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Spelling

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It Out

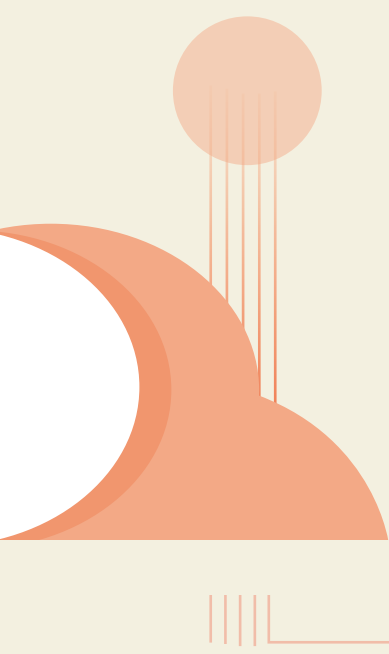


Unpacking the
latest science
and lingering
questions on
CBD, CBG, CBN,
and more





Whether in tinctures or gummies, on dispensary shelves or gas station counters, you've probably seen these acronyms. CBD is the most popular, but new ones have started to make their entrance as well, including CBG, CBN, and even CBC (not to be confused with the Canadian TV network behind *Schitt's Creek*).



These compounds (cannabinoids, formally speaking) have proliferated as vehicles for wellness or relaxation without the high of THC (tetrahydrocannabinol), the psychoactive component of cannabis. CBD (cannabidiol) “is the second most prevalent active ingredient in cannabis,” writes Dr. Peter Grinspoon in a Harvard Health Publishing blog post, and research on it is expanding.

Grinspoon, a medical cannabis advocate who regularly prescribes cannabis for various medical issues, states in his blog post: “The strongest scientific evidence is for [CBD’s] effectiveness in treating some of the cruelest childhood epilepsy syndromes, such as Dravet syndrome and Lennox-Gastaut

syndrome (LGS), which typically don’t respond to antiseizure medications. In numerous studies, CBD was able to reduce the number of seizures, and, in some cases, stop them altogether.”

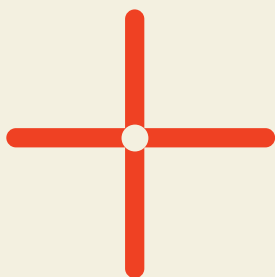
But for other medical cannabis patients or recreational users trying to decide which Scrabble combination of CB and G, N, or C is right for their needs, the answer isn’t as simple as a three-letter acronym. The 2018 Farm Bill removed hemp derivatives such as CBD from the Controlled Substances Act, provided they have less than 0.3% of THC content. As one might anticipate in the aftermath of the shrouds of prohibition, the research is ongoing—and currently spread unevenly across these cannabinoid family members.



CANNABIS PLANTS naturally produce cannabinoids in acidic forms. Cannabigerolic acid (CBGA) comes first—hence the colloquial distinction of CBG (cannabigerol) as the “mother of all cannabinoids”—and from there emerge the acidic forms of THC and CBD (tetrahydrocannabinolic acid [THCA] and cannabidiolic acid [CBDA], respectively). But that doesn’t mean a dose of CBG will break down into THC or CBD after consumption.

“When people take CBG, it’s not going to be converted to THC or CBD in the body,” explains Dr. Ethan Russo, a neurologist and psychopharmacology researcher with over two decades of cannabis research under his belt. “We don’t have the equipment, the enzymes, for that transformation.”

Accessing the more familiar nonacidic forms requires decarboxylation, or “heating, aging, exposure to light,” Russo says.



Trying to decide which Scrabble combination of CB and G, N, or C is right for your needs isn't as simple as a three-letter acronym.

CBN (cannabinol) is “a nonenzymatic oxidative breakdown product of THC,” he adds. “In other words, if someone has cannabis that’s been sitting around for a long period of time, particularly at room temperature or exposed to heat or light, the THC is going to break down into CBN,” which he notes is a more stable molecule than THC and “much less potent than THC.”

CBC (cannabichromene) is also derived from CBGA, and higher concentrations of it can be produced through “extensive cross-breeding,” writes science journalist Cheryl Pellerin in *Healing with Cannabis*, a 2020 book on the endocannabinoid system. This “ancient biological system,” which developed in some of the earliest life on

Earth hundreds of millions of years ago, enables the body to respond to the compounds in cannabis, and its “elements work throughout the body and brain to balance health and disease.”

Pellerin writes that per the latest research, “cannabis produces at least 120 plant cannabinoids.” Not all appear in the same concentrations within the plant, however, or have been studied as extensively as THC and CBD.

