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## Endocannabinoid System

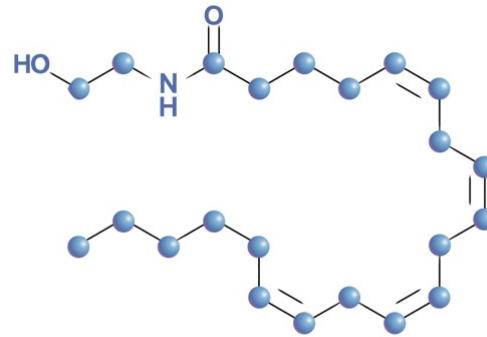
- A feedback system that helps to modulate or balance cellular responses
- The most recently discovered messaging system
- Two types of receptors have been discovered CB1 and CB2

| ENDOCANNABINOIDS       | PHYTOCANNABINOIDS |                 |                        |  |
|------------------------|-------------------|-----------------|------------------------|--|
| AEA                    | CBN               | CBD             | THC                    |  |
| Amandamide             | Cannabinol        | Cannabidiol     | Tetrahydrocannabinol   |  |
| 2-AG                   | CBG               | CBC             | THCV                   |  |
| 2-Arachidonoylglycerol | Cannabigerol      | Cannabichromene | Tetrahydrocannabivarin |  |

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## Amandamide

- The body's primary endogenous cannabinoid
- Made from arachidonic acid (an omega-6 fatty acid)
- Found in chocolate



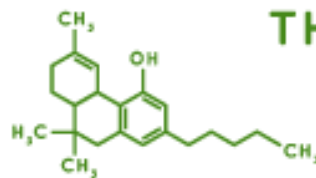
Anandamide

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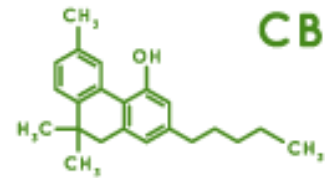
## Phytocannabinoids

### TABLE OF CANNABINOIDS

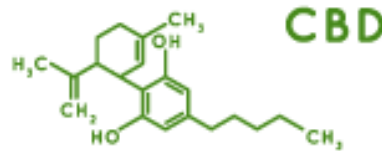
- Phytocannabinoids are cannabinoids found in plants like cannabis
- They are also found kava, echinacea, chocolate and other plants



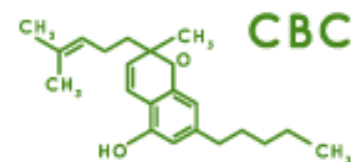
THC



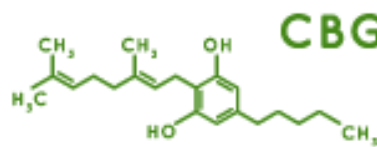
CBN



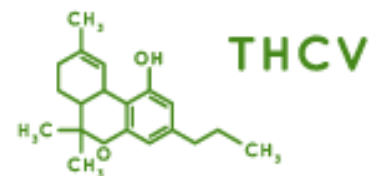
CBD



CBC




CBG



THCV

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**THC**  
TETRAHYDROCANNABINOL

- **THC is the phytocannabinoid that produces the psychoactive effects in marijuana**

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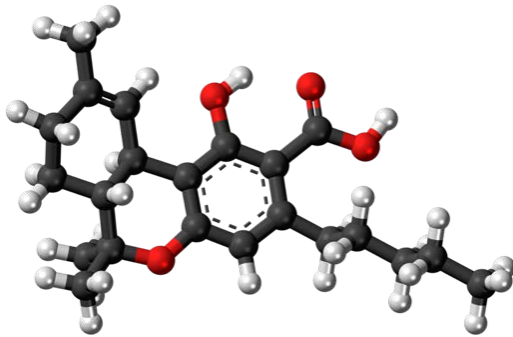
**THC (Delta-9-tetrahydrocannabinol)**



- **Discovered in 1964**
- **Created by heating THCa**
- **Most psychoactive cannabinoid**
- **Can develop tolerance with chronic use**
- **Can cause withdrawal symptoms if used heavily**
- **Mimics endocannabinoids**

