

The ABCs of CBD



The ABCs of CBD: Major and Minor Cannabinoids

Cannabinoids are the naturally occurring chemical compounds found in cannabis responsible for the variety of effects the plant provides. Currently, there are over 110 known cannabinoids, including the most well-known compounds, CBD and THC. More are likely to be discovered as studies continue to reveal the complex molecular structures of the cannabis plant (also known as marijuana and hemp).

While CBD has become the best-known non-psychoactive cannabinoid in recent years, hemp contains a host of other compounds that show strong promise for those looking to promote health and wellness. Numerous minor cannabinoids are being researched, including THCA, CBDA, CBN, CBG, CBC, and THCv.

- CBC
- CBD
- CBDA
- CBG
- CBN
- THC
- THCA
- THCv

A Brief History of Cannabinoids

Cannabis has been around long before humans began using it. The first documented case of its use was in 2800 BC when Emperor Shen Nung (regarded as the father of Chinese medicine) had cannabis listed in his pharmacopeia. Once discovered, its benefits started to surface, and its popularity rose.

Fast forward several thousand years to 1992. Lumír Hanuš, a Czech analytical chemist, and William Devane, an American pharmacologist, isolated the first known endocannabinoid in the human brain. The two scientists were working in the lab of renowned "father of cannabis" researcher Raphael Mechoulam at the time.

"One of the major effects of endogenous cannabinoids is to regulate the release of dopamine, serotonin, and other neurotransmitters," Mechoulam remarked. They also help the body withstand all kinds of damage. We can compare [endocannabinoids] to the immune system."

The endocannabinoid is a cannabis-like molecule produced by the human body. Studies began proving that cannabis mimics our body's endocannabinoids.

The endocannabinoid system (ECS) regulates and controls many of our most critical bodily functions. Endocannabinoids make up the ECS through a network in the brain, nerves, skin, immune cells, bone, fat tissue, liver, pancreas, skeletal muscle, heart, blood vessels, kidney, and gastrointestinal tract.

Functions of endocannabinoids include pain, memory, mood, appetite, stress, sleep, metabolism, and immune and reproductive functions – so it's arguably one of the most widespread and versatile signaling molecules ever discovered.

Cannabinoids interact with human physiology through our endocannabinoid system, the receptors that regulate health and promote homeostasis throughout the body. The ECS has two primary receptors, the CB1 and CB2. The CB1 receptor binds primarily to the brain and nervous system, while the CB2 receptor interacts mainly with the immune system. The cannabis plant relies on cannabinoids binding to these receptors to produce an array of potential benefits and effects, each cannabinoid compound holding unique characteristics that maximize desired outcomes.

The proper ratio of cannabinoids can generate a natural "entourage effect," or the effect produced from the synergistic interaction of the cannabinoids, flavonoids, terpenes, and fatty acids naturally found in cannabis.

CBC

also known as cannabichromene, is considered one of the "big six" cannabinoids prominent in medical research. Scientists are finding CBC to be very promising in many areas. CBC raises the brain's "bliss" molecule anandamide, a chemical that affects mental health. Scientific studies also highlight CBC's potential for pain relief, reducing inflammation, and anti-tumor effects in some cancers.

- A recent study showed cannabinoids might effectively inhibit inflammation and tumor growth. Anandamide is shown to fight breast cancer in vitro and in vivo, showing great promise as a chemopreventive agent.
- CBC binds with other receptors in the body, such as the vanilloid receptor 1 (TRPV1) and transient receptor potential ankyrin 1 (TRPA1), which are linked to pain perception. When CBC activates these receptors, increased levels of the body's natural endocannabinoids are released.
- In a 2013 study, CBC positively affected neural stem progenitor cells (NSPCs), which are essential to healthy brain function.
- CBC is shown to block pain and inflammation associated with collagen-induced osteoarthritis and acts on inflammation differently than non-steroidal anti-inflammatory drugs without the side effects.
- A 2016 study showed CBC as a powerful inhibitor of acne, offering anti-inflammatory properties. It also suppressed excessive lipid production in the sebaceous glands.
- Researchers also believe that CBC works synergistically with other cannabinoids to create the entourage effect. CBC works with THC and CBD to deliver a trifecta of antidepressant properties.

CBD

is scientifically known as cannabidiol and is the second most prevalent active ingredient in cannabis. CBD is one of the hundreds of components in marijuana, but CBD alone does not cause a high. That is because pure CBD uses a process to extract the THC to less than 3%. THC is the main psychoactive compound in marijuana.

A 2017 report from the World Health Organization stated, "Cannabidiol exhibits no effects indicative of any abuse or dependence potential... [and] to date, there is no evidence of public health-related problems associated with the use of pure CBD."

CBD

Demand for CBD is rising every day, and consumers report an extensive range of benefits. It's touted for the relief of a wide variety of health issues.

The most substantial scientific evidence has come through research suggesting its effectiveness in treating childhood epilepsy syndromes, like Dravet syndrome and Lennox-Gastaut syndrome (LGS), which typically do not respond to antiseizure medications.