EXPLORING TREATMENT POTENTIAL

In September 2021, Russo, alongside a team of five additional researchers, published a paper on “the first patient survey of CBG-predominant cannabis use

to date, and the first to document self-reported efficacy of CBG-predominant products, particularly for anxiety, chronic pain, depression, and insomnia.”

According to results from the survey, completed with the informed consent of patients self-reporting use of products with greater than 50% CBG content, “the efficacy [of CBG] was highly rated, with the majority reporting their conditions were ‘very much improved’ or ‘much improved’ by CBG. Furthermore, 73.9% claimed superiority of CBG-predominant cannabis over conventional medicines for chronic pain, 80% for depression, 73% for insomnia, and 78.3% for anxiety.”

“What we have at this point is some signal from people using the material that they’ve had efficacy for treating a wide variety of disorders,” Russo says. “We have evidence that there weren’t a lot of associated side effects or withdrawal [symptoms]. But it’s not the gold standard of medical proof, which is a randomized control trial.”

Russo says that CBG, like CBD, seems to help with anxiety at low doses, but unlike THC, doesn’t “flip over into aggravating anxiety at higher doses.” Lab investigations have also shown CBG to be a “strong antibiotic against methicillin-resistant *Staphylococcus aureus* (MRSA), which causes serious hospital-acquired infections.” CBG is also nonintoxicating and “shows promise in treating prostate cancer,” he adds.

“Seemingly all the cannabinoids have some antibiotic properties,” Russo says. “All the cannabinoids have some effects of being cytotoxic for cancer cells.”

For Laura Beohner, president and co-founder of The Healing Rose in Newburyport, Massachusetts, the possible gut health benefits of CBG (due to its anti-inflammatory potential) are of particular note. Beohner has been a medical cannabis patient for “close to a decade in Massachusetts.” She says her company’s 1:1 CBD and CBG oil (available in 30 mL bottles with 1200 mg and 2400 mg concentration options) has helped people with Crohn’s disease, colitis, and irritable bowel syndrome.

“Having something that can provide pretty quick relief when people are having a flare-up can be really powerful,” Beohner says.

ALTERNATIVE FORMS OF RELAXATION

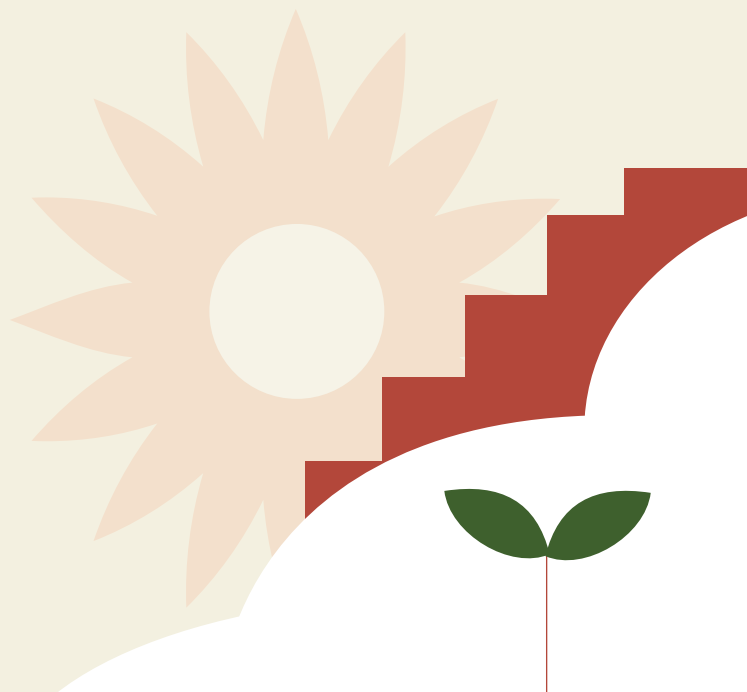
The popularity of CBD may well stem from how it offsets anxiety, rapid heart rate, and paranoia—side effects Russo observes are associated with THC. An anti-inflammatory and antianxiety agent in its own right, CBD has caught the attention of product makers and consumers less inclined to pursue the psychoactive route.

To Shaina Kerrigan, founder of Sausalito, California-based CBD gummy company Molly J., the preference was clear among mothers, in particular. “Moms really leaned into CBD over THC,” Kerrigan says. “And I think the reason why, or what they would say, was that being a mom is a 24/7 job. You’re on all the time. It’s sort of why moms drink wine and not tequila every day. You still have to be on. So, they were nervous around THC but excited about the

idea that CBD might be able to help take the edge off without that psychoactive element.”