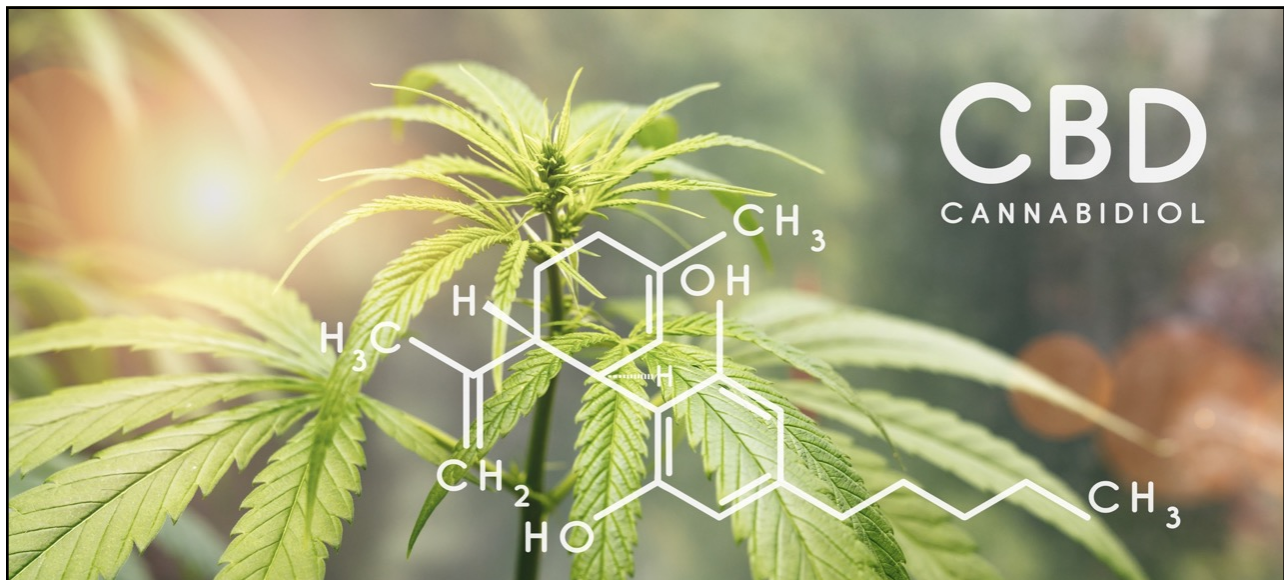
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## THCA (Tetrahydrocannabinolic Acid)



- Non-psychoactive
- Main compound in unheated cannabis flowers
- Changes to THC when heated
- Properties:
  - Immune: Anti-inflammatory, Antitumor
  - Nervous: Anti-spasmodic, possible anticonvulsant
  - Anti-nausea

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**CBD**  
CANNABIDIOL

- CBD is a non-psychoactive phytocannabinoid in cannabis

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## CBD (Cannabidiol)



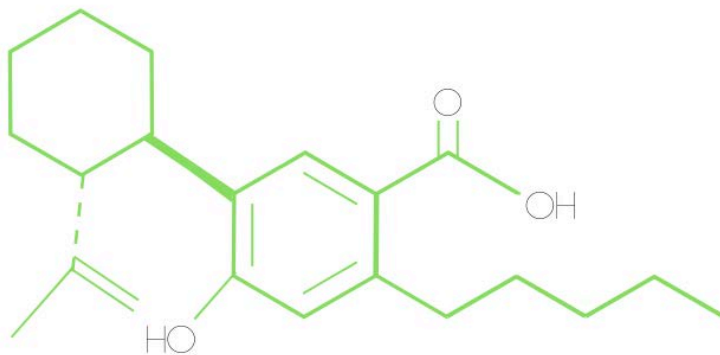
- Non-psychoactive, reduces psychoactive effect of THC
- Low doses increase alertness, larger doses are calming
- Does not build tolerance or cause withdrawal symptoms
- Can help treat THC withdrawal
- Enhances receptors for endocannabinoids
- Mediates pain and inflammation
- Reduces anxiety

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## CBDA (Cannabidiolic Acid)

