MWSHS Student Newsletter

Autumn 2021

MWSHS Alumna Profile

Kylene Seres

Kylene Seres, a licensed massage therapist, graduated from our Master-Herbalist Program in 2018. But what prompted her to want to become an herbalist in the first place? "A lifelong passion for plants" was the catalyst, she informed us: "Time in nature has always been a sanctuary of sorts."

Both the home study and the workshop components of the MH program really appealed to Kylene. "Home study makes things easier when you're juggling a lot," she observed. Yet, the workshop component of the program had its own attraction: "Meeting the requirements for in-class hours was nice because I found that MWSHS was a nice portal to supplement my skill-sets in assessment that complemented what I was already doing in my massage practice."

One way the program complemented Kylene's existing massage practice was with reference to what she learned about herb contraindications. "In my massage practice," she related, "clients would often talk about which herbs they were taking. Once, someone shared that they were still taking herbs that could increase their bleed-out risk a week before a scheduled surgery." This prompted Kylene to educate her client about the risks involved. "In situations like this, my education with MWSHS backed me up when our goal with others is to 'do no harm.'"

She also shared with us the following experience and happy outcome: "Using skills I learned at MWSHS helped me to keep a loved one with COVID out of the hospital when the methods their doctor had recommended were failing to manage their symptoms."

However, all students encounter challenges when progressing through the MH program and this was no different for Kylene. However, she tells us that she found inspiration to press on in the example set by the MWSHS director: "It's impossible not to be inspired and motivated by a person whose passion and professional commitment to the field spark the hearts and minds of those also passionate about maintaining the integrity of the work."

Of course, the crowning achievement of a MWSHS student's studies is his or her thesis. Here, combining her bodywork skills with the herbal knowledge she had gained, Kylene presented us with a most interesting thesis, entitled "Herbal-based Topicals for Pain Management with Consideration if Pain Is *(Continued in column two.)*

Recent Graduates

We offer congratulations to the following recent graduate of the Master-Herbalist Diploma Program:

Lucia More, MH

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

Eve Toomey

We offer congratulations to the following recent graduate of the Integrative-Herbalism Module:

Lisa Kofakis

We look forward to hearing more from all of these graduates as they continue to apply what they have learned in their lives.

Kylene Seres Profile *(continued from column 1)*

Muscular, Skeletal, or Neurological." In it, she discussed her experience in using a large variety of topical herbal analgesics based on her clients' energetics, humoural patterns, and specific complaints

Kylene's long-range goal is a most admirable (and enviable!) one: "I am currently putting together a business plan to start an herb farm to better supply clinics with quality plants that are becoming harder to find due to supply-and-demand issues and quality control." With key herbs being phased out by so very many of the herb companies, this is something that herbalists sorely need. We wish Kylene much success in this most worthy goal!

In conclusion, Kylene insightfully noted: "These are challenging times. I have little faith in the larger agenda of the Biotech industry. I have and will continue to place my faith in CAM-based therapies. People's ability to choose what health care means to them is a basic human right. In 2016 the 3rd leading cause of death for Americans was Medical Error. Many Americans with vaccine hesitancy are simply proactive in trying to avoid this. Folks, I implore us all to try to make peace with each other during this most challenging of times."

Inside This Issue

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 real-time online conferences for workshop credits continues at least till the Spring of 2022, owing to continued COVID restrictions on assemblies.*

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

"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.

Canadian Herb Conference. Online. Nov. 4-7, 2021. This virtual event seeks to bring together the herbalist community to learn more about all aspects of herbal medicine and the healing properties of plants. Activities will include presentations, workshops, panel discussions, and more. For more info or to register, visit the website: https://herbconference.com/

Ninth Annual Florida Herbal Conference. Online, February 25-27, 2022, is a virtual event featuring scads of workshops, including wild-plant walks, which qualify for Workshop Category #2 "Wild Plant Walks." For more info or to register, visit the website: www.floridaherbalconference.org.

Southwest Conference on Botanical Medicine. Online, March 25 – 27, 2022, is a is a virtual event featuring scads of workshops, including wild-plant walks, which qualify for Workshop Category #2 "Wild Plant Walks." For more info or to register, visit the website: https://www.botanicalmedicine.org/

2022 Spring Herb Seminar. Online. May 12-14, 2022. This herbal medicine-focused conference will feature presentations from experts drawing on ample clinical experience. Subjects to be discussed will include herbal medicine strategies for cardiology, neurology, gastroenterology, autoimmune conditions, and more. For more info or to register, https://restorativemedicine.org/conferences/2022-spring-herb-seminar/

Alpha-Lipoic Acid

(Part Three of a Series on Nutraceuticals)

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

Alpha-lipoic acid (ALA), also known simply as lipoic acid (LA) or as thioctic acid (TA), is an organosulfur compound that is produced from caprylic acid in the mitochondria. It has two enantiomers (optical isomers), an "R" and an "S." Of these, the R form is naturally occurring.

Functions of Alpha-Lipoic Acid in the Body

The R-isomer of alpha-lipoic acid functions as an essential co-factor in energy metabolism, specifically for the mitochondrial enzymes of oxidative metabolism, pyruvate dehydrogenase and alpha-ketoglutarate dehydrogenase. It is also a cofactor of the glycine cleavage system that degrades glycine into pyruvate.

Antioxidant

ALA, and especially in its reduced form, dihydrolipoic acid (DHLA), is perhaps best known and most appreciated as an antioxidant, being the only fat- and water-soluble antioxidant known. It reacts with reactive oxygen species such as superoxide radicals, hydroxyl radicals, hypochlorous acid, peroxyl radicals, and singlet oxygen and does so without itself become a free radical in the process. It also reduces the oxidized forms of other antioxidant agents such as vitamin C, vitamin E, and glutathione and increases the synthesis of the latter, thereby protecting membranes. Furthermore, it prevents the formation of advanced glycation end products (AGE) as well as mitochondrial damage from oxidative stress.

