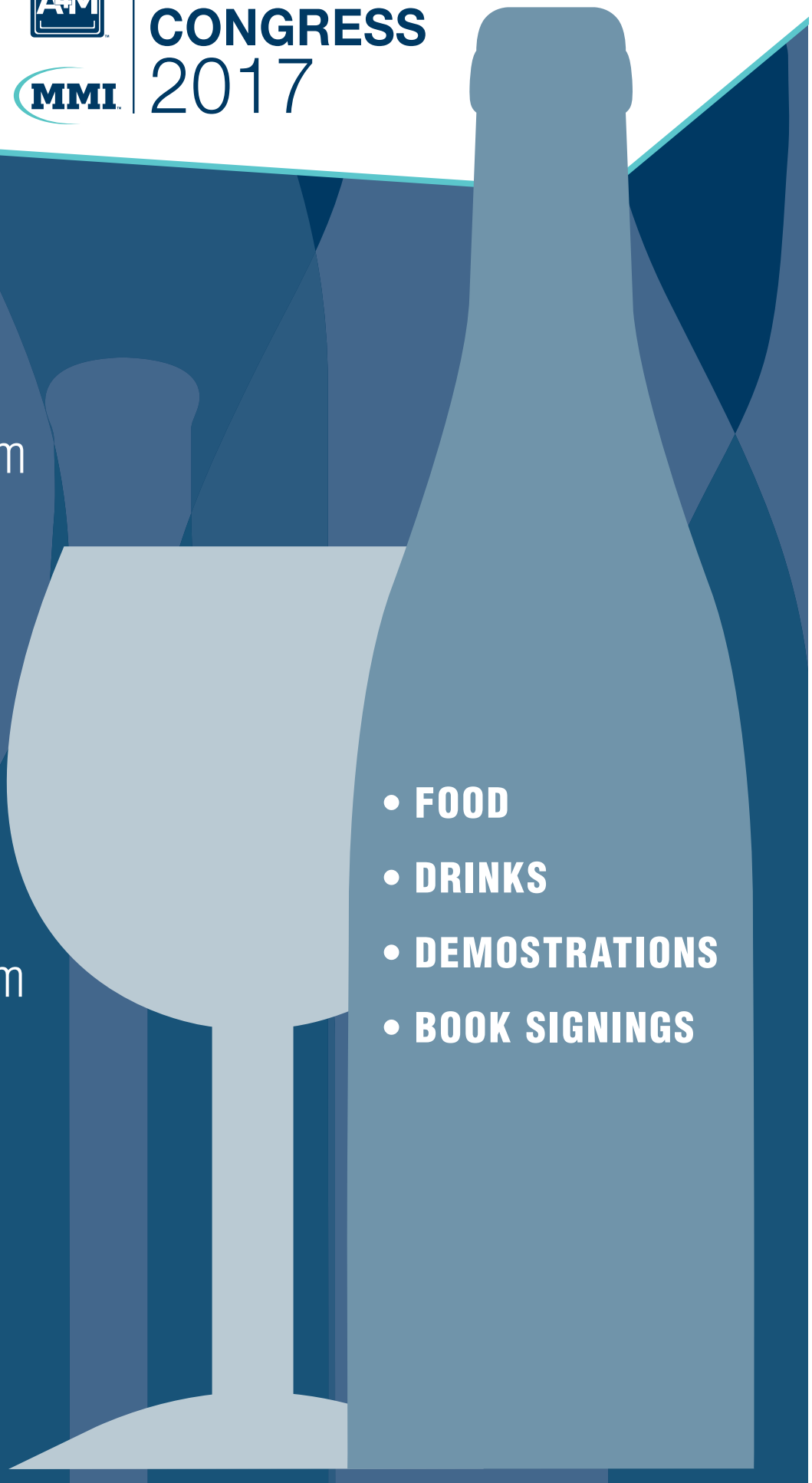

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Booth #420

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Booth #316

Booth #1000

Booth #119

Booth #125

Booth #1015

Booth #201

Booth #216

Booth #913

Booth #517

Booth #1013

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A Case Report of a 53-Year-Old Female with Rheumatoid Arthritis and Osteoporosis:

Focus on Lab Testing and CAM Therapies

By Kara Fitzgerald, ND

ABSTRACT

A 53-year-old female presented with rheumatoid arthritis and osteoporosis. Additional conditions and symptoms included Raynaud syndrome, fatigue, irritable bowel syndrome associated constipation (IBS-C), gastroesophageal reflux (GERD), menopausal symptoms, chronic urinary tract and upper respiratory infections, and weight gain. She was taking Arthrotec 75® (a combination of diclofenac and misoprostol – for pain and inflammation), Fosamax Plus D® (alendronate with vitamin D3 – recently prescribed because of low bone density), and Catapres® (clonidine – for menopausal symptoms). Against the advice of her rheumatologist, she had recently discontinued taking Plaquenil® (hydroxychloroquine), methotrexate, and prednisone, due to significant side effects. Lab tests to identify underlying imbalances and to direct treatment were ordered. Treatment included dietary, nutritional, hormonal, and mind/body support. After one year of therapy, the patient experienced improvement with all of her presenting conditions and symptoms, which enabled her to discontinue several medications. She became versed in identifying and avoiding the environmental triggers of her disease, including foods (dairy, wheat, eggs, and soy), molds, and emotional stress. Antinuclear antibodies were normalized. She experienced a 7.5-percent improvement in left trochanteric bone density – comparable to bisphosphonate therapy. Mild improvements were also noted in the spine and bilateral femoral neck. (Altern Med Rev 2011;16(3):250-262)

Patient Medical History and Initial Visit Findings NV was 53 years old when she presented with a four-year diagnosis of inflammatory arthritis (IA), which had been made by her rheumatologist. She complained of nearly constant swelling, stillness, and pain, with occasional numbness and tingling in her hands, wrists, and elbows. At the visit, she reported her pain using a visual analog scale (VAS) as 8/10 (0 = no pain; 10 = greatest pain) and stated that the morning pain was frequently unbearable, rating it as 9/10-10/10. The pain did not respond well to medication and lasted most of the morning. She had been using diclofenac 75 mg and misoprostol 200 mcg, twice a day for pain for about one year, with minimal relief. Because of the swelling in her fingers, she had been unable to wear her wedding ring for approximately one year. Although she thought she noted a worsening of IA symptoms when she ate dairy products, she continued to consume them.

NV recalled the onset of her arthritic symptoms, about 6.5 years earlier, coincided with the development of mold, which had been found after flooding in her basement. NV did not know what type of mold it was. She and her husband moved from the home two months after the start of her symptoms, and she experienced a full remission immediately after the move. She did not receive medical attention for her complaints at that time. Two years later, after the loss of a close aunt, NV experienced a return of all her arthritic symptoms. She was referred to a rheumatologist who, according to NV, diagnosed her with inflammatory arthritis and prescribed hydroxychloroquine, methotrexate, and prednisone. She did not recall the dosages of the medications. While they did help her arthritis, she was

unable to tolerate the side effects of the medications (reflux, photosensi- tivity, and alopecia). She discontinued the medica- tions against the advice of her rheumatologist and refused new medications. NV was also taking Arthrotec 75® (combination of the non-steroidal anti-inflammatory drug [NSAID] diclofenac with the synthetic prostaglandin misoprostol added to prevent NSAID-induced gastric ulcers), alendro- nate with D3 (Fosamax Plus D® – prescribed– prescribed because of low bone density), and clonidine (Catapres® – for menopausal symptoms).

NV reported that laboratory results within the past six months showed a pronounced elevation of antinuclear antibodies (ANA) and erythrocyte sedimentation rate (ESR); rheumatoid factor (RF) was negative. She reported that her ANA had been consistently positive since she was first tested by the rheumatologist, about four and a half years earlier.

NV also reported severe fatigue and rated it at 9/10, (1 = no fatigue, 10 = severe fatigue), with the afternoons being the most dificult time of day. She awoke feeling tired and unrefreshed, a situation that she attributed to IA and insomnia secondary to hot flashes. Although NV took clonidine (0.2 mg qhs) for menopausal hot flashes at night, it was only mildly helpful.

Patient-reported medical history included chronic urinary tract infections (UTIs), Raynaud syndrome in both hands and occasionally in the feet upon exposure to cold temperatures, a recent diagnosis of osteoporosis, irritable bowel syndrome with severe constipation (IBS-C; 1-2 bowel movements per week), and gastroesophageal reflux disease (GERD). She had gained 30 pounds over the past four years. She had undergone a radical hysterectomy (uterus, ovaries, fallopian tubes, and cervix) due to severe uterine fibroids when she was 32 years old, at which time the hot flashes and insomnia developed. NV had taken multiple antibiotics over the years for UTIs and upper respiratory tract infections.

NV's past family and social history included stressors from caring for ailing parents. Her father, age 86, had type 2 diabetes and had experienced two myocardial infarctions. Her mother had died at age 85. Prior to her death, she had undergone three hip replacements to treat severe osteoporosis. She had had a complete thyroidectomy, but was unable to recall the medicals reasons why this procedure was done.

NV had retired from nursing after 20 years. Her primary form of exercise involved training dogs. She was the primary caregiver of her father, who was living in her home. While they were very close, she found the caregiving highly stressful. She had a strong marriage and a number of good, supportive friends.

NV's diet and nutritional history also included multiple stressors. She skipped breakfast, drank black tea daily, and frequently had double cheeseburgers from a fast food restaurant for lunch. Dinner was frequently eaten out, and most recently had included Mexican chicken with rice, chips, and salsa. NV craved salty and sweet foods and drank diet soda daily.

At first visit, NV was 5'6" tall and weighed 170 lbs. Her body mass index was 27.4. There was marked swelling, warmth, and reported tenderness in her metacarpal phalangeal joints and her proximal interphalangeal joints bilaterally with passive and active range of motion. There was limited digital flexion bilaterally. Her capillary refill rate was normal, with no evidence of digital cyanosis or ulceration. Her wrists and elbows were warm, with mild edema and tenderness to palpation; active

Table 1. Results of ANA, hs-CRP, RF, and Thyroid Testing

Test	Initial	6-month Follow-up	1-year Follow-up	Reference Range
Antinuclear Antibodies (ANA)	1:2860 (H)	1:2560 (H)	<1:40	<1:40
hs-CRP	5 (H)	5.6 (H)	N/A	< 1 mg/dL
Rheumatoid Factor	N/A	24 (H)	< 14	<14 IU/mL
Thyroid Stimulating Hormone	1.48	3.45	0.85	0.40-5.50 IU/mL
Free T3	2.5	2.1	2.7	2.0-4.4 pg/mL

H denotes value considered to be high for the indicated test. N/A indicates test not done.

and passive range of motion were within normal limits, but painful with passive and active range of motion. Her neck was supple, with no masses. Her thyroid was of normal size, smooth without masses, and not tender. Her heart demonstrated a regular rate and rhythm, with no murmurs or rubs noted; her lungs were clear to auscultation bilaterally. Blood pressure was 112/72 mm HG.

LABORATORY TESTS AND FINDINGS

The list below summarizes the lab tests ordered for this patient and the clinical rationale for selecting these tests.

Complete blood count (CBC), comprehensive metabolic panel (CMP) with lipids, and thyroid panel (Table 1): Obtained to rule-out infection, anemia, and thyroid disease, and to check kidney and liver function.

Antinuclear antibodies (Table 1): ANAs are frequently elevated in inflammatory arthritis and indicate level of disease activity. They are useful for tracking treatment efficacy.

High-sensitivity C-reactive protein (hs-CRP)(Table 1): hsCRP is a standard acute phase reactant protein used to monitor general inflambition.

Rheumatoid factor: RF is an autoantibody, most relevant to rheumatoid arthritis.

Deoxypyridinoline (DPD) (Table 2): A marker of bone resorption tracked by a urine test to help monitor treatment efficacy for osteoporosis. Variability in serial testing is reduced by using the same lab and by testing at the same time of day.

Vitamin D (Table 2): Low levels are associated with increased inflammation and with increased incidence of numerous diseases.[1]

Food-Specific IgG4 antibodies (Table 3): Food reactions have been associated with inflammatory arthritis.[2,3] Multiple IgG4 reactions suggest intestinal hyperpermeability, also a factor in inflammatory arthritis. Removing o" ending foods may reduce pain and inflammation.

Multiprofile panel (amino acids) and essential elements (Table 4), essential fatty acids (Table 5), organic acids (Table 6), and oxidative stress markers: Obtained to detect nutrient deficiencies or imbalances that might be contributing to inflammation (only significant findings are discussed below).

Stool test (assessment of GI inflammation, microbiota, and pancreatic exocrine function) (Table 7): GI imbalances have been identified as involved in the pathogenesis of rheumatoid arthritis.[4]

Initial and subsequent findings on all lab tests are noted in the tables below. (Note: Complete blood count, comprehensive metabolic profile [also known as a complete blood chemistry panel], and lipid testing were within normal lab reference ranges and are not presented in Table 1.)

Bone densitometry obtained by Dexa scan (DXA) within the previous two weeks prior to the initial visit demonstrated left trochanter osteoporosis, with a T-score of -2.7 (a score below -2.5 is indicative of osteoporosis by World Health Organization [WHO] standards) (Table 2). As a result, she had been started on alendronate.

Table 2. Results of Bone DPD, DXA, and Vitamin D Testing

Test	Initial	6-month Follow-up	1-year Follow-up	Reference Range
Deoxypyridinoline (DPD)	4.9	7.7 (H)	5.7	≤ 7.4 nm/millimole creatinine
DXA T score (left trochanter)	-2.7	N/A	-2.5	+1 to -1 normal; -1 to -2.5 osteopenia; < -2.5 osteoporosis
25-Hydroxyvitamin D	27	N/A	N/A	10-64 ng/mL

H denotes value considered to be high for the indicated test. N/A indicates test not done.

INITIAL DIAGNOSIS

Although NV stated she had previously been diagnosed by her rheumatologist as having inflammatory arthritis, her clinical presentation strongly suggested rheumatoid arthritis (RA) as defined by 2010 American College of Rheumatology/European League Against Rheumatism (ACR-EULAR)

collaborative initiative classification criteria.5 These findings include involvement of greater than 10 joints (including at least one small joint), abnormal CRP, and greater than six weeks symptom duration.

NV's presentation also fit the older American Rheumatism Association diagnosis of RA, including morning stiffness lasting at least one hour, arthritis of three or more joint areas, hand joint involvement, and symmetrical distribution.

Anti-cyclic citrullinated peptide antibody (anti-CCP), a relatively new blood test used to help confirm a diagnosis of rheumatoid arthritis, was not conducted because, at the time patient first presented (2006), anti-CCP was not widely available. In 2010, anti-CCP testing was made a substantial part of the 2010 ACR-EULAR classification criteria for RA.[5]

Other potential issues revealed during initial testing or self-reported by the patient during intake included: osteoporosis (verified by DXA scan), Raynaud syndrome (patient self-reported), fatigue (patient self-reported), IBS-C (patient self-reported), GERD (patient self-reported), menopausal symptoms (patient self-reported), chronic UTIs (patient self-reported), several food sensitivities (verified with food-specific IgG4 antibodies) (Table 3), inflammation (verified with hs-CRP), oxidative stress (verified with testing for oxidative stress markers), and dysbiosis (verified with stool testing).

INTERVENTION

The initial focus was on reducing gastrointestinal and systemic inflammation and treating nutrient deficiencies identified via laboratory tests (Tables 4-6), and clinical assessment specific to the patient. This was achieved by prescribing a gastrointestinal anti-inflammatory medicinal food (which included antioxidants, vitamins and minerals, hypoallergenic rice protein, glutamine, anti-inflammatory botanicals and active constituents), dietary supplements, and intravenous (IV) nutrients. Omega-3 fatty acids (EPA and DHA) were given to correct insufficiencies identified on plasma fatty acid testing. Vitamin D was supplemented to increase vitamin D levels to a more desirable range. A proteolytic enzyme compound was given to help reduce the inflammatory proteins associated with RA and because evidence suggests proteolytic enzymes can reduce inflammatory mediators in rheumatic diseases.[6] CoQ10 and L-carnitine were supplemented to correct insufficiencies detected inlab testing. An anti-inflammatory oligoantigenic diet based on food-specific IgG4 antibody findings (Table 3) was prescribed. This diet also emphasized increasing monounsaturated fatty acid intake. Because stool testing (Table 7) identified dysbiosis, a botanical antimicrobial formula was given to reduce the number of opportunistic bacteria. A digestive enzyme formula was used to improve digestion of food and assimilation of nutrients. Selected nutrients – minerals, amino acids, B vitamins, vitamin C, and glutathione – were delivered intravenously (IV) to achieve rapid repletion. Nutrient IVs are suggested to be effective at improving fatigue, which was a chief complaint of the patient.[7]

Protocol for supplementation is listed below; all supplementation was oral unless otherwise indicated.

- Anti-inflammatory medicinal food, 2 scoops every morning
- EPA/DHA concentrate 3,000 mg, 1 tsp/day
- Vitamin D 2,000 IU, 1 drop/day
- Proteolytic enzymes, 3-6 tablets three times daily between meals as needed for pain (includes pancreatin, bromelain, papain, trypsin, chymotrypsin, lipase, rutin)
- CoQ10 100 mg, 1 tab/day
- L-Carnitine 500 mg, 2 tabs/day
- Antimicrobial botanicals, 3 capsules twice daily (includes wormwood, oleuropein, berberine, grapefruit seed extract, thyme, uva ursi extract,

Due to space constraints, this article may be missing tables that support the research. For in depth information and additional research, please visit https://www.a4mwc.com/wp-content/uploads/2017/02/A-Case-Report.pdf

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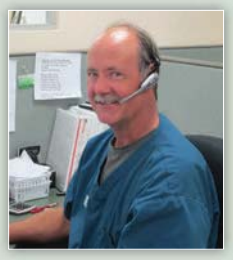

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MODULE II

A Metabolic & Functional Approach to Cardiovascular Disease

The causes, mechanisms, diagnosis, and management of cardiovascular and cardiometabolic diseases including CHD, CHF, hypertension, metabolic syndrome, dyslipidemia, atherosclerosis, and renal disease are covered in this module. Topics include cardiovascular pathophysiology and biology, inflammation, oxidation, hormones, adipokines, stress, nutrition and nutrigenomics, glycemic control, environmental factors and toxicology, infections, and risk factor testing.

MODULE III

A Metabolic & Functional Approach to Neurology

This module reviews the most recent developments in the field of neurology utilizing a metabolic approach to the prevention, management, and treatment of neurologic diseases. The course will cover pathophysiology and the role of neurotransmitters, inflammatory and degenerative disorders, neurovascular diseases, psychological and psychiatric syndromes, the gut-immune-brain connection, and healthy brain function.

MODULE IV

A Metabolic & Functional Approach to Gastroenterology

Comprehensive metabolic, functional, and nutritional approaches to gastrointestinal dysfunction and disease are reviewed in this module. Physiology and pathophysiology, GI microbiome and dysbiosis, gut permeability, hormones, diet, inflammatory bowel diseases, celiac disease and gluten sensitivity, the gut-immune-brain connection, irritable bowel syndrome, and other digestive and glandular disorders are highlighted.

MODULE V

A Metabolic & Functional Approach to Nutrition & Exercise

This module focuses on the role of nutrition and exercise in metabolic medicine with an emphasis on guidelines, protocols, and clinical applications. Nutritional biochemistry, aging, metabolism, diet and nutritional supplements, weight gain, weight loss and maintenance, exercise/sports and activity, nutrigenomics, proteomics, and metabolomics, and cancer risk are discussed.

MODULE VI

A Metabolic & Functional Approach to Toxicology & Detoxification

This module covers symptoms, disorders and diseases associated with exposures of heavy metals, pesticides, chemicals, drugs, nutrients, the natural environment, and other toxic causes of oxidative stress. This course describes the pathophysiology of toxic exposure, methods to prevent and avoid exposure including nutritional and lifestyle approaches, early detection, lab testing, and treatment protocols. Metabolic, digestive and antioxidative detoxification phases and processes are detailed.

MODULE VII

A Metabolic & Functional Approach to Inflammation & Autoimmune Disease

This module focuses on inflammatory disorders, autoimmune diseases, allergies, cancer, and the gut-immune-brain connection. Cellular and molecular biology of immunity, the cellular stress response, oxidation, genetic damage, inflammation, etiology of disease including environmental and lifestyle factors, and the risk for cancer development are reviewed. Clinical approaches to patient evaluations, testing, and disease management are provided.

MODULE VIII (NON–CME)

Clinical Practice Protocols

This review course examines patient case histories with a range of metabolic symptoms, disorders, or diseases that are covered in Modules I-VII. This clinical intensive course provides the tools to prevent, detect, diagnose, treat, and manage a variety of patient conditions that are commonly and uncommonly observed in the clinical setting. The goal is to provide comprehensive metabolic, functional, and nutritional approaches towards disease management that enable the Fellow to practice Metabolic Medicine confidently and effectively.

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By Laura Salvador, MD. Anti-aging Group Barcelona, Barcelona, Spain 08017**, Gunasekaran Singaravelu, PhD.** T. A. Sciences Inc., NY 10170**, Calvin B. Harley,PhD.** Independent consultant, Murphys, CA 95247**, Peter Flom, PhD.** Peter Flom Consulting, NY 10024**, Anitha Suram, PhD. and Joseph M. Raffaele,MD.** PhysioAge Systems, LLC, NY 10019

SUMMARY

TA-65 is a small molecule telomerase activator. The current study summarizes the findings on telomere length changes from a randomized, double blind, placebo controlled study of TA-65 over a one year period. The study was conducted on 117 relatively healthy CMV positive subjects aged 53-87 years old. Subjects taking the low dose of TA-65 (250 units) significantly increased telomere length over the 12 months period (530 ± 180 bp; p=0.005) while subjects in the placebo group significantly lost telomere length (290 ± 100 bp; p=0.01). The high dose of TA-65 (1000 units) showed a trend of improvements in telomere length compared to the placebo group;However the improvements did not reach statistical significance. Telomere length changes in the low dose group were similar for both median and 20th percentile telomere lengths. The findings suggest that TA-65 can lengthen telomeres in a statistically and possibly clinically significant manner.