Aurora Elixirs founder Victoria Pustynsky makes a similar point when describing the concept of her Portland, Oregon-based company’s 25 mg CBD cocktail-inspired beverages, which cater to a recreational audience. “I think we’re trying to match that occasion [of a cocktail], but also have the benefit of calm and balance,” she says. “Relaxation without the depletion, the way that alcohol can be depleting the next day.”

Kerrigan says that Molly J. isn’t seeking to substitute alcohol with CBD, but rather offer consumers an alternative soothing method. “I think we’ve used alcohol as a blanket Advil for our problems, whereas now I think consumers are getting a little smarter—at least we know there are so many more tools in our





CBs at a Glance

CBD (cannabidiol)

- The main nonpsychoactive cannabinoid in cannabis
- Legal forms derived from hemp plants with less than 0.3% THC
- Counteracts THC-associated side effects: anxiety, rapid heart rate, paranoia
- Uses: anti-inflammatory, antianxiety, anticonvulsant for epilepsy, possible antidepressant in CBGA form

CBG (cannabigerol)

- The “mother of all cannabinoids,” derived from CBGA, which is produced first in cannabis plants before breaking down into the acidic precursors to THC, CBD, and other cannabinoids
- Nonintoxicating
- Possible uses: treating chronic pain, acute pain, insomnia/sleep, nausea, irritable bowel syndrome, inflammation, depression, anxiety, and prostate cancer

CBN (cannabinol)

- A breakdown product of aging THC (tetrahydrocannabinol) and less potent than THC on the CB1 receptor in the brain (where THC produces an intoxicating effect)
- More similarities to than differences from THC
- Possible uses: antibiotic, anti-MRSA, treating psoriasis and burns
- Unproven efficacy as a sleep aid

CBC (cannabichromene)

- Also derived from CBGA, crossbreeding can produce plants with higher concentrations
- Nonintoxicating
- Possible uses: anti-inflammatory, pain relief, antibiotic, antifungal



tool belt we can use that are easier on our body, or a little bit more of a natural solution to the ailment that we're looking for."

Molly J.'s best-selling product is a sleep gumdrop that combines a 1:1 50 mg blend of CBD and CBN with 5 mg of melatonin. Although Kerrigan points out that the product has not been evaluated by the US Food and Drug Administration, she says, "the idea behind making it is that CBD ideally can help calm the body and mind, the CBN then kicks in to hopefully help you get to sleep, and the melatonin at the end helps keep you asleep for that full night of sleep."

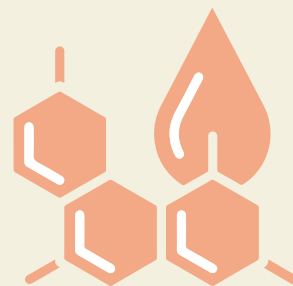
Russo explains the association of CBN with sleep as follows: "People have assumed [CBN is a sleep aid] because they know old cannabis tends to be sedating. But that isn't so much from the CBN. It's from the loss of the lower-molecular-weight terpenoids that tend to be alerting in some instances. What's left are the higher-molecular-weight sedating sesquiterpenoids."

"A HARM-REDUCTION STRATEGY"

In the experience of Dr. Dustin Sulak, a Maine integrative medicine physician who has treated medical cannabis patients at his private practice Integr8 Health since 2009, CBD (and CBDA) offers an alternative to younger populations for whom THC may not be ideal.

"Our fastest-growing demographic is adolescents with a variety of psychiatric conditions," says Sulak, who serves "about 8,000 patients a year for cannabis" overall at a practice that includes three other full-time medical providers.

A degree of vigilance is prudent while control trials for CBG, CBN, and others remain on the horizon.



"They're going to use cannabis, with or without our approval. It turns into a harm-reduction strategy to build a therapeutic relationship with them and help them use cannabis in a way that's best for them and least likely to cause harm."

When adolescent patients explain that THC affects their ability to study or wears off by midday and causes struggles in the afternoon, Sulak says "we're absolutely switching them over to CBD or CBDA. They can lean into the dosage without having to worry about impairments or any negative side effects, and try to get their focus and anxiety under control. Using something that's nonpsychoactive is certainly preferable."

Still, although animal lab testing and early patient surveys have begun to demonstrate promise for the range of cannabinoids emerging in the market, a degree of vigilance is prudent while control trials for

CBG, CBN, and others remain on the horizon.

"There's very little research on cannabinoids other than THC and CBD," Pellerin says. "The products coming out are coming out because companies can make money—and people will buy them, even though there's not much research, and try them for themselves. Like the '60s being a laboratory for psychedelics, this is a laboratory for phytocannabinoids. More research is needed. That's the answer for everything."🌀