Additional Functions

ALA increases the production of acetylcholine and promotes the down-regulation of inflammatory processes (by inhibiting I Kappa B kinase, a converging enzyme for the activation of NF-kappaB, and thereby suppressing the activation of other inflammatory cytokines), verified in rat studies. It is also understood that ALA and/or DHLA serve as toxic-metal (incl. mercury) chelators (by increasing the glutathione levels inside cells), as neuroprotectants (having the ability to cross the blood-brain barrier), and as modulators of the signaling transduction of several pathways.

Food and Supplemental Sources of Alpha-Lipoic Acid

Alpha-lipoic acid is present in several foods (spinach, broccoli, some organ meats, and yeast extract), but in very low amounts, and has poor bioavailability there from. Supplementation, in doses from 200–600 mg/day, can provide up to 1000 times the amount available from the diet. To acquire the benefits of ALA, then, supplemental sources are preferred. These are widely available on the supplement market—primarily as capsules, but also in liquid form. (The latter is thought to be more easily assimilated than the former.) The R-isomer is regarded as more bioavailable than the S-isomer due to its higher water-solubility, although many supplements contain a mixture of both forms. However, it is recommended that supplements be taken 30-60 minutes before a meal or at least two hours afterwards, in that their gastrointestinal absorption decreases when they are taken in conjunction with a meal.

Side effects are rare; when they do occur, they tend to take the form of nausea or other gastric discomfort and usually only occur in doses above 600mg/day.

Clinical Benefits of Alpha-Lipoic Acid Supplementation

Alzheimer's disease

Because oxidative stress and neuronal energy depletion are biochemical features of Alzheimer's disease (AD), it has been proposed that ALA might be a valuable therapy for slowing down, or even preventing, this terrible disease. Here, clinical trials have been conducted to determine efficacy, as follows…

In a clinical trial published in 2001, 9 AD patients were provided with 600mg/day of ALA in divided doses, in addition to the acetylcholinesterase (AChE)-inhibiting pharmaceuticals that they were already taking, over an average of 337 days. Prior to enrollment in the study, the Mental State Examination (MMES) and AD Assessment Scale-cognitive (ADAS-cog) scores indicated that their mental function was declining, but the trial revealed a stabilizing effect so that further deterioration seemed to have been halted.—Hager et al. 2001. *Arch Gerontol Geriatr.* 32:275–82

In 2007, the same investigators studied 43 AD patients who were assigned 600 mg/day of ALA over an observation period of up to 48 months. In patients with mild dementia, the study authors found that the disease progressed extremely slowly, while in patients with moderate dementia at approximately twice that rate. However, the progression appeared dramatically lower than data reported for untreated patients or patients on cholinesterase-inhibiting pharmaceuticals in the second year of long-term studies, suggesting to the authors that treatment with alpha-lipoic acid might be "a successful 'neuroprotective' therapy option for AD."—Hager et al. 2007. *J Neural Transm Suppl.* 72:189-93 In a paper published a year later that analyzed the results of the second clinical trial mentioned above and endeavored to provide a rationale for ALA's possible mechanism of action in

slowing down AD, Maczurek et al. observed that ALA exerts a variety of effects that could interfere with the pathogenesis or progression of AD: it increases glucose uptake to the brain and acetylcholine (ACh) production, inhibits the formation of hydroxyl radicals and scavenges reactive oxygen species (ROS), down-regulates the expression of redox-sensitive pro-inflammatory proteins such as TNF, and can scavenge lipid peroxidation products.—Maczurek et al. 2008. *Adv Drug Deliv Rev* 60:1463-70

The increase of glucose uptake to the brain mentioned by Macurek et al. is significant because Alzheimer's Disease has been called Type-III Diabetes and this because it is marked, at least in its early stages, by impaired glucose uptake to the brain. Research has discovered, however, that ALA possesses an insulin-mimetic effect and therefore can increase glucose uptake by the brain. This was demonstrated in a mouse study published in 2013, where ALA added to the rodents' drinking water for four weeks produced an insulin mimetic effect that resulted in increased brain glucose uptake and activation of both the insulin receptor substrate and the PI3K/Akt signaling pathway.—Sancheti et al 2013. *PLoS One*. 8:e69830)

In 2014, a revealing clinical trial was published involving 30 AD subjects who were randomized into one of three therapeutic groups: omega-3 fatty acids; omega-3 fatty acids plus ALA; or placebo. While the omega-3 fatty-acid group manifested less decline via the Instrumental Activities of Daily Living (IADL) index than did the placebo participants, the group receiving the combination of omega-3 fatty acids and ALA performed the best, revealing less decline in the IADL *and* in the Mini-Mental State Examination (MMSE) score over the placebo group. All in all, this combo slowed cognitive and functional decline in AD over a period of 12 months. —Shinto et al. 2014. *J Alzheimers Dis*. 38:111–20

Burning mouth syndrome

One of the more interesting clinical applications of alpha-lipoic acid is for burning mouth syndrome (BMS), a chronic condition characterized by burning pain and itching in the oral cavity. It most commonly occurs in post-menopausal women.