### CBDA

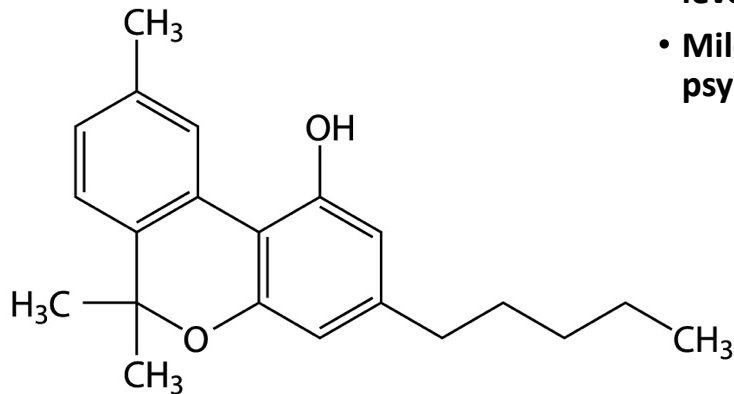
CANNABIDIOLIC ACID



- Non-psychoactive
- Found in raw (unheated) cannabis flowers)
- Changes to CBD when heated
- Properties:
  - Immune: Anti-inflammatory (COX-2 inhibitor), Antitumor, inhibits migration of certain breast cancer cells
  - Anti-nausea

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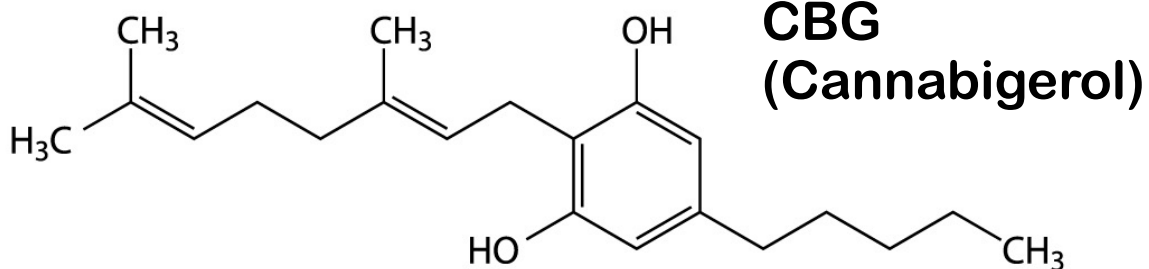
## CBN (Cannabinol)



Cannabinol

- Discovered in 1899
- Breakdown product of THC, levels increase as THC degrades
- Mildly psychoactive, increases psychoactive effects of THC

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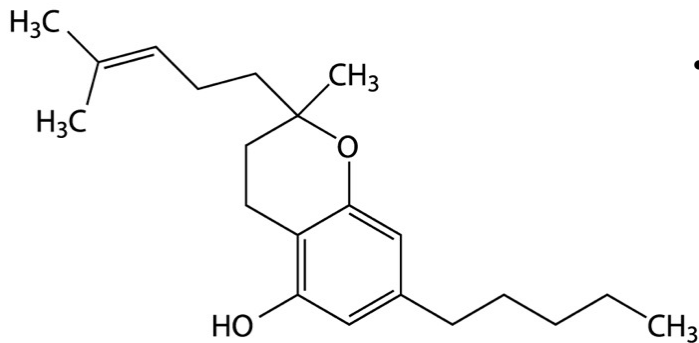


**CBG**  
**(Cannabigerol)**

- **Non-psychoactive**
- **Found in higher quantities in hemp, but hard to isolate**
- **Properties:**
  - Immune Enhancing: Anti-inflammatory, Antifungal Antibacterial, Antitumor
  - Nervous: Anti-anxiety, Antidepressant, Muscle relaxant, decreases pressure in eyes
  - Promotes bone growth
  - Appetite stimulant
  - Lowers blood pressure

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## CBC (Cannabichromene)

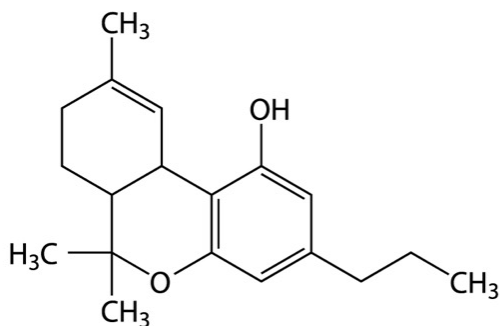


Cannabichromene

- Non-psychoactive
- Allows brain produced endocannabinoids to last longer
- May increase viability of developing brain cells
- Properties:
  - Immune: Anti-inflammatory, Antitumor, Antifungal
  - Nervous: Analgesic, Anti-anxiety,
  - Promotes bone growth
  - Binds to receptors for pain, but not to the receptors in the brain, so it kills pain without making you high
  - May be helpful for breast cancer

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## THCV ( $\Delta^9$ -tetrahydrocannabivarin)

