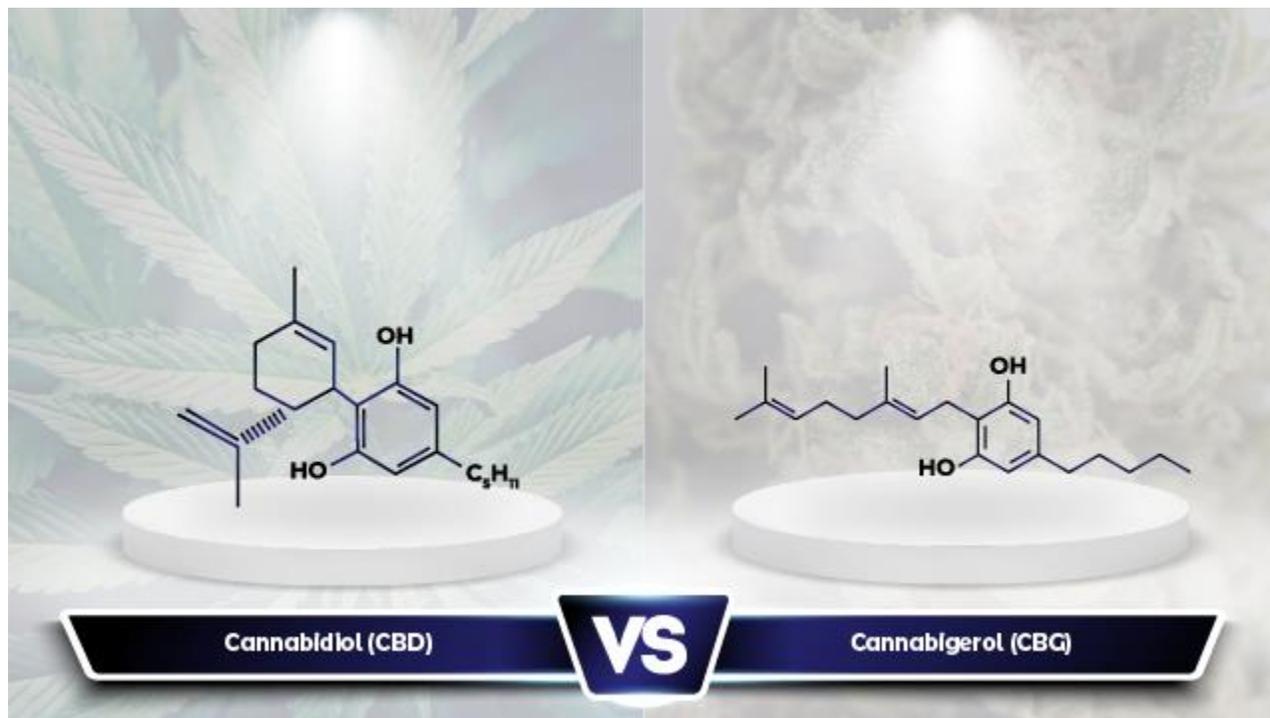


CBG vs CBD: What Are the Differences?

[Online Article](#)

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[Alexander Beadle](#)

Science Writer

[@alexbeadlesci](#)

Products containing cannabidiol (CBD) have exploded in popularity over the past few years, as the cannabinoid's reputed anti-inflammatory and anti-oxidant effects have made it into a trendy ingredient for [skincare brands](#) and ["wellness" products](#).

