VIBRANT HEALTH

Endocannabinoid System and The Rage for CBD

The Beginning

It all started in 1963 when Israeli scientists discerned the structure of CBD. By 1988, the first cannabinoid receptors were found in the brains of rats. In fact, there were more cannabinoid receptors in the brains of all mammals than receptors for any other neurotransmitter. This first-discovered cannabinoid receptor was sensibly called the cannabinoid 1 receptor (CB1).

By 1993, the second CB2 Receptors were found in abundance on cell membranes of the gut, spleen, heart, liver, bones, blood vessels, blood cells, lymph cells, and the reproductive organs; in fact, everywhere. The combination of receptors and the biochemicals that attach to them are now called the Endocannabinoid System or ECS. It is an important neuromodulatory system that helps regulate nerve and tissue functions throughout the body. By doing so, it helps maintain the critical biochemical balance we call homeostasis. Endocannabinoids are the ultimate, self-produced adaptogens.

In all, the endocannabinoid system is exceedingly complex, intertwined with immunity, cognition, psychological health, and even, it appears, with diet, appetite and possibly obesity. If something goes awry in one's endocannabinoid system, a healthy diet should provide the raw materials for the synthesis of the endocannabinoids that will re-balance biochemistry. Perpetual adjustment is part of the scheme.

Continued imbalance, however, can contribute to disease states that may be helped by increased levels of cannabinoids. Exogenous cannabinoids from plant foods and dietary supplements can mimic endocannabinoids, helping rebalance the system.

Hemp

The foremost source of supplemental phytocannabinoids is hemp oil. The psychoactive cannabinoid, THC, is minimally present in the stalk and can be refined completely out of oils used in supplements.

And that's just fine because there are far more cannabinoids in hemp than just THC. Even hemp oil supplements that contain THC contain only up to 0.3 percent. That tiny amount is so heavily outweighed by non-psychoactive cannabinoids that the risks from THC evaporate.

Cannabidiol (CBD), the most prominent cannabinoid, exerts a number of beneficial pharmacological effects including but not limited to its anxiolytic, anti-inflammatory, antiemetic, and antipsychotic effects. Moreover, it may have neuroprotective properties that might allow it to be used at high doses for the treatment of a variety of medical and psychiatric disorders such as schizophrenia and dementia, as well as diabetes and nausea.

The Entourage Effect

Hemp is a significant source of much more than THC and CBD including tetrahydrocannabivarin (THCV), cannabidivarin (CBDV), cannabigerol (CBG), and cannabichromene (CBC), all of which are now known to exert additional positive benefits. A synergism among phytocannabinoids has been revealed and is referred to as the "entourage effect."

We must anticipate a steady flow of revelations for research investigating the entourage effect is still in its early years. For example, cannabidiol (CBD) alone exerted complex anti-acne effects in an in vitro study. A follow-up study evaluated additional non-psychotropic phytocannabinoids, CBC, CBDV, CBG, CBGV, and THCV only to find similar, beneficial results.

The entourage effect appears again in work centered on schizophrenia with both CBD and THCV demonstrating efficacy. These are important findings because schizophrenics show higher use of marijuana as compared to the healthy population in an effort to seek relief. The practice can backfire, however, given that the use of marijuana can trigger psychotic episodes in schizophrenic patients, an effect ascribed to THC.

Individual and combinations of non-psychoactive phytocannabinoids affect a wide range of pharmacological targets, not solely limited to CB receptors, expanding their regulatory influence to perhaps all body tissues, improving epilepsy, anxiety, schizophrenia, depression, neurodegenerative diseases, affective disorders, and the central modulation of feeding behavior. Having an appetite is critically important to healing. Many illnesses decrease appetite to the point of preventing the body from healing itself. CBD stimulates appetite, according to the National Cancer Institute. CBD also eases nausea and vomiting. This is especially helpful for individuals enduring chemotherapy and other treatments for serious diseases.

