

Beyond CBD: Exploring the Endocannabinoid System in Health and Disease

Carl Germano, CNS, CDN

Carl Germano, CNS, CDN, is a board certified clinical nutritionist and has more than 35 years of experience using innovative and complementary nutritional therapies in private practice as well as in product development for several of the largest vitamin-supplement companies in the trade, including Solgar, Country Life, Bluebonnet, Nutatech, Ajinomoto, and Martha Stewart. He has been instrumental in bringing cutting-edge nutritional substances and formulations for medical foods, functional beverages, and dietary supplements to market. Currently he is involved in product development and research on the clinically important phytocannabinoid ingredients and has spearheaded the PhytoCannabinoid Initiative for Inergetics, where he has served as chief science officer. He has authored several bestselling trade books, including The Mised Athlete, Nature's Pain Killers, The Osteoporosis Solution, and The Brain Wellness Plan. His new book The Road To Ananda: The Illustrated Guide to The Endocannabinoid System, Phytocannabinoids, Hemp & Your Health will be published in the fall 2018. (Altern Ther Health Med. 2018;24(S1):22-24.)

Alternative Therapies in Health and Medicine (ATHM): Is the cannabinoid segment of supplement industry a challenging marketplace right now?

Dr Germano: I don't think so, and I'll tell you why. For the past 5 years I have been involved in the hemp and phytocannabinoid space, and I am dedicating the rest of my life to bringing ingredients that nourish and support the body's endocannabinoid system to the marketplace. We are in the midst of the perfect storm. One, the botanical travesty of how hemp—not marijuana—has been treated, or I should say, mistreated. And two, the medical travesty of how the endocannabinoid system in the body has been ignored since its discovery in the 1990's. It is time to dismantle the stigma that hampered research and education as the endocannabinoid system needs to be taught from high school through graduate school or practitioner school.

The storm has been a result of the misguided stigma attached to hemp and cannabinoids and why they are important to the human body. The United States government, for 70 years, has been systematically misleading people about the plant and its important compounds that nourish the endocannabinoid system. It classified cannabis as a Schedule-1 drug, and wrongfully included both marijuana

and hemp. Schedule 1 is where LSD and heroin are classified. Can you imagine, then, that the government would have to tell you, "Oh, by the way, while we consider cannabinoids to be like heroin and LSD, you actually make them in your body, and every single organ in your body relies on them to function properly."

First, we have to dismantle the misinformation. Certainly by genus and species, *Cannabis sativa* represents both marijuana and hemp—industrial hemp, as people call it. But that is where the similarity ends. Marijuana has been cultivated for the psychoactive effects of the cannabinoid THC. It has medical value, but recreational use is what made it popular. Whereas, hemp has been cultivated for many reasons: food, clothing, fiber, fuel. They make concrete out of hemp, called *hempcrete*. On his car show, Jay Leno featured a whole sports car with a shell made from nanosheets of hemp that were stronger than steel.

The plant is an agricultural powerhouse that blows away all other plants. When you look at the socio-political history, our forefathers grew it: Jefferson and Washington on their plantations. The paper for the Declaration of Independence was made using hemp as well. There were drugs made from hemp, cannabis, or marijuana—whatever you want to call it. The use of cannabis as a medicine dates back to Ayurvedic and Chinese medicine. It has been around a long time, and it is a tragedy how the government has misconstrued everything.

In order to understand CBD, phytocannabinoids, and hemp and their usefulness to the body, one must truly understand the endocannabinoid system. Here we have a physiological system that controls or influences all others. You cannot be healthy unless cannabinoid receptors in the body that are found everywhere, on every organ are being fed the cannabinoids. As I mentioned, we produce cannabinoids ourselves, and if we do not produce enough, endocannabinoid deficiency states are associated with migraines, fibromyalgia, irritable bowel syndrome, and inflammatory and neurological conditions.

The elucidation of what the endocannabinoid system does has been remarkable. The data show clearly that it has significant effects on every organ system and that it governs major physiological functions, like neurotransmission, inflammatory signaling, insulin sensitivity, pain signaling to the brain, bone building—the list goes on and on. We have ignored this master regulatory homeostatic system and the time has come for that stigma to go. The truth must be told; the science cannot be held back. We have to understand its importance and how to feed and nourish it.

