
MWSHS Student Newsletter

Winter 2020-2021

Our Alumni in Action... Updates on Some of Our Many Graduates!

Mary Schmidt

Mary Schmidt graduated from our Master-Herbalist Diploma Program in 2012, but was active in herbal studies and endeavors even well before that time.

"I had been doing an herbal consultation practice for many years in Wisconsin and then in Washington State since I moved there," she informs us.



"While in Wisconsin, I co-produced an herbal radio segment, 'A Weed Walk through the Seasons' with a couple of other herbalists in Viroqua WI: a once-a-week segment on the herbs to harvest as the seasons cycle throughout the year. I also helped run the Coulee Region Herbal Institute in Lacrosse.

"After moving to Washington, I co-founded and co-chaired the Four Season Herbal Guild in Spokane. We sponsor an Herbal Faire every year (except this year, because of COVID-19) as well as community gardens to grow herbs and we support the Herbalists Without Borders (HWB) Spokane Chapter that I initiated. We raise funds and herbs to run our HWB Free Clinic and work with the Woman's Club supplying boxes of food and herbal support to the underserved community here in Spokane and for HWB Global efforts."

Mary adds: "I have also held many herb walks and taught classes on a wide variety of topics for community education and other groups. The Guild here in Spokane focuses on herbal education and HWB projects."

Grace Watkins-Wright was profiled in our Summer 2017 Newsletter, as a then-graduate of our Western Herbalism module.



"I have recently relocated to Santa Fe, NM from Minneapolis, MN" she tells us. "While in Minneapolis, I worked with an Ayurveda practitioner, helping to mix herbal formulas and capsulizing these custom blends for patients. Now my focus has been on familiarizing myself with the native New Mexican herbal materia medica that comes out of the rich Pueblo and Spanish culture here in the 'Land of Enchantment.'" *(Continued in column two.)*

Late-2020 Graduate

We offer congratulations to the following recent graduate of the Western-Herbalism Certificate Program:

Michelle Konkle

We look forward to hearing more from this graduate as she continues to apply what she has learned in her life.

Our Alumni in Action *(continued from column 1)*

Grace continues: "The High Desert of New Mexico is truly abundant with herbs and walking down any street one will encounter lavender, grindelia, sage, and a host of other treasures. My immediate goal is to complete the last of my three exams here in Santa Fe, with the longterm goal of finishing my thesis for the MH Diploma Program. After that, the possibilities are endless!"

Erica Allen

Erica Allen was one of our earlier graduates from the Master-Herbalist Diploma Program—way back in 2008.

"You ask what I've been up to since graduating? A lot, actually," she shares with us. "First off, I wanted to be the village herbalist and so, in 2010, I launched Atonement Herbs and from then through 2012, I saw over 2,000 clients and witnessed more healing than I could ever describe! I also taught 'Seasons of Herbal Wisdom' at my home with another herbalist and managed the Wellness Department at Lakewinds Natural Foods as well as taught a Dandelion class there and wrote articles for their newsletter.



"In 2015, I started Allen Naturals and developed sprays, soaps, and my own herbal tea. I then went through a season where I needed health insurance and retirement and so I took a job as a weight-loss coach with a start-up digital company and had the opportunity to become a Board-Certified Health Coach in 2017. (www.coachericaallen.com/) During this time, I planted a native herb garden in my back yard: elderberry, yarrow, Solomon's seal, violet, and more. In 2020, I started talks with two friends in England: they want to start a herbal school in Scotland and have invited me to teach!"

In conclusion, Erica muses: "As I age, I hope always to have the spirit of the violet, the fortitude of the yarrow, and the wisdom of the elder." *(Updates continued on p. 6)*

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WORKSHOP CREDIT OPTIONS

Except where noted, all of the below-listed events qualify as Workshop credits toward the Master-Herbalist program. Each hour of *verified* attendance (e.g., per instructor-completed workshop-credit slips as supplied by MWSHS) counts toward an equivalent hour of Workshop Category #3 credits (up to the student limit of 20 hours), unless another category is specified or unless one attends a particular workshop at one of these events that is *strictly* in one of these other categories. Note that our allowance of online conferences for workshop credits continues through May 2021, owing to COVID restrictions.

Workshops, Conferences, Lectures, & Events in Herbal Studies Across North America

Southwest Conference on Botanical Medicine. Online. Begins online video streaming March 26, 2021. Features an online 4-hour pre-conference intensive on Managing the Side Effects of Pharmaceuticals, plus 24 other lectures on botanical therapies for chronic disease, including fungal infections, opiate use disorder, long-term COVID-19 syndrome, inflammatory bowel disease with associated arthritis, eczema, psoriasis and more. 40 hours of continuing education for ND, DO, MD, RN, FNP, LAc and others. Early-bird registration ends 2/19/21. For information and registration: 541-482-3016 or <https://botanicalmedicine.org/>

Heal Con. April 8-11, 2021. Bellevue, WA. Online. This annual conference invites naturopathic doctors, dietitians, holistic nutrition professionals, and others to connect with like-minded practitioners and attend workshops, round tables, and talks presented by prominent industry experts on the most important topics in the holistic nutrition industry. For more info, see <https://healcon.org/>

2021 Spring Herb Seminar. May 13-15, 2021. Online. This online event will feature experts in herbal medicine presenting their knowledge and experience on case-study-supported protocols. Topics to be discussed will include herbal strategies for cardiovascular health, neurodegeneration, the gut microbiome, and more. <https://restorativemedicine.org/conferences/2021-herb-seminar/>

"Where Do I Find Qualifying Workshops in My Local Area?"