INTRODUCTION

TA-65 was discovered as a chemically defined small molecule activator of telomerase in the year 2000.[1,2] Interest in TA-65 as a telomerase activator is largely driven by the potential health benefit of telomere maintenance. This report provides the first evidence from a randomized, double blind, placebo controlled study that dietary supplementation with TA-65 has the ability to lengthen telomeres and potentially improve health outcomes in humans, with no observed safety concerns.

CYTOMEGALOVIRUS (CMV) INFECTS THE MAJORITY OF THE POPULATION WORLDWIDE ASYMPTOMATICALLY.

Here we investigated whether TA-65 can alleviate telomere attrition in CMV+ subjects, to support our previous observational study finding that TA-65 appears to preferentially lengthen critically short telomeres in CMV+ subjects.[1] The current study is aimed at understanding telomere length changes in CMV+ subjects taking the telomerase activator TA-65 in comparison to the placebo group.

MATERIALS AND METHODS

STUDY DESIGN

This is a randomized, double blind, placebo controlled, parallel group study with three arms. Subjects were randomized to placebo, low dose, or high dose groups using a random number table. The Principle Investigator and subjects were blinded until the completion of the study. Following initial screening (168 subjects), a total of 117 subjects were recruited and 97 subjects completed the study. Forty-five subjects 45 received TA-65: 23 subjects received one TA-65 capsule (250 units) and three placebo capsules; 22 subjects received four TA-65 capsules, each consisting of 250 units of TA-65 (i.e. 1000 units/4 capsules). Fifty-two 52 subjects received four placebo capsules. The study involved 104-day cycles consisting

of 90 days of taking product or placebo, followed by 14 days of abstinence from taking the test materials. The trial was run for a period of one year. The subjects had 6 visits during the study: pre-selection, day 0 (baseline), at 3 months, 6 months, 9 months and 12 months (final visit). The capsules were taken on an empty stomach in the morning.

The study was conducted in Barcelona, Spain. Inclusion criteria were subjects with IgG antibodies positive for CMV, aged between 53 and 87 years old and who were able to sign informed consent. Exclusion criteria were subjects with active carcinoma, a prior history of cancer, severe infectious diseases (Hepatitis C, Hepatitis V, HIV and syphilis), autoimmune diseases, hormonal therapy, prior intake of TA-65, or nutritional supplements enriched with Omega-3. The male to female ratio was 1.25.

BLOOD COLLECTION

Blood was collected 5 times during the study: at day 0, at 3, 6, 9 and 12 months. Blood was tested for the clinical biomarkers, and an aliquot was used to isolate peripheral blood mononuclear cells (PBMC) for the high-throughput measurement of telomere length by fluorescent in situ hybridization (FISH).

MEASUREMENT OF TELOMERE LENGTH

Median telomere length in PBMC was measured by Life Length (Spain) using the high throughput (HT) Q-FISH technique. This method is based on a quantitative fluorescence in situ hybridization method modified for cells in interphase.[3]

CLINICAL LABORATORY ASSAYS

During visits at baseline and at the end of visits at 3, 6, 9 and 12 months after initiation of the test products (placebo or TA-65), vitals were checked and blood was drawn from each subject. Assays for a comprehensive metabolic panel, hematology panel, lipid panel, inflammatory markers and immune cells were carried out at Labco, Spain.

STATISTICAL ANALYSIS: MULTILEVEL MODEL

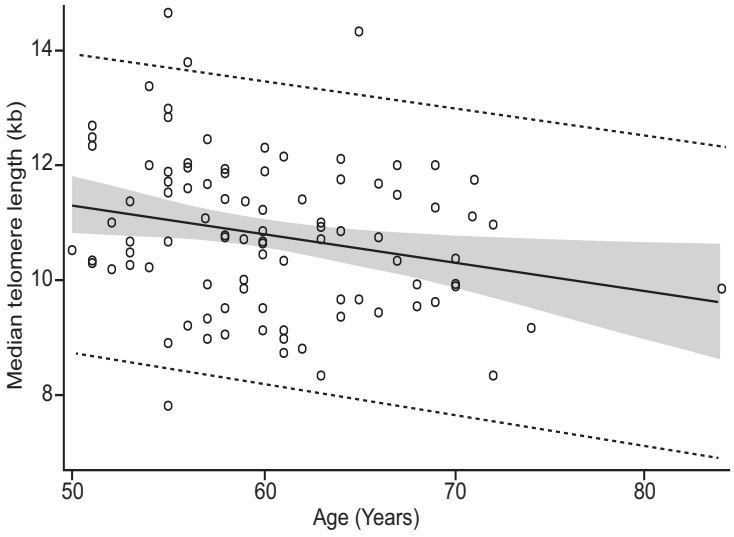
Since each person was measured multiple times, the errors from a regression model would not be independent. To deal with this, we used a multilevel model. Because we were interested in nonlinear and possibly non-monotonic relationships between time and median telomere length, we used month as a categorical variable. We included time, group and their interaction in the model. The interaction term is most important, since it indicates whether the effect of time on median telomere length was different in the different groups.

RESULTS

Median telomere length: baseline characteristics

We used a linear regression model to analyze cross-sectional data of telomere lengths of all 97 subjects at baseline. Telomere length at baseline ranged from 7 to 15 kilo base pairs (kb) for the subjects aged from 53 to 87 years, and was inversely correlated with age (R-Square = 0.056). The cross sectional rate of decline in telomere length for the baseline population was 50 ± 21 bp/year. Figure 1 shows the distribution of telomere length of the study participants at baseline.

Figure 1



Average change in the median telomere length for TA-65 group and placebo group

Median telomere length (TL) was measured in placebo group, low dose TA-65 (250 units) group and high dose TA-65 (1000 units) group at baseline, 3 months, 6 months, 9 months and 12 months (see Table 1). At baseline, there were no significant differences in TL among the three groups, although the range of lengths was bigger for the placebo group.

TABLE 1: AVERAGE OF MEDIAN TELOMERE LENGTHS AT 5 VISITS.

The average telomere length in Placebo, low dose TA-65 (250 units) and high dose TA-65 (1000 units) groups at baseline and at the end of 3, 6, 9 and 12 months in kilo base pairs (kb) with standard deviation (s.d.).

	Average of median telomere length (s.d.) in kb				
Group	**Baseline**	**3 months**	**6 months**	**9 months**	**12 months**
Placebo	11.03 (1.49)	11.00 (1.38)	11.19 (1.28)	10.85 (1.36)	10.74 (1.55)
TA-65 (250 Units)	10.57 (1.12)	10.92 (1.30)	10.89 (1.30)	10.92 (1.23)	10.81 (1.40)
TA-65 (1000 Units)	10.44 (1.04)	10.86 (1.40)	10.59 (1.32)	10.61 (1.11)	10.22 (1.19)

Change in the median telomere length for TA-65 group vs placebo group: multilevel analysis

The effect of greatest interest was the interaction effect between time and group. The main effect of time tests whether the placebo changed over time, while the main effect of group tests whether the groups were different at baseline. While both must be accounted for, our interest is in whether the three groups behaved differently over time and this is tested by the interaction (Group and Time interaction). It is important to distinguish between the raw data (shown in table 1) and the parameter estimates by the multilevel analysis (shown in table 2).

The telomere lengths at baseline among the three groups were not significantly different as estimated by the group effect (Table 2). In the placebo group, there was a decrease in median TL at 9 and 12 months compared with baseline (Table 2 and Figure 2). At 9 months the decrease was 170 ± 90 bp (p= 0.07) and at 12 months the decrease was 290 ± 100 bp (p=0.01).

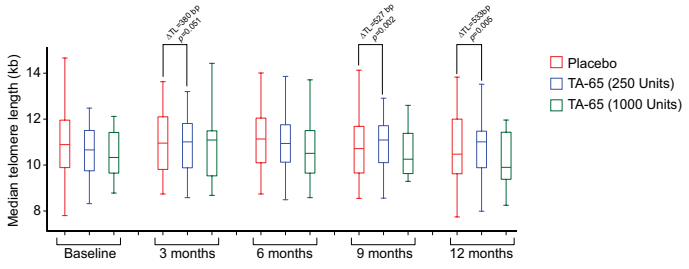
In the low dose TA-65 (250 unit) group, there was an increase in median TL at 3 months followed by relative stability (Table 2). Compared to the placebo group, the effect of time was significantly different in the TA-65 groups. The effect of low dose TA-65 (250 units) on median TL was significantly higher at 9 months (median TL was 530 ± 170 bp longer, p=0.002), and 12 months (again, median TL was 530 ± 180 bp longer, p= 0.005) and borderline significantly higher at 3 months (median TL was 380 ± 190 bp longer, p=0.05) but not significant at 6 months (Table 2 and Figure 2).

TABLE 2: MULTILEVEL MODEL ANALYSIS OF MEDIAN TELOMERE LENGTH CHANGES COMPARED TO BASELINE.

Placebo, low dose TA-65 (250 units) and high dose TA-65 (1000 units) groups are compared at baseline (0 months), and at the end of 3, 6, 9 and 12 months for median telomere length. The data show change in telomere length in comparison to the reference group(s). Results were adjusted for age and sex.

Effect	Group	Time (months)	Change in TL (kb)	Standard Error	*P* value
Group effect	Placebo	At baseline	Reference group		
	TA-65 (250 Units)		-0.47	0.32	0.15
	TA-65 (1000 Units)		-0.24	0.33	0.47
Time effect	Placebo	0	Reference group		
		3	-0.02	0.11	0.82
		6	0.16	0.09	0.07
		9	-0.17	0.09	0.07
		12	-0.29	0.10	0.01
Group and time effect	TA-65 (250 Units)	0	Reference group		
		3	0.38	0.19	0.05
		6	0.16	0.16	0.34
		9	0.53	0.17	0.002
		12	0.53	0.18	0.005
	TA-65 (1000 Units)	0	Reference group		
		3	0.25	0.20	0.22
		6	-0.13	0.17	0.46
		9	0.22	0.17	0.20
		12	-0.06	0.19	0.77

Figure 2



The high dose TA-65 (1000 units) showed a trend of improvement in telomere length compared to the placebo group, but the improvements did not reach statistical significance. It is not known why in this study the high dose TA-65 (1000 units) group appeared to change in a random manner. This may have resulted from a compliance issue with subjects who took the higher dose.

Change in telomere length of the short telomeres (20th percentile) for TA-65 group and placebo group.

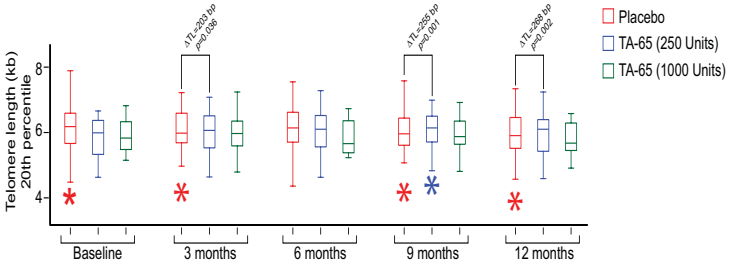
The shortest quintile of telomere lengths (< 20th percentile) were represented in table 3.

In the placebo group, there was a gradual decrease in average shortest quintile telomere length with time, as expected (Table 3). However, telomere length of the 20th percentile in the low dose TA-65 (250 units) group increased at 3 months and was then relatively stable. In the high dose TA-65 (1000 units) group, there was no consistent change in the 20th percentile telomere length (see Table 3).

TABLE 3: AVERAGE OF 20TH PERCENTILE TELOMERE LENGTHS.
The average 20th percentile telomere length in Placebo, low dose TA-65 (250 units) and high dose TA-65 (1000 units) group at baseline and at the end of 3, 6, 9 and 12 months in kilo base pairs (kb) with standard deviation (s.d.).

	Average of 20th percentile telomere length (s.d) in kb				
Group	**Baseline**	**3 months**	**6 months**	**9 months**	**12 months**
Placebo	6.14 (0.71)	6.08 (0.64)	6.17 (0.62)	6.01 (0.66)	5.97 (0.68)
TA-65 (250 units)	5.84 (0.68)	5.98 (0.78)	5.98 (0.81)	5.96 (0.72)	5.93 (0.49)
TA-65 (1000 units)	5.93 (0.49)	6.01 (0.64)	5.83 (0.52)	5.92 (0.52)	5.77 (0.52)

Figure 3



KEY CHANGES IN THE SAFETY MARKERS

There were no clinically significant changes in the safety markers during the study as judged by the physician (Joseph M. Raffaele). Immune cell bio markers were unfortunately inappropriately run and hence could not be used.

DISCUSSION

We tested a cohort of CMV+ subjects for the effect of TA-65 on telomere length. The telomere lengths were measured using HT Q-FISH with automation to handle large numbers of human samples and to improve consistency.
Loss of 290 bp/year in the placebo group is indeed large, but a large loss is to be expected in a group that is 100% CMV positive and consists of older individuals aged > 60yrs. The accelerated attrition is supported by: (1) CMV infection- which causes significant shortening of telomere length in the age group of >60 years4 and (2) CMV seropositivity increases the oligoclonal expansion of the immune cells with age.[5]

Analysis of the 20th percentile group showed trends similar to that of the overall group, but there was no consistent change in the high dose TA-65 (1000 units) group. The cause of no significant change over time in the high dose TA-65 group is unknown and unexpected. However, there was a trend in the observational studies[1, 2] that high doses partially reverse some of the positive effects of TA-65.

The bulk of the evidence suggests that TA-65 lengthens telomeres by increasing telomerase activity. The results from the current study are consistent with the previous observations regarding the lack of any toxicity associated with the intake of TA-65. We did not find any product-related toxicities, as assessed by the biochemical markers of liver, kidney, and metabolic functions.

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AUTHOR DISCLOSURE STATEMENT

Laura Salvador, clinical investigator of the study, was supported by funding from T.A. Sciences Inc. Gunasekaran Singaravelu and Anitha Suram are employees of T.A. Sciences Inc. Calvin Harley, Peter Flom and Joseph Raffaele consult for TA Sciences Inc. ■

REFERENCES

1. Harley CB, Liu W, Blasco M, et al. A natural product telomerase activator as part of a health maintenance program. Rejuvenation research. Feb 2011;14(1):45-56.
2. Harley CB, Liu W, Flom PL, Raffaele JM. A natural product telomerase activator as part of a health maintenance program: metabolic and cardiovascular response. Rejuvenation research. Oct 2013;16(5):386-395.
3. Canela A, Vera E, Klatt P, Blasco MA. High-throughput telomere length quantification by FISH and its application to human population studies. Proc Natl Acad Sci U S A. Mar 27 2007;104(13):5300-5305.
4. van de Berg PJ, Griffiths SJ, Yong SL, et al. Cytomegalovirus infection reduces telomere length of the circulating T cell pool. Journal of immunology. Apr 1 2010;184(7):3417-3423.
5. Khan N, Shariff N, Cobbold M, et al. Cytomegalovirus seropositivity drives the CD8 T cell repertoire toward greater clonality in healthy elderly individuals. Journal of immunology. Aug 15 2002;169(4):1984-1992.

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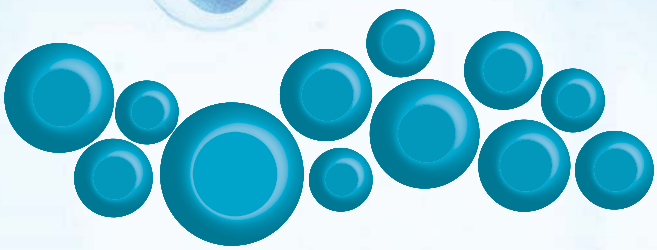

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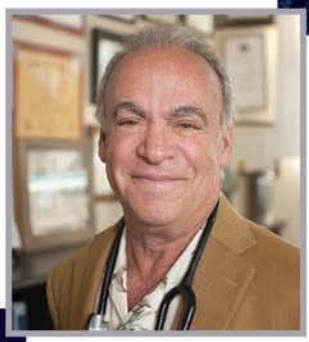

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OVERVIEW ON PREBIOTICS

The definition of prebiotics has been revised several times in the past 20 years. The most current definition was described in 2010 by the International Scientific Association for Probiotics and Prebiotics (ISAPP) as "…a selectively fermented ingredient that results in specific changes in the composition and/or activity of the gastrointestinal microbiota, thus conferring benefit(s) upon host health."[1]

Simply put, prebiotics are nondigestible substances that function as food for the gut microbiota, and they fuel growth or activity of health-promoting bacteria that live in the gut. In light of recent breakthroughs in technologies and the understanding of diet-microbiome-host interactions, experts have indicated that it is time to revise the 2010 ISAPP definition to make it more clinically relevant. They proposed to define prebiotics as "…a nondigestible compound that, through its metabolization by microorganisms in the gut, modulates composition and/or activity of the gut microbiota, thus conferring a beneficial physiological effect on the host."[2]

Classic prebiotics that have been previously identified include inulin, fructo-oligosaccharides (FOS), oligofructose (OF), transgalacto-oligosaccharides (tGOS), also spelled as galacto-oligosaccharides (GOS), and lactulose.[1] Recent research has identified new compounds that also have prebiotic effects. They include (but are not limited to) isomalto-oligosaccharides (IMOs), polydextrose, soybean oligosaccharides, lactosucrose, glucans, or glucooligosaccharides (GlOS), and xylooligosaccharides (XOS).[1]

Mechanisms of prebiotics

Prebiotics confer health benefits via various mechanisms of actions:[3,4]

- Modulation of the gut microbiota composition, such as the stimulation of beneficial bifidobacteria and lactobacilli. They help restore a diverse gut microbiota which is important for host health.
- Production of short-chain fatty acids (SCFAs), such as butyrate, propionate and acetate. SCFAs are an energy source, have immunological and metabolic effects, and reduce intestinal pH which inhibits the growth of pathogenic bacteria.
- Anti-adhesive function. Some prebiotics prevent adhesion of pathogenic microbes to intestinal linings by mimicking the binding sites of those microbes.

OVERVIEW ON ISOMALTO-OLIGOSACCHARIDES (IMOS)

IMOs are a mixture of short-chain carbohydrates (i.e., oligosaccharides) that have digestion-resistant properties. The majority of IMOs consists of 3 to 6 glucose units linked together by digestion-resistant α1-6 linkages. IMOs are found in nature, such as honey, but also in various fermented foods such as miso, sake, and soy sauce.[5] IMOs can also be commercially produced from starch (e.g., tapioca) via enzymatic reactions.

Properties of IMOs

Research has demonstrated that IMOs exert health benefits in humans. The properties of IMOs are summarized below.

PROPERTY	DESCRIPTION OF EVIDENCE
(Partial) resistance to digestion	Unlike starch, which is broken down rapidly in the upper gastrointestinal tract, IMOs resist digestive enzymes and are broken down slowly.6 Undigested IMOs reach colon where they are fermented by resident microbiota.[7]
Selective bifidogenic effects	In human studies, ingestion of IMOs has been shown to (1) increase the levels of Bifidobacteria, Lactobacilli, and Eubacteria;[8] (2) increase Bifidobacteria numbers in feces;[9] and (3) increase fecal bacteria mass.[10]
Beneficial effects on bowel functions	Ingestion of IMOs has been shown to relieve constipation and increase number of bowel movements.[10,11]
Beneficial effects on serum lipids	Ingestion of IMOs has been shown to lower total cholesterol and triglycerides and increase HDL-C in hemodialysis patients.[11]
Low glycemic index	The glycemic index of IMOs was evaluated at 34.66 ± 7.65.[12]

Well known in Asia (especially Japan) as "functional oligosaccharides" for decades, IMOs are becoming a promising ingredient in the prebiotic market in the Western countries.

OVERVIEW ON HUMAN MILK OLIGOSACCHARIDES (HMOS)

It was more than 100 years ago when researchers first noticed that breast-fed infants had higher survival rate and better health than bottle-fed infants. Thanks to decades of work and discoveries, we now know that one of the reasons human milk is unique is because it contains high concentrations of oligosaccharides that are scarcely present in bovine milk (and bovine milk-based infant formula). There are 5-15 g/L of oligosaccharides in human milk but only 0.05 g/L in bovine milk.[13]

Structurally, an oligosaccharide is a sugar polymer consisting of a small number of simple carbohydrates linked together. HMOs are a mixture of different kinds of oligosaccharides, and they resist digestive enzymes in the stomach.

HMOs are more than just prebiotics

HMOs meet the criteria of prebiotics. Once ingested, the great majority (~99%) of HMOs can reach colon and provide a growth advantage for beneficial bacteria such as Bifidobacterium longum subsp. infantis and Bifidobacterium bifidum.14,15 Historically HMOs were called "bifidus factor."

HMOs also have other important biological functions that go beyond prebiotics. These biological properties are summarized here:

PROPERTY	DESCRIPTION OF EVIDENCE
Resistance to digestion	HMOs resist digestive enzymes in the stomach and upper small intestine and thus can reach distal small intestine and colon intact.[16,17]
Selective bifidogenic effects	HMOs promote the growth of the beneficial Bifidobacterium longum subsp. infantis and Bifidobacterium bifidum.[14,15]
Production of short-chain fatty acids	Bifidobacteria consume HMOs and produce short-chain fatty acids that create an environment favoring the growth of commensal bacteria over potential pathogens.[18]
Antiadhesive antimicrobials	Serving as decoy receptors, HMOs block pathogens such as Campylobacter jejuni from adhering to host intestinal epithelial cells, thereby reducing risks of infections and diarrhea.[19,20]
Modulators of intestinal epithelial cell responses	HMOs affect certain gene expressions in epithelial cells. The reprograming modulates the cell surface, resulting in reduced binding of pathogenic bacteria to epithelial cells.[21]
Immune modulators	HMOs affect lymphocyte maturation resulting in a more balanced Th1/Th2-cytokine production.[22] HMOs also reduce leukocyte rolling and adhesion to endothelial cells and leukocyte activation[23,24]

Regarding 2'-fucosyllactose (2'-FL)

More than 100 types of oligosaccharides have been identified in human milk, and the most abundant type is 2'-FL. Researchers have confirmed that 2'-FL alone possesses the biological properties summarized in the table above. That is, 2'-FL functions as a prebiotic utilized by the beneficial bifidobacteria in the gut, preventing pathogenic microorganisms from sticking to host intestinal epithelial cells (which increases the risk of infection and diarrhea), and influencing host immune responses.[13,25] 2'-FL can now be produced for commercial use via a fermentation process.

