



Cannabinol (CBN)

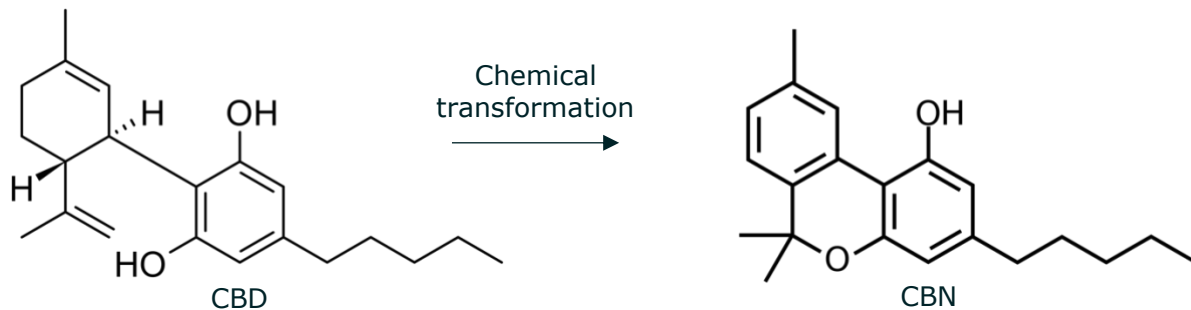
Introduction and selected scientific references

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Cannabinol (CBN)

Introduction

While present in cannabis, CBN is not formed directly by the plant. Rather, it is a breakdown product of the psychoactive cannabinoid tetrahydrocannabinol (THC), formed by exposure to oxygen, heat or light. For this reason, its content in plants is variable, depending on the freshness of the plant. CBN can also be generated through the chemical transformation of CBD.



Potential benefits

There is a growing body of primary scientific research exploring the potential benefits of CBN, in areas including:

1. Antibacterial;
2. Pain relief;
3. Amyotrophic lateral sclerosis (ALS, Lou Gehrig's disease);
4. Alzheimer's disease;
5. Attention deficit hyperactivity disorder (ADHD);
6. Dental health;
7. Loss of appetite;
8. Neuroprotection;
9. Seizure;
10. Antioxidant;
11. Cancer;
12. Glaucoma;
13. Sleep disorders.

Scientific literature

Subject	Quotation	Ref.
Antibacterial	"All five major cannabinoids (cannabidiol (1b), cannabichromene (2), cannabigerol (3b), Delta (9)-tetrahydrocannabinol (4b), and cannabiol (5)) showed potential activity against a variety of methicillin-resistant Staphylococcus aureus (MRSA) strains of current clinical relevance."	1
Analgesic (pain relief)	"Cannabinoids can activate TRPA1, TRPV1, and TRPV2, and functionally antagonize TRPM8 receptors in a manner dependent on their chemical structure...CBN being relatively potent at TRPA1 and only weakly active at TRPV2...In conclusion, our data support the current concept that not only cannabinoids different from THC (and CBD), but cannabis extracts enriched in such compounds might be used in the future as potential therapeutic agents."	2
	"This study investigated whether local intramuscular injection of non-psychoactive cannabinoids, cannabidiol (CBD), cannabiol (CBN), cannabichromene (CBC) and their combinations can decrease nerve growth factor (NGF)-induced masticatory muscle sensitization in female rats... Combinations of CBD/CBN induced a longer-lasting reduction of mechanical sensitization than either compound alone...These results suggest that peripheral application of these non-psychoactive cannabinoids may provide analgesic relief for chronic muscle pain disorders such as temporomandibular disorders and fibromyalgia without central side effects."	3
ALS (motor neuron disease)	"We therefore tested whether cannabiol (CBN), a non-psychotropic cannabinoid, influences disease progression and survival in the SOD1 (G93A) mouse model of ALS ...We found that this treatment significantly delays disease onset by more than two weeks while survival was not affected"	4
Alzheimer's disease	"Pairwise combinations of THC and CBN lead to a synergistic neuroprotective interaction. Together, these results significantly extend the published data by showing that non-psychoactive cannabinoids are potential lead drug candidates for AD and other neurodegenerative diseases".	5
ADHD	"We found an association between lower ASRS [ADHD self-report scale] score and consumption of high doses of cannabiol (CBN), but not with Δ -9-tetrahydrocannabinol (THC)".	6
Dental health	"In our study, cannabinoids were found to be more effective in reducing the colony count of the bacterial strains (dental plaque biofilm) as compared to the well-established synthetic oral care products such as Oral B or Colgate...In group DPSI 0, the maximum number of colonies was found with the Oral B treatment, whereas the minimum number of colonies was present in the CBN."	7