Several clinical trials have used 600 to 800 mg of alpha-lipoic acid a day for sufferers of burning mouth syndrome. One of these, a 2015 double-blinded, controlled trial, divided 60 patients with BMS into a treatment group and a placebo group, with the treatment group receiving 600 mg ALA/day. A two-month follow-up found 64% of the ALA group reporting improvement as opposed to only 27.6% in the placebo group, with a level of maintenance of 68.75% one month after the treatment period had ended. (Palacios-Sanchez et al. 2015. *Med Oral Patol Oral Cir Bucal*; 20: e435–e440.) In another clinical trial, ALA was pitted against gabapentin and a placebo. Of the 120 participants, 600 mg of ALA was given to one group, 400 mg of gabapentin was given to another group, a combination of ALA and gabapentin was given to another group, and a placebo was given to the fourth group—all for two months. At the end, the group receiving the ALA plus gabapentin experienced the best results, with 70% of them noting reduced burning. In all, there was a 13.2 times greater chance of positive changes presenting for these patients than for those taking the placebo; but even the ALA group had a seven times chance over the placebo group.—López-D'alessandro & Escovich. 2011. *Med Oral Patol Oral Cir Bucal* 16: e635–e640

A 2014 randomized, placebo-controlled trial also showed improvement in subjects using alpha-lipoic acid vs. placebo over a period of two months. (Femiano et al. 2004. *J Eur Acad Dermatol Venereol* 6:676-8), while a comparison trial implementing ALA in patients using tranquilizers as opposed to those not using them demonstrated improvement only in the group not using the tranquilizers.—Marino et al. 2010. *J Oral Pathol Med*. 39:611-6

The most recent randomized clinical trial to date found ALA effective in providing symptom relief in BMS and in increasing salivary flow.—Barbosa et al. 2018. *Lasers Med Sci* 33:1255-62

Glaucoma

Another exciting therapeutic avenue for ALA is in the treatment of persons with glaucoma and especially the open-angle form of this eye disease. In that research has uncovered a glutathione deficiency in open-angle glaucoma (OAG) (Bunin et al. 1992. *Vestn Oftalmol* 108:13-15) and in that we have earlier seen that ALA increases glutathione synthesis and levels inside of the cells, the thought has been that ALA might favorably impact this ocular disease. Moreover, as OAG is associated with an up-regulation of the inflammatory nuclear protein NF-kappaB (Erb. 2010. *Klin Monbl Augenheilkd*. 227:120-7) and as ALA has been shown to reduce this protein, as we have earlier seen, this correlation has further stimulated hope that ALA might benefit sufferers of this form of glaucoma. Yet, clinical trials to test these hypotheses have been few.

In one trial of 45 patients with stages I and II of open-angle glaucoma (OAG), however, 26 of the trial subjects received 0.075g of ALA daily for 2 months while 19 others took 0.15g/day for one month. A control group received only hypotensive therapy. The 19 patients receiving the 0.15g-dose experienced the most marked improvement—in biochemical parameters, in visual function, and in some other markers. Improvement was attained in approximately 45-47.5% of examined eyes and most often in patients with stage-II OAG, where it was noted in 57% of eyes.—Filina et al. 1995. *Vestn Oftalmol*. 111:6-8

Pregnancy Complications

A promising area of research involves supplementation of ALA in patients with threatened miscarriage: (1) in order to improve the resorption of a subchorionic hematoma and (2) in prevention of premature rupture of fetal membranes. (Di Tucci et al. 2018. *Gynecol Endocrinol.* 34:729-733; Pocaro et al. 20215. *Eur Rev Med Pharmacol Sci* 19:3426-32) Clients in my own clinical practice have indeed experienced accelerated resorption of subchorionic hematomas with the use of ALA.

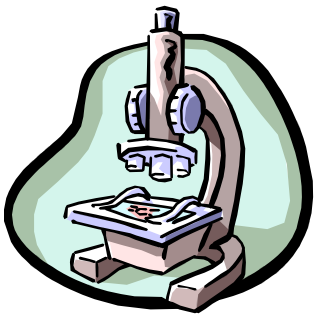
Cancer

Promising results have accrued from applications of ALA to cell lines and/or to rodents with the following cancers: (1) Lung; (2) Breast, (3) Thyroid, (4) Liver, (5) Gastric, and (6) Colorectal. Disappointingly, no clinical trials have been published as of this writing.

Mechanisms of action have included antiproliferative activity, cell-cycle arrest, cytotoxic effects, induction of apoptosis, impairment of oncogenic signaling, antitumor activity, and antimetastatic potential.

Breast cancer

Several different studies have yielded positive effects of ALA in breast cancer. In a 2009 study, Na et al. demonstrated that ALA inhibited cell proliferation and induced apoptosis in MDA-MB-231 breast-cancer cell lines. (Na et al. 2009. *Nutr Res Pract*. 3:265-71) Three years later, a study by Feuerecker et al. studied ALA in a breast-cancer cell line and in mice, with the result that it was found to have hampered cell viability/proliferation and lactate production and to have increased apoptosis in the cell line, while in the mouse xenograft model tumor progression was retarded with daily treatment.—Feuerecker et al. 2012. *Cancer Biol Ther*. 13:1425-35



In another beast-cancer cell-line study published in 2010, ALA actually inhabited metastasis (a reduction of cell motility, migration, and invasion was observed), which was attributed to its inhibition of matrix metalloproteinase (MMP). (Lee et al. 2010. *Nutr Res*. 30:403-9.) Yet another cell-line study published in the same year found ALA to induce cell-cycle arrest and apoptosis.—Dozio et al. 2010. *Eur J Pharmacol*. 64:29-34.