A recent double-blind, randomized controlled trial demonstrated that consumption of 2'-FL for 2 weeks is sufficient to beneficially modulate the microbiota in adults.[26] Another randomized controlled trial found that infants given formula supplemented with 2'-FL exhibited lower levels of inflammatory cytokine profiles, similar to those of breast-fed infants.[27] Other health benefits of 2'-FL in humans require additional ongoing research and will take some time, but experimental research using animal models have shown that 2'-FL quenches Campylobacter jejuni-induced inflammation, attenuates the severity of necrotizing enterocolitis, and improves cognitive abilities in both young and adult animals.[28-31]

SUMMARY

Conflicting information regarding prebiotics found on the Internet likely has caused a lot of confusion even among health-conscious consumers. In a recent scientific survey of adult patients at two urban medical centers, researchers found that 38% of those patients were consuming some forms of prebiotics, but only 7% of them could correctly define the meaning of prebiotics from a list of answers.[32] It is hoped that this overview brings some clarity on prebiotics, and also provides recent clinical evidence for supporting the use of novel ingredients including IMOs and HMOs in food products. ■

REFERENCES

1. Gibson, GR, Scott, K.P., Rastall, R.A., Touhy, K.M., Hotchkiss, A., Dubert-Ferrandon, A., Gareau,M., Murphy,E.F., Saulnier, D., Loh, G., Macfarlane, S., Delzenne, N., Ringel, Y., Kozianowski, G., Dickman, R., Lenoir-Wijnkoop, I., Walker, C., Buddington,R., Dietary prebiotics: Current status and new definition. Journal of Food Science and Technology Bulletin: Functional Foods, 2010. 7: p. 1-19.

2. Bindels, LB, et al., Towards a more comprehensive concept for prebiotics. Nat Rev Gastroenterol Hepatol, 2015. 12(5): p. 303-10.

3. Valcheva, R and Dieleman, LA, Prebiotics: Definition and protective mechanisms. Best Pract Res Clin Gastroenterol, 2016. 30(1): p. 27-37.

4. Slavin, J, Fiber and prebiotics: mechanisms and health benefits. Nutrients, 2013. 5(4): p. 1417-35.

5. Goffin, D, et al., Will isomalto-oligosaccharides, a well-established functional food in Asia, break through the European and American market? The status of knowledge on these prebiotics. Crit Rev Food Sci Nutr, 2011. 51(5): p. 394-409.

6. Kaneko, T, et al., Digestibility characteristics of isomaltooligosaccharides in comparison with several saccharides using the rat jejunum loop method. Biosci Biotechnol Biochem, 1995. 59(7): p. 1190-4.

7. Gibson, GR, et al., Dietary modulation of the human colonic microbiota: updating the concept of prebiotics. Nutr Res Rev, 2004. 17(2): p. 259-75.

8. Kaneko, T, et al., Effects of isomaltooligosaccharides with different degrees of polymerization on human fecal Bifidobacteria. Biosci Biotechnol Biochem, 1994. 58(12): p. 2288-90.

9. Kohmoto, T, et al., Effect of isomalto-oligosaccharides on human fecal flora. Bifidobacteria Microflora, 1988. 7: p. 61-9.

10. Chen, HL, et al., Effects of isomalto-oligosaccharides on bowel functions and indicators of nutritional status in constipated elderly men. J Am Coll Nutr, 2001. 20(1): p. 44-9.

11. Wang, HF, et al., Use of isomalto-oligosaccharide in the treatment of lipid profiles and constipation in hemodialysis patients. J Ren Nutr, 2001. 11(2): p. 73-9.

12. Sheng, GE, et al., Determination of glycemic index of xylitol and isooligosccharide. Chin J Clin Nutr, 2006. 14(4): p. 235-7.

13. Bode, L, Human milk oligosaccharides: every baby needs a sugar mama. Glycobiology, 2012. 22(9): p. 1147-62.

14. Asakuma, S, et al., Physiology of consumption of human milk oligosaccharides by infant gut-associated bifidobacteria. J Biol Chem, 2011. 286(40): p. 34583-92.

15. Marcobal, A, et al., Bacteroides in the infant gut consume milk oligosaccharides via mucus-utilization pathways. Cell Host Microbe, 2011. 10(5): p. 507-14.

16. Chaturvedi, P, et al., Survival of human milk oligosaccharides in the intestine of infants. Adv Exp Med Biol, 2001. 501: p. 315-23.

17. Coppa, GV, et al., Characterization of oligosaccharides in milk and feces of breast-fed infants by high-performance anion-exchange chromatography. Adv Exp Med Biol, 2001. 501: p. 307-14.

18. Gibson, GR and Wang, X, Regulatory effects of bifidobacteria on the growth of other colonic bacteria. J Appl Bacteriol, 1994. 77(4): p. 412-20.

19. Ruiz-Palacios, GM, et al., Campylobacter jejuni binds intestinal H(O) antigen (Fuc alpha 1, 2Gal beta 1, 4GlcNAc), and fucosyloligosaccharides of human milk inhibit its binding and infection. J Biol Chem, 2003. 278(16): p. 14112-20.

20. Morrow, AL, et al., Human milk oligosaccharides are associated with protection against diarrhea in breast-fed infants. J Pediatr, 2004. 145(3): p. 297-303.

21. Angeloni, S, et al., Glycoprofiling with micro-arrays of glycoconjugates and lectins. Glycobiology, 2005. 15(1): p. 31-41.

22. Eiwegger, T, et al., Human milk--derived oligosaccharides and plant-derived oligosaccharides stimulate cytokine production of cord blood T-cells in vitro. Pediatr Res, 2004. 56(4): p. 536-40.

23. Bode, L, et al., Inhibition of monocyte, lymphocyte, and neutrophil adhesion to endothelial cells by human milk oligosaccharides. Thromb Haemost, 2004. 92(6): p. 1402-10.

24. Bode, L, et al., Human milk oligosaccharides reduce platelet-neutrophil complex formation leading to a decrease in neutrophil beta 2 integrin expression. J Leukoc Biol, 2004. 76(4): p. 820-6.

25. Castanys-Munoz, E, et al., 2'-fucosyllactose: an abundant, genetically determined soluble glycan present in human milk. Nutr Rev, 2013. 71(12): p. 773-89.

26. Elison, E, et al., Oral supplementation of healthy adults with 2'-O-fucosyllactose and lacto-N-neotetraose is well tolerated and shifts the intestinal microbiota. Br J Nutr, 2016. 116(8): p. 1356-68.

27. Goehring, KC, et al., Similar to Those Who Are Breastfed, Infants Fed a Formula Containing 2'-Fucosyllactose Have Lower Inflammatory Cytokines in a Randomized Controlled Trial. J Nutr, 2016.

28. Yu, ZT, et al., The Human Milk Oligosaccharide 2'-Fucosyllactose Quenches Campylobacter jejuni-Induced Inflammation in Human Epithelial Cells HEp-2 and HT-29 and in Mouse Intestinal Mucosa. J Nutr, 2016. 146(10): p. 1980-90.

29. Good, M, et al., The human milk oligosaccharide 2'-fucosyllactose attenuates the severity of experimental necrotising enterocolitis by enhancing mesenteric perfusion in the neonatal intestine. Br J Nutr, 2016. 116(7): p. 1175-87.

30. Oliveros, E, et al., Oral supplementation of 2'-fucosyllactose during lactation improves memory and learning in rats. J Nutr Biochem, 2016. 31: p. 20-7.

31. Vazquez, E, et al., Dietary 2'-Fucosyllactose Enhances Operant Conditioning and Long-Term Potentiation via Gut-Brain Communication through the Vagus Nerve in Rodents. PLoS One, 2016. 11(11): p. e0166070.

32. Betz, M, et al., Knowledge, use and perceptions of probiotics and prebiotics in hospitalised patients. Nutrition & Dietetics, 2015. 72(3): p. 261-6.

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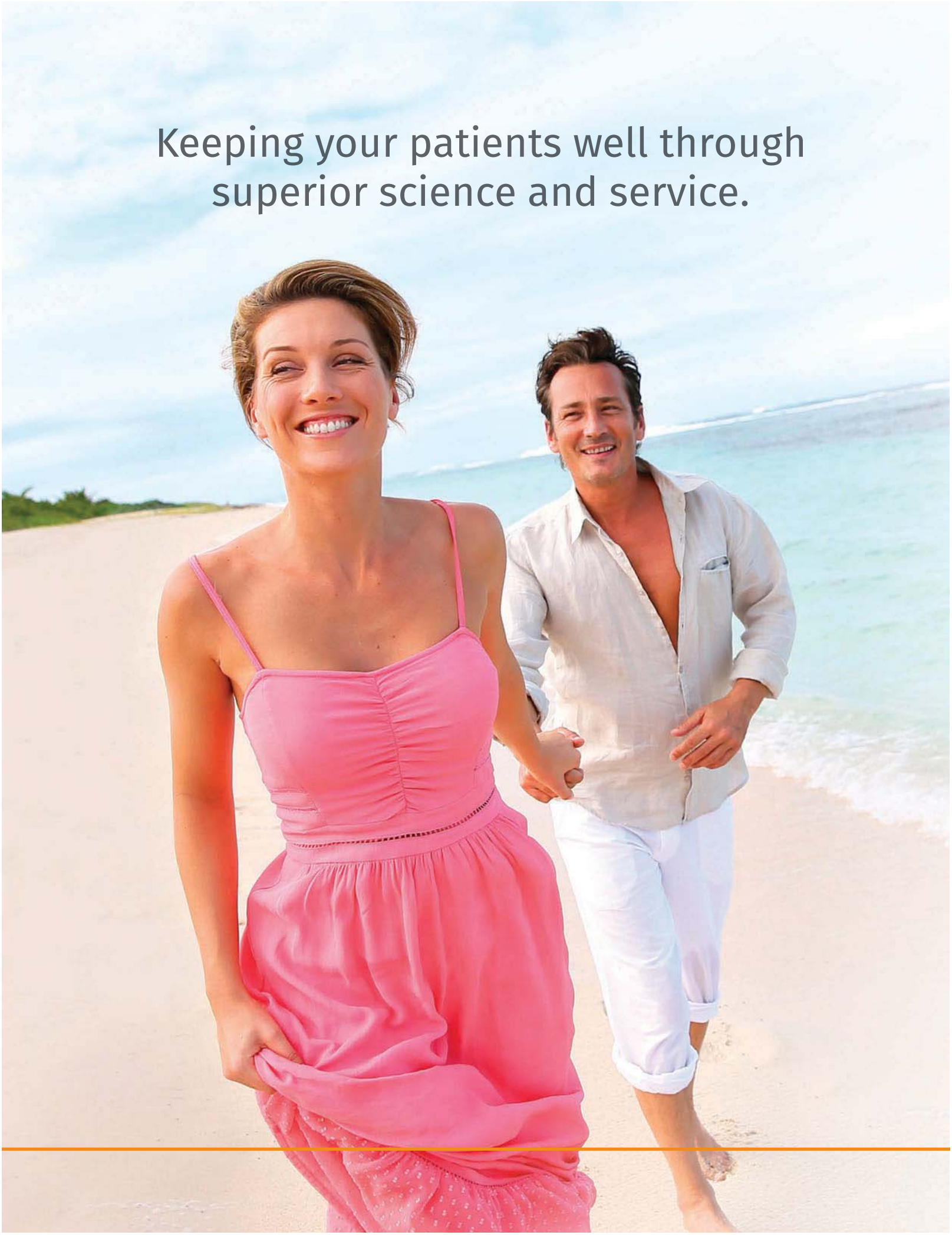

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SERMORELIN & ASSOCIATED PEPTIDES:

Restoring Growth Hormone in Aging

By Anthony J. Campbell, PharmD

INTRODUCTION

There are few things in life as relentless as aging. It is an inescapable part of life; ever pursuing us from the moment we draw our first breath to the day we breathe our last. Patiently, aging slowly chips away at one's youthful vigor and vitality, gradually deteriorating things such as lean body mass, bone density, aerobic exercise capacity, and cognitive function to name a few. Because of the aggressive and unprovoked assault on human longevity, aging may be categorized by some as an adversary; a disease necessitating eradication. Truthfully, however, aging is as normal a life process as is breathing and while it does take its toll and demands its dues over time, aging should not be viewed as an ailment in need of a cure. Yet, due to increased frailty and because many of the traditional signs of aging appear to mirror the features associated with the distinct clinical entity of Adult Growth Hormone Deficiency (AGHD), providing growth hormone (GH) directly to individuals as they age would appear to be the most direct and obvious route to restoring declining levels of GH. However, due to the wide array of potential side effects in older adults (i.e. edema, arthralgia, elevated blood glucose, etc.) it is typically undesired and many times contraindicated. Moreover, while initiating therapy at lower doses may decrease the likelihood of developing these common side effects, its use for anti-aging purposes (outside of controlled clinical research studies) is currently prohibited by US Federal law, 21 U.S.C. §333(e). Nevertheless, with the discovery and implementation of GH secretagogues in aged individuals – (i.e. Growth Hormone Releasing Hormone [GHRH], Growth Hormone Releasing Peptides [GHRP], and similar mimetics – the signs and symptoms of aging have recently become vulnerable to an alternative method of having their deleterious effects on the body decreased and slowed in rate of appearance.

GROWTH HORMONE SECRETION AND REGULATION

A substantial number of studies and published literature indicate that while there is an exponential decline in GH secretion after puberty, there is a progressive and nearly linear rate of decline of GH secretion after the third decade of life in otherwise normal, healthy adults. In clinical literature, Melmed reports that GH secretion typically peaks at puberty at about 150μg/kg/day, then gradually and relentlessly decreases to approximately 25μg/kg/day by the age of 55.[1] Of particular interest is the fact that while the amplitude, or strength, of recurring GH pulses throughout the day are significantly reduced in older individuals, the frequency, or number of pulses, remain nearly unchanged; moreover, the nocturnal pulsatile release of GH secretion is most significantly reduced in an aged individual (Figure 1). It has been reported in the literature that there are as many as 10 pulses of GH secretion per day, each lasting approximately 90 minutes with a separation of about 2 hours with the highest secretory activity occurring within an hour after the onset of deep sleep.[2(p.122-123)] Due to this physiologic occurrence, many protocols utilizing GHRH and/or GHRP therapy call for a once-daily dose provided prior to bedtime. The release of GH subsequently stimulates the production of insulin-like growth factor-1 (IGF-1), which in addition to mediating many of GH's positive effects, happens to be a potent inhibitor in the negative feed-back loop of growth hormone releasing hormone (GHRH) and GH secretion. Therefore, because IGF-1 production is primarily regulated by GH, the consequence is a decrease in GH secretion via this negative feed-back loop (Figure 2). Perhaps for this reason, many clinicians find that treated patients will initially see IGF-1 levels surge, only to plateau or decrease with continued, uninterrupted use. This will be discussed a bit later as well as potential modalities to prevent this phenomenon from occurring or at least limit the severity of inhibition. In addition to IGF-1, there are three hypothalamic factors regulating GH secretion: (i) Somatostatin, a non-competitive inhibitor of GH secretion; (ii) GHRH, the principal stimulator for GH production/release; and (iii) Ghrelin, secreted by the stomach, an endogenous ligand to the GH secretagogue re-

ceptor.2(p.122) Intertwined with one another and combined with other peripheral factors (e.g. exercise, sleep, food intake, stress, and body composition), all of these elements are involved in an intricate symphony regulating the physiologic patterns of pulsatile GH secretion.

GROWTH HORMONE BENEFITS AND THE ASSOCIATED RELATIVE RISK

It is true that a number of clinical trials have reported that by providing GH to adults with GHD, many of the features often associated with AGHD are significantly reversed or improved. Fat mass/volume is decreased, reductions in abdominal fat are obtained, and while there is little change in overall body weight, increases in lean body mass and skeletal muscle volume are observed signifying a shift away from fat to lean body mass. Additionally, there is no denying the thousands of published papers indicating better exercise capacity and cardiovascular function, improved bone mineral density, and enhanced quality of life in adults with GHD treated with GH. In spite of these advantageous findings, there remains an equal number of potential risks that have been described associated with the use of GH. In experimental trials, ≈40% of users reported clinical edema, ≈20% develop joint swelling and myalgia, and ≈10% develop carpal tunnel syndrome.[3] Additionally, many report hyperglycemia, hypertension, glucose intolerance and hyperinsulinemia.[4] Interestingly, a number of these adverse events can be attributed to incorrect dosing, in that they were much too high. In other words, they were the result of over-dosing and over-exposure to physiologic levels of GH. This is where the use of GHRH and other associated peptides have come to be advantageous as their mechanism of increasing GH preclude the potential for over-exposure or tachyphylaxis.

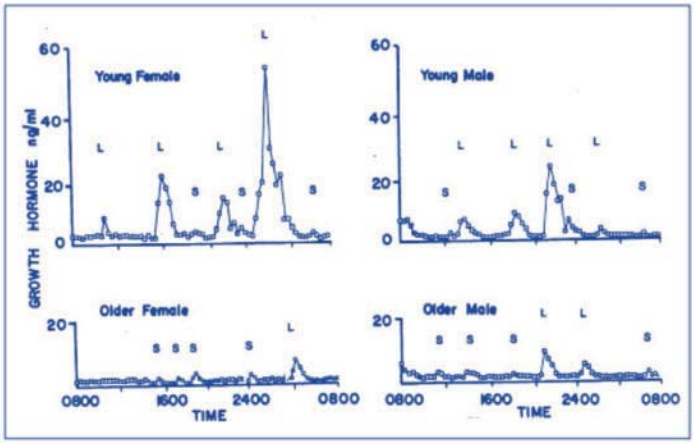

Figure 1 Patterns of GH secretion in younger & older women and men. There is a marked age-related decline in GH secretion in both sexes and a loss of nighttime enhancement of GH secretion see during deep sleep. This decrease is primarily due to a reduction in GH pulse amplitude, with little change in pulse frequency.
L=large pulse, S=small pulse. (From Ho et al 1987)[12]

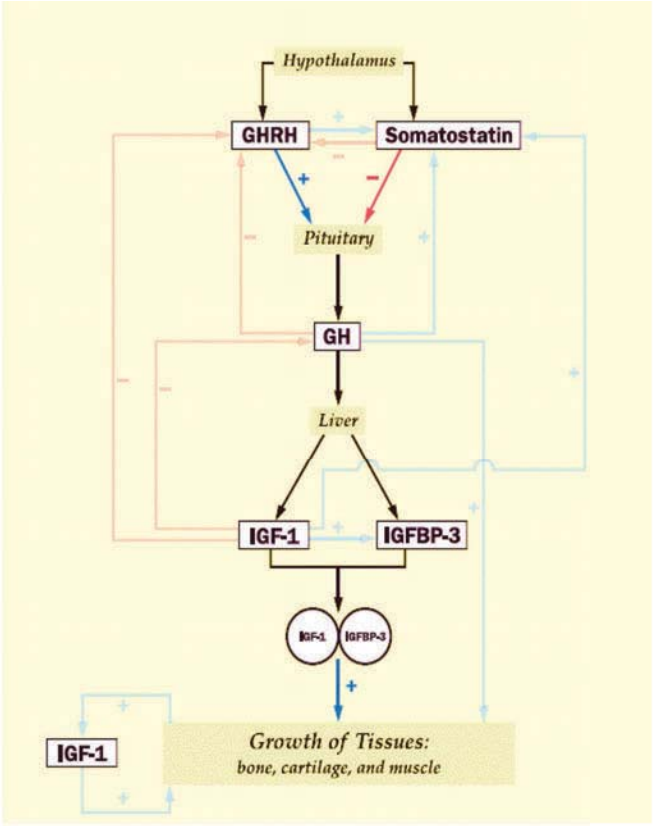

Figure 2 Regulation of the GH/IGF-1 axis. Pituitary inhibition of GH secretion results from an increase in Somatostatin as well as decreased GHRH stimulation, both of which result from increased levels of circulating IGF-1. (Mayo Communiqué March 2006)[13]

GHRH: A BETTER METHOD OF INCREASING GROWTH HORMONE

Physiologic and Clinical Advantages of GHRH

Rather than introducing exogenous and supraphysiologic doses of GH directly to the liver, GH secretagogues like GHRH (i.e. Sermorelin and others) stimulate the normal and physiologic secretion of GH in an intact and responsive pituitary (Figure 3). This normal and physiologic secretion results in a normal, time-separated, pulsatile release of GH, rather than prolonged elevation of exogenous exposure; thereby avoiding tachyphylaxis and preserving the capability for negative feed-back inhibition of GH by the rising levels of IGF-1.[2](p.127) It is because of this normal, negative feed-back regulation that treatment with GHRH results in much less frequent and milder side effects as compared to those experienced strictly with GH use. The most frequent side effects associated with GHRH (e.g. Sermorelin) use in clinical trials were reported to be localized injection site reactions such as pain, swelling, or redness; occurring in approximately 16% of users. Other events such as headache, flushing, dysphagia, dizziness, hyperactivity, somnolence, and urticaria were reported in less than 1%.[5]

SUGGESTED DOSING OF GHRH

In the complete sequence, hGHRH is a 44-amino acid chain. However, it is recognized that biological activity is induced solely utilizing only the first 29 amino acid sequence. It is this sequence, specifically GHRH(1-29)NH2 or Sermorelin, that received FDA approval (e.g., Geref®, Serono) in October 1997 for the treatment of GHD in children. Oddly enough, it was subsequently withdrawn from the market in November 2002 due to the limited demand for the product, most likely due to the limited efficacy Sermorelin has in elevating GH in children (i.e. GHD deficient children require much higher levels of GH than what can be achieved by stimulating their own, already deficient production). In the normal aging adult, however, pituitary stimulation of GH production by Sermorelin has been demonstrated to clinically elevate GH and subsequent IGF-1 levels to at least the lower portion of the young adult normal range and by as much as 35%.[2](p.127)

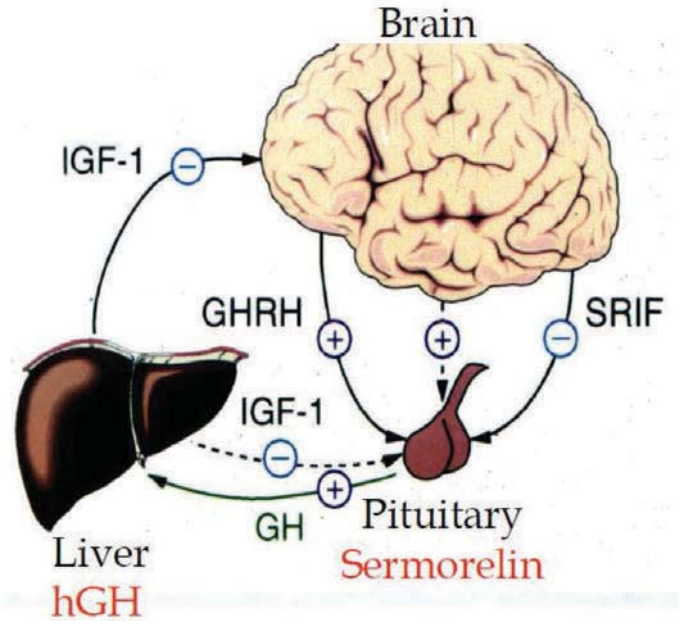

Figure 3 Sermorelin activity is upon the pituitary, stimulating the production of GH under negative feed-back control. Exogenously provided hGH acts directly upon the liver and GH is increased outside of the feed-back control mechanism resulting in prolonged, supraphysiologic GH exposure.

