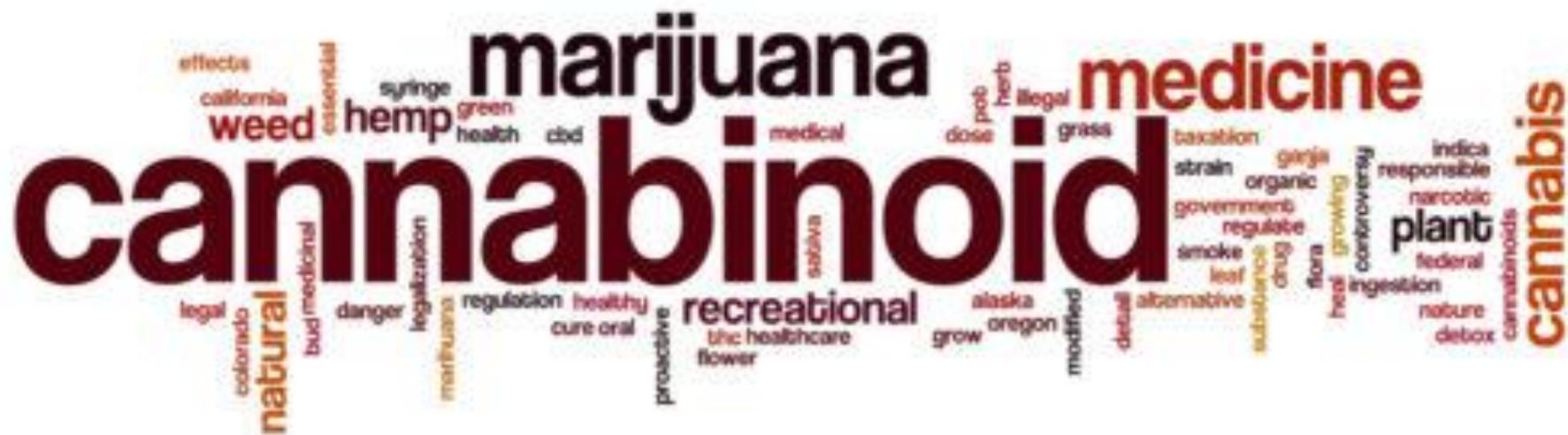


BRAIN AWAKENING: THE ENDOCANNABINOID SYSTEM

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Synergistic Integrative Health



"The brain on marijuana will never deviate from its destined disposition, nor be driven to madness. Marijuana is a mirror reflecting mans deepest thoughts, a magnifying mirror. It's true, but only ever a mirror."

— CHARLES BAUDELAIRE, 1860



HISTORY OF CANNABIS

- 8000+ BC hemp used in pottery in modern day Taiwan
- 6000 BC oil and seeds used for food in China
- 4000 BC textiles made from hemp used in China
- 2700 BC first documented medicinal use in China
- 2000 BC discovered in Hindu ancient text, one of 5 sacred plants
- 1000-500 BC noted in Middle East and Russia
- 300 BC appears in Greece
- 100 AD appears in England, Vikings take to Iceland
- 1000-1200 AD used in Egypt



- 1300 AD Marco Polo makes Europe more aware
- 1753 AD Linnaeus classifies *Cannabis sativa*
- 1800 AD Marijuana plantations flourish in America
- 1910 AD Mexican Revolution introduced rec use
- 1914 AD Harrison Act defined marijuana use as a crime
- 1915-1927 Prohibition of nonmedical use starts
- 1919 18th Amendment bans manufacturing, sale and transportation of alcohol, makes marijuana attractive alternative
- 1920s to 1930s worldwide restriction
- 1933 21st Amendment ends alcohol prohibition
- 1937 Marijuana Tax Act, drug is criminalized
- 1977-1981 Pres Carter pushes for decriminalization



- 1986 Reagan signs Anti-Drug Abuse Act
- 1996 CA, the 1st US state to ban marijuana use, now re-legalizes it, followed by other states
- 1997 Amer Office of Nat'l Drug Control Policy commissions IOM to conduct medical efficacy of cannabis and IOM concluded it's safe & effective
- 1997-2001 Clinton continues Reagan's legacy
- 2001-2009 Bush continues that fight
- 2010 Obama tries to end the anti-drug war
- 2012 Legalization for recreation use begins
- Jan 3, 2017 Amendment 2 passed in Florida
- Illegal under federal law, as schedule 1 drug



