



An Introduction to Cannabidiol (CBD)

by Lisa Hogan, MD

Cannabidiol or CBD is currently the subject of a virtual explosion of research. It is extracted from hemp, the *Cannabis sativa* plant. *Cannabis sativa* is better known as marijuana, however not all cannabis is the same. Cannabis used to “get high” is bred to have high levels of THC (tetrahydrocannabinol). Cannabis used for medicinal purposes is bred to have higher levels of CBD, which does not have psychoactive properties, i.e., CBD does not get you high. These are two of the better-known compounds called phytocannabinoids (cannabinoids that come from plants) contained in cannabis—there are more than 100 known phytocannabinoids in cannabis, and to date less than 10% have been investigated. Scientists are just beginning to understand the many actions, effects and medicinal applications of phytocannabinoids. Research on cannabis has been restricted until very recently, and much of what we do know is new information. For example, the receptors for our own endocannabinoid system were just discovered between 1988 and 1993. This system is not fully characterized and most medical schools have yet to incorporate this information into their curricula.

Phytocannabinoids are just one of the beneficial compounds in cannabis, which has over 400 identified chemical compounds. There are also terpenoids (or terpenes), phenols and flavonoids (a subcategory type of phenol). Terpenes are found in many plant essential oils and function as defense and support mechanisms for plants. They are often beneficial for humans as well. Phenols and flavonoids are also found in many plants and are famously antioxidant and antimicrobial. These compounds are known to have preventative action against infections, degenerative diseases, inflammation and allergies. Numerous studies have shown that phytocannabinoids, terpenes and phenols have synergistic and complimentary functions; and, for this reason, the whole plant extract is often much more effective than the CBD isolate.

Humans and many animals have an endocannabinoid system and make molecules with properties like THC and CBD. Receptors for our own internal cannabinoids are found throughout the neurological system (including the central nervous system, the autonomic system and the peripheral nervous system), the endocrine system and other organ systems. This system plays a critical role in re-establishing balance when there is injury or illness and

in regulating disease. There is a complex interaction between this system and other systems in the body that regulate and express hormones, cytokines (molecular signals), immune activity, endorphins, bone metabolism, connective tissue metabolism, cell healing and regeneration, growth factors, nerve cell inflammation and pleasure molecules. This system has profound effects on inflammation, pain, anxiety, mood, immunity, well-being, pleasure, weight, bone building/osteoporosis, heart disease, and neurodegenerative diseases. In addition, this system has anti-tumor effects on many types of cancer.

The endocannabinoid system is the reason THC, CBD and other phytocannabinoids affect us. Other molecules, including some terpenes, also interact with our endocannabinoid receptors. CBD does not work directly on endocannabinoid receptors. It does prevent the rapid metabolism of our own endocannabinoid molecules, thus allowing them to remain in action for a longer period. Medical cannabis interacts with our endocannabinoid system and with our immune system (especially in the transformation from acute to chronic inflammation), our endorphin system, our vanilloid system (involved in the transformation from acute to chronic pain), our endocrine and neurotransmitter systems (involved in mood, anxiety and pain) and our PPAR-Gamma (peroxisome proliferator-activated receptor gamma) system. PPAR-Gamma is a receptor of the cell nucleus, mainly found in fatty tissue, colon tissue and certain types of immune cells. This system affects sugar metabolism, fat metabolism, fat storage, fat tissue differentiation and therefore obesity and diabetes. It also affects atherosclerosis and cancer.

Common uses of CBD are as an anti-inflammatory and to reduce pain. One of the more remarkable properties of CBD is that it changes the physiology of chronic pain and brings relief to many who have struggled for years. It has also proven useful in helping people get free of opioid addiction, particularly since chronic pain is often the lead-in to opioid addiction. CBD is outstanding at reducing anxiety and is an excellent aid for sleep. It has also been used to treat PTSD (Post traumatic stress disorder).

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