Dosing protocols in clinical literature widely vary and, as such, an established, standardized dose effective for everyone has not been determined. Nevertheless, early clinical studies performed by Corpas and colleagues used twice daily subcutaneous GHRH doses of both 500mcg and 1000mcg which resulted in significant increases in GH peak amplitude ($P < 0.05$), but also in mean 24-hour GH and IGF-1 ($P < 0.001$ and 0.005, respectively).[6] Likewise, later additional studies performed by Vittone, et al utilized nightly subcutaneous GHRH doses of 2000mcg resulting in significantly increased nocturnal GH peak amplitude.

Furthermore, 33% of participants showed improved measurements of muscle strength and endurance ($P < 0.04$).[7] Of particular interest, no significant adverse events were reported in either study. This is of importance because many of the currently employed dosing protocols utilize daily subcutaneous GHRH doses of ≤ 300mcg giving practitioners and patients alike at least some semblance of certainty that the risk of experiencing an adverse event is quite low. As promising as many of the published clinical findings report the use of GHRH to be, there still remains some uncertainty as to the frequency of dosing. Due to either small sample sizes, short trial duration and/or variances in doses, it is still clinically unknown whether GHRH can be equally effective when administered once daily as opposed to daily divided doses. To date, however, nearly all studies involving the use of once-daily, evening subcutaneous injections of GHRH(1-29)NH2 have proven to be well-tolerated, increasing 24-hour GH secretion, boosting circulating levels of IGF-1, and improve body composition in older patients.

Currently, typical dosing protocols for younger patients, in their 40's and early 50's, with good body composition have utilized single daily doses of 100 – 300mcg via subcutaneous injection administered one-hour prior to bedtime. This regimen very often results in sustaining youthful characteristics, health, and vitality without the use of additional hGH supplementation. In patients with excessive abdominal fat due to inactivity and increased weight gain (e.g. BMI > 30), a slightly different protocol may be considered. For example: 1-2u of hGH administered each morning for approximately 3 to 6 months until the patient's body composition has improved, followed by nightly injections of 200mcg to 300mcg of Sermorelin one hour prior to bedtime. This should provide the maintenance dose to sustain pituitary functional cells and increase hGH reserve and secretory volume. Although tachyphylaxis and IGF-1 mediated inhibition of GH is unlikely, one caveat to consider when evaluating a patient's declining response to daily GHRH therapy is the insertion of a short "drug-holiday" in the dosing protocol. Consider the provision of a 21/7 or 5/2 protocol (i.e. 21-consecutive days, followed by 7-days of rest or alternatively, a regimen of 5-consecutive days with 2-days off). This may be quite useful in order to maintain the continued benefits with chronic therapy, particularly in patients who have shown significant improvements initially only to find that later they begin to exhibit a plateau or declining effect of circulating IGF-1 levels.

THE ESTROGEN FACTOR AND ORAL DOSING

Doses for females on oral estrogen replacement therapy (ERT) will likely require dosage adjustments (i.e. increased) to see a clinical improvement in IGF-1 as it has been reported in the literature that estrogen has a blunting effect of hGH upon the liver to produce IGF-1.[8,9] Curiously, this blunting effect is only associated with oral estrogen therapy, and is not seen in women using transdermal ERT. Therefore, in order to elicit clinically effective outcomes, women should be transitioned and stabilized from oral to topical ERT prior to initiating daily GHRH therapy. Lastly, there is an alternative for patients averse to daily injections. Due to the smaller molecular nature of GH secretagogues, at least one of them has been clinically shown that it can be administered orally and elderly patients can still benefit from increases in pulsatile GH secretion and IGF-1.[10,11] These results provide speculative hope that other GH secretegogues may also be equally effective via alternative routes such as sublingual, transdermal, or nasal delivery.

GHRP: ELICITING ENHANCED OUTCOMES THROUGH DRUG-DRUG SYNERGISM

Growth Hormone Releasing Peptides

Concurrent administration of GHRH and GHRP has been well documented and established to provide synergistic release of GH from the pituitary. While there are a number of GHRPs that have been researched and/or studied, the two that have garnered much attention and clinical use are GHRP2 and GHRP6. Others that have been used are Ipamorelin and Hexarelin, but are typically un-favored favored due to the former being a weaker GH promoter and the latter having a stronger, adverse effect on cortisol and prolactin. GHRP2/6 are both very potent at promoting GH release, yet have little to no effect on cortisol or prolactin. While several studies have concluded increases in GH secretion and IGF-1 are achievable with solitary use, concurrent use with GHRH is more than additive. This is, in part, due to the fact that GHRH is much less capable of increasing GH when physiologic levels of somatostatin are high and GHRP inhibits somatostatin. Recommended doses for GHRP 2 or 6 are typically around 150mcg as there is a receptor saturation point, and delivering more yields little benefit and may promote desensitization with chronic dosing.

CONCLUSION

While the stimulation of GH with GHS – rather than direct GH replacement – clearly has the advantage of being more akin to mirroring a physiologic approach of increasing endogenous GH pulsatility and secretion, there still remain important and unanswered questions that need resolution before conclusive statements about efficacy and benefits can be made. Defining measurable, therapeutic endpoints, measuring a reduction in frailty, and the safety of chronic, long-term GHRH therapy are a few of the clinical outcomes that have yet to be determined. Certainly, GHRH has been shown to afford a place in therapy for the aging adult, but much larger and extended clinical trials will need to be completed before it takes its place among routine medicine for the aged. Until then, closely monitored individuals under a physician's direct care can benefit from its availability via compounding pharmacies. ■

REFERENCES

1. Melmed S. Physiology of growth hormone In: UpToDate 2006 [online]. Accessed 13 Jan 2017. URL: http://www.utdol.com Cited by: Hersch EC, Merriam GR. Growth hormone (GH)-releasing hormone and GH secretagogues in normal aging: Fountain of Youth or Pool of Tantalus? Clin Interv Aging 2008:3(1) 121-129.
2. Hersch EC, Merriam GR. Growth hormone (GH)-releasing hormone and GH secretagogues in normal aging: Fountain of Youth or Pool of Tantalus? Clin Interv Aging 2008:3(1) 122-123.
3. Cummings DE, Merriam GR. Age-Related Changes in Growth Hormone Secretion: Should the Somatopause Be Treated? Semin Reprod Med 1999;17(4): 319.
4. Walker RF, Bercu BB. Issues Regarding the Routine and Long-Term Use of Growth Hormone in Anti-Aging Medicine. Journal of Anti-Aging Medicine. Jul 2004: 290.
5. Gold Standard, Inc. Sermorelin, GHRH Geref. Clinical Pharmacology [database online]. Available at: http://www.clinicalpharmacology.com. Accessed: January 10, 2017.
6. Corpas E, Harman SM, Piñeyro MA, Roberson R, Blackman MR. Growth hormone (GH-releasing hormone-(1-29) twice daily reverses the decreased GH and insulin-like growth factor-I levels in old men. J Clin Endocrinol Metab. 1992 Aug;75(2):530-535.
7. Vittone J, Blackman MR, Busby-Whitehead J, et al. Effects of single nightly injections of growth hormone-releasing hormone (GHRH 1-29) in healthy elderly men. Metabolism 1997 Jan;46(1):89-96.
8. Merriam GR, Barsness S, Buchner D. et al. Growth Hormone Releasing Hormone Treatment in Normal Aging. Journ of Anti-Aging Med 2001;4(4):338.
9. Cook DM, Ludlam WH, Cook MB. Route of Estrogen Administration Helps to Determine Growth Hormone (GH) Replacement Dose in GH-Deficient Adults. J Clin Endocrinol Metab 1999 Nov;84(11): 3956-3960.
10. Chapman IM, Bach MA, Van Cauter E. et al. Stimulation of the growth hormone (GH)-insulin-like growth factor I axis by daily oral administration of a GH secretogogue (MK-677) in healthy elderly subjects. J Clin Endocrinol Metab 1996 Dec;81(12):4249-4257.
11. Svensson J, Lönn L, Jansson JO, et al. Two-month treatment of obese subjects with the oral growth hormone (GH) secretagogue MK-677 increases GH secretion, fat-free mass, and energy expenditure. J Clin Endocrinol Metab 1998 Feb;83(2):362-369.
12. Ho KY, Evans WS, Blizzard RM, et al. Effects of Sex and Age on the 24-Hour Profile of Growth Hormone Secretion in Man: Importance of Endogenous Estradiol Concentrations. J Clin Endocrinol Metab 1987 Jan;64(1):51-58.
13. MAYO CLINIC Mayo Medical Laboratories Communique March 2006;31(3) Available at: http://www.mayomedicallaboratories.com/media/articles/communique/mc2831-0306.pdf23. Bode, L, et al., Inhibition of monocyte, lymphocyte, and neutrophil adhesion to endothelial cells by human milk oligosaccharides. Thromb Haemost, 2004. 92(6): p. 1402-10.

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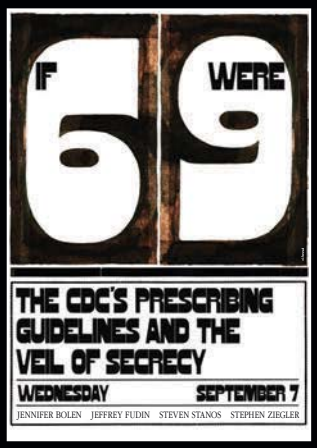

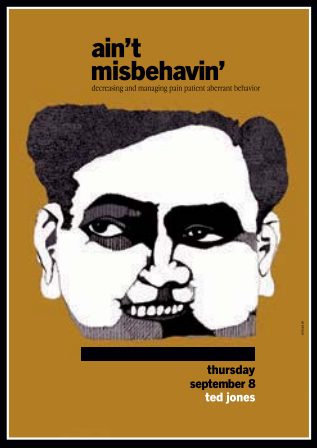

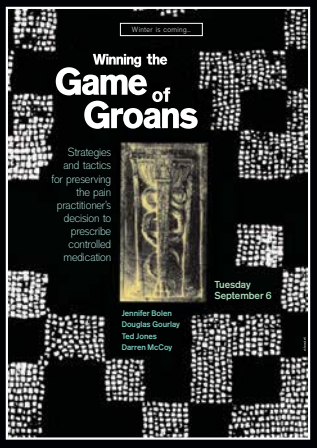

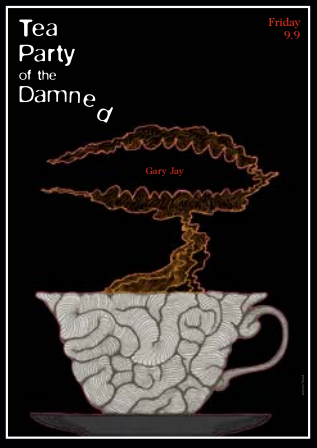

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The Metabolic Code Making Inroads in Patient Care

By Bassel Haidar, CEO of Metabolic Code

BOCA RATON, FL; Metabolic Code empowers health care providers to Deliver Better Health Outcomes and work more efficiently. The Metabolic Code cloud-based system offers a compelling point of care platform for practitioners to manage patients effectively. The platform aggregates biologic and self-reported data from each patient and generates an individualized care plan. This information is conveyed to the patient by the provider in a comprehensive report, which includes suggestions for nutrition, exercise and strategic dietary supplementation to correct metabolic imbalances and restore vitality. Providers can track patients longitudinally, assess interim outcomes and make adjustments between office visits. Metabolic Code represents the nexus between lifestyle medicine, technology and personalized care.

In a review of the underlying science, practical clinical application and market place innovation, George Washington University has agreed to include the Metabolic Code system in the Master's program in Integrative Medicine for all their students. Metabolic Code offers an information-rich teaching environment for students that accelerates their understanding of fundamental concepts in lifestyle medicine and ensures exposure to real world tools for future integrative practitioners. According to the American College of Preventive Medicine, "lifestyle medicine is a scientific approach to decreasing disease risk and illness burden by utilizing lifestyle interventions such as nutrition, physical activity, stress reduction, rest, smoking cessation, and avoidance of alcohol abuse. Lifestyle medicine is the recommended foundational approach to preventing and treating many chronic diseases."

"We are delighted to finalize this partnership with the Metabolic Code. This represents many years of hard work and sacrifice to produce a platform that creates efficiencies for practitioners while serving patients in their journey towards wellness. George Washington University has a strong interest in the educational and research opportunities that the Metabolic Code provides, and together, we will improve the evidence base of lifestyle medicine and hopefully change the practice of medicine as well," says Andrew Heyman, MD, Program Director of Integrative Medicine, GWU.

The deployment of the Metabolic Code platform is an enormous research opportunity as physician practices adopt the system. Many challenges exist in the collection of medical outcomes data, especially in the field of health and wellness. Physician practices generally function independently of the conventional health care system, little industry oversight occurs, and dietary supplements are unregulated. The core of the Metabolic Code is a sophisticated technology that ensures cohesive clinical decision-making across participating practices, access to high quality products, and the extraordinary opportunity to track outcomes data among large populations.

Additionally, Metabolic Code has amassed an impressive array of partners to enable it to provide one-click lab ordering and posting, best in class medical grade supplements that can be delivered on a recurrent basis to patients, and access to clinical expertise through highly respected educational institution affiliations.

NATIONAL CLINICAL LABORATORIES

Metabolic Code selected national clinical laboratories True Health Diagnostics, Quest Diagnostics, and Physicians Lab to analyze data from patient lab samples in conjunction with patient lifestyle questionnaires and personal biometric information to help determine an individual's greatest areas of metabolic risk. Practitioners then use that information to develop the most beneficial and engaging health plan for the patient.

LEADING SUPPLEMENT MANUFACTURERS

Metabolic Code joined forces with leading supplement manufacturers which meet or exceed all safety and quality standards. Ortho Molecular Products, Designs for

Health, and NuMedica have included their products in Metabolic Code's supplement formulary and product offerings to bolster Metabolic Code's mission of supporting health care practitioners' abilities to deliver better patient health outcomes.

EDUCATIONAL INSTITUTIONS

James LaValle, Founder and Chairman of Metabolic Code and Andrew Heyman, MD and Chief Medical Officer of Metabolic Code, are both sought-after thought leaders in integrative Medicine and speakers at the American Academy of Anti-Aging Medicine (A4M), where they teach a variety of continuing medical education courses (CME) with a focus on a systems biology approach to medicine, known as "the Triads".

More information can be found at www.metaboliccode.com

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Probiotics,
the Gut Microbiota, and Healthful Aging

By Marina MacDonald, PhD and Stephen Olmstead, MD

SUMMARY

The gastrointestinal microbiota is a complex microecological system consisting of over trillions of microorganisms. It may be considered a vital organ acquired during infancy. As with all other organs, the gut microbiota ages resulting in diminished microbial diversity, reduced Bifidobacterium populations, and increased pathogen numbers. Age-related shifts in intestinal microbial populations increase the susceptibility of the elderly to infections such as Clostridium difficile-associated disease. The loss of Bifidobacterium and other beneficial microbes is associated with a decline in innate and adaptive immune function termed "immunosenescence." This renders older people vulnerable to infection, cancer, and autoimmune disease. Immunosenescence causes a low-grade systemic inflammation termed "inflamm-aging." Healthy centenarians have robust Bifidobacterium populations that mediate anti-inflammatory effects. Multispecies Bifidobacterium and Lactobacillus probiotics show great potential to support healthy, diverse gut microbiota during aging and evidence suggests they may reduce the risks of infection, cancer, and chronic inflammatory diseases often encountered in the elderly.

AGING AND DYSBIOSIS

The gastrointestinal tract is home to trillions of microorganisms, including any of 15,000 to 36,000 microbial species.[1,2] Each individual hosts around 160 different species that essentially constitute an organ within the body that has a profound effect on gastrointestinal function, immune modulation, and metabolic balance.[3] This gut microbiota is acquired during birthing, matures during infancy, changes during childhood, and ages just as does every other organ system.[4-7] Aging is associated with diminished gastric acid production, increased gastric pH, delayed gastric emptying, and decreased gastrointestinal motility, all of which can negatively affect the microbiota.[8,9] These physiologic changes, together with a lifetime of poor diet and repeated exposures to antibiotics and non-steroidal anti-inflammatory drugs, contribute to a shift from a diverse, balanced microbiota to a dysbiotic gut microbiota characterized by a loss of microbial diversity and heightened pathogen numbers.[10,11] The most important characteristic of age-related gut dysbiosis is the decline in the abundance, diversity, and adhesive properties of Bifidobacterium species.[10,12-15] Bifidobacteria have important anti-infective and immunomodulatory functions.[16-18] Diminished diversity and numbers of gastrointestinal Bifidobacterium are increasingly viewed as associated with an increased susceptibility to gastrointestinal and systemic infections as well as age-related inflammatory conditions.[19,20] Other dysbiotic findings prevalent in the aging gastrointestinal tract include decreased numbers of butyrate-producing species such as Faecalibacterium prausnitzii and reduced populations of Clostridium clusters IV and XIV leading to increased inflammatory cytokine levels.[12,22-24] The reduction in beneficial species with age is accompanied by an increase in the relative proportions of potentially harmful species such as Proteobacteria, Fusobacterium, and pathogenic clostridia.[11,12,22,25] The elderly have increased numbers of Clostridium difficile, especially in people receiving antibiotic therapy.[26-28] In one study, 21% of hospitalized elderly subjects tested positive for C. difficile as compared with 1.6% of elderly subjects in the community.[29] Age-related shifts in bacterial populations increase the susceptibility to C. difficile in older people. Elderly patients with C. difficile-associated diarrhea (CDAD) have greatly reduced numbers of Bacteroides, Bifidobacterium, and Prevotella[26] and a marked reduction in microbial diversity.[29] Since similar but less pronounced gut microbial composition changes have been observed in elderly individuals as a whole, it has been suggested that age-related shifts in bacterial populations could increase the susceptibility to C. difficile in aging individuals.[30] Recent successes with fecal microbiota transplantation underscore the importance of a healthy microbiota in eliminating C. difficile.[31] Organ failure incidence and ICU mortality in the elderly is significantly higher in patients with profound reductions in microbiota size and diversity, especially when associated with a massive presence of enterococci and with antibiotic use.[32,33] Similar but more extensive changes in the gut microbiota have been observed in critically ill patients with severe systemic inflammatory response syndrome (SIRS), suggesting that an abnormal intestinal microbiota may affect the inflammatory response after severe sepsis, trauma, and shock.[34] Although considerations of diet and ethnicity complicate the definition of an "aged" gut microbiota,[14,35] these data indicate that intestinal microbiota composition and diversity has a significant effect on health maintenance and disease incidence during aging.[10]

IMMUNOSENESCENCE AND INFLAMM-AGING

The loss of a robust and diverse Bifidobacterium population as well as reduced numbers of other beneficial microbes coupled with an increase in pathogenic microbial species leads to a decline in immunologic function and an increase in systemic inflammation. A gradual decline in both innate and adaptive immune function associated with aging has been called "immunosenescence"[36-38] while an age-related increase in chronic, low-level inflammation is termed "inflamm-aging."[40-42] Immunosenescence is associated with an increased susceptibility to infections and a weakened immunization response rendering elderly individuals more susceptible to infection, autoimmune disease, and cancer. Inflamm-aging, which often accompanies immunosenescence, has been implicated in the pathogenesis of major diseases such as cardiovascular disease, type 2 diabetes, Alzheimer's disease, Parkinson's disease, osteoporosis, rheumatoid arthritis, and cancer.[43-45]Inflamm-aging is predictive of mortality independent of pre-existing morbidity.[41,42] Even in the absence of acute infection, interleukin-6 (IL-6), TNF, and C-reactive protein (CRP) levels increase with age.[46] These inflammatory cytokines are strongly associated with frailty in the elderly.[47,48] Unlike acute inflammation, inflamm-aging is characterized by a relative decline in adaptive immunity and T-helper 2 (Th2) responses, together with persistent activation of cells of the mononuclear phagocyte lineage.[21,49,50] Senescent CD8+ T cells also produce more proinflammatory cytokines than their more "youthful" counterparts.[51] In prospective studies, CRP, an independent predictor of mortality,[52] predicted the risk of myocardial infarction, stroke, peripheral arterial disease, and other chronic age-related diseases including Alzheimer's and Parkinson's disease.[46,53-55] Proinflammatory cytokines interfere with processing and production of amyloid beta peptide, the pathological hallmark feature of Alzheimer's disease, suggesting that inflamm-aging may be a "prodrome" to Alzheimer's disease.[56] In patients with rheumatoid arthritis, IL-6 and other cytokines may contribute to autoimmunity, resulting in joint damage.[57,58] Animal studies suggest that a particular dysbiotic microbiota is required to trigger, if not drive, systemic autoimmunity leading to inflammatory arthritis.[59] An age-related increase in gut wall permeability to microorganisms and microbial constituents reflected by an increase of circulating antibodies against commensal gut bacteria, may contribute to low-grade systemic inflammation.[60,61] Aging is associated with impaired regulatory T cells (Treg) modulation of IL-10 production.[62] Gut microbiota composition regulates the ratio of Treg cells to effector T cells thereby influencing intestinal immunity, tolerance, and susceptibility to inflammatory diseases and allergies.[63,64] Several probiotic bacteria, including Bifidobacterium bifidum and B. infantis in humans and indigenous Clostridium species in mice have been shown to induce Treg cells and IL-10 production and produce anti-inflammatory effects.[65-69]