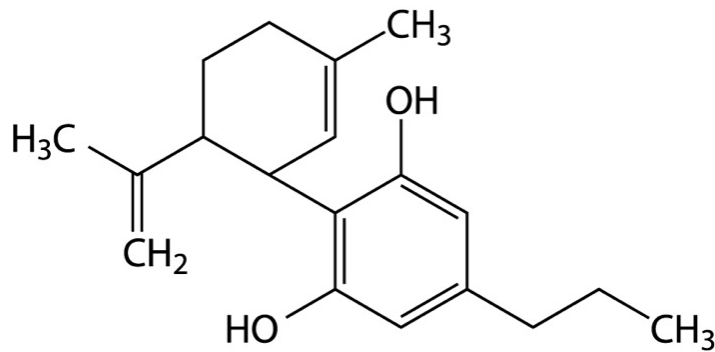


Tetrahydrocannabivarin

- Potent antagonist of cannabinoid receptors
- Suppresses THC effects in low doses, enhances in higher doses
- Decreases time of psychoactive THC effects
- Chemovar with THC:THCV ratio of 6:7 is reported to help PTSD and Parkinsons
- Properties
  - Immune: Analgesic, Anti-anxiety, Anticonvulsant, Stimulating
  - Decreases appetite
  - Promotes bone growth

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## CBDV (Cannabidivarin)

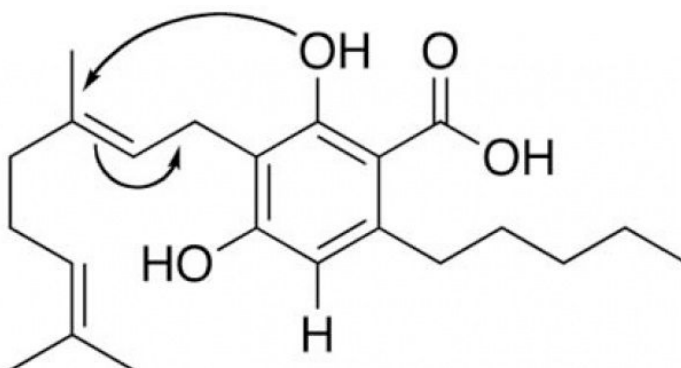


Cannabidivarin

- Non-psychoactive
- Properties:
  - Anti-convulsant
  - Anti-nausea
  - Promotes bone growth
- Plays a role in pain and inflammation
- Possible anti-inflammatory and pain relief

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## CBGA (Cannabigerolic Acid)



Cannabigerolic Acid (CBGA)

- Precursor to THCA and CBDA and CBG and CBC
- Properties:
  - Analgesic
  - Anti-inflammatory
  - Anti-bacterial

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## The Entourage Effect

- The theory that a diverse, naturally occurring variety of terpenes and cannabinoids work synergistically to improve health or fight disease
- A full spectrum of cannabinoids works better than isolated CBD or THC
- Other compounds in cannabis, such as terpenes and flavonoids also enhance the activity of cannabis
- The idea that whole plants can work better than isolates is not a new idea to herbalists



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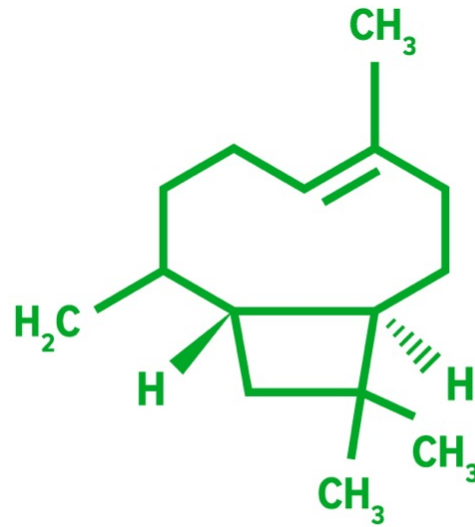
## Terpenoids: Cannabis and Aromatherapy



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## B-Caryophyllene

- Aroma: Wood, Spicy
- Often found in CBD Rich chemovars
- May act as a phytocannabinoid
- Also found in:
  - Black pepper
  - Cloves
  - Cotton
  - Oregano
  - Hops



**BETA-CARYOPHYLLEN BCP**

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**β-Caryophyllene**

- Activates CB2 receptors in the immune system and gut
- Properties:
  - Nervous: Analgesic
  - Immune: Anti-bacterial, anti-fungal, antitumor, anti-inflammatory
- Synergies:
  - Enhances THC protection of gastric cells
  - Enhances anti-inflammatory effects of CBD