Like everything else we produce in our bodies, there are times when we do not produce enough. When the endocannabinoids we produce are not enough, we have to rely on diet. Phytocannabinoids are no strangers to the human body. Carrots, hops, chocolate, echinacea, cloves, pepper, thyme, and rosemary all have very minute levels of phytocannabinoids. Hemp is a very rich phytocannabinoid source, and so we rely on hemp and hemp-based products. Of which, the stem is currently the only part of the plant cannabinoids can legally be pulled from if you want federally legal material. The seed does not contain phytocannabinoids, and the leaves, flower, and bud right now—from a federally legal standpoint—you really can't touch until the laws change, and they will. And although industrial hemp has been defined as *Cannabis sativa* with less than 0.3% THC they want us to stay away from the part of the plant that has the most THC.

Just 2 to 3 weeks ago, Senator Mitch McConnell fast tracked a bill in the Senate that completely dismantles and deregulates hemp, which it should be. At this point, we have to abide by current law until those things change.

ATHM: It is their standpoint that they do not recognize a difference between industrial hemp and marijuana?

Dr Germano: I think people are waiting for the official laws to come down. Right now, there is a viewpoint that even the nonpsychoactive phytocannabinoids are considered Schedule-1 drugs, which is ridiculous since you cannot schedule a nonpsychoactive compound. This would be comparable to telling you the DEA is going to schedule water as a Schedule-1 drug. CBD and all the nonpsychoactive compounds are not scheduled drugs, even though the language is confusing when you look at the Controlled Substances Act. Although the final ruling on the Controlled Substances Act says that materials pulled from the stalk and the stem are not prohibited. It's very confusing, and the laws need to be changed. At this point, we are in that very gray area with very confusing laws that make no sense. Again, this bill by McConnell has been getting a lot of attention and support from many colleagues.

I perceive that it will probably pass at some point, maybe late this year. Nevertheless, on the scientific side, it is truly a tragedy. Less than 13% of medical schools are teaching the endocannabinoid system, let alone that it should be taught in high schools. That is like me telling you for the next 70 years, "We're going to forget there's a cardiovascular system." It is so absurd it's not funny.

ATHM: When you mention that the endocannabinoid system helps maintain homeostasis in the body, does it act like an adaptogen?

Dr Germano: Well, some people view the endocannabinoid system as an adaptogenic system because it helps the body address, process, and react to various stressors. So yes, you

can look at a homeostatic system as an adaptogenic system. *The American Journal of Medicine* published a paper, I believe back in 2007, about how the endocannabinoid system from a global perspective is all about maintaining health, well-being, and balance—what we call *homeostasis*.

ATHM: Cannabis and its constituents have not been legal for the last 70 years, so what has supported that system?

Dr Germano: That's not true. Various forms of hemp oil from various parts of the plant have been in use, even from marijuana, for thousands of years, so we have a very long history of use in humans. As far as its legality, 70 years ago things changed here in this country making the plant illegal for both marijuana and hemp.

ATHM: In utilizing hemp CBD-based products, where do you see the most benefits or most opportunities? There's recently been a synthetic product that's in clinical trials for epilepsy with GW.

Dr Germano: That is kind of old news. They had cited that source which was a mix of CBD and THC in Sativex. Epidiolex most recently got approved, which is just purified CBD. That just lends more validation to the efficacy of these compounds. But just like any other pharmaceutical drug, it is a myopic picture of the usefulness of this category of compounds. I say that because CBD is one of 100-plus phytocannabinoids in *Cannabis*—CBG, CBC, and beta caryophyllene—to name a few—there are over a hundred of them. Those of us in botanical medicine and those of us in this trade, we know all too well that when it comes to a plant, there is a synergy between all the compounds found in the plant. That is why, when you go to the health-food store, you do not buy curcumin with one curcuminoid in it, echinacea with one echinacoside in it, or ginseng with one ginsenoside in it. There are a family of compounds, and the family of compounds at hand in hemp, is known as *phytocannabinoids*.