THE GUT MICROBIOTA – A KEY TO HEALTHFUL AGING

One of the important keys to healthful aging and longevity is to develop and maintain an immune system that minimizes chronic inflammation without compromising the body's ability to respond to pathogens and neoplastic cells.[41] Individuals who live to be 100 years old have well-conserved immune parameters such as preserved T cell repertoire and, despite showing some inflammation markers, avoid or delay major inflammation-driven, age-related diseases.[70,71] A study that compared stool samples from centenarians with those of younger adults suggests that healthy centenarians can maintain a balanced, diverse gut microbiota with health-producing properties. The numbers of Bifidobacterium species in healthy centenarians ranged from 53% to 87% of all anaerobes compared to the average of 40% in healthy younger people.[72] Bifidobacterium strains isolated from healthy centenarians enhanced both immune and intestinal function in healthy mice following oral administration.[72,73] These findings provide tantalizing evidence that healthy centenarians are characterized by a gastrointestinal microbiota containing more numerous, diverse Bifidobacterium populations that possess valuable immunomodulatory properties than are even present in younger healthy people. Furthermore, studies show that preserved immune function modulated by a balanced gut microbiota is a characteristic of healthy elderly people at any age.[21]

PROBIOTICS TO SUPPORT A HEALTHY AGING GUT MICROBIOTA

Probiotic consumption can shift the gastrointestinal microbiota composition in elderly people from an overabundance of pathogenic species towards a more beneficial, diverse microecosystem.[74-78] Probiotics affect the microbiota directly by modulating its microbial composition through the production of bacteriocins, hydrogen peroxide, lactic acid, and short-chain fatty acids.[79] As gut bifidobacteria populations tend to diminish with age, probiotic administration containing ample Bifidobacterium numbers and diverse species represents a strategy to support aging gastrointestinal microbiota. Combining large numbers of Bifidobacterium with Lactobacillus probiotics may be the optimal approach.[80] The benefits to this type of support are borne out by the use of probiotics in the treatment of C. difficile in the elderly. Meta-analyses of clinical studies have shown that probiotic intervention is more effective than placebo in ameliorating C. difficile symptoms and/or preventing C. difficile-associated disease.[81-83] In elderly patients, consumption of Lactobacillus-containing cheese reduced C. difficile populations as compared with a run-in period.[77] The probiotic effect was associated with enhanced innate immune function manifested by improved cytotoxicity of NK

cells and an increase in phagocytic activity.[84] In a study of probiotics versus placebo in hospitalized patients with an average age of 74 only 12% of the probiotic group developed diarrhea as compared with 34% in the placebo group.[85] The ability of lactobacilli to persist through antibiotic treatment accentuates their value as probiotics against antibiotic-associated diarrhea.[13,86] In another study, a probiotic formula containing 10 bacterial strains at a combined dose of 10 billion CFU/day was administered as adjunctive therapy during C. difficile infection.[80] The adjunctive use of probiotics resulted in complete resolution of C. difficile in adults in the clinical setting. The investigators postulated that only a multistrain probiotic mixture could fully address the needs of patients with C. difficile infection.

PROBIOTICS AND THE PREVENTION OF IMMUNOSENESCENCE

The ability of probiotics to modulate and support healthy immune system function is well established.[87-89] Probiotics influence the numbers and function of cells responsible for innate and acquired immunity and produce anti-inflammatory effects. Species that modulate immune cell function in vitro and/or in vivo include B. bifidum,[90,91] B. breve,[92] B. infantis,[93,94] B. lactis,[95] B. longum,[96] L. acidophilus,[68,97] L. casei,[98,99] L. gasseri,[100,101] L. plantarum,[102,103] and L. rhamnosus.[68,104] Bifidobacterium strains produce a more anti-inflammatory profile (IL-10), modulate regulatory T cells, and are associated with anti-inflammatory effects.[18,105,106] Many different Lactobacillus strains promote Th1 cytokines (IL-12) and probiotics from the Lactobacillus genera have the greatest ability to reduce the incidence and/or symptoms of common cold or respiratory tract infections.[95] The anti-inflammatory effects of probiotics are not limited to their influence on immune cells.[107] Probiotic microorganisms may also counteract inflammation-aggravating bacteria, which will decrease the inflammatory tone of the system and improve the gut mucosa barrier function.[108] This reduces translocation of proinflammatory microbial components from the gut lumen out into the body. The ability of many Lactobacillus strains to improve the gut mucosa barrier function is a subject of intense investigation, since a strong epithelial barrier lowers the risk of systemic inflammation due to a chronic immune reaction of pro-inflammatory components originating from the gut microbiota.[109-112] The stimulation of CD8+ T cells and NK cells by various probiotic compositions suggests that probiotics enhance the immune defense against viral infections and tumors.[113-118] Dietary supplementation with probiotics can modulate innate and adaptive immune responses both locally and systemically and mixtures of Lactobacillus and Bifidobacterium may produce a balanced effect, consistent with the view that the immune system responds to whole suites of bacteria.

CONCLUSION

Probiotics are increasingly being recognized as immune-modulating nutritional factors, and interest in their impact on the immune response of the elderly has grown in recent years. Chronic probiotic consumption represents a strategy to maintain a robust, diverse microbiota with age and to support against immunosenescence. Research shows that probiotic molecules can induce beneficial changes in the host via enhancement of gut epithelial barrier function, competitive exclusion and inhibition of pathogens, and balanced modulation of immune cell behavior and cytokine profiles. Evidence suggests a promising role for probiotics to improve age-related immune system defects and to reduce infectious disease severity and cancer incidence in the elderly. Each probiotic strain produces a different set of molecular and cellular responses, such that mixtures of probiotics are likely to be more effective than single strains. In an older person, a composition of Lactobacillus and Bifidobacterium probiotics with the numbers weighted heavily in favor of the Bifidobacterium species is likely to be most effective. Probiotics require an adequate dosage and a prolonged supplementation period to have greatest benefit. Due to the transient nature of probiotic colonization, microbiota composition is likely to regress if probiotic administration ceases, so chronic consumption is required for ongoing effect. ■

REFERENCES

1.Frank DN, St Amand AL, Feldman RA, et al. Molecular-phylogenetic characterization of microbial community imbalances in human inflammatory bowel diseases. Proc Natl Acad Sci USA 2007;104:13780-5.
2. Frank DN, Pace NR. Gastrointestinal microbiology enters the metagenomics era. Curr Opin Gastroenterol 2008;24:4-10.
3. Qin J, Li R, Raes J, Arumugam M, et al. A human gut microbial gene catalogue established by metagenomic sequencing. Nature 2010;464:59-65.
4. Fanaro S, Chierici R, Guerrini P, Vigi V. Intestinal microflora in early infancy: composition and development. Acta Paediatr Suppl 2003;91:48-55.
5.Mackie RI, Sghir A, Gaskins HR. Developmental microbial ecology of the neonatal gastrointestinal tract. Am J Clin Nutr 1999;69:1035S-45S.
6. Salminen S, Gueimonde M. Gut microbiota in infants between 6 and 24 months of age. Nestle Nutr Workshop Ser Pediatr Program 2005;56:43-56.
7. Mitsuoka T. Intestinal flora and aging. Nutr Rev 1992;50:438-46.
8. Hughes SG. Prescribing for the elderly patient: why do we need to exercise caution? Br J Clin Pharmacol 1998;46:531-3.
9. Walker AW, Duncan SH, McWilliam Leitch EC, et al. pH and peptide supply can radically alter bacterial populations and short-chain fatty acid ratios within microbial communities from the human colon. Appl Environ Microbiol 2005;71:3692- 700.
10.Claesson M, Jeffery I, Conde S, et al. Gut microbiota composition correlates with diet and health in the elderly. Nature 2012;488:178-84.
11. Woodmansey EJ, McMurdo ME, Macfarlane GT, Macfarlane S. Comparison of compositions and metabolic activities of fecal microbiotas in young adults and in antibiotic-treated and non-antibiotic-treated elderly subjects. Appl Environ Microbiol 2004;70:6113-22.
12. Bartosch S, Fite A, Macfarlane GT, McMurdo MET. Characterization of bacterial communities in feces from healthy elderly volunteers and hospitalized elderly patients by using real time PCR and effects of antibiotic treatment on the fecal microbiota. Appl Environ Microbiol 2004;70:3575–81.
13. Woodmansey EJ. Intestinal bacteria and ageing. J Appl Microbiol 2007;102:1178-86.
14. Claesson MJ, Cusack S, O'Sullivan O, et al. Composition, variability, and temporal stability of the intestinal microbiota of the elderly. Proc Natl Acad Sci USA 2011;108(Suppl 1):4586-91.
15. He F, Ouwehand AC, Isolauri E, Hosoda M, et al. Differences in composition and mucosal adhesion of bifidobacteria isolated from healthy adults and healthy seniors. Curr Microbiol 2001;43:351–54.
16. Leahy SC, Higgins DG, Fitzgerald GF, van Sinderen D. Getting better with bifidobacteria. J Appl Microbiol 2005;98:1303-15.
17. Riedel CU, Foata F, Philippe D, et al. Anti-inflammatory effects of bifidobacteria by inhibition of LPS-induced NF-kappaB activation. World J Gastroenterol 2006;12:3729-35.
18. Khokhlova EV, Smeianov VV, Efimov BA, et al. Anti-inflammatory properties of intestinal Bifidobacterium strains isolated from healthy infants. Microbiol Immunol 2012;56:27-39.
19. Hopkins MJ, Sharp R, Macfarlane GT. Age and disease related changes in intestinal bacterial populations assessed by cell culture, 16S rRNA abundance, and community cellular fatty acid profile. Gut 2001;48:198-205.

20. Drago L, Toscano M, Rodighiero V, et al. Cultivable and pyrosequenced fecal microflora in centenarians and young subjects. J Clin Gastroenterol 2012;46 Suppl:S81-4.
21. Biagi E, Nylund L, Candela M, et al. Through ageing, and beyond: gut microbiota and inflammatory status in seniors and centenarians. PLoS One 2010;5:e10667.
22. Mariat D, Firmesse O, Levenez F, et al. The Firmicutes/Bacteroidetes ratio of the human microbiota changes with age. BMC Microbiol 2009;9:123.
23. van Tongren SP, Slaets JP, Harmsen HJ, Welling GW. Fecal microbiota composition and frailty. Appl Environ Microbiol 2005;71:6438-42.
24. Ottman N, Smidt H, de Vos WM, Belzer C. The function of our microbiota: who is out there and what do they do? Front Cell Infect Microbiol 2012;2:104.
25. Guigoz Y, Doré J, Schiffrin J. The inflammatory status of old age can be nurtured from the intestinal environment. Curr Op Clin Nutr Metab Care 2008;11:13–20.
26. Hopkins MJ, Macfarlane GT. Changes in predominant bacterial populations in human faeces with age and with Clostridium difficile infection. J Med Microbiol 2002;51:448-54.
27. Karlström O, Fryklund B, Tullus K, Burman LG. A prospective nationwide study of Clostridium difficile-associated diarrhea in Sweden. The Swedish C. difficile Study Group. Clin Infect Dis 1998;26:141-5.
28. Bartlett JG. Narrative review: the new epidemic of Clostridium difficile-associated enteric disease. Ann Intern Med 2006;145:758-64.
29. Rea MC, O'Sullivan O, Shanahan F, et al. Clostridium difficile carriage in elderly subjects and associated changes in the intestinal microbiota. J Clin Microbiol 2012;50:867-75.
30. Chang JY, Antonopoulos DA, Kalra A, et al. Decreased diversity of the fecal microbiome in recurrent Clostridium difficile-associated diarrhea. J Infect Dis 2008;197:435-8.
31. Karadsheh Z, Sule S. Fecal transplantation for the treatment of recurrent Clostridium difficile infection. N Am J Med Sci 2013;5:339-43.
32. Bengmark S. Nutrition of the critically ill; a 21st-century perspective. Nutrients 2013;5:162-207.
33. Iapichino G, Callegari ML, Marzorati S, et al. Impact of antibiotics on the gut microbiota of critically ill patients. J Med Microbiol 2008;57(Pt 8):1007-14.
34. Shimizu K, Ogura H, Goto M, et al. Altered gut flora and environment in patients with severe SIRS. J Trauma 2006;60:126-33.
35. Mueller S, Saunier K, Hanisch C, et al. Differences in fecal microbiota in different European study populations in relation to age, gender, and country: a cross-sectional study. Appl Environ Microbiol 2006;72:1027-33.
36. Kalache A. Active ageing makes the difference. Bull World Health Organ 1999;77:299.
37. Goodwin JS. Decreased immunity and increased morbidity in the elderly. Nutr Rev 1995;53:S41-4; discussion S44-6.
38. Hajishengallis G. Too old to fight? Aging and its toll on innate immunity. Mol Oral Microbiol 2010;25:25-37.
39. Bruunsgaard H, Pedersen M, Pedersen BK. Aging and proinflammatory cytokines. Curr Opin Hematol 2001;8:131-6.
40. Franceschi C, Bonafè M, Valensin S, et al. Inflamm-aging. An evolutionary perspective on immunosenescence. Ann N Y Acad Sci 2000;908:244-54.
41. Franceschi C. Inflammaging as a major characteristic of old people: can it be prevented or cured? Nutr Rev 2007;65:S173–S176.
42. Vasto S, Candore G, Balistreri CR, et al. Inflammatory networks in ageing, age-related diseases and longevity. Mech Ageing Dev 2007;128:83-91.
43. DeMartinis M, Franceschi C, Monti D, Ginaldi L. Inflamm-ageing and lifelong antigenic load as major determinants of ageing rate and longevity. FEBS Lett 2005;579:2035-9.
44. DeMartinis M, Franceschi C, Monti D, Ginaldi L. Inflammation markers predicting frailty and mortality in the elderly. Exp Mol Pathol 2006;80:219-27.
45. Li H, Manwani B, Leng SX. Frailty, inflammation, and immunity. Aging Dis 2011;2:466-73.
46. Singh T, Newman AB. Inflammatory markers in population studies of aging. Ageing Res Rev 2011;10:319-29.
47. Hubbard RE, O'Mahony MS, Savva GM, et al. Inflammation and frailty measures in older people. J Cell Mol Med 2009;13:3103-9.
48. Michaud M, Balardy L, Moulis G, et al. Proinflammatory cytokines, aging, and age-related diseases. J Am Med Dir Assoc 2013;14:877-82.
49. Salminen A, Huuskonen J, Ojala J, et al. Activation of innate immunity system during aging: NF-□B signaling is the molecular culprit of inflamm-aging. Ageing Res Rev 2008;7:83-105.
50. Moro-García MA, Alonso-Arias R, López-Larrea C. Molecular mechanisms involved in the aging of the T-cell immune response. Curr Genomics 2012;13:589-602.
51. Effros RB, Dagarag M, Spaulding C, Man J. The role of CD8+ T-cell replicative senescence in human aging. Immunol Rev 2005;205:147-57.
52. Ferrando-Martínez S, Romero-Sánchez MC, Solana R, et al. Thymic function failure and C-reactive protein levels are independent predictors of all-cause mortality in healthy elderly humans. Age (Dordr) 2013;35:251-9.
53. Krabbe KS, Pedersen M, Bruunsgaard H. Inflammatory mediators in the elderly. Exp Gerontol 2004;39:687-99.
54. Johnson TE. Recent results: biomarkers of aging. Exp Gerontol 2006;41:1243-6.
55. Quaglia LA, Freitas WM, Soares AA, et al. C-reactive protein is independently associated with coronary atherosclerosis burden among octogenarians. Aging Clin Exp Res 2014;26:19-23.
56. Giunta B, Fernandez F, Nikolic WV, et al. Inflammaging as a prodrome to Alzheimer's disease. J Neuroinflammation 2008;5:51.
57. Maggio M, Guralnik JM, Longo DL, Ferrucci L. Interleukin-6 in aging and chronic disease: a magnificent pathway. J Gerontol A Biol Sci Med Sci 2006;61:575-84.
58. Lindstrom TM, Robinson WH. Rheumatoid arthritis: a role for immunosenescence? J Am Geriatr Soc 2010;58:1565-75.
59. Scher JU, Abramson SB. The microbiome and rheumatoid arthritis. Nat Rev Rheumatol 2011;7:569-78.
60. Percival RS, Marsh PD, Challacombe SJ. Serum antibodies to commensal oral and gut bacteria vary with age. FEMS Immunol Med Microbiol 1996;15:35-42.
61. Yeoh N, Burton JP, Suppiah P, et al. The role of the microbiome in rheumatic diseases. Curr Rheumatol Rep 2013;15:314.
62. Fessler J, Ficjan A, Duftner C, Dejaco C. The impact of aging on regulatory T-cells. ront Immunol 2013;4:231.
63. Wu HJ, Wu E. The role of gut microbiota in immune homeostasis and autoimmunity. Gut Microbes 2012;3:4-14.
64. Ivanov II, Littman DR. Modulation of immune homeostasis by commensal bacteria. Curr Opin Microbiol 2011;14:106-14.
65. López P, González-Rodríguez I, Gueimonde M, Margolles A, Suárez A. Immune response to Bifidobacterium bifidum strains support Treg/Th17 plasticity. PLoS One 2011;6:e24776.
66. Konieczna P, Groeger D, Ziegler M, et al. Bifidobacterium infantis 35624 administration induces Foxp3 T regulatory cells in human peripheral blood: potential role for myeloid and plasmacytoid dendritic cells. Gut 2012;61:354-66.
67. Atarashi K, Tanoue T, Shima T, et al. Induction of colonic regulatory T cells by indigenous Clostridium species. Science 2011;331:337-41.
68. Boirivant M, Strober W. The mechanism of action of probiotics. Curr Opin Gastroenterol 2007;23:679-92.
69. Kwon HK, Lee CG, So JS, et al. Generation of regulatory dendritic cells and CD4+Foxp3+ T cells by probiotics administration suppresses immune disorders. Proc Natl Acad Sci USA 2010;107:2159–64.
70. Franceschi C, Monti D, Sansoni P, Cossarizza A. The immunology of exceptional individuals: the lesson of centenarians. Immunol Today 1995;16:12-6.
71. Bürkle A, Caselli G, Franceschi C, et al. Pathophysiology of ageing, longevity and age elated diseases. Immun Ageing 2007;4:4.
72. Yang HY, Liu SL, Ibrahim SA, et al. Oral administration of live Bifidobacterium substrains isolated from healthy centenarians enhanced immune function in BALB/c mice. Nutr Res 2009;29:281-9.
73. Yang H, Liu A, Zhang M, et al. Oral administration of live Bifidobacterium substrains isolated from centenarians enhances intestinal function in mice. Curr Microbiol 2009;59:439-45.
74. Ahmed M, Prasad J, Gill H, et al. Impact of consumption of different levels of Bifidobacterium lactis HN019 on the intestinal microflora of elderly human subjects. J Nutr Health Aging 2007;11:26-31.
75. Rampelli S, Candela M, Severgnini M, et al. A probiotics-containing biscuit modulates the intestinal microbiota in the elderly. J Nutr Health Aging 2013;17:166-72.
76. Björklund M, Ouwehand AC, Forssten SD, et al. Gut microbiota of healthy elderly NSAID users is selectively modified with the administration of Lactobacillus acidophilus NCFM and lactitol. Age (Dordr) 2012;34:987-99.
77. Lahtinen SJ, Forssten S, Aakko J, et al. Probiotic cheese containing Lactobacillus rhamnosus HN001 and Lactobacillus acidophilus NCFM® modifies subpopulations of fecal lactobacilli and Clostridium difficile in the elderly. Age (Dordr) 2012;34:133-43.
78. Malaguarnera G, Leggio F, Vacante M, et al. Probiotics in the gastrointestinal diseases of the elderly. J Nutr Health Aging 2012;16:402-10.
79. Kanmani P, Satish Kumar R, Yuvaraj N, et al. Probiotics and its functionally valuable products-a review. Crit Rev Food Sci Nutr 2013;53:641-58.
80. Hell M, Bernhofer C, Stalzer P, et al. Probiotics in Clostridium difficile infection: reviewing the need for a multistrain probiotic. Benef Microbes 2013;4:39-51.
81. Fitzpatrick LR. Probiotics for the treatment of Clostridium difficile associated disease. World J Gastrointest Pathophysiol 2013;4:47-52.
82. Johnston BC, Ma SS, Goldenberg JZ, et al. Probiotics for the prevention of Clostridium difficile-associated diarrhea: a systematic review and meta-analysis. Ann Intern Med 2012;157:878-88.
83. Hempel S, Newberry SJ, Maher AR, et al. Probiotics for the prevention and treatment of antibiotic-associated diarrhea: a systematic review and meta-analysis. JAMA 2012;307:1959-69.
84. Ibrahim F, Ruvio S, Granlund L, et al. Probiotics and immunosenescence: cheese as a carrier. FEMS Immunol Med Microbiol 2010;59:53-9.
85. Hickson M, D'Souza AL, Muthu N, et al. Use of probiotic Lactobacillus preparation to prevent diarrhoea associated with antibiotics: randomised double blind placebocontrolled trial. BMJ 2007;335:80.
86. Zhou JS, Pillidge CJ, Gopal PK, Gill HS. Antibiotic susceptibility profiles of new probiotic Lactobacillus and Bifidobacterium strains. Int J Food Microbiol 2005;98:211-7.
87. Fang H, Elina T, Heikki A, Seppo S. Modulation of humoral immune response throughprobiotic intake. FEMS Immunol Med Microbiol 2000;29:47-52.
88. Dong H, Rowland I, Yaqoob P. Comparative effects of six probiotic strains on immune function in vitro. Br J Nutr 2012;108:459-70.
89. Hardy H, Harris J, Lyon E, et al. Probiotics, prebiotics and immunomodulation of gut mucosal defences: homeostasis and immunopathology. Nutrients 2013;5:1869-912.
90. López P, González-Rodríguez I, Gueimonde M, et al. Immune response to Bifidobacterium bifidum strains support Treg/Th17 plasticity. PLoS One 2011;6:e24776.
91. López P, González-Rodríguez I, Sánchez B, et al. Interaction of Bifidobacterium bifidum LMG13195 with HT29 cells influences regulatory-T-cell-associated chemokine receptor expression. Appl Environ Microbiol 2012;78:2850-7.
92 Joen SG, Kayama H, Ueda Y, et al. Probiotic Bifidobacterium breve induces IL-10-producing Tr1 cells in the colon. PLoS Pathog 2012;8:e1002714.
93. Groeger D, O'Mahony L, Murphy EF, et al. Bifidobacterium infantis 35624 modulates host inflammatory processes beyond the gut. Gut Microbes 2013;4:325-39.
94. O'Hara AM, O'Regan P, Fanning A, et al. Functional modulation of human intestinal epithelial cell responses by Bifidobacterium infantis and Lactobacillus salivarius. Immunology 2006;118:202-15.
95. Kekkonen RA, Lummela N, Karjalainen H, et al. Probiotic intervention has strain-specific anti-inflammatory effects in healthy adults. World J Gastroenterol 2008;14:2029-36.
96. Laparra JM, Olivares M, Gallina O, Sanz Y. Bifidobacterium longum CECT 7347 modulates immune responses in a gliadin-induced enteropathy animal model. PLoS One 2012;7:e30744.
97. Gill HS, Rutherfurd KJ, Prasad J, Gopal PK. Enhancement of natural and acquired immunity by Lactobacillus rhamnosus (HN001), Lactobacillus acidophilus (HN017) and Bifidobacterium lactis (HN019). Br J Nutr 2000;83:167-76.
98. Dong H, Rowland I, Thomas LV, Yaqoob P. Immunomodulatory effects of a probiotic drink containing Lactobacillus casei Shirota in healthy older volunteers. Eur J Nutr 2013;52:1853-63.
99. Chiba Y, Shida K, Nagata S, et al. Well-controlled proinflammatory cytokine responses of Peyer's patch cells to probiotic Lactobacillus casei. Immunology 2010;130:352-62.
100. Mohmadzadeh M, Olson S, Kalina WV, et al. Lactobacilli activate human dendritic cells that skew T cells toward T helper 1 polarization. Proc Natl Acad Sci USA 2005;102:2880-5.
101. Olivares M, Paz Díaz-Ropero M, et al. Dietary deprivation of fermented foods causes a fall in innate immune response. Lactic acid bacteria can counteract the immunological effect of this deprivation. J Dairy Res 2006;73:492-8.
102. Rask C, Adlerberth I, Berggren A, et al. Differential effect on cell-mediated immunity in human volunteers after intake of different lactobacilli. Clin Exp Immunol 2013;172:321-32.
103. Smelt MJ, de Haan BJ, Bron PA, et al. Probiotics can generate FoxP3 T-cell responses in the small intestine and simultaneously inducing CD4 and CD8 T cell activation in the large intestine. PLoS One 2013;8:e68952.
104. Evrand B, Coudeyras S, Dosgilbert A, et al. Dose-dependent immunomodulation of human dendritic cells by the probiotic Lactobacillus rhamnosus Lcr35. PLoS One 2011;6:e18735.
105. Jeon SG, Kayama H, Ueda Y, et al. Probiotic Bifidobacterium breve induces IL-10-producing Tr1 cells in the colon. PLoS Pathog 2012;8:e1002714.
106. López P, González-Rodríguez I, Gueimonde M, Margolles A, Suárez A. Immune response to Bifidobacterium bifidum strains support Treg/Th17 plasticity. PLoS One 2011;6:e24776.
107. Tsai YT, Cheng PC, Pan TM. The immuno modulatory effects of lactic acid bacteria for improving immune functions and benefits. Appl Microbiol Biotechnol 2012;96:853-62.
108. Hakansson A, Molin G. Gut microbiota and inflammation. Nutrients 2011;3:637–82.
109. Yu LC, Wang JT, Wei SC, Ni YH. Host-microbial interactions and regulation of intestinal epithelial barrier function: From physiology to pathology. World J Gastrointest Pathophysiol 2012;3:27-43.
110. Howarth GS, Wang H. Role of endogenous microbiota, probiotics and their biological products in human health. Nutrients 2013;5:58–81.
111. Ahrné S, Johansson Hagslatt M-L. Effect of lactobacilli on paracellular permeability in the gut. Nutrients 2011;3:104-117.
112. Gourbayre P, Denery S, Bodinier M. Probiotics, prebiotics, and synbiotics: impact on the gut immune system and allergic reactions. J Leukoc Biol 2011;89:685-95.
113. Pae M, Meydani SN, Wu D. The role of nutrition in enhancing immunity in aging. Aging Dis 2012;3:91-129.
114. Namba K, Hatano M, Yaeshima T, et al. Effects of Bifidobacterium longum BB536 administration on influenza infection, influenza vaccine antibody titer, and cell-mediated immunity in the elderly. Biosci Biotechnol Biochem 2010;74:939-45.
115. Akatsu H, Iwabuchi N, Xiao JZ, et al. Clinical effects of probiotic Bifidobacterium longum BB536 on immune function and intestinal microbiota in elderly patients receiving enteral tube feeding. JPEN J Parenter Enteral Nutr 2013;37:631-40.
116. Zhu Y, Luo TM, Jobin C, Young HA. Gut microbiota and probiotics in colon tumorigenesis. Cancer Lett 2011;309:119-27.
117. Gill HS, Rutherfurd KJ, Cross ML. Dietary probiotic supplementation enhances natural killer cell activity in the elderly: an investigation of age-related immunological changes. J Clin Immunol 2001;21:264-71.
118. Ishikawa H, Akedo I, Otani T, et al. Randomized trial of dietary fiber and Lactobacilluscasei administration for prevention of colorectal tumors. Int J Cancer 2005;116:762-7.
119. Ley RE, Peterson DA, Gordon JI. Ecological and evolutionary forces shaping microbial diversity in the human intestine. Cell 2006;124:837-48.