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## Limonene



- **Aroma: orange, citrus, spicy**
- **Found in:**
  - Citrus peel
  - Caraway seed
  - Dill seeds
  - Rosemary
  - Juniper
  - Peppermint

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## Limonene

- Has antidepressant and anti-anxiety effects, enhances anti-depressant and anti-anxiety effects of CBD
- Enhances anticancer effects of CBD & CBG
  - Helps certain breast cancer cells commit apoptosis
  - Antitumor
- Suppresses GERD and enhances anti-GERD effects of THC
- Antibacterial and antifungal
- Bronchodilator

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## a-Pinene

- **Aroma: Skunky**
- **Found in:**
  - **Pine trees**
  - **Rosemary**
  - **Dill**
  - **Sage**
  - **Eucalyptus**



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## a-Pinene

- **Properties:**
  - **Immune: Anti-inflammatory, antibacterial**
  - **Reduces THC related memory loss**
  - **Increases permeability of the blood-brain barrier**
  - **Increases mental focus**
  - **Bronchodilator**



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## Linalool

- **Found in:**
  - Lavender
  - Citrus
  - Birch
  - Coriander
  - Rosewood
- **Fragrance:** Floral, spicy, citrus
- **Properties**
  - **Nervous:** Antianxiety, analgesic, anti-convulsant, sedative, calming
  - **Immune:** Antibacterial against bacteria that cause acne, anticancer
- **Synergies**
  - Enhances CBD's anti-anxiety and analgesic effects
  - Enhances THC's sedation and analgesic effects
  - Enhances anticonvulsive effects of CBD/THCV/CBDV

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## $\beta$ -Myrcene

- **Most common terpenoid in THC rich cannabis, but not found in hemp**
- **Found in:**
  - Mango
  - Hops
  - Bay leaves
  - Lemongrass
  - Eucalyptus
- **Fragrance:** Earthy, fruity

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## $\beta$ -Myrcene

- **Properties:**
  - **Immune:** Anticancer, anti-inflammatory, antibacterial
  - **Nervous:** Sedating, muscle relaxant, analgesic, antidepressant
- **Synergistic Effects:**
  - Enhances effects of THC
  - Enhances anti-inflammatory effects of CBD and CBG



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## Humulene

- **Isomer of  $\beta$ -Caryophyllene**
- **Found in:**
  - Hops
  - Basil
  - Coriander
- **Fragrance:** Herbaceous, woody
- **Properties:**
  - **Immune:** Anti-inflammatory, anticancer, antibacterial
  - Suppresses appetite

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## Other Terpenoids in Cannabis

- Terpineol (sedating)
- Geraniol (antioxidant, anticancer)
- Terpineol (Antibacterial, antiviral, anti-anxiety, sedating)
- Cineole (Anti-depressant, anti-inflammatory, antibacterial)
- Citronellol (Anti-inflammatory, sedating, anticancer)
- Borneol (Analgesic, sedating, bronchodilator, antibacterial)
- Nerolidol (Sedating, anti-fungal)
- Phytol (Sedating, immune suppressant, antifungal)
- Ocimene (Antifungal, antibacterial, decongestant)
- Terpineol (Sedating, analgesic, antifungal)
- Valencene (Antiallergy)

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## Striving for Balance

- Altering the balance of the endocannabinoid system may help move the body towards homeostasis, but it will not fix:
  - Poor thought processes and life choices
  - Nutritional deficiencies
  - Poor health habits (losing sleep, not exercising, not drinking enough, etc.)
  - Toxicity
- Therefore CBC and other cannabinoids should ideally be part of a holistic approach to health



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## A Gateway Herb?

- My hope is that the interest in cannabis will promote a renewed interest in whole plant medicine
- Cannabis should ideally be used as one plant in our herbal arsenal, not as the “cure-all” plant it is being promoted as
- Understanding the endocannabinoid system may also helps us understand aromatherapy better



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## Upcoming Education

- **A Holistic Approach to Disease**
  - Two free webinars on Dec 5, 12 at 6:00 PM MT introducing next year’s member webinar series  
(<https://events.genndi.com/channel/wholisticapproach>)
- **2019 Healthy Perspective Webinar Series**
  - <https://events.genndi.com/channel/healthyperspective>
- **2019 Seeking Light and Truth**
  - Webinar series:  
<https://events.genndi.com/channel/seekinglight>

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