Aside from the *MWSHS Student Newsletter*, which lists resources from around the country of which we become aware, you can check holistic newspapers that are available in many larger cities. In these areas, as well as in less populated communities, you might check local, independently-owned health food stores and food co-ops, which may have bulletin boards or knowledgeable staff who may be aware of local teachers of holistic-assessment skills, herbal-medicine-making, or who may lead wild-plant walks. (Local nature centers, plant nurseries, greenhouses, horticultural clubs, and native-plant-appreciation societies may know of local wild-plant-walk instructors as well.) Finally, check the phone book for local naturopaths, herbalists, acupuncturists, and other holistic-health professionals who may be willing to mentor you on some of these skills or allow you to "shadow" them as they see clients.

Medicines from the Earth Herb Symposium. Online. Begins online video streaming June 4, 2021 Friday. Online intensive: Targeting the Biological Terrain in Collaborative Oncology, plus over 25 other lectures. Lectures include: Targeting Cancer Stem Cells with Botanical Medicine; Herbal Medicine for Parasites (Giardia, Blastocystis, etc); Vaporizer Technologies for the Delivery of Botanicals; Lifting Deep Lethargy and Melancholy; PANDAS and PANS—Natural Medicine Rescue for Post-Infectious Autoimmune Conditions and more. Local in-person field studies and herb walks in the Asheville, NC area. Over 40 hours of continuing education for ND, DO, MD, RN, FNP, LAc and others. Early bird ends March 3rd. Information and registration: 541-482-3016 <https://www.botanicalmedicine.org/>

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Immunosupportive Herbs & Supplements: Part Two

(Continued from the Spring 2020 *MWSHS Student Newsletter*)

by Matthew Alfs, MH, RH (AHG), MWSHS Director

In the Spring, 2020 issue of this *Newsletter*, I discussed herbs, nutrients, and lifestyle modifications that can support what has traditionally been referred to as “winter wellness,” since winter is the season during which people have traditionally been challenged by respiratory infections such as influenza and the common cold. However, the timeliness of this article could not have been more appropriate, as SARS-Cov-2 was just beginning to make its impact in the U.S. at the tail end of winter, having devastated China earlier—until the time that regional governments there began implementing herbal formulas developed by Traditional Chinese Medicine (TCM) and administering intravenous vitamin C to hospitalized COVID patients.

A good number of students expressed their appreciation for that *Newsletter* article and we hope that it helped many to effectively support their optimal immune function in the face of this grave challenge. Since April, however, a tremendous amount of research has been underway on herbal and nutritional approaches to supporting immune and respiratory health and I would like to summarize some of this for you below....

Chinese Herbal Medicine

ShuangHuangLian

In the Spring 2020 Newsletter, I discussed the *ShuangHuangLian* Formulation, noting that it was being tested via clinical trials in China for treatment of COVID-19 at that time, (Wang et al. 2020. *Zhongguo Zhong Yao Za Zhi* 45[6]:1232-41) having shown impressive results via a case study report. (Ni et al 2020. *Front Med.* Mar 13 [Epub ahead of print]) It consists of 2 parts forsythia (*Forsythia suspensa*), 1 part honeysuckle (*Lonicera* spp.), and 1 part Chinese skullcap (*Scutellaria baicalensis*). I noted that flavonoids from the latter herb have even been shown to inhibit coronavirus-type inflammasome (NLRP3).—Luo et al. 2017. *Sci Rep* Nov 27; 7(1):16374.

Yet additional research has been conducted on this amazing herbal formula relative to COVID-19. In a study published in September, researchers from the Chinese Academy of Sciences in Shanghai used enzymatic assays to determine whether this herbal formula inhibited the proteolytic activities of 3CL pro, a protease essential for SARS-Cov-2 replication. They found that it showed “significant inhibitory activities” and that the major chemicals responsible were baicalin and baicalein from Chinese skullcap. They also looked at the activity of the formula in a cell-based system and found that it “exhibited potent antiviral activities” there.—Su et al 2020. *Acta Pharmacol Sin.* 41(9):1167-77

Although the individual herbs in this formula have been available in the U.S. for quite some time, the formula itself was not commercially available on the American market when our Spring Newsletter article was written. Now, however, it is available—as a syrup.—<https://www.cvsciences.com/cbd-products/immunity/600.html>

Lian Hua Qing Wen

I also highlighted the Chinese formula known as *Lian Hua Qing Wen* in the Spring *Newsletter*, noting that it consists of 13 herbs, one of which is ephedra, which is banned in the U.S. (Forsythia, honeysuckle, and 10 other herbs compose the rest of the formula.) I pointed out that research published in March of 2020 demonstrated that the formula, utilized in Vero E6 cells, “significantly inhibits the SARS-COV-2 replication, affects virus morphology and exerts anti-inflammatory activity in vitro.”—Li et al. 2020. *Pharmacol Res.* 156:104761

Here again, further research, published in September, has confirmed the efficacy of this formula in COVID-19 “recovery, rate of improvement in chest computed tomographic manifestations, and clinical cure.”—Guan et al. 2020. *Virol Sin.* Sep 30: 1–14

Yin Qiao San

Yin Qiao San has been a classic formula for the initial stage (*Wei Fen*) of influenza—marked by fever, a thin and yellow tongue coating, dry cough, and body pains—in Traditional Chinese Medicine. It consists of honeysuckle, forsythia, burdock (*Arctium lappa*) fruit, wild mint (*Mentha arvensis*), and a handful of other herbs.