In still another breast-cancer cell line studied, researchers found that ALA and its reduced form, DHLA, decreased the activity of enzymes involved in the development of tumors and manifested inhibitory effects on the viability and proliferation of breast-cancer cells. (Kuban-Jankowska et al. 2017. *Anticancer Res.* 37:2893-98) More recently, researchers found that ALA enhanced the anticarcinogenic effects of cisplatin in a MCF-7 breast-cancer cell line. (Nur et al. 2017. *J Recept Signal Transduct Res*. 37:569-577) Finally, a 2018 cell-line study revealed that ALA inhibited the migration and invasion of metastatic breast cancer cells.—Tripathy et al. 2018. *Life Sci*. 207:15-22.

Cell-line research published in the journal *Apoptosis* in 2009 described how ALA and DHLA effectively induced apoptosis in HT-29 human colon cancer cells by a pro-oxidant mechanism that was initiated by an increased uptake of oxidizable substrates into the mitochondria of the cancer cells. (Wenzel et al. 2005. *Apoptosis*. 10:359-68) In a 2014 study by Dorsam et al. investigating the cytotoxicity of ALA on colorectal cells differing in their p53 status, they found that ALA induces a dose-dependent decrease in cell viability, which was independent of the p53 status. They also discovered that ALA increases the cytotoxic effect induced by the chemotherapy drug 5-fluorouracil (5-FU), as revealed by significantly enhanced cell death rates in the HCT116 and CaCO-2 cancer cells and that it does this without causing DNA damage on its own, thus making it a candidate for tumor therapy. (Dörsam et al. 2015. *J.Arch Toxicol.* 89:1829-46) In another study with a similar approach, the investigators found that the combination of ALA with 5-FU and with doxorubicin attenuated p53-mediated stabilization of p21 and resulted in synergistic killing in colon cancer cells in a p53-dependant manner. —Neitzel et al. 2019. *Cells* 8:794

Thyroid Cancer

In a cell-line and rodent study evaluating the effects of ALA on thyroid-cancer cell proliferation, migration and invasion, Jeon et al. found that it reduces cancer cell migration and invasion and also that it significantly suppressed tumor growth in a mouse xenograft model. They concluded that ALA could be a potential therapeutic agent for treatment of advanced thyroid cancer, possibly as an adjuvant therapy with other systemic agents.—Jeon et al. 2016. *Mol Cell Endocrinol* 419:113-23

Gastric Cancer

In a 2019 paper, Yang et al. explored whether ALA could be used to inhibit the proliferation and invasion of human gastric cancer. Using three different cell lines, they discovered that it did in fact reduce the proliferation and invasion of human gastric cancer cells, by suppressing STAT-3-mediated MUC4 gene expression.—Yang et al. 2019. *Oxid Med Cell Longev*. Dec 13:3643715 eCollection

Liver Cancer

In 2008, Shi et al. investigated the effect of ALA on cancer of the cells of the liver (hepatoma). They found that ALA scavenges reactive oxygen species (ROS) followed by an increase in apoptosis of human hepatoma cells through the mitochondrial pathway.—Shi et al. 2008. *FEBS Lett*. 582:1667-71

Lung Cancer

One of the most studied applications of ALA to a cancer is for lung cancer, currently the deadliest of all cancers. Research published in 2009, for instance, revealed that ALA induced apoptosis in lung cancer cells. (Choi et al. 2009. *Acad Sci.* 1171:149-55) In a 2013 study, ALA inhibited proliferation of human non-small cell lung cancer cells. (Michikoshi et al. 2013. *K.Cancer Lett*. 335:472-8) When lung cancer cells were exposed to ALA in a 2016 study, the cells wound up being sensitized to cisplatin, etoposide, and paclitaxel-induced apoptosis. (Puchsaka et al. 2016. *Int J Oncol.* 49:1445-56) A study published in the following year found ALA to inhibit proliferation of non-small cell lung cancer cells. (Yang et al. 2017. *Biochem Biophys Res Commun*. 494:325-331) In research published just last year, ALA limited lung cancer growth in xenograft mice and reduced lung cancer A549 cell viability.—Peng et al. 2020. *FEBS Open Bio* 10:607-18

Radiation Damage

Radiation therapy is one of the main cancer treatment modalities, utilized in 50-70% of cancer patients. However, it can induce complications in irradiated healthy cells/tissues and result in severe toxicity. Fortunately, there are a number of radio-protective agents that can alleviate radiation-induced complications. Research indicates that ALA is one of these agents. In a 2021 review of 29 papers published on the subject, it was concluded that alpha-lipoic acid could alleviate the radiation-induced toxicities in most cases, exerting its effects through anti-oxidant, anti-apoptosis, and anti-inflammatory mechanisms.—Sheikholeslami et al. 2021. *Int Immunopharmacol*. 96:107741

Chemotherapy-induced Peripheral Neuropathy

ALA seems to be beneficial in chemotherapy-induced peripheral neuropathy (CIPN) as well. A 2003 study found that when 14 patients with peripheral neuropathy induced by cisplatin plus docetaxol received 600 mg i.v. of ALA once a week for 3–5 weeks and then1800 mg of oral ALA over a period of several months, a significant reduction in neurological symptoms was achieved in eight of them. (Gedlicka et al. 2003. *Ann Oncol* 14: 339-340) Even idiopathic pain has responded to ALA, at doses of 400-600 mg/day vs. placebo, as revealed in a recent clinical trial that enrolled 210 subjects (57 of whom had experienced neuropathic pain)—Esposito et al. 2021. *Pharmacother*. 144:112308

Cardiovascular Disease

Research has revealed a number of benefits to cardiovascular health from ALA supplementation, especially with reference to endothelial health and function, significant because endothelial dysfunction is understood be a major factor in atherosclerosis, hypertension, and other cardiovascular disorders.