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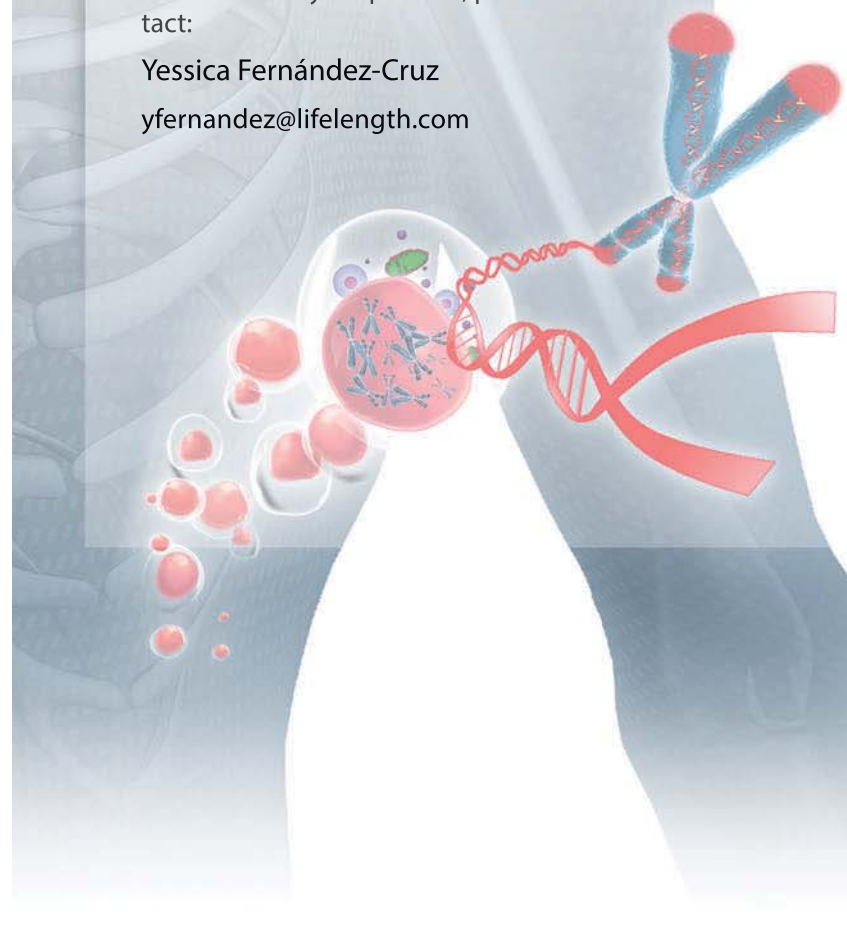

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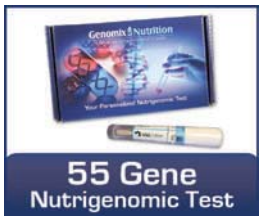

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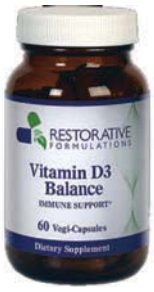

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The Role of the Endothelial Glycocalyx in the Pathogenesis of Atherosclerosis:

A New Frontier in Cardiovascular Health

By Derrick DeSilva Jr, MD, Jeffrey Gladden, MD, FACC, Chen Chen, PhD, Jon Ward, MA

Much recent work on the pathogenesis of atherosclerosis has focused on the "response to injury theory". In brief, the theory holds that atherosclerosis may be understood as an inflammatory response to insults occurring to the endothelium. [1]

When the endothelium is healthy, atherosclerosis does not occur. When the endothelium is damaged, it produces surface-adhesion molecules causing monocytes and t-lymphocytes to stick to its surface, which then penetrate the endothelium into intima. As low density lipoprotein(LDL) particles follow the path, they enter the intima and begin to oxidize. This sets the stage for foam cell formation and plaque development. The resulting plaque then builds up and, when internally inflamed or externally eroded, can be a threat to rupture its contents into the arterial flow, potentially triggering a blood clot that if large enough, or not lysed quickly enough, can occlude the artery to various degrees causing anything from mild to devastating downstream ischemia. Indeed, it is the clotting in response to plaque disruption, not the plaque accumulation in the arteries per se, that poses the real threat. 75% of heart attacks occur at arteries that are less than 50% blocked, while mild plaquing escapes traditional stress tests 80% of the time.

Needless to say, this means that merely measuring the serum levels of LDL and HDL is inadequate to assess event risk. To interrupt the cycle, clinicians need to be primarily concerned with the health of the endothelium.

The injury-response theory is gaining widespread acceptance, but it begs an important question: What causes the injury to the endothelium in the first place? Multiple candidates have been cited such as:

- Direct trauma causing physical injury
- Turbulence in the blood flow, for example at artery bifurcations
- Excessive blood glucose levels
- Circulation of free radicals
- TMAO (trimethylamine-N-oxide)
- Higher than normal concentrations of LDL or VLDL
- High blood pressure
- Circulating toxins
- Deterioration of the NO system

All of these explanations have value, but they miss a critical factor in endothelial health which merits more attention than it has received in the current literature. That factor is the endothelial glycocalyx.

THE ENDOTHELIAL GLYCOCALYX

Popular accounts of the endothelium inaccurately describe it as "the inner lining" of the blood vessels. Here is Wikipedia:

> "Endothelium is a type of epithelium that lines the interior surface of blood vessels and lymphatic vessels, forming an interface between circulating blood or lymph in the lumen and the rest of the vessel wall."

What is missing from these accounts is the glycocalyx, a slippery smooth gel coating of the endothelium that positions an additional layer between the endothelium and the circulating blood. This is the true interface. In other words, it is the endothelial glycocalyx—not the endothelial cells themselves—that has (or should have) direct contact with the circulating fluids and particles.

When we help doctors explain the endothelial glycocalyx to patients, we sometimes liken it to the non-stick surface of a

frying pan. The analogy is useful because it highlights the protective function of this important structure. A healthy glycocalyx ensures that LDL particles "slip by" without contacting the endothelium. Conversely, when the endothelial glycocalyx is compromised (which happens very easily), the endothelium becomes susceptible to injury impairment and LDL penetration. Important clinical implications follow. To prevent atherosclerosis, we must protect the endothelium from injury and preserve its vital functions. To protect endothelial function, we must support its existing natural protection, the endothelial glycocalyx. In layman's terms: if you want to stop food sticking to your saucepan, take care of the non-stick coating! If you want the infrastructure of the endothelium to work, you need to protect its surface.

A CLOSER LOOK AT THE GLYCOCALYX

The endothelial glycocalyx is a thin gel-like layer that coats the entire luminal side of the vascular endothelium. It is a meshwork mainly of glycoproteins, proteoglycans and glycosaminoglycans at a thickness of approximately 1 µm magnitude.[2-4] Syndecans and glypicans are the core proteins of heparan sulfate (a glycosaminoglycan) proteoglycans bound to endothelial cells identified in the glycocalyx. Glycoproteins such as selectins and integrins are also anchored on endothelial cells while some other soluble proteins and proteoglycans simply dock in glycocalyx.[5]

Extensive research has revealed the importance of glycocalyx-mediated endothelial function in vascular and microvascular health.

FOR EXAMPLE, THE ENDOTHELIAL GLYCOCALYX:

- Regulates vascular permeability and fluid balance due to the large size and negative charge of glycosaminoglycans.[6,7]
- Provides a physical barrier against inadvertent adhesion of platelets and leukocytes to the vascular wall.[8]
- Regulates coagulation as many of mediators of coagulation pathway are buried inside the glycocalyx under normal physiological condition.[5]

Most intriguingly, the glycocalyx is found to be a mechano-sensor and -transducer of the shearforce inside blood vessels.3 The signal is believed to be transduced to endothelial nitric oxide synthase (eNOS) via heparan sulfate in the glycocalyx to either up- or down-regulate the synthesis of nitric oxide (NO) in response to the blood flow.[9,10]

Figure 1 illustrates the chemical structure of the endothelial glycocalyx and its signal transduction to eNOS and subsequently sGC (soluble guanynyl cyclase) to induce smooth muscle relaxation via shear stress.

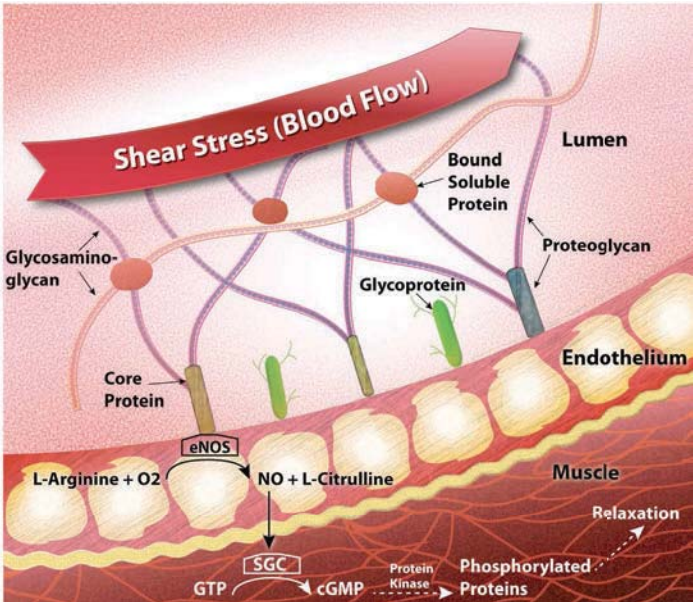


Figure 1. Structure of the endothelial glycocalyx and its activation of vascular muscle relaxation via NO in response to increased shear force

DAMAGE TO THE ENDOTHELIAL GLYCOCALYX

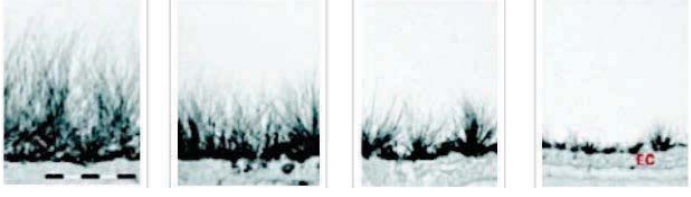
The endothelial glycocalyx is a delicate structure and can be damaged by several common mechanisms involved in the pathogenesis of atherosclerosis. These include high blood glucose, [11] oxidative stress, [12] and inflammation. [4] It is known that high-sugar diets, cigarette smoking, stress, and aging can all degrade the glycocalyx.

Hyperglycemia is a major cause for disruption of the endothelial glycocalyx.[11,13] In fact, individuals with hyperglycemia and diabetes are known to have less endothelial glycocalyx.[14] Such a change may explain the endothelial dysfunction and increased microvascular permeability that lead to major complications in the diabetic population.[15,16]

There are several other disease conditions identified so far to be associated with a compromised endothelial glycocalyx:

- Coronary heart disease[17]
- Renal diseases[18]
- Lacunar stroke (a small vessel disease)[19]
- Severe trauma[20]

These electron-microscope images show the deterioration of the endothelial glycocalyx:



CLINICAL INTERVENTIONS

Given the vital role the endothelial glycocalyx plays in the pathology of many vascular and micro-vascular related diseases, it has naturally become a target for pharmaceutical intervention.[21,22] However, glycocalyx drug development is still in its infancy, and no substantial progress has been made to date. [23]

A dietary supplement has been tested and shown to have measurable benefits for a compromised glycocalyx in healthy subjects. Brand-named Arterosil, its primary ingredient is rhamnan sulfate derived from rare marine algae. Rhamnan sulfate has a similar chemical structure to heparan sulfate found abundantly in the human endothelial glycocalyx, and may exert its bioactivity by regenerating the glycocalyx.

In an early clinical trial, the positive impact on the glycocalyx was established by measuring recovery of RHI (reactive hyperemia index) in 20 healthy human subjects following a high sugar, high-fat meal. Results were compared with and without consumption of ArterosilHP. The study confirmed a significant improvement in glycocalyx RHI recovery with the supplement.

Important safety data were obtained for complete metabolic panel (CMP), thyroid stimulating hormone (TSH), complete blood count (CBC), and partial thromboplastin time (PTT) from the trial. No significant changes were observed for any of these tests after 4 weeks of ArterosilHP supplementation. There was also no serious adverse event reported during the study, and the product was well tolerated by all subjects.

THE GLYCOCALYX AND ARTERIAL ELASTICITY: A NEW FRONTIER

The clinical significance of arterial elasticity is well established: Central arterial stiffness has been shown to be an independent predictor of cardiovascular morbidity and mortality. [24] While the prognostic value of this measure is widely accepted, the causes of arterial stiffness are still subject to debate. Some research suggests that the issue is not limited to the larger arteries themselves, but may extend to the microvascular system. [25] Other studies indicate the role of endothelial function in determining the degree of arterial elasticity. [26]

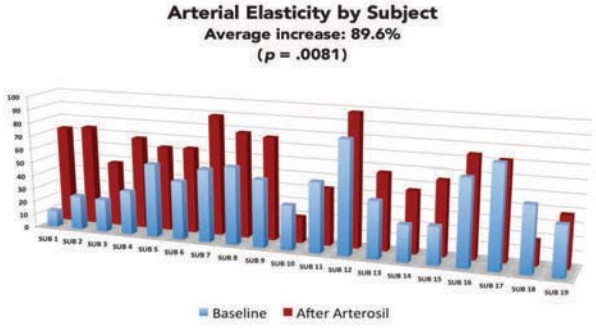
One useful contribution to this debate may prove to be a new focus on the endothelial glycocalyx. Because the glycocalyx serves to protect the integrity of the endothelium, and hence of the arterial wall, it stands to reason that a healthy glycocalyx might be associated with good arterial elasticity.

We conducted a pilot study to test patients for arterial elasticity — among other markers — before and after the consumption of ArterosilHP.

Nineteen healthy human subjects (11 females age 22 to 64 and 8 males age 30 to 60) were randomly recruited for the single blinded clinical study, which was conducted at an independent cardiology center on the Baylor Medical Campus in Plano, Texas. Their vascular health condition was evaluated utilizing MaxPulse, an FDA approved Class II device. The MaxPulse utilizes accelerated plethysmography technology with data being gathered by way of a finger probe. This technology, also known as pulse wave analysis, includes multiple factors including wave type, arterial elasticity, eccentric constriction and remaining blood volume valuations.

In this study, the baseline reading was taken at approximately 2 hours (+/- 30 minutes) post consumption of a breakfast of the subject's choice. Immediately after the baseline reading one capsule of ArterosilHP was swallowed. A post-dose reading was taken every 30 minutes for 3 hours, for a total of 7 readings (baseline, 30 min, 60 min, 90 min, 120 min, 150 min & 180 min +/- 5 minutes). The patients were kept in a quiet ambient environment. No food or liquid (other than small amounts of water as needed) was consumed during the 3 hour testing period.

THE RESULTS ARE SUMMARIZED IN THE TABLE BELOW:



In sum, 78.9% of subjects experienced an increase in arterial elasticity. The average percentage increase in arterial elasticity was 89.6% (p = .0081). The mean time to maximum increase was 118 minutes. There was concurrent improvement in remaining blood volume and eccentric contraction. In this preliminary study, we were able to demonstrate that ArterosilHP improves arterial elasticity in healthy human subjects. It is likely this acute beneficial effect is a result of improved glycocalyx and its mediated endothelial func-

tions. These new data are in agreement with our previous findings that ArterosilHP helps regenerate the endothelial glycocalyx and restore compromised endothelial functions. Clearly there is a need for further studies to validate these early results.

We know that arterial stiffness indicates adverse changes of blood vessel structure and function, and poses a significant threat to patients' cardiovascular health. [27] If it transpires that rebuilding the glycocalyx has a rapid and positive impact on arterial elasticity, this could suggest a valuable clinical intervention, both for patients presenting disease conditions and for those seeking preventative care.