I have used it on many an occasion and have urged that my clients and students always have it on hand. A number of these have reported quite satisfactory results using this formula—not only with the flu, but also with coronavirus infection. Some have alternated (staggered) it every 2 hours with the North-American herb boneset (*Eupatorium perfoliatum*)—another herb that has successfully been used with influenza in the U.S. and research on which we highlighted in the Spring *Newsletter* with reference to it and to one of its chemicals reducing certain cytokines that surge with coronavirus infection.

A study just published in the scientific journal *Phytotherapy Research*, after noting that the *Yin Qiao* formula is increasingly being used in China for the *Wei Fen* stage of COVID-19, explored the active ingredients, targets, and potential mechanisms of the powdered form of this formula “in the treatment of COVID-19” and also “predicted the therapeutic mechanisms of Yinqiao powder in the treatment of COVID-19.” The result? “Yinqiao powder has a certain therapeutic effect on COVID-19,

with an intervention score of 20.16.” This study found the “potentially active ingredients against COVID-19” as being a number of the flavonoids in the formula—specifically, quercetin, eirodictyol, naringenin, luteolin, and hesperetin.—Lin et al 2021, *Phytother Res* Jan 15. doi: 10.1002/ptr.7012. Online ahead of print

Sweet Annie (Artemisia annua)

Sweet Annie (*Artemisia annua*), a plant native to Asia and long utilized in TCM, gained some acclaim not long ago for yielding the chemical artemisinin as a treatment for malaria. Both that chemical and another, artesunate, have been shown to exert potent antiviral effects as well.

A recent cell study showed marked anti-SARS-Cov-2 activity for the plant’s leaves and for artemisinin and artesunate. In this intriguing study, still awaiting peer review, it was found that a simple infusion of the herb’s leaves “prevents SARS-CoV-2 replication.”

(<https://www.biorxiv.org/content/10.1101/2021.01.08.425825v1>) This research has spurred the development of a clinical trial by the University of Kentucky, to wit: “UK’s clinical trial is reserved for high-risk patients both at home and in the hospital who have tested positive for COVID-19, or who have COVID-19 symptoms but have not developed severe symptoms that would require intensive care unit treatment.”—<https://med.uky.edu/news/artemisia-annua-could-be-promising-treatment-covid-19>)

ClinicalTrials.gov lists yet another clinical trial with the herb, conducted under the auspices of the Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran in Mexico, and which is currently recruiting trial subjects.—<https://clinicaltrials.gov/ct2/show/NCT04530617>

Nutrition

Vitamin C

In a well-researched paper published in the Dec. 7th issue of the scholarly journal *Nutrients*, vitamin-C expert Paul Marik (who created an innovative and highly successful vitamin C-based treatment for sepsis) and six other researchers performed a literature review on the implementation of vitamin C for COVID-19 in China and elsewhere. These authors also highlighted studies showing a correlation between low vitamin-C status and severity of COVID-19 disease. They concluded their paper with these thoughts: “Vitamin C’s potential benefits, low cost, safety profile and multiple disease-modifying actions... make it an attractive therapeutic candidate in reducing viral load with oral supplementation in the range of 2–8 g/day to help attenuate the conversion to the critical phase of COVID-19. Likewise, vitamin C has potential benefits in treating acute respiratory infections and mitigating inflammation in critical COVID-19 patients with intravenous vitamin C infusion in the range of 6–24 g/day.”—Holford et al. 2020. *Nutrients* 12(12):3760.

Vitamin D (The Sunshine Vitamin)

As of the date of this article, ClinicalTrials.gov lists over half a dozen clinical trials scheduled or ongoing relative to vitamin D and COVID-19, while the National Library of Medicine lists 383 *published studies in scientific journals on vitamin D and COVID-19!*—<https://pubmed.ncbi.nlm.nih.gov/?term=%22Vitamin+D%22+%22COVID-19%22&sort=date&size=200>

The thrust of a sizable number of these studies is that a person’s vitamin-D status *actually determines the severity of his or her affliction with COVID-19!* It would be difficult to do justice to these studies in the space provided in this article; but a good summary of, and commentary on, 50 or more of the more important studies can be found at the following websites, to which I refer the reader: <https://www.wellnessdoc.com/vitamin-d-status-as-it-relates-to-covid-19-complications-and-death/>; <https://c19vitamind.com/>