Of interest here is a 2019 double-blinded, placebo-controlled trial that investigated the results of ALA supplementation in 67 overweight youths vs. a placebo (in 22 normal-weight subjects). The result of the trial was that the supplement significantly increased the basal and peak diameter of brachial artery in the treatment group compared to the placebo group. The study authors contended that this demonstrated that ALA supplementation improves vascular tone and may have a beneficial effect on CV health in overweight/obese youths. (Tromba et al. 2019. Nutrients. 11:375) Additional studies have shown ALA to benefit endothelial function in persons with glycemic abnormalities. (Sola et al. 2005. *Circulation.* 111: 343-348; Xiang et al. 2007. *Clin Endocrinol* [Oxford] 6:716-23; Xiang et al. 2011. *Metabolism* 60:480-85) A 2002 study revealed that ALA enhances both the antioxidant defenses and the function of endothelial cells, without reference to dysglycemia.—Jones et al. 2002. *Free Radic Biol Med* 33: 83-93.

Research has also revealed that ALA ameliorates lipid abnormalities (Kim et al. 2013. *Gut and Liver* 7:221–227; Zhang et al. 2011. *Obesity*. 19:16747-53) and inveighs against the development of atherosclerosis, even inhibiting the progression of atherosclerosis plaque that has already been established. (Ying et al,. 2010. *Life Sci*. 2010, 86: 95-102) It fights against hypertension by supporting production of nitric oxide and by offsetting vasoconstriction, as well as provides benefits in combating heart failure and ischemic disease.—Skibska et al. 2015. *Oxid Med Cell Longev*. 2015:313021

Obesity

Obesity is another condition for which ALA administration can produce markedly positive effects. For example, in a 2015 clinical trial by Huerta et al., 77 obese women with BMI values between 27.5 and 40 kg/m2 were studied. All participants were randomly divided into 4 groups: (1) treated with 1300 mg eicosapentaenoic acid (EPA) or (2) 300 mg of ALA or (3) 1300 mg of EPA plus 300 mg of ALA or (4) placebo daily for 10 weeks. All individuals were adapted to 30% energy-restricted diet during this period. In the end, the ALA treated group showed significantly higher body weight loss and an important drop in leptin levels from the first week of treatment, as well as marked improvements in insulin level during the oral glucose tolerance test (OGTT).—Huerta et al. 2015. *Obesity 23*: 313–321

A number of other studies have been conducted with ALA on obese individuals and meta-analyses have been done to quantify the results. In one of the latter, which examined 12 clinical trials and was published in 2018, the study authors concluded that ALA significantly reduced body weight and BMI compared to the placebo group, but that effects on waist circumference did not reach a level of significance. (Namazi N, et al. 2018. *Clin Nutr*. 37:419-428) A meta-analysis published two years later arrived at

strikingly similar conclusions for body weight, BMI, and waist circumference. (Vajdi et al. 2020. *Int J Clin Pract*. 74:e13493) A randomized clinical trial published a few months later found that ALA, supplied at 600mg/day in overweight adults, produced greater weight loss, loss of body fat, and antioxidant gene expression than did a placebo over a period of 24 months, inducing the authors to conclude that long-term ALA supplementation reduced potential for inflammation in overweight adults.—Bobe et al. 2020. *J Nutr* 150:2336-2345

Diabetes & Complications

By far the best-known and most widely tested clinical application of ALA has been for pre-diabetes (metabolic syndrome), diabetes, and diabetic complications such as retinopathy and neuropathy. In fact, there are more published studies on ALA for diabetic neuropathy than for any other health condition and the supplement has been clinically used as therapy for both that health condition and for diabetic retinopathy in Germany since 1966. Benefits in these conditions appear to accrue largely from ALA's anti-inflammatory, hypoglycemic, and antioxidant effects. Its ability to inhibit glycation, which generates free radicals, seems to be especially crucial here. (Thirunavukkarasu. rt al. 2005. *Die Pharm.* 60: 772–775.) In fact, both ALA and DHLA exhibit hydrophobic binding to proteins such as albumin, which can prevent glycation reactions.—Kawabata et al. 1994. *Biochem. Biophys. Res. Commun*. 203:99–104; Thirunavukkarasu et al. 2005. *Die Pharm 60*:772–775; Rochette et al. 2015. *Can. J. Physiol. Pharmacol. 93*:1021–1027

ALA also activates AMKP, a cellular energy sensor, that results in an increased ATP production through glucose and fatty-acid oxidation and which can increase glucose uptake through translocation of glucose transporter-4 (GLUT4) to plasma membrane independent of the action of insulin, thus accomplishing the same thing as the latter, so that ALA can be said to mimic insulin's mechanism of action. (Zhou et al. 2001. *J Clin Invest*. 108: 1167-1174; Packer et al. 2001. *Nutrition* 17, 888–895) The end result of the AMPK action is an increase in insulin sensitivity and a consequent decrease in blood glucose, perhaps at least partly explaining the weight loss that we saw to occur in the studies cited above, under the subhead "obesity." —Steinberg et al. 2009. *Physiol Rev*. 89: 1025-1078; Lee et al. 2005. *Biochem. Biophys. Res. Commun*. 332:885–891; Jacob et al. 1999. *Biofactors* 10: 169-174

Numerous studies have strongly supported the role of ALA in positively affecting diabetic neuropathy, which it may at least partly accomplish by enhancing nitric oxide-mediated endothelium-dependent vaso-dilation, thus improving microcirculation in patients so afflicted.—Vallianou et al. 2009. *Rev Diabet Stud*. 6:230-6