- In numerous studies, CBD reduced the number of seizures; in others, it stopped them altogether. In 2018, the FDA approved the first-ever cannabis-derived medicine for these conditions, Epidiolex, which contains CBD.
- CBD is commonly used to address anxiety, insomnia, and chronic pain.
- A study from the European Journal of Pain showed that CBD applied on the skin could help lower pain and inflammation due to arthritis, concluding that "topical CBD application has therapeutic potential for relieving arthritis pain-related behaviors and inflammation without evident side effects."
- While more studies are needed to substantiate claims centered around pain management, consumers generally report a slew of personal benefits, and demand continues to rise.

CBDA

or cannabidiolic acid is another cannabinoid shown to have anti-inflammatory, antibacterial, anti-nausea, and anti-proliferative properties. Both CBD and CBDA are thought to cause some of their most noted effects on the body by activating the 5-HT_{1A} serotonin receptors. Serotonin is a type of neurotransmitter in the brain that regulates mood, anxiety, sleep, and feelings of nausea.

- CBD and CBDA have been tested on humans with social anxiety, finding that subjects performed better in simulated public speaking tasks after taking the cannabinoid.
- Pre-clinical CBDA research into depression has elicited antidepressant effects at doses 10–100 times lower than CBD. It's thought that these anti-anxiety and mood-boosting effects result from increased serotonin levels.
- CBDA's activation of the 5-HT_{1A} serotonin receptors has also led to potential as an anti-nausea drug, with one study finding CBDA more effective at reducing nausea than CBD.
- Like CBD, CBDA is thought to be anti-inflammatory, inhibiting key inflammatory mediators called COX-1 and COX-2 enzymes.

CBG

is a minor cannabinoid called cannabigerol, quickly rising in popularity due to its exciting potential health benefits. It presents in low levels (usually less than one percent) in most cannabis strains.

Excited by the past decade or so of research, scientists are finding initial CBG results inspiring and are promoting future research with CBG alone or CBG in combination with other cannabinoids and therapies for treating diseases, disorders, and conditions. Because it is non-psychoactive, CBG has a promisingly wide range of potential applications.

- CBG is thought to be an effective treatment for glaucoma since endocannabinoid receptors are prevalent in eye structures. In a 2008 study, it was proven to reduce intraocular pressure and be a powerful vasodilator with neuroprotective effects.
- CBG has also been found to be effective in decreasing the inflammation characteristics of inflammatory bowel disease.
- In a 2015 study, CBG protected neurons against Huntington's disease, which is characterized by nerve cell degeneration in the brain. The CBG in the study improved motor deficits and preserved striatal neurons against toxicity.
- CBG is also showing great promise as a cancer fighter. In a 2014 study, CBG inhibited the growth of colorectal cancer, slowing colon cancer growth. CBG inhibited tumors and chemically induced colon carcinogenesis, demonstrating a possibility of a cure for colorectal cancer.
- Topical formulations of cannabis have been effective in skin infections since the 1950s, but research at the time was unaware of the plant's chemical composition. European research shows that CBG is an effective antibacterial agent. Their most promising finding is its use against methicillin-resistant *Staphylococcus aureus* (MRSA) microbial strains resistant to several classes of drugs.
- A 2017 study showed that a form of CBG was an effective appetite stimulant, which could lead to a new non-psychoactive therapeutic option for cachexia, a muscle-wasting and severe weight loss byproduct seen in late-stage cancer and other diseases.
- In a study that looked at the effects of five different cannabinoids on bladder contractility in vitro, CBG tested best at inhibiting muscle contractions, showing promise as a future tool in preventing bladder dysfunction disorders.
- Other uses currently in research are as an analgesic, therapy for psoriasis, and antidepressant.

CBN

cannabinol is considered a mildly psychoactive cannabinoid known for its powerful sedative properties and shares similar chemical composition to THC.

- A 1976 review suggested that CBN had sedative effects, particularly when paired with THC.
- The pain-relieving potential of CBN was studied in June 2002, citing vasorelaxation and effects on sensory receptors, again, especially when paired with THC.
- A September 2004 study found that CBN can potentially delay the progression of amyotrophic lateral sclerosis (ALS).
- A 2008 study focused on the antibacterial efficacy of CBN, along with other major cannabinoids, as a possible treatment for MRSA and other topical skin issues.
- A study from September 2012 examined the possible appetite-inducing effects of CBN.



When looking for quality CBD verify that a third-party lab has tested the products. This ensures that consumers will receive the best quality ingredients manufactured safely and that the product has correct labeling.

While readily available in most parts of the United States, CBD's and other cannabinoids exact legal status is still in a state of change. All 50 states have laws legalizing CBD with varying degrees of restriction. However, the federal government still considers CBD in the same class as marijuana, although it doesn't habitually enforce it.

At the same time, interest in research is surging as the knowledge gaps in basic biology, pharmacology, epidemiology, and clinical efficacy are identified. These compounds' potential health benefits are exciting for researchers and consumers alike.