Vitamin K2

Similar to the research connecting vitamin D levels to severity of coronavirus disease as noted above, “low vitamin K status predicts mortality in patients with COVID-19,” explained Allan Linnenberg, leader of a team from Bispebjerg Hospital in Denmark that has made public a preprint of their preliminary results from an investigation into whether low vitamin-K levels might predict mortality in COVID-19 patients. They examined 138 COVID-19 patients against a control group of 140 persons from the general population and found that deaths among the COVID patients were associated with CV disease, hypertension, advanced age, and low vitamin-K status. The study’s authors concluded: “There is an urgent need for measures to improve the outcome and long-term consequences of COVID-19. Supplementation with vitamin K2 represents an inexpensive and simple-to-use solution.”—https://vitaminretailer.com/study-confirms-correlation-between-low-vitamin-k-and-severe-covid-19/?utm_source=Robly.com&utm_medium=email&utm_campaign=vre-news&utm_content=459f214a33d829fc6c6ddee8569a11aa

Earlier research by Rob Janssen from Canisius Wilhelmina Hospital in the Netherlands and associates had also evinced a correlation between severity of COVID-19 disease and K2 status.—Janssen et al. 2020. *Br J Nutr* Oct 7:1-8. doi: 10.1017/S0007114520003979. Online ahead of print; Dotterhoff 2020. *Clin Infect Dis* Aug 27:ciaa1258. doi: 10.1093/cid/ciaa1258. Online ahead of print.

Zinc & Vitamin A

A retrospective and observational study by researchers from Germany and Spain on 120 patients admitted to the ICU and to the internal medicine ward of a tertiary hospital for COVID-19 found that “low levels of vitamin A and zinc were associated with a greater need for

admission to the ICU and orotracheal intubation.” (Berrocal et al. 2020. *Research Square* 10.21203/rs.3.rs-95524/v1) It is of possible relevance here that these two nutrients are the major nutrients needed by the thymus gland to oversee the immunological competence of T-lymphocytes associated with the adaptive immune system.

Quercetin



Roses are a source of both quercetin and vitamin C—synergistic compounds.

Noting that quercetin inhibits the 3CL protease needed by Sars-Cov-2 to replicate, a research team consisting of Paul Marik and three other authors highlighted its synergy with vitamin C and concluded: “We strongly suggest the combined administration of these two compounds for both the prophylaxis and the early treatment of respiratory tract infections, especially among COVID-19 patients.”—Biancatelli et al. 2020. *Front Immunol* 11:1451

ClinicalTrials.gov currently lists 6 clinical trials relative to quercetin and COVID-19, four of which are currently recruiting and two of which are not yet actively recruiting. One of the latter is a variation of the trial on which I reported in the *Spring Newsletter*, overseen by Michel Chrétien, FRS MD FRCP.

Propolis

In the *Spring Newsletter*, I outlined the antiviral effects of propolis, obtained from beehives, including its demonstrated effects against upper-respiratory viruses. Now, a newly published study has revealed that propolis exhibits potential to inhibit SARS-CoV-2 main protease activity. —Sahlan et al. 2021. *J King Saud Univ Sci* 33(1): 101234.

A case report also published this month links the use of propolis to a complete recovery (in 12 days) of COVID-19 in a 52-yo woman who used an extract at a dose of 45 drops, tid. Still, as the study authors noted: “The relevance of this therapeutic intervention based on a single case report is debatable because the clinical effectiveness could have been influenced by several factors, including the patient's response to the use of other adjuvant therapies.”—Fiorini et al, 2021. *Clinics [Sao Paulo]* 76:e2357

However, given the history of the successful use of propolis for upper-respiratory and other viruses, a well-designed, randomized, placebo-controlled trial was initiated in August of 2020 to evaluate its effects upon patients with confirmed COVID-19 from Al-Zahra Hospital in Isfahan city, Isfahan, Iran. The anticipated

completion date of this trial is March 21st. <https://pubmed.ncbi.nlm.nih.gov/33272309/>

EGCG/Green tea

The antiviral and zinc-ionophore activities of epigallocatechin-galate (EGCG) from green tea were highlighted in the *Spring Newsletter*. Since then, at least three different studies have shown that EGCG efficiently blocks protease function in SARS-Cov-2, impressing upon the authors of these studies its therapeutic potential for treating COVID-19.—Mhatre et al. 2021. *Comput Biol Med* Feb; 129: 104137; Chiou et al. 2021. *Biochem Biophys Res.* Jan 6;S0006-291X(20)32299-3. Online ahead of print. Zhu and Xie. 2020. *Front. Plant Sci.* 30. Nov 30;11:601316.doi:10.3389/fpls.601316. eCollection. See a layman's summary of the latter study at <https://today'spractitioner.com/covid-19/compounds-in-green-tea-grapes-and-chocolate-block-protease-function-in-sars-cov-2/#.YA09QZUSmkz>

Probiotics

COVID-19, as is well known, may manifest as gastrointestinal symptoms and may even result in multi-organ complications. Recent research has proposed that an altered gut microbiome and a leaky gut may lead to both—the latter by allowing the virus to leak into the circulatory system. (<https://mbio.asm.org/content/12/1/e03022-20>)

The logical approach, then, would be to increase fiber, as such induces gut bacteria to create short-chain fatty acids like butyrate, which helps to maintain gut-barrier integrity and which also promotes regulatory T cells that have been connected with the ability to suppress allergic and inflammatory responses.