Positive results from clinical trials have abounded. For example, the oral pilot (ORPIL) study showed a reduction in diabetic polyneuropathic symptoms after three weeks of using 600 mg of ALA, three times a day. (Ruhnau et al. 1999. *Diabet Med.* **16**:1040–1043) A later study (ALADDIN II) published that same year recruited 299 patients for a 24-month-long trial that pitted the use of 600 mg of ALA, twice a day, vs. 600 mg of ALA once a day plus placebo vs. a placebo + a placebo. Those subjects receiving ALA reported improvement in several aspects of sensory nerve conduction.—Reljanovic et al. 1999. *Free Radic Res.* 31:171–179

Then there was the SIDNEY 2 Trial, which was a multicenter study that used doses of ALA at 600, 1200, and 1800 mg daily or a placebo for five weeks. This study revealed an improvement in both neuropathic symptoms and deficits in patients, including stabbing and burning pain. (Ziegler et al. 2006. *Diabetes Care.* 29:2365–70) Five years later saw the publication of the NATHAN 1 (Neurological Assessment of Thioctic Acid in Diabetic Neuropathy) clinical trial, a multicenter study that used 600 mg of ALA daily for four years. This well-designed and accomplished trial resulted in a significant clinical improvement and a prevention of the progression of neuropathic impairments.—Ziegler et al. 2011. *Diabetes Care.* 34**:** 2054–2060

An open-label and prospective study by Bertolloto et al., published a year later, found an improvement in pain and sensory nerve conduction in 50 diabetic patients with neuropathy when a combination of 400 mg of ALA and 140 IU of superoxide dismutase (SOD), another antioxidant available on the market, was given to them for four months. (Bertolloto and Massome. 2012. *Drugs* 12:29–34) ALA has even been suggested to combat neuropathic pain during pregnancy—not only due to the evidence for its successful treatment of this condition as revealed in the clinical trials cited above, but because it is perhaps the only oral agent for neuropathic pain that would be safe for pregnant women —Costantino et al. 2014. *Eur Rev Med Pharmacol Sci* 18: 2766-2771

Polycystic Ovary Syndrome

Polycystic ovary (or, ovarian) syndrome (PCOS) is a disorder affecting 10% of women in their reproductive years and producing a constellation of symptoms that can vary slightly according to geographic region, but which in North America typically consist of the following: Many small cysts on the ovaries (i.e., *polycystic* ovaries), hirsutism, dark and straggling chin hairs, stray hairs on the breasts, cystic acne, male-pattern baldness, anovulatory menstrual cycles and consequent infertility, amenorrhea, aggressive behavior, and short temper. In 35-70% of American women, there is also elevated blood sugar.

Extensive research has demonstrated that long-term treatment with ALA reduces oxidative stress and insulin resistance in women with this syndrome and positively affects its clinical and metabolic features.

In one clinical trial, controlled-release ALA was administered to six, lean, non-diabetic subjects with PCOS, at a dosage of 600mg, bid, for 16 weeks. At the

end of treatment, insulin sensitivity was improved by 13.5%, triglycerides were lowered, and their LDL shifted from the dangerous, small, dense form to the desirable larger, fluffy, buoyant form. Moreover, a desirable increase in menstrual cycles was observed in the two subjects who were not using oral contraceptives.—Masharani et al. 2010. *Endocrinol Invest*. 4:359-64

In a clinical trial published in 2019, Genazzani et al. discovered that 400mg of controlled-release ALA given to 32 obese patients with PCOS over a period of 12 weeks significantly decreased insulin, glucose, BMI, and the HOMA index. Interestingly, though, hormonal parameters involved in reproduction such as LH, FSH, and androstenedione did not change.—Genazzani et al. 2018. *Endocrinol Invest*. 41:583-590

Since 2015, however, most of the clinical research relative to PCOS has focused on using a combination of ALA with inositol (either myo-inositol or d-chiro-inositol), another natural substance that is available on the supplement market, which combo was spearheaded by a clinical trial by Cianco et al published in that year. In that trial, 46 women with PCOS were split into a group of 26 women who received di-chiro-inositol and a placebo group of 20 women, with a number of parameters investigated at baseline and after 180 days. At the end of the treatment period, the study group manifested clinical and metabolic improvement over the control group.—Cianci et al. 2015. *Gynecol Endocrinol*. 31:483-6

In another clinical trial published that same year, 36 infertile, PCOS subjects being treated with in-vitro fertilization (IVF) and with a normal BMI were treated with a cycle of ALA and myo-inositol and the results compared to a prior treatment by myo-insositol alone. In the treatment group, insulin levels, BMI, and ovarian volume were significantly reduced compared with the prior treatment by myo-inositol alone. Moreover, grade 1 embryos were significantly increased, with a significant reduction in the number of grade 2 embryos. There was a trend for a higher percentage of clinical pregnancy in the treatment group, although this did not reach clinical significance. The conclusion of the study authors was that supplementation of ALA plus myo-inositol in PCOS patients undergoing an IVF cycle can help to improve their reproductive outcome and also their metabolic profiles, opening potential for their use in long-term prevention of PCOS.—Rago et al. 2015. *Biol Regul Homeost Agents*. 29:913-23

Two years later, De Cicco et al. also investigated a combo of ALA and myo-inositol on the metabolic, clinical, and endocrine features of forty women afflicted with PCOS, over a period of six months. The results were impressive: There was a significant increase in the number of menstrual cycles over that period, BMI decreased, key androgen levels (mean DHEA-S and androstenedione and free androgen index) markedly decreased, while mean sex-hormone binding (SHBG) levels increased. Ovarian volume and total antral follicular count were reduced.—De Cicco. 2017. *Endocrinol.* 33:698-701