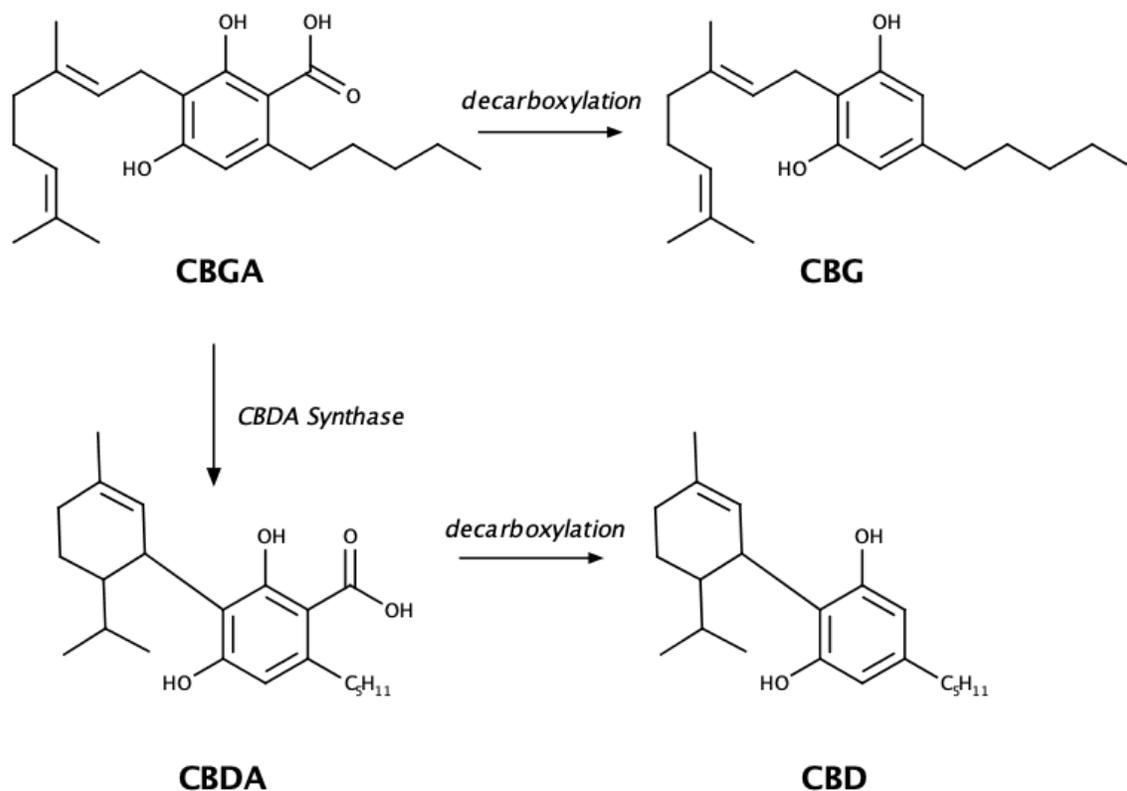
As the major non-intoxicating component in cannabis, CBD is fairly abundant in common cannabis strains, making the cannabinoid's isolation and use easily translatable to commercial product making operations.

But recently another non-intoxicating cannabinoid has been making headlines as a potential therapeutic product. Cannabigerol (CBG) is a less abundant cannabinoid, but it has been observed to reduce inflammation, combat pain, and even [slow the proliferation of some cancer cells](#).

CBG may sound similar to CBD on the surface, but dig a little deeper and key differences can be found.

What is CBG?

In the first two installments of this series on the chemistry of cannabis, [CBDA Vs CBD: What Are the Differences?](#) and [THCA Vs THC: What Are the Differences?](#), it was explained how all of the cannabinoids present in cannabis are derived from cannabigerolic acid (CBGA).



Conversion of cannabigerolic acid (CBGA), into cannabigerol (CBG), and cannabidiol (CBD) via cannabidiolic acid (CBDA)

As the cannabis plant matures, CBGA, which is the acidic form of CBG, is converted by plant enzymes into some ratio of the three major cannabinoid precursors: tetrahydrocannabinolic acid (THCA), cannabidiolic acid (CBDA), and cannabichromenic acid (CBCA).

From the amounts of CBGA that are not converted into these precursors, or any of the other minor cannabinoids, CBG is formed through decarboxylation.

Due to this process, cannabis strains ordinarily contain very little CBG, often [below 1 percent by weight](#). In order to obtain higher yields of CBG within cannabis, specialist plant breeders have begun experimenting with genetic manipulation and crossbreeding. [Leafly](#) reports that scientists have also successfully pinpointed the optimum extraction window for cannabis in order to preserve the highest amounts of CBG, recommending extraction be done around six weeks into an eight-week flowering cycle.

CBG benefits

Unlike CBD, which has a relatively low affinity for cannabinoid receptors and acts mostly through indirect interactions with the endocannabinoid system, CBG is thought to elicit its therapeutic effects directly through [interaction with the CB1 and CB2 cannabinoid receptors in the brain](#).