Probiotics may also prove to be an option in the fight against COVID. Among them, *Lactobacillus plantarum* L-137 stands out, at present, as an option here, in that it has been shown to decrease upper-respiratory infections, improve pulmonary function, and activate anti-inflammatory cytokines.—Hirose et al.. 2013. *J Nutr Sci* 2, e39, Dec. 6 eCollection; Percopo et al. 2015. *Antiviral Res* 121:109-19

In Conclusion

When I wrote Part One of this article for the *Spring Newsletter*, I concluded that article with a quotation from some acknowledged specialists in nutrition who had written in a scholarly journal that nutrition, which had been ignored up to that point by public health officials and by the media, needed to be widely presented to the public as an option in the fight against SARS-Cov-2. The evidence then was impressive, but now it is *overwhelming*—even from just the fraction of evidence I have presented in this article. And yet, still, *government health officials and the media continue to ignore this mighty weapon in the fight against the novel coronavirus!*

With this situation as it is, the question I posed in the conclusion of my article in the *Spring Newsletter* deserves to be offered once again, and that is: *How many more lives will be lost* while our health officials and the media shamefully ignore the potency and the potential of nutrition and herbs in the fight against COVID-19?

Coenzyme Q10: A Real Powerhouse!

(Part One of a Series on Nutraceuticals)

by Matthew Alfs, MH, RH (AHG), MWSHS Director

This article is the first in a series of articles on nutraceuticals—nutrient-like compounds capable of creating physiological and even therapeutic effects but which do not qualify as nutrients. While these compounds are mentioned repeatedly in the Western-Herbalism module, they are not elaborated to any detail. This series is an attempt to present such a detailed elaboration. As this article goes to press in February, which is American Heart Month, I have chosen CoQ10 as the first nutraceutical to be discussed because of its demonstrated favorable effects upon the heart, as will be seen below....

Nature and Functions of CoQ10

Coenzyme Q10 is a lipid-soluble, vitamin-like compound that occurs naturally in the body and is most highly concentrated in the kidneys, pancreas, liver and especially the heart. It serves as an outstanding antioxidant in cell membranes. As such, it protects cell structures against oxidative damage and even recycles vitamin E back to its active, antioxidant form after that vitamin has neutralized free radicals.

CoQ10 is a cofactor in the mitochondrial electron transport chain and has been shown to improve mitochondrial oxidative phosphorylation in humans. More precisely, it is one of a number of factors utilized in mitochondrial respiration to generate energy via adenosine triphosphate (ATP) because CoQ10's enzymatic processes facilitate electron transfer.

It especially supports heart health. How so? For one thing, it continually supports the cellular energy production (ATP) by this never resting organ. Secondly, it increases the utilization of oxygen by the myocardium (heart muscle) and especially supports the health and function of both the heart's left ventricle and its mitral valve. It has also been shown to increase HDL cholesterol and ApoA1, two markers of healthy cardiovascular function, and to decrease the oxidation of LDL cholesterol—the latter of importance because oxidized LDL cholesterol is implicated in cardiovascular disease. CoQ10 also supports a healthy endothelium in the arteries. Finally, it helps to maintain an optimal blood pressure there.

Natural Sources of CoQ10

Coenzyme Q10 is found in very small amounts in certain foods (especially animal foods—meat and fish), but the human liver makes the lion's share of what our bodies require for optimal health. This occurs via a multi-step process that requires vitamin C and a number of the B vitamins, trace elements, and the amino acid tyrosine.

Supplemental Sources of CoQ10

As is well known, CoQ10 is widely available on the supplement market—in two forms: (1) ubiquinone (the oxidized form, which has been on the market for quite a few years) and (2) ubiquinol (the non-oxidized, or “reduced,” form that is newer on the market). (Both of these forms also occur in the body, with ubiquinone converting to ubiquinol in the mitochondria, as needed.) Most CoQ10 supplements are produced by fermentation of yeast, although some of them used to be derived from other sources. These products are almost always combined with an oil for enhanced absorption. Despite this, any CoQ10 supplements should be taken with fats/oils in food in order to be most efficiently utilized by the body.

Benefits of CoQ10 Supplements

CoQ10 supplements can provide many benefits to users, most of which relate to its antioxidant and energy-producing effects. Increased exercise tolerance and capacity are among its most appreciated benefits. For example:

In a study of 41 subjects divided into a treatment group receiving 200 mg of CoQ10 and another group receiving a placebo, the treatment group experienced a greater resistance to exercise-related exhaustion as against the placebo group. —J Cooke et al. 2008. *J Int Soc Sports Nutr* 5:8



Anti-fatigue effects for CoQ10 (at a dose of 300mg) were demonstrated in a controlled study of 17 persons using bicycle ergometers, with the study group showing better results in maximum velocity achieved and in experiencing less fatigue than subjects in the control group. —Mizuno 2008. *Nutrition* 24(4):293-99

In a placebo-controlled study of 100 healthy and well-trained exercise enthusiasts over a period of 2 weeks, 200mg/day of ubiquinol before exercise decreased oxidative stress and increased plasma nitric oxide (NO) in the study group as against the control group, leading to improved endothelial function, energetic substrate supply, and muscle recovery after strenuous exercise.—Sarmiento et al 2016. *Biofactors*. Nov 12;42(6):612-622. doi: 10.1002/biof.1297. Epub 2016 May 19.