In a 2019 study of ninety overweight/obese patients who were administered myo-inositol (1 g/die per os), ALA (400 mg/die per os), or myo-inositol (1 gr/die) + ALA (400 mg/die) per os over 12 weeks of treatment, it was discovered that the myo-inositol modulated more hormonal profiles and oral glucose tolerance test (OGTT) in PCOS patients who had no familial diabetes, ALA improved insulin response to OGTT and metabolic parameters in all patients with no effects on reproductive hormones, and the combination of myo-inositol + ALA improved hormonal and metabolic aspects and insulin response to OGTT in all patients. In summary, it was found that myo-inositol was less effective when familial diabetes was present, that ALA improved only metabolic aspects, and that the combo of myo-insositol and ALA was effective on all PCOS patients independently from familial diabetes.—Genazzani et al. 2019. *Gynecol Endocrinol*. 35:1088-1093

Menstrual cycles and insulin sensitivity in 72 women with PCOS were investigated over a period of six months in a clinical trial published in 2019, with 41 of the women receiving a combination of myo-inositol and ALA and the remainder receiving a placebo. The results were that the menstrual cycle length improved in 76.7% of the women and ovulation was restored in 40% of them. BMI also decreased significantly. Insulin sensitivity improved in the women who had insulin resistance only. (Fruzzetti. 2019. *Gynecol Endocrinol*. 35:506-510) In a follow-up study by one of the authors of this study in conjunction with three other authors, fifty-seven women experiencing PCOS and with a history of oligoamenorrhea were treated with 800 mg of myo-inositol and 2,000 mg of ALA a day. After 6, 12, and 24 months, those with complete clinical charts were checked for any improvement via a variety of parameters. Cycle length was significantly reduced at 6, 12, and 24 months of treatment. BMI showed a reduction only at 6 months, thereafter returning similar to the basal values. The insulin response to a 3-hour oral glucose tolerance test was improved after 6 and 18 months of treatment. In conclusion, the study authors concluded that a combination of ALA and myo-inositol was useful as long-term therapy in PCOS women, providing a normalization of the menstrual cycle and an amelioration of insulin levels.—Fruzzetti. 2020. *Gynecol Endocrinol*. 36:152-155

Conclusion

I hope you have found this review of ALA to be of interest and of value. Reviewing the supplement's benefits here has even further informed my own clinical practice.

Reviews of Books on Tommie Bass

The Great Southeast-American Folk Herbalist!

By Matthew Alfs, MH, RH

As a MWSHS student, you are no doubt well familiar with A.L. ("Tommie") Bass (1908-1996), the great southeast-American folk herbalist of the 20th century, in that we have highlighted him numerous times in the Western-Herbalism module. He practiced in a rural area in northern Alabama, approximately at the same time as Dr. John Raymond (Ray) Christopher practiced in the western U.S. and Michael Moore practiced in the southwestern U.S—three remarkable herbalists and teachers who have passed on to that great Foraging Ground in the Sky.

We trust that you will all enjoy the following reviews of several books and a video documentary about Tommie—two of the books written by students of his and another by a physician and pharmacist who followed his practice for some time in the 1980s. These works well illustrate that Bass was not only a skilled herbalist and mentor, but also a kindly, spiritual, and wonderful human being.

Crellin, John K, and Philpott, Jane. *Herbal Medicine Past and Present.* Vol. 1: *Trying to Give Ease: Tommie Bass and the Story of Herbal Medicine* (Duke University Press, Durham, North Carolina, 1990), softcover, 335pp.

Crellin, John K, and Philpott, Jane. *Herbal Medicine Past and Present.* Vol. 2: *A Reference Guide to Medicinal Plants.* (Duke University Press, Durham, NC, 1990), softcover, 549pp.

When I was first introduced to herbalism in the mid-to-late 1970s, it was through several books on folk herbalism such as *Back to Eden* by Jethro Kloss, *American Folk Medicine* by Clarence Meyer, the Foxfire series, and *Nature's Healing Arts* by Lonnelle Aikman (featuring a lovely photo of folk herbalist Kathy Cranor on the cover, grinding herbs with a mortal and pestle). Since then, American folk herbalism has always been my favorite form of herbalism, along with Native-American plant medicine.

Imagine my excitement and delight when, in 1989, a 2-volume set of books on the life, herbal practice, and teachings of Tommie Bass was published! Based on extensive interviews with Bass by a medical doctor and pharmacist (John Crellin) and a botanist (Jane Philpott) over a period of eight years, these well-researched and written volumes quickly became top sellers for Duke University Press. Their research was inspired by Allen Tullos, who wrote his master's thesis on Tommie in 1976 and who invited Crellin and Philpott to follow up in researching Bass.

Volume One, entitled *Trying to Give Ease: Tommie Bass and the Story of Herbal Medicine,* chronicles Bass' life and herbal practice in its initial chapter. The next couple of chapters review the changes in social attitudes toward herbal healing and orthodox medicine that took place from the 1940s through the 1980s and how Bass came to view them and to make adjustments in his practice. Later chapters focus more on Bass' remedies for particular health issues. All chapters quote Bass at various points, allowing great insight into his character and humor.

Volume Two, *A Reference Guide to Medicinal Plants*, presents detailed monographs on 700 individual plants collected or used by Bass in his practice, prefaced by a paragraph or more on Bass talking about each of the plants—often peppered with humorous anecdotes. This is where Crellin's research skills really shine, as he incorporates many historical gems and scholarly analyses of the plants. (The bibliographic references printed at the end of the volume span a whopping 58 pages!)

Needless to say, I devoured each of these volumes when they first came out and have treasured them ever since, returning to them time and again.