YOU CALL IT THIS, I CALL IT THAT

- Formal scientific name is Cannabis (Greek origin)
- Ganja (Sanskrit)
- Bhang (Hindi)
- Ma ren hua (Chinese)
- Marihuana/Marijuana (Mexican-Spanish)
- Mejorana chino (Colloquial Spanish)
- South American portmanteau of Maria & Juana
- Ma-kana (Bantu)
- Hashish (Arabic)
- Pot (potiguaya, mulled vino with marijuana buds)
- Weed (pop-culture word from 80s)
- Hemp



- Cannabis
- Pot
- Chronic
- Bud
- Herb
- Weed
- Ganja
- Reefer
- Grass
- Green
- Mary Jane (or MJ)
- Dutch
- Swisher Sweets (or Swishers)
- Joint (or J)
- Tree
- Spliff
- Dank
- Sess (or Sensimilla)
- Skunk
- Buddha
- Lye
- Piff
- Kief
- Hydro
- Hashish (or Hash)
- Dabbing
- Pipe
- Blunt (or L)
- Bone
- Zig-Zag
- Bong
- Vaporizer

TYPES OF CANNABIS



SATIVA

Long thin light color leaves
8-15 Feet tall plant
High THC level
10-16 weeks flowering time
Day time consumption



INDICA

Wide broad dark color leaves
2-6 Feet tall plant
Medium THC level
6-8 weeks flowering time
Night time consumption



RUDERALIS

Fewer light color leaves
1-2 Feet tall plant
Very low THC level
4-5 weeks autoflowering
Generally not used for consumption

○ **Indica:**

- ~ equal ratios of THC to CBD (cannabidiol)
- ~ relaxes, reduces anxiety, down-regulates

○ **Sativa:**

- ~ 20:1 THC to CBD
- ~ produces energy, thought-provoking, elevates mood

○ **Ruderalis:**

- ~ very low THC content unlike other 2 strains
- ~ cross-breed with other strains to create auto-flowering regardless of light cycle