When CoQ10 Levels Are Not Optimal

Advanced age (esp. over the age of 69) is connected with lower coenzyme Q10 production, although there is a noticeable decrease after age 40. The liver similarly

reduces production when the vascular system is stressed.

A number of pharmaceuticals also deplete bodily levels: statins, beta-blockers, phenothiazines, and tricyclic antidepressants are major players here. Depletion with statins occurs because the production of both cholesterol and CoQ10 stems from the same biochemical pathway—the Mevalonate Pathway—which statins interrupt quite early in its flow.

Hyperglycemia, obesity, inflammation, cholesterol oxidation, and left-ventricular dysfunction can occur when coenzyme Q10 levels are less than optimal. As to the latter, in your herbal program (Part Four, Lesson Three), a study from the *American Journal of Cardiology* is reviewed, which found that when fourteen persons with elevated cholesterol took atorvastatin at a dosage of 20 mg/day (the standard dosage), ten of them were found to develop left-ventricular dysfunction. The administration of coenzyme Q10 (100 mg, three times a day) to nine of them found this cardiac dysfunction improved or rectified in eight of these folks within three months.—Silver et al 2004. *Am J Cardiol* 94(10):1306-10.

Clinical Applications of CoQ10 Supplements

Congestive heart failure

In 1992, cardiac specialists K. Folkers and P. and P. H. Langsjoen noted in a paper for a medical journal: “Twenty years of international open and seven double blind trials established the efficacy and safety of coenzyme Q10 (CoQ10) to treat patients in heart failure.” In the same paper, they reported on the administration of CoQ10 to 11 persons with heart failure awaiting heart transplants. The authors noted that all of these patients improved, with nine of them even moving from late stages of heart failure to earlier stages, with some no longer even requiring medication.—Folkers et al. 1992. *Biochem Biophys Res Commun* 182(1):247-53

When 2664 heart-failure patients in New York Heart Association (NYHA) classes II and III were enrolled in an open, non-comparative, three-month study in 173 Italian centers and given CoQ10 to the tune of 50-150mg/day (78% received 100mg/day), marked improvement was achieved in serious symptoms (edema, palpitations, vertigo, insomnia, dyspnea, sweating, vertigo, and others) by day 90 for the vast majority of the subjects—Baggio et al. 1994. *Mol Aspects Med* 15(Suppl):287-94

A double-blind, placebo-controlled, crossover trial was published in 2005 involving 21 heart-failure patients in NYHA class II and III who were divided into a treatment group that received coenzyme Q10 at 100 mg, 3 times a day, and a control group. The four-week-long trial resulted in the treatment group experiencing significantly improved left-ventricular ejection fraction that resulted in enhanced functional capacity.—Belardinelli et al. 2005. *Biofactors* 25(1-4):137-45.; cf. a trial published a year later by some of the same authors: Belardinelli et al. 2006. *Eur Heart J* 27(22):2675-81; cf., also, re: improvement in ejection fraction and survival: Langsjoen and Langsjoen. 2008. *Clin Pharmacol Drug Dev* 3(1):13-17

In a 2008 paper entitled “Coenzyme Q10, an Independent Predictor of Mortality in Chronic Heart Failure,” researchers found that the plasma concentration of CoQ10 was “an independent predictor of mortality” for 236 patients admitted to the hospital with CHF.—Molyneux et al 2008. *J Am Coll Cardiol* 52(18):1435-41

With the year 2014 came the results of the now-famous, two-year-long Q-SYMBIO trial, in which moderate to severe heart failure patients (420 altogether) were given either 100mg of CoQ10 three times a day or a placebo in addition to standard drug therapy. The exciting results revealed pronounced improvement in the coenzyme Q10 group for cardiovascular mortality (9% vs. 16%, p = 0.026), all-cause mortality (10% vs. 18%, p = 0.018), and incidence of hospital stays for heart failure. In addition, a significant improvement of NYHA class was found in the CoQ10 group at the 2-year terminus of the study.—Mortensen et al. 2014. *JACC Heart Fail* 2(6):641-49

Finally, a recent meta-analysis of 14 randomized clinical trials involving 2149 heart-failure patients found that the CoQ10-treated patients experienced a lower mortality and a higher exercise capacity improvement than did the placebo-treated patients.—Li and Yan. 2017. *BMC Cardiovasc Disord* Jul 24;17(1):196. doi: 10.1186/s12872-017-0628-9

Hypertension

In 1994, a clinical trial was published in a scientific journal that sought to determine the effects of CoQ10 on blood pressure. In this study, 26 patients with essential arterial hypertension were treated with CoQ10, 50 mg twice daily, for 10 weeks. At the end of the treatment, systolic blood pressure decreased from 164.5 +/- 3.1 to 146.7 +/- 4.1 mmHg and diastolic blood pressure decreased from 98.1 +/- 1.7 to 86.1 +/- 1.3 mmHg (P < 0.001).—Digiesi et al. 1994. *Mol Aspects Med* 15(Suppl):S257-S263

In a randomized, double-blind trial published five years later among patients receiving antihypertensive medication, the effects of coenzyme Q10 (60 mg twice daily) were compared for 8 weeks in 30 (coenzyme Q10: group A) and 29 (B vitamin complex: group B) patients known to have essential hypertension and presenting with coronary artery disease (CAD). At the 8-week endpoint, systolic and diastolic blood pressure were reduced in the CoQ10 group, but also fasting and 2-hour plasma insulin, glucose, triglycerides, and lipid peroxides, while HDL-cholesterol increased. The results were thought to be possibly due to decreased oxidative stress and insulin response.—Singh et al. 1999. *J Hum Hypertens* 13(3):203-08.