Yes, CBD is incredibly important, research has generated data behind it. Yes, CBD is the most dominant in terms of the cannabinoids in industrial hemp. But no, you cannot ignore the entire family. Just because they are minor in number, they are not minor in effect to the body. It has been pretty clear that the entourage of this whole family of compounds is more important than just any one singular compound. And I point to research that went up against Sativex, containing the single magic bullet THC and CBD, up against patients who vaporized strains of whole cannabis. For the vaporizing group, the clinical outcome was always better, because vaporization provides a full entourage of all the phytocannabinoid family members, not just one molecule.

So this single magic-bullet molecule attempt ignores the importance of synergy in a botanical that contains so much more than just CBD. It ignores, also, the law. When you look at the language in the Dietary Supplement Health and Education Act (DSHEA), it's quite clear: if a compound

wasn't in commerce before 1994, it cannot be grandfathered as a dietary supplement. So CBD as a single entity was never in commerce prior to 1994, and so it would never be grandfathered as a dietary supplement. That leaves the alternative, submitting a new dietary ingredient application. If you did that today, it would be immediately rejected because of GW Pharmaceuticals drugs that contain CBD. This speaks to the other part of DSHEA that refers to unacceptance of a nutritional ingredient classified as a dietary supplement if a pharmaceutical company first develops drugs with it.

So for these reasons, which companies that tout only CBD have ignored, why are we focusing on CBD at all? Also, why are companies placing CBD on the front panel and calling it a dietary supplement when the FDA clearly states on their website that CBD is not a dietary supplement!

So, we have been providing our clients with a different viewpoint. We are educating them about the more important class of compounds, called phytocannabinoids in hemp, and their collective effects on the body. Also, we are emphasizing the most important story which is how phytocannabinoids feed, nourish and support the endocannabinoid system in the body. So, as you can see, it is not about CBD and by trying to follow the coattails of GW, they got the messaging all wrong. To come into a trade that has always rejected the big pharma single magic bullet approach, by isolating single compounds and ignoring the beautiful fingerprint of botanicals, is truly myopic.

ATHM: Do health care practitioners typically understand the difference between hemp and marijuana?

Dr Germano: Interestingly enough, in my travels across the country, I have done numerous lectures to doctors who are clueless about the endocannabinoid system, application of phytocannabinoids and hemp.

ATHM: In your presentation, what are you hoping for attendees to take away from the lecture?

Dr Germano: Well, I want to cover the science, the application, and the legal issues surrounding hemp, phytocannabinoids in general. And number two, I want them to leave with a complete understanding of the importance of the endocannabinoid system, its relationship to many general diseases and the maintenance of health, and how it becomes a focal point in any nutritional protocol. They should get an idea of how to use phytocannabinoids in a nutritional protocol addressing these conditions.

ATHM: Do you see a future for cannabinoid products that have other supplement ingredients added to treat certain types of conditions?

Dr Germano: We know many compounds are complementary to phytocannabinoids and their effects in the body. We also

know several nutritional compounds—omega 3's, curcumin, etc.—also assist in supporting the endocannabinoid system, so applications matched with other accessory nutrients are a kind of no-brainer for pain, inflammation conditions, stress and anxiety conditions, insomnia, eye health, bone health, and neurological conditions. Those are probably six of the most defined areas of phytocannabinoid applications and treatments.

ATHM: Do you think that the pharmaceutical companies are going to try to get into this game?

Dr Germano: Oh, they are. GW Pharmaceuticals is doing it now, with epilepsy and cancer, and their data is very good. It continues to validate and demonstrate how endocannabinoid deficiencies are related to a variety of disease conditions. They are looking at phytocannabinoids and their effects on the endocannabinoid system very keenly, but, unfortunately, they will focus in on one or two different cannabinoids, as they always do with plants. They focus on single, magic-bullet compounds, or making them synthetically. The endocannabinoid system is not going away. It dates back 600-million years, it is found in all vertebrates and humans. It controls all physiological functions. The pharmaceutical industry cannot ignore that.