KNOW YOUR CANNABIS

SATIVA

TALLER
& SLIMMER

LEAVES ARE

LONGER
& THINNER



HEAD HIGH

ALERTNESS



UPLIFTING
& EUPHORIC

CREATIVITY



INCREASED
ENERGY

BEST FOR
DAYTIME USE



INDICA

SHORTER
& BUSHIER

LEAVES ARE

SHORTER
& WIDER



BODY HIGH



RELAXATION

APPETITE
STIMULATOR



SLEEP AID

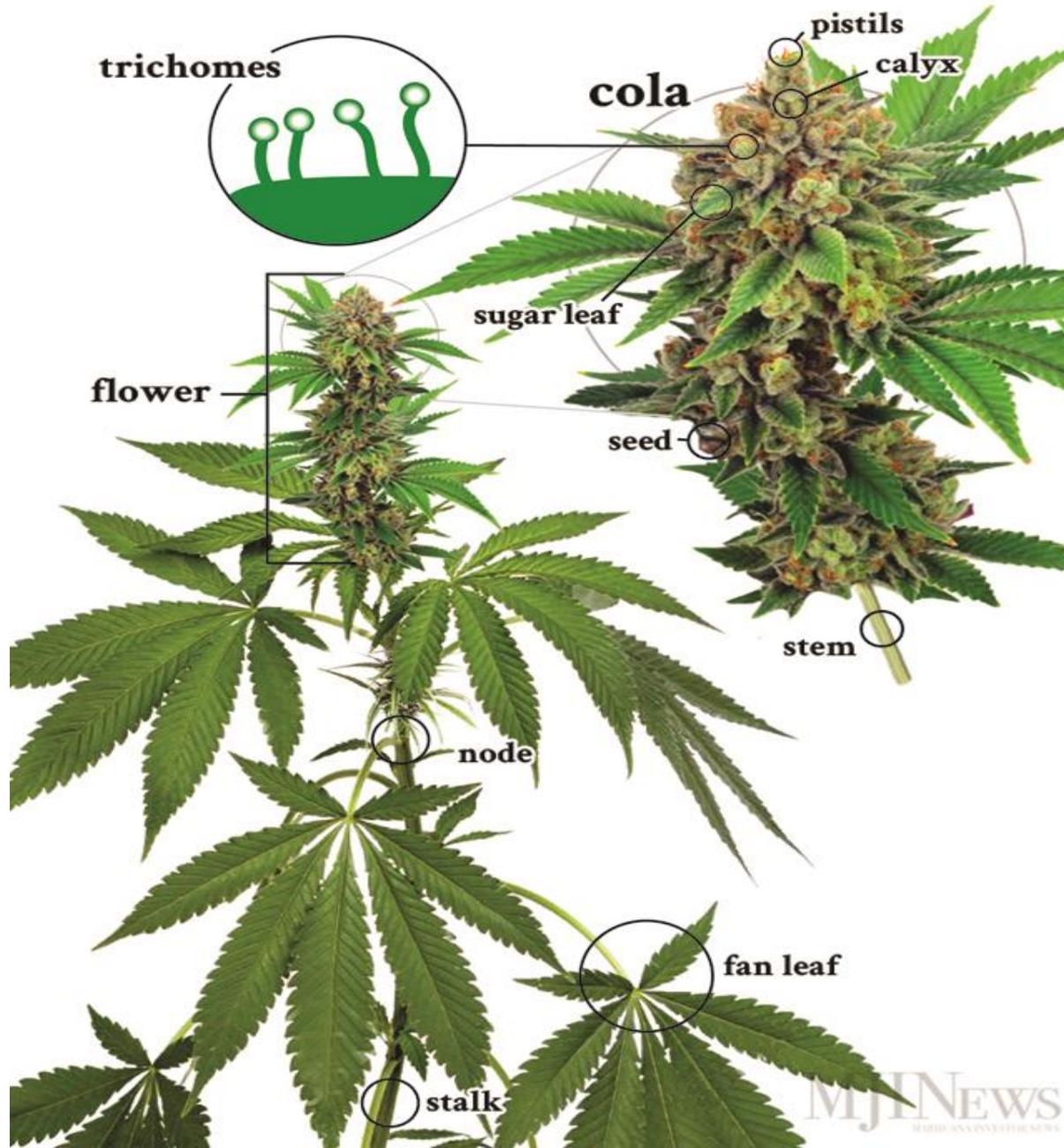
PAIN RELIEF



BEST FOR
NIGHTTIME USE



Cannabis Anatomy



The Amazing Endocannabinoid System



Once cannabis is ingested, it is broken down and cannabinoids are released into the body. The human body has an endocannabinoid system, which helps regulate appetite, energy, balance, metabolism, stress responses, immune functions, the autonomic nervous system, thermo-regulation, sleep and many other important body systems.

ENDOCANNABINOID SYSTEM

THE HUMAN ENDOCANNABINOID SYSTEM

CBD, CBN and THC fit like a lock and key into existing human receptors. These receptors are part of the endocannabinoid system which impact physiological processes affecting pain modulation, memory and appetite plus anti-inflammatory effect and other immune system responses. The endocannabinoid system comprises two types of receptors, CB1 and CB2, which serve distinct functions in human health and well-being.



THC
TETRAHYDROCANNABINOL



CBD
CANNABIDIOL



CBN
CANNABINOL

CB1 receptors are primarily found in the brain and central nervous system and to a lesser extent in other tissues



CBD has low affinity for CB1 or CB2 receptors but has powerful indirect effects still being studied



CB2 receptors are mostly in the peripheral organs especially cells associated with immune system