A double-blind, placebo-controlled trial published in 2001 showed a marked reduction in systolic blood pressure with CoQ10 vs. placebo over a period of 12 weeks with a dose of 60mg, twice a day, in a group of 46 men and 37 women divided into the treatment and control groups. The mean reduction in systolic blood pressure of the CoQ10-treated group was 17.8 +/- 7.3 mm Hg (mean +/- SEM).—Burke et al. 2001. *South Med J* 94(11):1112-17

A 2007 meta-analysis of 12 clinical trials (362 hypertensive patients, total) found that supplementation with CoQ10 has potential to lower systolic blood pressure by up to 17 mm Hg and diastolic blood pressure by up to 10 mm Hg, without significant side effects.”—Rosenfeldt et al 2007. *J Hum Hypertens* 21(4):297-306

Migraines

One of the most appreciated applications of CoQ10 is for persons experiencing migraines. In an open-label trial of thirty-two patients (26 women, 6 men) with a history of episodic migraine with or without aura who were treated with coenzyme Q10 at a dose of 150 mg per day, 61.3% of the patients had a greater than 50% reduction in the number of days with migraine headache after 3 months of therapy. (Mean reduction in migraine frequency after only 1 month of treatment was 13.1%). Mean migraine attack frequency was 4.85 during the baseline period and this decreased to 2.81 attacks by the end of the study period.—Rozen et al 2002. *Cephalalgia* 22(2):137

In a double-blind, randomized, controlled clinical trial of 42 migraine patients that was published in 2005, supplementation of CoQ10 (3 x 100 mg/day) vs. placebo found the treatment group experiencing significantly less attack-frequency, headache-days, and days-with-nausea in the third treatment month.—Sandor et al 2005. *Neurology* 64(4):713-5

When 1,550 migraine patients were assessed as to their coenzyme Q10 levels, a staggering 1/3 of them were found to be deficient. Supplementation was initiated with a dose of 1 to 3 mg/kg per day in the CoQ10-deficient patients, with the result that both their headache frequency and their disability were reduced.—Hershey et al. 2007. *Headache* 47(1):73-80

When 36 migraine patients received 100 mg of CoQ10 a day in addition to their migraine preventive pharmaceuticals as against a control group of 37 patients who were given only their pharmaceuticals, the CoQ10 group reported a marked reduction in the frequency and severity of attacks. —Ali et al. 2017. *Acta Neurol Belg* 117(1):103-109

The thought proposed by some of the researchers finding improvement with CoQ10 is that migraines are a mitochondrial disorder and that CoQ10 is helpful because it is integral to the normal function of the mitochondria.—See, e.g., Markley. 2012. *Headache* 52 Suppl 2:81-7; Yorns and Hardison 2012. *Semin Pediatr Neurol* 20(3):188-93.

Breast cancer

In the early 1990s, Lockwood et. al presented two case reports of breast cancer with affected axillary lymph nodes who experienced remission with a dose of 300mg and 390 mg, respectively, of CoQ10 a day. A case report published a number of months later detailed two patients with *metastatic* breast cancer who went into complete remission on 390mg/day of CoQ10; one of these had “numerous metastases in the liver” that simply “disappeared.”—Lockwood et al. 1994: *Biochem Res Commun*

199(3):1504-08; Lockwood et al. 1995. *Biochem Biophys Res Commun* 212(1):172-77.

Research since that time has tended to confirm the benefits of CoQ10 relative to breast cancer. In 2008, for example, research was published demonstrating that the supplementation of coenzyme Q10 (100 mg) with tamoxifen (10 mg, twice a day) in breast-cancer patients reduced the level of markers of angiogenesis (growth of new blood vessels that support local tumor progression and invasion and enable tumor cell dissemination and metastasis formation) and triglycerides (which become elevated with tamoxifen use).—Panchanatham. 2008. *Biofactors* 32(1-4):151-9; cf. Premkumar. 2008. *Vascul Pharmacol* 48(4-6):191-201.

In 2010, a study using the MCF-7 cell line (a model of cancerous breast ductal epithelium) found that coenzyme Q10 reduced the activity of matrix metalloproteinases-2, a key molecule in cellular invasion and metastasis that is mediated by mitochondrial reactive oxygen species (ROS).—Bahar et al 2010. *Nutr J* 9:62.