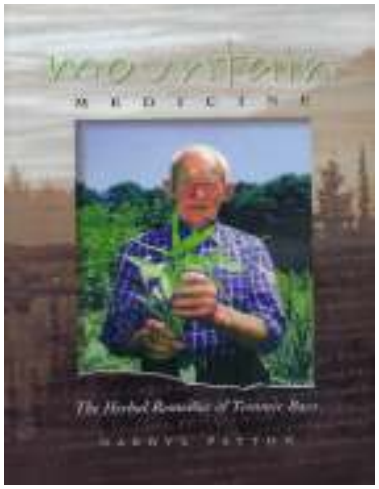
Patton, Darryl. *Mountain Medicine: The Herbal Remedies of Tommie Bass* (Little River Press, Gadsden, Alabama, 2017), softcover, 241pp. $40.00

Darryl Patton, who runs the Deep South Center for Herbal Studies in Mentone, Alabama, had the enviable experience of having apprenticed under Tommie Bass for an astounding *thirteen years*, during which time he learned to identify and to use over 1,500 different plants!

This book of Patton's, a loving tribute to his mentor, uses as its template audio recordings of countless hours of talks with Bass, giving rise to a very personal and touching narrative. It is highly illustrated: the first half is replete with photos of Tommie gathering herbs and practicing his craft and the second half features color photos of many of the plants that Tommie utilized, including a number of herbs not typically discussed in other books or even in herbal-study programs such as crossvine, cucumber magnolia, dogwood, huckleberry, persimmon, redbud, smartweed, sourwood, sweet gum. bay laurel, tag alder, tulip poplar, mountain mint, wahoo, wild plum, and yellowroot. These photos are

accompanied by full-page monographs on how Tommie used— and Patton still uses—these plants.

It's always a joy to read of an herbalist's most-utilized herbs and why they are so appreciated. Here I was especially impressed by the many applications that Bass had for the roots of redroot (*Ceanothus americanus*), including for colitis, diarrhea, prostate-gland trouble, and high blood pressure. "Just take the roots, something like a teacup full of the roots to a half a gallon of water," Tommie explained, "and boil it for about thirty minutes and then strain it."



I also enjoyed reading of Tommie's love for, and uses of, what Southerners call rabbit tobacco, a plant referred to as cudweed in other areas of the country and what we in Yankee-land call sweet everlasting (*Gnaphalium obtusifolium*). I have an especial fondness for this herb, as I successfully utilized it decades ago in my very first case as a professional herbalist for a young man with acute sinus congestion. I had instructed that client to avail himself of its assistance in exactly the same fashion as Tommie had outlined: "Just throw a big handful in the sink and run the hot water over it and put something like a towel over your head and inhale the steam."

Mountain Medicine also features a loving Preface by Phyllis Light, another herbalist for whom Bass was a powerful influence and who authored her own book, incorporating much of what she had learned from him (see below).

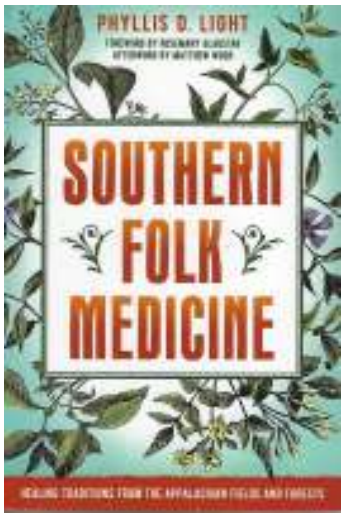
Patton informs me that he has a sequel in the works, which has me salivating for its soon publication!

Light, Phyllis. *Southern Folk Medicine: Healing Traditions from The Appalachian Fields and Forests* (North Atlantic Books, Berkeley, CA, 2018), softcover, 278 pp., $21.95

Phyllis Light, a fourth-generation herbalist, is the director of the Appalachian Center for Natural Health in Arab, Alabama. *Southern Folk Medicine* is her noble effort to establish the authenticity of Southern folk herbalism as a major branch of American herbalism and to perpetuate its existence and value to a whole new generation of herbalists and herbal students.

Light's initial chapter, "Common Tenets of Folk Herbalism," is my favorite chapter in the book. It is largely about Tommie Bass and offers a fine summary of the man, his life, and his herbal practice. Light, who first met Bass in the community room of a small church where he was speaking about healing plants, credits him with a lot of what she has learned—about both plants and people. She came to appreciate Tommie as a genuine community herbalist who seldom left his habitat owing to his love of the land and of the genuine folk who lived there. Interestingly, she notes that the incredible span of time over which Bass practiced herbalism was longer than that of any other herbalist she has known.

With succeeding chapter titles like "The Calling," "Common Tenets of Folk Medicine." "Many Peoples, Many Traditions," "Hot/Cold and Wet/Dry," and "The Constitutions," as well as individual chapters on the Four Humours, this book should beckon any herbal student's appetite. As for myself, I can say that I read *Southern Folk Medicine* in one sitting, over a period of several hours, and enjoyed it immensely.



The book also features an interesting and well-written Foreword by Rosemary Gladstar, author of many books on herbalism and the founder of the incredible Sage Mountain Botanical Sanctuary in Vermont.

***Tommie Bass: A Life in the Ridge and Valley Country* (A Folkstreams video)**

http://www.folkstreams.net/film-detail.php?id=83

This is a 49-minute film by Allen Tullos, the inspiration behind Crellin and Philpott's 2-vol. study of Tommie Bass, reviewed above. It was released in 1993.

The film tells the life story of Tommie Bass and does so almost entirely in Bass' own words.

To watch this kindly man, to listen to his words, and to revel in his humor was an indescribable delight for me the very first time I viewed this film. I have watched it countless times since and truly believe that I enjoy it more and more each and every time I see it!

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