Newly revealed antioxidant/anti-inflammatory properties of the ECS imply that it may significantly control the production of reactive oxygen species and the resultant inflammation and subsequent tissue injury. For instance, CBD is more effective than vitamins C and E as a neuroprotective antioxidant and can ameliorate skin conditions such as acne. Full understanding holds tremendous therapeutic potential in cancer, pain,

neurodegenerative, and cardiovascular diseases, obesity and metabolic syndrome, diabetes, and diabetic complications including liver damage and inflammation.

Terpines: Part of the Entourage

Cannabinoids in nature are found alongside powerful hydrocarbons called terpenes lodged in the essential oils and resins of plants. They are quite potent and can affect human behavior even when casually inhaled from ambient air.

The most studied terpenes in Cannabis are limonene, myrcene, α-pinene, linalool, β-caryophyllene, caryophyllene oxide, nerolidol, and phytol. They synergistically engage with phytocannabinoids in the treatment of pain, inflammation, depression, anxiety, addiction, epilepsy, cancer, fungal and bacterial infections (including MRSA, methicillin-resistant Staphylococcus aureus).

Consumer products that contain all terpenes and phytocannabinoids from Cannabis, including tiny or trace amounts of THC, are referred to as "full spectrum" products. Those that eliminate THC yet retain all or nearly all other phytocannabinoids and terpenes are referred to as "broad spectrum" products. The entourage effect characterizes both full and broad-spectrum products.

Dosage

As lipids, phytocannabinoids require other fats in the diet and adequate bile for absorption, giving them poor bioavailability. Taking supplemental phytocannabinoids during meals that contain fats helps mitigate their low oral bioavailability. Simultaneous use of lecithin supplements may also aid absorption. Nevertheless, absorption is increased with food.

In general, however, the bioavailability of oral CBD is around 6%. The half-life of CBD in humans has been found to be between 2–5 days following oral administration, giving credence to the claims that low-dose hemp oil products taken daily gradually accumulates cannabinoids to a level where benefits may be realized.

How large that daily dose may need to be is unknown. Although the phytocannabinoids may not be as quickly inactivated as endocannabinoids (by FAAH, MGL), metabolic degradation will occur at the hands of other enzymes. Personal biochemical individuality may allow a 3 or 5 mg daily dose to eventually ease knee pain in one aging tennis player, for example, while his playing partner may require 10 mg or 30 mg per day. Indeed, daily dosages of CBD have ranged from 2 mg to 1,280 mg, the latter in tests involving bipolar disorder and schizophrenia.

Safety

Cannabinoid receptors function from the very early stages of life. They regulate embryonic stem cell survival, proliferation, and differentiation, affecting the formation of diverse, specialized adult tissues. It is a delicate balance that must be maintained throughout the stages of development, suggesting that use of phytocannabinoid supplements by pregnant and lactating women, infants, and young children should be undertaken only under the guidance of a qualified health professional informed in the endocannabinoid system.

For others, the safety and efficacy of phytocannabinoids are strong. A comprehensive review of 132 original studies describes the safety of CBD, showing that it does not upset common physiological parameters of heart rate, blood pressure, gastrointestinal transit, food intake, and body temperature. Psychological and psychomotor functions are not adversely affected either. Additionally, chronic use and high doses of up to 1500 mg per day have been repeatedly shown to be well tolerated by humans.

In a world beset by ill-health, re-establishing a person's biochemical homeostasis results in vibrant health. An entourage of phytocannabinoids offers a sure-fire opportunity to achieve that goal in combination with a lifestyle of exercise, sound sleep, and abstinence from alcohol, sugar, and artificial stimulants. Join these practices to a largely plant-based diet to enjoy life in the most healthful way possible.

Uses

CBD, its fellow phytocannabinoids, and terpenes now claim to be useful everywhere including:

- Addiction treatment
- Pain relief; arthritis
- Post traumatic stress disorder
- Reducing nausea
- Reducing anxiety
- Reducing psychoses
- Controlling epilepsy
- Moderating schizophrenia
- Immunosuppression
- Muscle relaxation
- Reducing inflammation
- Reducing insomnia
- Alleviating sleep disorders
- Relieving dry skin and acne
- Helping control type 2 diabetes
- Reducing stress
- Reducing cardiovascular disease risk

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