Subject	Quotation	Ref.
Loss of appetite	"This is the first time cannabiniol has been shown to increase feeding . Therefore, cannabiniol could, in the future, provide an alternative to the currently used and psychotropic Δ9-tetrahydrocannabinol-based medicines since cannabiniol is currently considered to be non-psychotropic".	8
Neuroprotection	"Cannabiniol reduced LDH activity in medium at 20 and 100 μM...CBN decreased LDH release by 84%...Protective EC50 of CBN was determined to be 30 μM in this model".	9
	"Cannabiniol was shown to be a potent antioxidant ."	10
	"[O]ur data highlight the potential of mitochondrially-targeted compounds such as CBN as novel oxytotic/ferroptotic inhibitors to rescue mitochondrial dysfunction as well as opportunities for the discovery and development of future neurotherapeutics ."	11
Oncology (cancer)	"In this study, we provide evidence that CBN inhibits proliferation of A172, HB8065 and HCC1806 cells in a dose- and time-dependent manner. We find that CBN induces apoptosis through downregulation of p21 and p27 and a G1 or S-phase cell cycle arrest through a dose-dependent downregulation of cyclin E1, CDK1 and CDK2. These data support the medicinal potential of CBN in anti-cancer therapy.	12
	"While many cannabinoids are being considered for anti-cancer therapies, CBN seems to be particularly effective. For example, one study found that CBN was able to significantly reduce tumor size and increase the lifespan of mice with lung cancer, while CBD did neither."	13
	"High-risk neuroblastoma is an aggressive pediatric tumor...Our findings reveal a suppressive role of CBN in neuroblastoma tumorigenesis, highlighting a novel and crucial miR-34a tumor suppressor network in CBN's anti-neuroblastoma actions."	14
Seizure	"Cannabiniol was the most effective at reducing total distance relative to controls. In addition to CBD, other cannabis-derived compounds showed promise in reducing seizure -like activity in zebrafish."	15
Antioxidant	"The presented data prove that all the examined cannabinoids [CBN] exhibit antioxidant activity... Although the intensity of these activities is not the same for the individual cannabinoids it is comparable for all of them with that of E vitamin."	16
	"A comprehensive study of the redox transformation, electronic structure, stability, and photoprotective properties of phytocannabinoids is presented... For UVB radiation, CBN was the most effective."	17

Subject	Quotation	Ref.
Glaucoma	<p>“[T]his study aims to evaluate the role of cannabiniol (CBN) on RGC [retinal ganglion cell] protection, modulation of IOP [intraocular pressure], and its effects on the level of extracellular matrix (ECM) proteins using both in vitro and in vivo models of glaucoma...CBN promotes neuroprotection, abrogates changes in ECM protein, and normalizes the IOP levels in the eye. Therefore, our observations in the present study indicate a therapeutic potential for CBN in the treatment of glaucoma.”</p>	18
Sleep disorders	<p>“[T]he composition comprises from about 5 wt % to about 25 wt% CBN, from about 2 wt% to about 12 wt% of terpenes selected from β-myrcene, linalool, eucalptol, limonene, α-pinene, citral, linalyl acetate, borneol, nerolidol, terpenolene, and any combination thereof ... The compositions of the present invention are useful for inducing sleep and/or for increasing the duration of sleep. Thus, the composition of the present invention is a hypnotic, sedative or sedative-hypnotic composition.”</p>	19
	<p>“When pure cannabiniol was obtained using regular chemical laboratory synthesis, a similar effect of relaxation and good quality sleep were obtained when such compound was ingested by five male volunteers suffering from insomnia.”</p>	20

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