The psychoactive cannabinoid THC also produces its psychoactive effects through interactions with these receptors; CBG has been observed to work as a buffer to THC's psychoactivity and can even alleviate the feelings of paranoia that sometimes come with consumption of high levels of THC.

Research is relatively sparse regarding the therapeutic benefits of CBG, when compared to the apparent wealth of information available on THC and CBD within the cannabis science community. But there are early studies linking the compound to a whole host of potential therapeutic uses, such as:

[Treating glaucoma](#), through its vasodilator and neuroprotective effects.

[Decreasing inflammation](#), as seen in animal models of inflammatory bowel disease.

[Combating Huntington's disease](#), again through its neuroprotective effects.

[Inhibiting tumor growth](#), in animal models of colorectal cancer.

[Killing drug-resistant bacteria](#), such as methicillin-resistant Staphylococcus aureus (MRSA).

The difficulty producing CBG

With no intoxicating effects and a vast number of potential therapeutic uses, why hasn't CBG experienced the same swell in popularity as CBD?

The largest stumbling block to CBG's realization as a common therapeutic treatment is the cost of its production. CBG is thought to be one of the [most expensive cannabinoids to produce](#), so much so that it has been dubbed "the Rolls-Royce of cannabinoids."

"It takes thousands of pounds of biomass to create small amounts of CBG isolate," James Rowland, CEO of the Colorado CBG brand Steve's Goods, told [Forbes](#).

"That's because most hemp only contains minute percentages of CBG, whereas there are now hemp strains that contain 20 percent CBD in the crop. If the CBG content of the same crop is only 1 percent, that means you need to extract 20 times the amount of biomass to get the same amount of CBG out."

CBG also presents a problem to cultivators. The longer that a cannabis plant matures, the more chance there is that the CBGA and CBG present in the strain will be converted into other cannabinoids. This leaves cultivators with a choice: either grow cannabis with the express purpose of producing CBG, meaning that you can harvest the crop early before this conversion completes; or allow the crop to fully mature, so that some of the crop can be sold for other purposes but the rest will have a lower CBG content for extraction.

As well as requiring larger amounts of plant material compared to THC or CBD extraction, CBG extraction also requires the use of specialized production equipment. Due to the low levels of CBG present in cannabis strains, the chromatography apparatus that is used to isolate and purify CBG extracts need to

be as precise as possible, in order to not necessitate using even more raw cannabis or hemp material than is absolutely needed. The cost of this high-performance chromatography apparatus can be a high, up-front production cost for processors who may not already operate this equipment in their standard processing procedures.

“The cannabinoid specific markets are going to wildly fluctuate for another few years until the demand evens out,” added Rowland. “I do think it will remain considerably more expensive than CBD for a long time, but if CBD prices drop, you’ll see CBG prices drop too.”

This is only part one of a layered and complex problem. Part of the biomass problem is the genetics of cannabis plants. Cannabis plants have been bred to produce as much THC and/or CBD as possible thanks to consumer demand. And since plants can only produce a finite amount of cannabinoids, many cannabis plants today contain less than 2% CBG by volume.

The potential health benefits of CBG are extensive. A non-intoxicating compound, it’s thought to help regulate mood thanks to its ability to [boost anandamide](#), the body’s native “bliss” molecule, as well as act as a [GABA reuptake inhibitor](#). CBG is also a potent neuroprotectant and is currently being evaluated for its ability to combat ailments like [Huntington’s Disease](#). It also has [cancer fighting properties](#) and is a potent antibacterial that can even [treat MRSA](#).

Despite the medical appeal and consumer demand there’s one big hurdle to face, though: CBG is notoriously expensive to produce, so much so it’s been dubbed the “the Rolls Royce of cannabinoids.”

“It takes thousands of pounds of biomass to create small amounts of CBG isolate,” continues Rowland. “That’s because most hemp only contains minute percentages of CBG, where as there are now hemp strains that contain 20% CBD in the crop. If the CBG content of the same crop is only 1%, that means you need to extract 20 times the amount of biomass to get the same amount of CBG out.”