ABOUT THE PRIMARY AUTHOR

Dr. Derrick DeSilva is a practicing internist with a wide range of medical interests. He serves as Senior Attending Staff at the Department of Medicine, Raritan Bay Medical Center (RBMC) in Perth Amboy, New Jersey. He also serves on the teaching faculty of the JFK Medical Center in Edison, New Jersey. Dr. DeSilva serves as Chairman of the Planning Committee for the Age Management Medicine Group (AMMG) and is a Past President of the American Nutraceutical 7 Association. He has been a recipient of the Alan Mintz Award for Excellence in Clinical Age Management Medicine, and he has received the Best Doctor Award by Castle Connolly for the past 15 consecutive years. Dr. DeSilva is host of "Ask the Doctor" on WCTC Radio, a medical correspondent for Cablevision (News 12 New Jersey) and host of "12 to Your Health". ■

REFERENCES

1. Russell Ross, John Glomset & Laurence Harker. Response to Injury and Atherogenesis. Am J Pathol. (1977) 86(3): 675–684.
2. C. S. Alphonsus & R. N. Rodseth. The Endothelial Glycocalyx: A Review of the Vascular Barrier. Anaesthesia (2014) 69(7):777-84.
3. Bingmei M. Fu & John M. Tarbell. Mechano-sensing and Transduction by Endothelial Surface Glycocalyx: Composition, Structure, and Function. Wiley Interdiscip Rev Syst Biol Med. (2013) 5(3): 381–390.
4. Hana Kolálová, Barbora Ambruzová, Lenka Švihálková Šindlerová, Anna Klinke & Lukáš Kubala. Modulation of Endothelial Glycocalyx Structure under Inflammatory Conditions. Mediators of Inflammation (2014) Article ID 694312, 1-17.
5. Sietze Reitsma, Dick W. Slaaf, Hans Vink, Marc A. M. J. van Zandvoort & Mirjam G. A. oude Egbrink. The Endothelial Glycocalyx: Composition, Functions, and Visualization. Eur J Physiol (2007) 454:345–359.
6. Bernard F. Becker, Daniel Chappell & Matthias Jacob. Endothelial Glycocalyx and Coronary Vascular Permeability: the Fringe Bene t. Basic Research in Cardiology (2010) 105:687– 701.
7. F. E. Curry & R. H. Adamson. Endothelial Glycocalyx: Permeability Barrier and Mechanosensor. Annals of Biomedical Engineering (2012) 40:828–839.
8. A. W. Mulivor & H. H. Lipowsky. Role of Glycocalyx in Leukocyte-endothelial Cell Adhesion. American Journal of Physiology: Heart and Circulatory Physiology (2002) 283(4):H1282– H1291.
9. Eno E. Ebong, Sandra V. Lopez-Quintero, Victor Rizzo, David C. Spray & John M. Tarbell. Shear-induced Endothelial NOS Activation and Remodeling via Heparan Sulfate, Glypican-1, and Syndecan-1. Integr Biol (Camb). (2014) 6(3): 338–347.
10. Wanyi Yen, Bin Cai, Jinlin Yang, Lin Zhang, Min Zeng, John M. Tarbell & Bingmei M. Fu. Endothelial Surface Glycocalyx Can Regulate Flow-Induced Nitric Oxide Production in Microvessels In Vivo. PLoS One (2015) 10(1):e0117133.
11. Max Nieuwdorp, Timon W. van Haeften, Mirella C.L.G. Gouverneur, Hans L. Mooij, Miriam H.P. van Lieshout, Marcel Levi, Joost C.M. Meijers, Frits Holleman, Joost B.L. Hoekstra, Hans Vink, John J.P. Kastelein & Erik S.G. Stroes. Loss of Endothelial Glycocalyx During Acute Hyperglycemia Coincides With Endothelial Dysfunction and Coagulation Activation In Vivo. Diabetes (2006) 55(2):480-486.
12. Hans Vink, Alina A. Constantinescu, & Jos A.E. Spaan. Oxidized lipoproteins degrade the endothelial surface layer: implications for platelet-endothelial cell adhesion. Circulation (2000)101:1500–1502
13. Bart J. M. Eskens, Thomas M. Leurgans, Hans Vink & Jurgen W. G. E. VanTeeffelen. Early Impairment of Skeletal Muscle Endothelial Glycocalyx Barrier Properties in Diet Induced Obesity in Mice. Physiol Rep. (2014) 2(1):e00194.
14. Claudia Nussbaum, Ana Cavalcanti Fernandes Heringa, Zuzana Mormanova, Alexandra F. Puchwein- Schwepcke, Su- sanne Bechtold-Dalla Pozza & Orsolya Genzel-Boroviczény. Early Microvascular Changes with Loss of the Glycocalyx in Children with Type 1 Diabetes. J Pediatr. (2014) 164(3):584589.
15. Sandra V. Lopez-Quintero, Limary M. Cancel, Alexis Pierides, David Antonetti, David C. Spray & John M. Tarbell. High Glucose Attenuates Shear-Induced Changes in Endothelial Hydraulic Conductivity by Degrading the Glycocalyx. PLoS One. (2013) 8(11):e78954.
16. Andrew H. J. Salmon & Simon C. Satchell. Endothelial Glycocalyx Dysfunction in Disease: Albuminuria and Increased Microvascular Permeability. J Pathol (2012) 226: 562– 574.
17. Ties A. Mulders, Max Nieuwdorp, Erik S Stroes, Hans Vink & Sara-Joan Pinto-Sietsma. Non-invasive Assessment of Microvascular Dysfunction in Families with Premature Coronary Artery Disease. Int J Cardiol. (2013) 168(5):5026-5028.
18. Carmen A. Vlahu, Bregtje A. Lemkes,Dirk G. Struijk, Marion G. Koopman, Raymond T. Krediet & Hans Vink. Damage of the Endothelial Glycocalyx in Dialysis Patients. J Am Soc Nephro (2012) l23:1900–1908.
19. Remy J.H. Martens, Hans Vink, Robert J. van Oostenbrugge & Julie Staals. Sublingual Microvascular Glycocalyx Dimensions in Lacunar Stroke Patients. Cerebrovasc Dis (2013) 35:451–454.
20. Elaheh Rahbar, Jessica C Cardenas, Gyulnar Baimukanova, Benjamin Usadi, Roberta Bruhn, Shibani Pati, Sisse R Ostrowski, Pär I Johansson, John B Holcomb & Charles E Wade. Endothelial Glycocalyx Shedding and Vascular Per-meability in Severely Injured Trauma Patients. J Transl Med. (2015) 13:117.
21. Angela J. Drake-Holland & Mark I. Noble. The Important New Drug Target in Cardiovascular Medicine – the Vascular Glycocalyx. Cardiovascular & Haematological Disorders-Drug Targets (2009) 9:118-123.
22. Angela J. Drake-Holland & Mark I. Noble. Update on the Important New Drug Target in Cardiovascular Medicine the Vascular Glycocalyx. Cardiovascular & Haematological Disorders-Drug Targets (2012) 12:76-81.
23. John M. Tarbell & Limary M. Cancel. The Glycocalyx and Its Significance in Human Medicine. J Intern Med. (2016) 280(1):97-113. doi: 10.1111/joim.12465. Epub 2016 Jan 8.
24. M. Cecelja and P. Chowienczyk. Role of Arterial Stiffness in Cardiovascular Disease. JRSM Cardiovascular Disease (2012) 1(4): 11.
25. E. Grey, C. Bratteli, S. P. Glasser, C. Alinder, S.M. Finkelstein, , B. R. Lindgren, & J. N. Cohn. Reduced Small Artery But Not Large Artery Elasticity Is an Independent Risk Marker for Cardiovascular Events American J of Hypertension (2003) 16(4): 265-269.
26. Jun Tao, Ya-Fei Jin, Zheng Yang, Li-Chun Wang, Xiu-ren Gao, Liu Lei & Hong Ma. Reduced Arterial Elasticity Is Associated with Endothelial Dysfunction in Persons of Advancing Age. American J of Hypertension (2004) 17(8): 654-659.
27. J.L. Cavalcante, J.A. Lima JA, A. Redheuil, M.H. Al-Mallah. Aortic Stiffness: Current Understanding and Future Directions. J Am Coll Cardiol. (2011) 57(14):1511-22. doi: 10.1016/j.jacc.2010.12.017.

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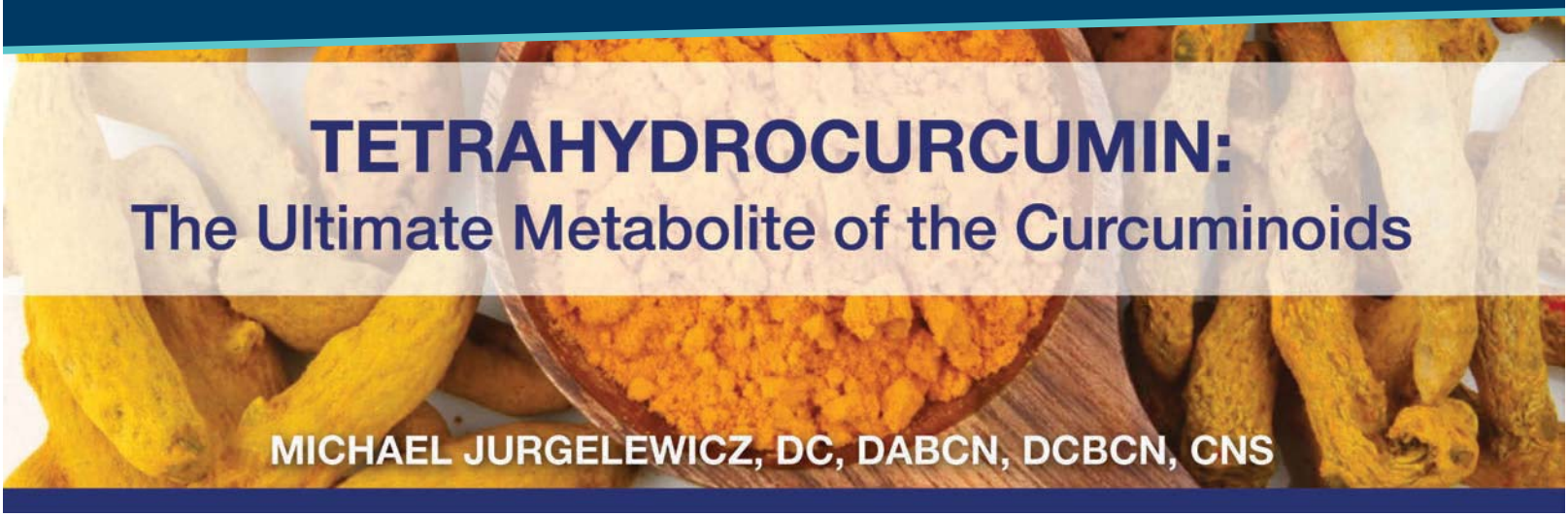


TETRAHYDROCURCUMIN:
The Ultimate Metabolite of the Curcuminoids

MICHAEL JURGELEWICZ, DC, DABCN, DCBCN, CNS

There are only a few natural products that have demonstrated the wide range of protective properties as curcumin. Some of the challenges with curcumin are its poor solubility, low intestinal absorption, rapid metabolism, and rapid systemic elimination.[1]

In order to achieve any significant absorption from curcumin, special technology is necessary to successfully facilitate this. Some manufacturers make the curcumin particles very fine so it can be soluble in water. While this can be effective, it results in a very low amount of curcumin per capsule, as most of the material is needed to increase absorption. Another method is the use of phospholipids to assist in allowing curcumin to across the intestinal wall, which is also an impressive and efficacious technique. Unfortunately, this only yields approximately 20% curcumin per capsule, making it difficult to deliver a sound, therapeutic dose. Also, other curcumin products may use piperine (an alkaloid derived from pepper) to increase bioavailability. The problem is that piperine is a common allergen and stomach irritant, and it increases curcumin's absorption by inhibiting the glucuronidation pathway of the liver.[2,3]

Turmeric's three main bioactive components are curcumin, desmethoxycurcumin, and bisdemethoxycurcumin. These curcuminoids have many biological effects, including anti-inflammatory, antioxidant, antitumor, antibacterial, and antiviral properties. However, the poor circulating bioavailability of the curcuminoids limits their biological effects in vivo.[4] Recently, there has been significant attention on tetrahydrocurcumun, which is the most powerful metabolite of the curcuminoids.[5]

Tetrahydrocurcumin is not typically found in turmeric extract powders containing 95% curcuminoids used in dietary supplement products, but it appears in the plasma following ingestion of curcuminoids.[6] Tetrahydrocurcumin plays an important role in the antioxidant mechanism of curcumin and has been shown to be the most potent antioxidant of the curcuminoids.[7] In a January 2014 study in the Nutrition Journal, several trademarked curcumin formulas were analyzed for their bioavailability. Although all of these formulations did enhance absorption of the curcuminoids, none of them significantly produced tetrahydrocurcumin in vivo.[6]

The free radical scavenging ability was compared in a series of studies of various curcuminoids including curcumin, bisdemethoxycurcumin, and tetrahydrocurcumin.[8] As a result, tetrahydrocurcumin was demonstrated as being the most effective, followed by curcumin and bisdemethoxycurcumin.

Curcumin and tetrahydrocurcumin have distinct benefits over one another, and it would make sense to have both and not just one. It would be best to consume a bioavailable curcumin product that produces significant levels of this metabolite in vivo. Most studies have indicated that tetrahydrocurcumin exhibits a higher antioxidant activity, while curcumin exhibits both pro-oxidant and antioxidant properties.[9]

Several independent studies have reported the significant antioxidant effects of tetrahydrocurcumin.[7,10,11] One study evaluated the antioxidant activity of the curcuminoids and tetrahydrocurcumin and found that tetrahydrocurcumin had the strongest antioxidant activity among all curcuminoids and, therefore, must play an important role in the antioxidant mechanism of curcumin in vivo.[6]

A highly absorbed curcumin formula would be the best choice to reduce peripheral inflammation directly. This may include neurodegenerative diseases, cardiovascular diseases, osteoarthritis, various cancers, benign prostatic hypertrophy, diabetic microangiopathy and retinopathy, anterior uveitis, maculopathy, and glaucoma.

Tetrahydrocurcumin has been shown to have specific neuroprotective properties. One study demonstrated a protective effect of tetrahydrocurcumin against oligomeric amyloid-β-induced toxicity.[12] This antioxidant activity may have a neuroprotective effect in Alzheimer's disease.

Oxidative stress has been associated with many diseases, including diabetes. A separate study demonstrated that tetrahydrocurcumin increased the total number of insulin binding sites, resulting in a significant increase in plasma insulin. Note that this effect was superior to that of curcumin.[13]

Tetrahydrocurcumin also demonstrates powerful cardioprotective properties. In a study in Hypertension Research, tetrahydrocurcumin alleviated hypertension and reversed the effects of aortic wall thickness and stiffness, and oxidative stress.[14] Therefore, tetrahydrocurcumin may be considered as a protective agent against cardiovascular alterations under nitric oxide-deficient conditions.

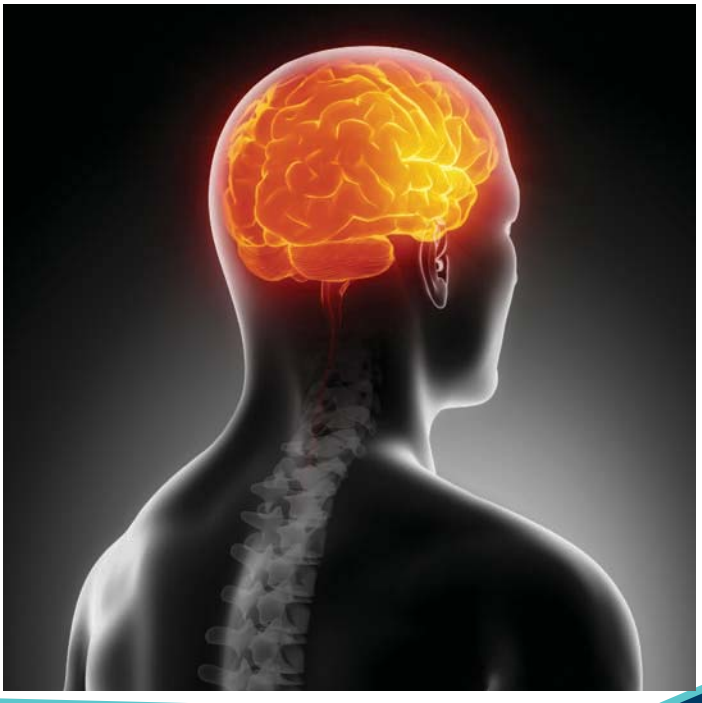
Curcumin is metabolized to tetrahydrocurcumin, and both of these compounds have distinct protective properties. Curcumin binds and modulates a wide array of targets, whereas tetrahydrocurcumin is a superior antioxidant but lacks some of the anti-inflammatory and pro-oxidant activities of curcumin.

Research demonstrates tetrahydrocurcumin has potent antioxidant properties, but if taken by itself, what does this metabolite get metabolized into? Will it appear as unconjugated tetrahydrocurcumin or some other metabolite? Will it have the same effect as what is being produced in vivo from the parent compounds?

It makes sense to use a curcumin formula that produces the potent metabolite, tetrahydrocurcumin, in vivo. It remains to be seen whether taking tetrahydrocurcumin is better than a formula that naturally produces significant levels of plasma tetrahydrocurcumin in vivo from the parent compounds. ■

REFERENCES

1. Wahlström B, Blennow G: A study on the fate of curcumin in the rat. Acta Pharmacol Toxicol (Copenh) 1978, 43:86–92.
2. .Anand P, Kunnumakkara AB, Newman RA, Aggarawal BB. Bioavailability of curcumin: problems and promises. Mol Pharm. 2007 Nov-Dec;4(6):807-18. Epub 2007 Nov 14.
3. Singh J, Dubey RK, Atal CK. Piperine-mediated inhibition of glucuronidation activity in isolated epithelial cells of the guinea-pig small intestine: evidence that piperine lowers the endogeneous UDP-glucuronic acid content. J Pharmacol Exp Ther. 1986 Feb;236(2):488-93.
4. Huang MT et al. (1997) Inhibitory effects of curcumin on tumorigenesis in mice. J Cell Biochem Suppl, 27:26-34.
5. Pan, M.H. et al. (1999) Biotransformation of curcumin through reduction and glucuronidation in mice. Drug Metab. Dispos. 27(4):486-94.
6. Jäger R, Lowery RP, Calvanese AV, Joy JM, Purpura M, Wilson JM. Comparative absorption of curcumin formulations. Nutrition Journal. 2014;13:11. doi:10.1186/1475-2891-13-11.
7. Osawa, T. et al. (1995) Antioxidative activity of the Tetrahydrocurcuminoids. Biosci. Biotechnol. Biochem. 59(9): 1609-12.
8. Research Report No. 786, Sabinsa Corporation, U.S.A. (1995).
9. Aggarwal, L. Deb, S. Prasad. Curcumin Differs from Tetrahydrocurcumin for Molecular Targets, Signaling Pathways and Cellular Responses. Molecules 2015, 201(1), 185-205.
10. Sugiyama, Y. (1996) Involvement of the beta-diketone moiety in the antioxidative mechanism of Tetrahydrocurcumin. Biochem Pharmacol, 52(4):519-25 Aug 23.
11. Nakamura, Y. et al. (1998) Inhibitory effects of curcumin and Tetrahydrocurcuminoids on the tumor- promoter-induced reactive oxygen species generation in leukocytes, in vitro and in vivo. Jpn J Cancer Res, 89(4):361-70.
12. Mishra S, Mishra M, Seth P, Sharma SK. Tetrahydrocurcumin confers protection against amyloid β-induced toxicity. Neuroreport 2011 Jan 5;22(1):23-7.
13. Murugan P, Pari L, Rao CA. Effects of tetrahydrocurcumin on insulin receptor status in type 2 diabetic rats: studies on insulin binding to erythrocytes.
14. Nakmareong S, Kukingviriyapan U, Pakdeechote P, Kukingviriyapan V, Kongyingyoes B, Donpunha W, Prachaney P, Phisalaphong C. Tetrahydrocurcum alleviates hypertension, aortic stiffness and oxidative stress in rats with nitric oxide deficiency. Hypertension Research. 2012 Apr;35(4):418-25.



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ONDAMED:

A Non-Disease Label Approach to Improving Body Functions Versus Treating Disease

By Rolf D. Binder, Inventor, & Silvia Binder, N.D., Ph.D.

SUMMARY

Disease labels do not help us cure our patients. Imagine an approach that would rapidly allow you to find the hidden physiological and emotional cause of your patient's symptoms, while simultaneously stimulating your patient's nervous system with focused therapeutic electromagnetic fields. This is a non-invasive method to help you, the therapist, find the source of your patient's symptoms within minutes, while simultaneously treating and stabilizing your patient.

OVERVIEW

The human body works on the basis of biophysics and biochemistry. While traditional medicine has much to offer in the chemical sense, it lacks the therapeutic approach of physics. Practitioners use the noninvasive ONDAMED technology and the biofeedback loop to scan the body for underlying dysfunctions, such as inflammation, infections, scar tissue, and emotional trauma residing at a cellular level. These areas often prove to be the source of disease and symptoms that might be otherwise difficult to find. Identified areas are treated with focused pulsed electro-magnetic fields to stimulate tissue and the nervous system. Therapy with ONDAMED focused pulsed fields helps reduce local stress and improve metabolism and lymphatic flow resulting in reduced inflammation, pain and edema, while improving stress tolerance by reducing cortisol levels and by influencing the nervous system.

MORE SPECIFICALLY:

ONDAMED is very unique in its ability to deliver specific resonant frequencies to the source of illness. While other devices deliver either a pulsed electromagnetic stimulus to a symptomatic region in order to reduce pain and swelling or affect abnormal brain electrophysiology, the ONDAMED approach is focused on what we discover about the illness and its location. Once discovery is completed, ONDAMED accurately delivers focused pulsed fields to the dysfunctional cellular/tissue areas which are found with the unique biofeedback loop.

ONDAMED's emotionally driven feedback helps locate the patient's weakened or dysfunctional areas such as inflammation, degenerated tissue or even more critical areas linked to experienced traumas, residing at a cellular level. Traumas that reside on a cellular level often prove to be the primary cause of disease and dysfunction.

It is quite impossible for either the practitioner or the patient to find such areas by themselves. The solution is "Emotional Biofeedback", which an ONDAMED practitioner receives when stimulating the patient's nervous system with specifically selected pulsed fields at an area which may be linked to an either recent or even old physiological, mental, or emotional trauma.