A 2017 study published in the medical journal *Future Oncology* (London) noted, after outlining the standard methods of treatment for breast cancer: “Numerous studies in recent years tried to find safe and effective alternatives. A promising candidate is coenzyme Q10 which is an antioxidant that can target the mechanisms of B[reast] C[ancer] tumor progression.”—Tafazoli 2017. *Future Oncol* 13(11):1035-1041

Chemotherapy in Oncology

Another benefit of CoQ10 in oncology is the protection that it has been demonstrated to provide against heart damage caused by anthracyclines—a class of chemotherapy drugs. In a study involving children undergoing chemotherapy with this class of drugs, oral use of 100 mg, twice a day, offset anthracycline-induced cardiotoxicity (Iarussi et al. 1994. *Mol Aspects Med*. 1994;1[Suppl]:207–s212; cf. Conklin 2005. *Integr Cancer Ther* 4[2]:110-30) In another study of 80 patients, the cardiotoxic effects of doxorubicin, a commonly used anthracycline, were negated by CoQ10 to the extent that the negative electrocardiographic changes induced by the drug seem to have been prevented by coenzyme Q10. (Okuma. 1984. *Gan To Kagaku Ryoho* 11[3]:502–508) Moreover, a 2012 study evinced that the use of CoQ10 with doxorubicin did not decrease the latter’s effectiveness in combating cancer —Greenlee et al. 2012 *Integr Cancer Ther* Sep 11(3):243-50

In Conclusion

I can say that I have witnessed every one of the results discussed above relative to this amazing nutraceutical—in either my own health or in the health of many of the thousands of persons I have worked with as I enter the second quarter-century of my clinical practice. I hope that you, as well, find this summary of the amazing coenzyme Q10 to be as valuable in your own life and in the lives of those with whom you interact.

Our Alumni in Action

(continued from page 1)

Marlene McKenzie

Another MH graduate from way back in 2008, Marlene McKenzie has been a medical technologist, frontline lab worker, for almost 40 years.

“I have always been a naturalist and wanting to help people,” she explains: “However, due to time restrictions, I have not fully been able to attain in life what I feel I am here to do—helping people with natural medicine and teaching them to be aware of their bodies and the earth around them. But that is forthcoming, and I have been working hard at attaining a new life where I have the land



on which to start my business.

“My goal is to have a local clinic set up on my property, where my clients or students (yes, it will be a small school) will be able to enter the clinic which will be attached to a large greenhouse, powered by solar energy. There will be room for talks, demos, and hands-on. I will have garden tours right on my land to show and to teach people about the plants. I do hope to retire this year as a medical technologist and to fully pursue this dream!”

Marlene elucidates: “The plot of land I purchased in central Virginia (4.5 acres) after having moved here from Connecticut had never been worked in more than 40 years. The soil is clay and shale, so it has been quite a task to reshape it. We have been using raw materials from our land to build the soil and to create the gardens. We have turned a barren lawn, mowed only twice a year, into a beautiful ecosystem where I now find many medicinals: eyebright, violet, plantain, yarrow, and butterfly-weed to name a few.

“The garden, now at four years old, has a hedgerow of hawthorn and medicinal plants such as gotu kola, blue vervain, wood betony, motherwort, anise hyssop, and many more. I also have vegetables and fruits such as cherries, apples, raspberry, blackberry, kiwi, wolfberry, and many flowers. Everything is incorporated so as to build a sustainable ecosystem, inviting the pollinators and

good bugs. I also have a linden tree, magnolia tree (started from a baby), ginkgo tree, weeping willow, and fringe-tree, and have planted several red maples for added color. I am currently building a shade garden to grow shade-loving medicinals. I will also be growing some American ginseng under the canopy.

“I’ve also restarted my side business that I had in Connecticut: <https://www.earthstresuresva.com>. I’ve also been selling at a local farmers market—now for three years: dried herbs, teas, soaps, salves, and syrups. My specialty area is herbal tea and I have quite a few customers that regularly return for more. I include a poster board with the tea that is featured for the week, listing the main botanical, the parts of it that are used, and its origins, nutrition, and phytotherapy. People are amazed at the simple things they see every day and what these plants have to offer!

“Virginia, and the Appalachian region in general, is behind with herbal medicine, it seems, and I think it is due to the economics of the region: people are a lot poorer down here and many are old-world country people. But I have seen a big change here in just the past three years.”

In conclusion, Marlene tells us: “Goldenspirit, my email created while I was attending MWSHS, explains it all: my head hangs high and my spirit shines just like goldenrod flowers on a late summer day.”

New, Revised Edition of *Edible & Medicinal Wild Plants of the Midwest* (by Matthew Alfs) Now Available and In Stock at MWSHS!

MWSHS Director Matthew Alfs’ book, *Edible & Medicinal Wild Plants of the Midwest*, which was originally published in 2001 and then revised in 2013, is now back in print in a third, revised edition! This time, the book has been published by Minnesota Historical Society Press.

A much appreciated feature of this new edition is the integration of the many color photos in the book with the text, whereas before the photos were gathered together in an appendix and merely keyed to the text.

Please note that we have copies available here at MWSHS and so may your local bookstore—the latter of which would no doubt very much appreciate your business in this era when visits to bookstores are progressively decreasing and such are struggling to stay in business. (Barnes & Noble stores in the Twin Cities area are also stocking the book.) We hope that you have opportunity to obtain and to enjoy this new edition of a now-classic work!