It is thought that by stimulating areas connected with experienced traumas, the focused fields reanimate the areas' functions.

Reanimating these areas' functions may help patients resolve the secondary indication or symptom(s), for which the patients had originally come to seek help. ONDAMED may be considered a combination of "emotional feedback therapy" and "focused electro-magnetic stimulus causing an induction within tissue".

Within minutes, the ONDAMED therapist finds the specific treatment stimuli for the patient, finds the actual location that is in most need to receive therapy and treats the discovered area by applying a systemic therapeutic stimulus. The stimulus energizes the flow of electrons across natural immune system inflammation barriers. These barriers are often undetectable or treatable in any other way, and include free radical scavengers.

When placing the nonintrusive applicator to a specific area, electrons and white blood cells are summoned to the area to start the repair process.

ONDAMED, therefore, jumpstarts the body's immune functions and directs the immune response to the area of dysfunction, which is often hidden or in "stealth mode" to the immune system. Cells and tissue in need of therapeutic stimulation can be oscillated by specific resonant frequencies selected from a wide range of 0.1 to 32,000 Hz. In standard electro-medical treatment, the tissue of least resistance will draw the current while potential dysfunctional tissue stays untreated.

ONDAMED applicators emit a focused field, which implements a vector driven current induction to access the tissue of dysfunction.

A vector driven current induction allows stimulation of tissue dependent on the position of the applicator rather than the tissue's structure.

Tissue vibration can enable detoxification of unwanted heavy metals, waste and toxins, potentially resulting in improved metabolic functions. Nutrients, remedies and supplements can then be assimilated by "cleaner", or detoxified tissue and cells.

The lymphatic system (an important part of the immune system) can also be stimulated. Toxins and waste can then be discharged by stool, urine, sweat and the release of fluid in certain areas.

One of the first effects patients usually notice is a general feeling of relaxation due to the influence of ONDAMED's resonant stimulus on the entire central nervous system, particularly when the therapy calls for frequencies in the delta and theta ranges.

ONDAMED's wide range of personalized frequencies enables the targeted therapy of a wide range of issues; often issues with difficult abnormalities otherwise going undetected.

THE ONDAMED COMPLETE SOLUTION

After all, it is the specific tissue of the individual that we treat and not just a symptom or disease. The ONDAMED System enables the practitioner to draw upon four prepared Modules and each Module can be considered application specific:

Module 1:
Selecting and using 2 specific pulsed fields relating to organs and organ systems.

Module 2:
Selecting and using 170 preset protocols to stimulate tissue with pre-programmed frequency combinations.

Module 3:
Selecting and using one (1) highly focused frequency to stimulate immune functions.

Module 4:
Selecting and using nutritionally related resonant frequencies.

From your research, you will find that the ONDAMED technology stands on its own due to its intelligence and personalization to each patient. The use of this 20+ year old invention allows the practitioner to obtain a larger diagnostic perspective of the patient complementing, yet going beyond standard diagnostics and offers the solution as to WHERE treatment is needed on the body and WHICH frequencies prove most significant for the patient.

The ONDAMED epigenetic impact is now being considered, and while we appreciate that no energy system or even medication can bring about a cure of any disease, ONDAMED shows that the body can effectively be stimulated to heal itself.

It has become recognized that the body's DNA, when fully able to express its protective (genes) mode by enabling the reduction of the excessive cellular histone acetylase DNA tightening, may become the 'holy grail' of healing most chronic diseases. Leading scientists are now in hot pursuit to determine if biological energy healing will become the final answer to histone acetylase reduction.

A multi-disciplinary collaborative program between Alfa-Gene Bioscience Inc., NJ, the Department of Biology, City University of New York and the Ondamed Companies in New York and Germany is now underway to study bio-interactive mechanisms of ONDAMED's focused electromagnetic fields with cell and/or tissue types in the physiological and disease state. Modern bio-medical engineering tools, novel stem cell technology, sophisticated cellular, molecular, and genetic techniques are utilized in our studies. The results will be published in the near future.

Finally, ONDAMED encompasses the individual's specific needs at the time of discovery by finding the patient-specific treatment stimulus, the exact location that needs stimulation and non-intrusively delivers the stimulus during the same session, often providing immediate results.

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Rolf Binder: Inventor of the ONDAMED Technology and Founder of the ONDAMED companies in Germany and New York and The Binder Institute for Personalized Medicine in Germany. Binder worked as an electronics engineer in research and development of a German Biomedical technology company for twelve years. In 1993, Binder came up with a totally new approach with his own invention of the ONDAMED. His goal was to create a treatment modality for the medical field which offers a specific intervention driven by the patient's hidden emotional information linked to physiological stress and disease.

Silvia Binder is CEO of the Ondamed Companies in New York and Germany and the Founder of The Binder Institute for Personalized Medicine in Southern Germany. She was born in Germany, and grew up in Vienna, Austria, where she earned her degree in business. Her career led her to New York in 1989 where she lived for 22-years until moving back to Germany in 2010. Her personal story with her 5-year old son fueled her passion for integrative medicine. Silvia received her N.D. degree from the College of Naturopathy in London, U.K. followed by her Ph.D. degree in naturopathy. Silvia has been helping chronically ill patients from around the world, she is faculty of the American Academy of Anti-Aging Medicine, is on the Advisory Boards of the Medical Wellness Association and the Occidental Institute Research Foundation. She is involved with clinical studies at various university clinics, lectures around the world, and offers specialized courses on Integrative Personalized Medicine and Biomedical Information Therapy (Bio-IT) for healthcare practitioners. She is the author of several scientific publications and the book "Ondamed A story of love, healing, and medical revolution".

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— *R.Ph., MS., CCN, Founder of The Metabolic Code.*

James LaValle is an innovator, educator and Industry Opinion Leader in the field of anti-aging healthcare. ■ As a nationally recognized clinical pharmacist, author and board certified clinical nutritionist, he has written hundreds of articles for a variety of industry journals and publications and has lectured for thousands of healthcare professionals and consumer audiences globally on unique and highly effective preventive approaches to integrative healthcare. ■ LaValle founded ***The Metabolic Code*** with the mission of uncovering the underlying metabolic issues that keep people from achieving optimum health. He has demonstrated that practitioners can significantly improve the health of their patients through the application of well chosen, high quality supplements and dietary planning driven by specific lab bio-markers, testing and assessment methods.

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THERE IS A WIDE-SPREAD BELIEF IN THE HEALTHCARE COMMUNITY THAT WE ARE UNDERGOING A GLOBAL EPIDEMIC OF DIABETES AND OBESITY.[1]

Poor glucose control and insulin resistance are two of the most pervasive biomarkers associated with chronic diseases affecting over 80% of Americans.[2] Insulin resistance occurs for a variety of reasons, but in most cases the struggle is that our diets tend to gravitate toward starchy foods with high sugar content. Researchers have suggested that an important factor of this epidemic is the increased intake of simple carbohydrates that are rapidly absorbed (particularly sugars).[1] ■ The issue with simple carbohydrates, like sugar, is that they are quickly converted into blood glucose. After consumption, the pancreas detects this sudden rise in glucose and tries to regulate it by excreting insulin into the bloodstream. A rise in insulin signals the body to stop burning stored fat and begin to burn circulating glucose. Until glucose levels return to normal, the body is more efficient at storing fat than burning it.[2] ■ A sensible diet and exercise plan is the cornerstone of metabolic management — however — *if we can begin to safely impact the absorption of glucose, help insulin receptors work more efficiently, and at the same time increase the amount of resistant starch that gets delivered to the large intestine (to feed the microbiome and modulate the gut hormones responsible for appetite) — we start to take a very big step toward health.* ▶

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The modulating effects of these two ingredients on glycemic response has been researched and supported by multiple clinical studies with significant results.[1, 2, 3, 4] In two human clinical studies, a patented, proprietary blend of these two ingredients was tested against a 70 g glucose challenge. ■ In both studies, as compared to the control groups, the treatment groups had significantly lower glycemic responses for all testing times, concluding that the consumption of the LA-Cr formula after a 70 gram glucose challenge was significantly effective in safely lowering both circulating glucose (-28.95% avg.) and insulin levels (-20.19% avg).[1]

WHITE KIDNEY BEAN EXTRACT *(PHASEOLUS VULGARIS)*

Recently, there has been a shift towards the reduction carbohydrate intake, particularly simple carbohydrates, as an approach to manage excess weight.[5] The digestion of carbohydrates begins with amylase secreted by the salivary glands. The alpha-amylase inhibitor properties of white kidney bean extract have been heavily studied with positive results in delaying the digestion and absorption of carbohydrates, thereby lowering their glycemic impact.[5, 6, 7] Carbohydrates that are resistant to digestion in the small intestine are delivered to the large intestine where they act more like dietary fiber — feeding the microbiome and upregulating GLP-1 which regulates satiety signaling. In a 12-week weight-loss and a subsequent 12 week weight-maintenance study, subjects were randomized to receive either a patented, proprietary extract of white kidney bean or a placebo.[7] All subjects adhered to a mildly hypocaloric diet and body weight and other body composition parameters were measured at baseline and every 4 weeks thereafter.[7] At the end of the 12-week weight-loss period, the treatment group lost a mean of 2.91 ± 2.63 kg in body weight compared with 0.92 ± 2.00 kg in the placebo group.[7] During the weight maintenance phase, 36 out of 49 subjects were able to maintain their weight, even without dietary restrictions.[7]

PANAX NOTOGINSENG AND ASTRAGALUS MEMBRANACEUS

AMP-activated protein kinase (AMPK) has been shown to be a key regulator of glucose and lipid metabolism.[8] Ginseng, a widely used ingredient in herbal medicine, is well-known for its prominently hypoglycemic activity.* In an effort to clarify the gluco-regulatory activity of ginsenosides, the main active component of ginseng, researchers studied its effects on human hepatoma HepG2 cells with positive results.[8] Ginsenoside Rg1 was found to activate the PI3K and AMPK Pathways in HepG2 cells, thereby increasing fatty acid oxidation and inhibiting glucogenesis, hepatic lipogensis and glycogen biosynthesis.[8, 9, 10] ■ In a patented, proprietary blend with Astragalus membranaceus, clinical results have shown this synergistic combination to be a safe and effective long-term weight management blend that addresses the underlying metabolic derailment by correcting and optimizing glucose and fat metabolism.*

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REFERENCES

1. "A Combination of L-Arabinose and Chromium Lowers Circulating Glucose and Insulin Levels After an Acute Oral Sucrose Challenge," Gilbert R. Kaats, Samuel C. Keith, Patti L. Keith, et al., Nutrition Journal 2011; 10:42. ■ 2. "A Pilot Study of the Effects of L-A/Cr: A Novel Combination of L-Arabinose and a Patented Chromium Supplement on Serum Glucose Levels After Sucrose Challenges," Gilbert R. Kaats, Harry Preuss, Joel E. Michalek, et al., 2009. ■ 3. "L-Arabinose Selectively Inhibits Intestinal Sucrase in an Uncompetitive Manner and Suppresses Glycemic Response After Sucrose Ingestion in Animals," Kenji Seri, Kazuko, Noriki Matsuo, et al., Metabolism 1996; 45: 1368-1374. ■ 4. "Effect of Chromium Picolinate on Insulin Sensitivity in Vivo," William Cefalu, Audrey Bell-Farrow, Jane Stegner, et al., The Journal of Trace Elements in Experimental Medicine 1999; 12:71-83. ■ 5. "A proprietary alpha-amylase inhibitor from white bean (Phaseolus vulgaris): A review of clinical studies on weight loss and glycemic control," Marilyn L. Barrett, Pharmacognosy Consulting, Jay K. Udani, MD, Medicus Research LLC, Nutrition Journal, March 2011. ■ 6. "Lowering the Glycemic Index of White Bread Using a White Bean Extract," Jay K. Udani, Betsy B. Singh, Marilyn L. Barrett, Harry G. Preuss, Nutrition Journal 2009, 8:52. ■ 7. "Weight Reduction and Maintenance with IQP-PV-101: A 12-Week Randomized Controlled Study with a 24-Week Open Label Period," Barbara Grube, Wen-Fen Chong, Pee-Win Chong and Linda Riede, Obesity, published online 2013. ■ 8. W.L. Chang, et al., The inhibitory effect of ginsenoside Rg1 on glucose and lipid production in human HepG2 cells. Adaptive Medicine. 2013, 5(4), 181-188. ■ 9. T.C. Chang, et al., Effect of Ginsenosides on Glucose Uptake in Human Caco-2 Cells is Mediated-through Altered Na+/Glucose Cotransporter 1 Expression. J. Agric. Food Chem. 2007, 55, 1993-1995. ■ 10. C.W. Wang, et al., An essential role of cAMP response element binding protein in ginsenoside Rg1-mediated inhibition of Na+/Glucose Cotransporter 1 Expression. Molecular Pharmacology. 2015, 88, 1072-1083.

*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure or prevent any disease.

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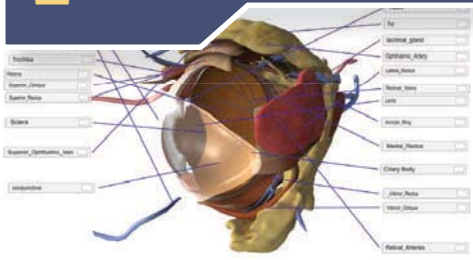

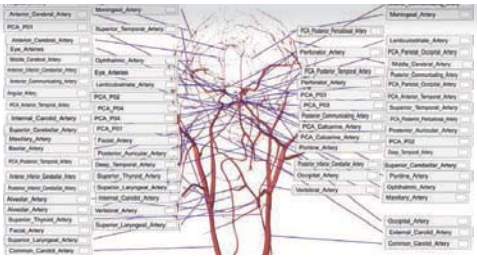

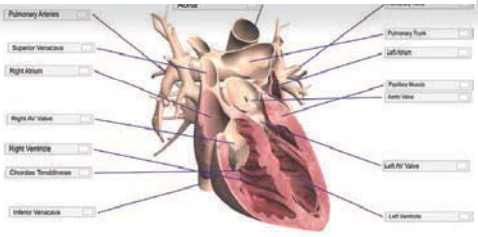

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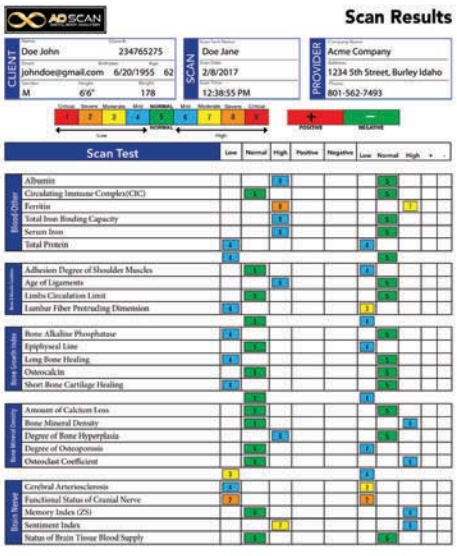

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Ferritin			6		
Total Iron Binding Capacity			4		
Serum Iron			4		
Total Protein	4			4	
	4				
Adhesion Degree of Shoulder Muscles		5		4	
Age of Ligaments			6		
Limbs Circulation Limit		5			
Lumbar Fiber Protruding Dimension	4			3	
		5			
Bone Alkaline Phosphatase	4				
Epiphyseal Line		5		4	
Long Bone Healing	4				
Osteocalcin		5			
Short Bone Cartilage Healing	4				
		5		7	
Amount of Calcium Loss		5			
Bone Mineral Density		5			4
Degree of Bone Hyperplasia			6		
Degree of Osteoporosis		6		4	
Osteoclast Coefficient		5			4
	3			4	
Cerebral Arteriosclerosis	4			3	
Functional Status of Cranial Nerve	7			3	
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Sentiment Index			7		4
Status of Brain Tissue Blood Supply		5			5

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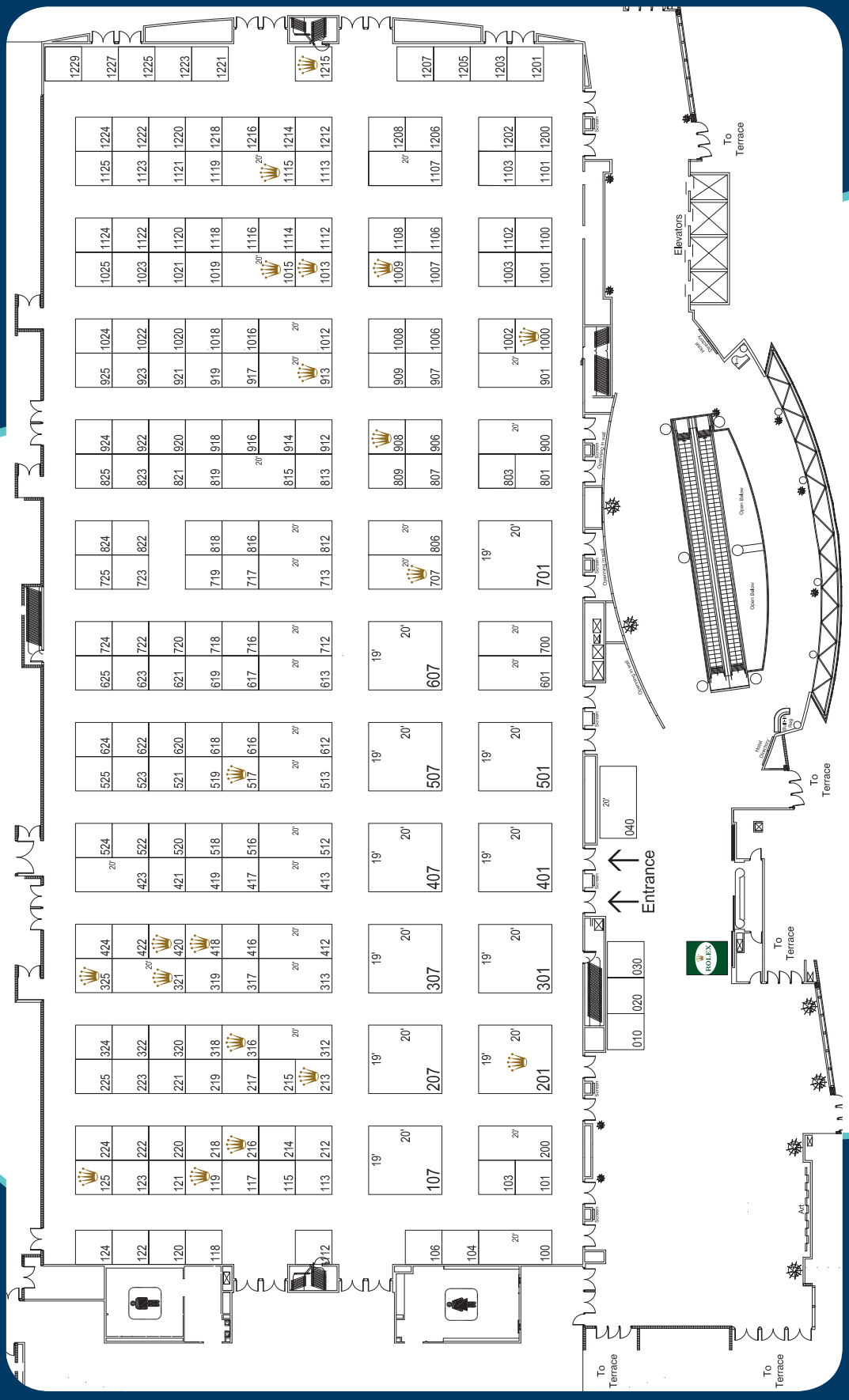

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Ph: 972-255-3918 • **Fax:** 972-255-6648
Email: gaguilera@essentialformulas.com • **Website:** www.essentialformulas.com
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Email: docnetwork@foreverhealth.com • **Website:** www.foreverhealth.com
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Ph: 888-895-6463 • **Fax:** 608-237-2124
Email: mgaza@quincybioscience.com • **Website:** www.quincybioscience.com
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Email: info@sbi-europe.com • **Website:** sbi-europe.com
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2017 Educational Schedule

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MAY

San Diego Marina Marriott
San Diego, CA

Symposium - Lab Interpretation
May 4-6, 2017

Intro to Anti Aging Medicine Workshop
May 7, 2017

San Francisco Marriott Marquis
San Francisco, CA

Module III - Neurology
May 19-21, 2017

Module V - Nutrition and Exercise
May 19-21, 2017

JULY

West Palm Beach Hilton
West Palm Beach, FL

Pellet Workshop
July 28-29, 2017

Sleep Workshop Part II
July 29, 2017

AUGUST

Venetian/Palazzo - Las Vegas
Las Vegas, NV

Module VII - Autoimmune Disease & Inflammation
August 10-12, 2017

IV Symposium/Chelation
August 11-12, 2017

Chronic Infections Workshop Part II
August 12, 2017

SEPTEMBER

Chicago Marriott Downtown
Chicago, IL

ABAARM & ABAAHP Exams
September 13-16, 2017

BHRT Symposium
September 14-16, 2017

Module IV - Gastroenterology
September 14-16, 2017

Module XVI-C - Cardio
September 14-16, 2017

Module XX-A - Triad
September 14-16, 2017

Aesthetic Module I - Injectables & Cosmeceuticals
September 14-16, 2017

OCTOBER

Sheraton Boston Hotel
Boston, MA

Weight Symposium
October 6-7, 2017

West Palm Beach Hilton
West Palm Beach, FL

Pellet Workshop
October 20-21, 2017

Advanced Symposium - Sexual Health
October 20 - 21, 2017

Bio-Energetic Workshop
October 21, 2017

DECEMBER

Venetian/Palazzo - Las Vegas
Las Vegas, NV

ABAARM/ABAAHP Written Exams
December 13, 2017

ABAARM Oral Exams
December 14-16, 2017

World Congress
December 14-16, 2017

Practice Enhancement Training
December 12-13, 2017

Peptides Pre-Conference Workshop
December 13, 2017

Obesity Management Pre-Conference Workshop
December 13, 2017

Nitric Oxide Pre-Conference Workshop
December 13, 2017

Module I - Endocrinology
December 14-16, 2017

Module VIII - Clinical Practice Protocols
December 14-16, 2017

Aesthetic Module II - Laser & Light
December 14-16, 2017

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