RECEPTORS ARE FOUND ON CELL SURFACES

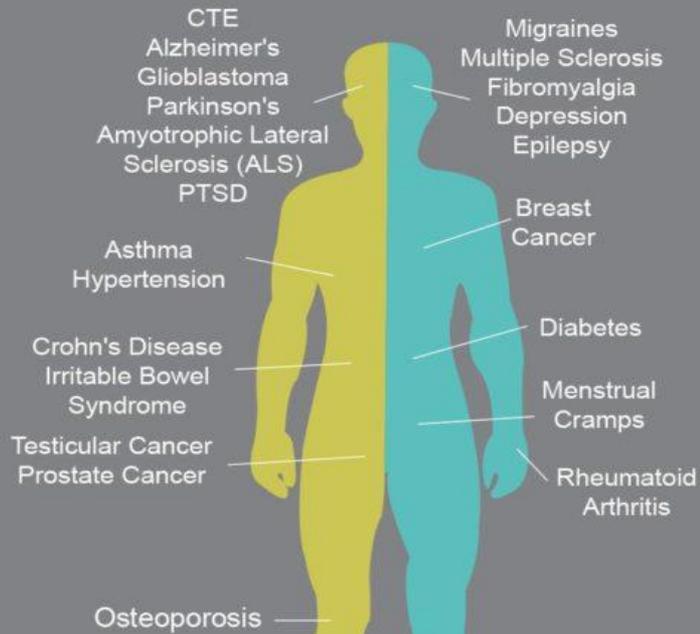


The recent identification of **cannabinoid** receptors has triggered an exponential growth of studies exploring the **endocannabinoid system** and its regulatory functions in health and disease. This system has been implicated in a growing number of physiological functions, both in the central and peripheral nervous systems and in peripheral organs

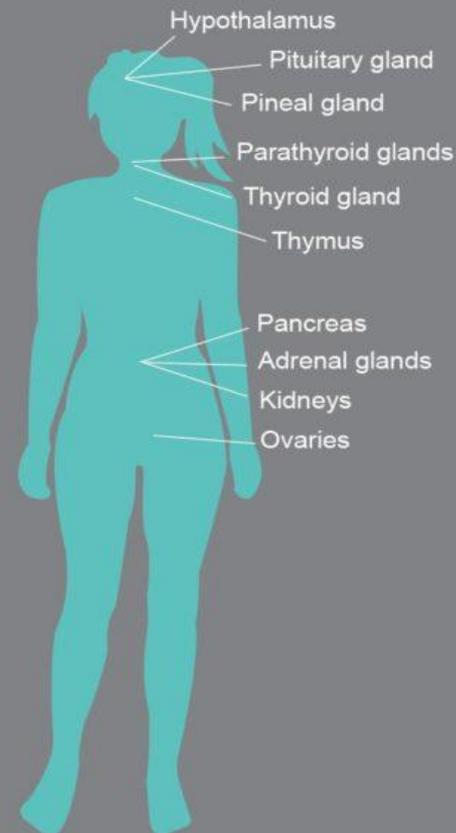
THE ENDOCANNABINOID SYSTEM

The human endocannabinoid system (ECS) is a network of receptors spread throughout our entire body that control some of our most vital life functions, including our immune system, memory, appetite, sleep pattern, mood, and pain sensation.

Disorders CBD Assists with:



Endocannabinoid System Controls:



THE ENDOCANNABINOID SYSTEM : ECS

- ECS is a fundamental, regulatory system
 - ~ Existed before the brain
 - ~ Named after research with cannabis
 - ~ First identified in late 1980s
 - ~ Composed of neurotransmitters & receptors
- Why does cannabis work so well?
 - ~ We produce endogenous cannabinoids, thus the name endocannabinoids
 - ~ Examples are:
 - Anandamide (ananda is Sanskrit for bliss)
 - 2-AG (2-arachidonoylglycerol)



CB1 RECEPTORS IN THE ECS

○ Located predominantly in:

~ CNS

~ connective tissue

~ gonads

~ endocrine glands

~ GI and GU tracts

~ spinal cord

~ hypothalamus

~ cerebellum

~ basal ganglia

~ amygdala

~ cerebral cortex



CB2 RECEPTORS IN THE ECS

- Located predominantly in:
 - ~ immune system
 - ~ blood vessels
 - ~ spleen
 - ~ tonsils
 - ~ heart
 - ~ liver
 - ~ kidneys





CB1 RECEPTORS

The CB1 receptors are primarily located on nerve cells in the brain, spinal cord, but they are also found in some peripheral organs and tissues such as the spleen, white blood cells, endocrine gland and parts of the reproductive, gastrointestinal and urinary tracts.

In the brain, the CB1 receptors are abundant in the cerebellum, basal ganglia, hippocampus and dorsal primary afferent spinal cord regions, which is why cannabinoids influence functions such as memory processing, pain regulation and motor control. ⁽¹⁾

CB2 RECEPTORS

The CB2 receptors are mainly found on white blood cells, in the tonsils and in the spleen. The immune cells also express CB1, although there are fewer of them than CB2. In the immune system, one important function of the cannabinoid receptors is the regulation of cytokine release. Studies suggest that CB2 modulate the pain sensation and could play a role in various diseases, from liver and kidney problems to neurodegenerative diseases. ⁽¹⁾

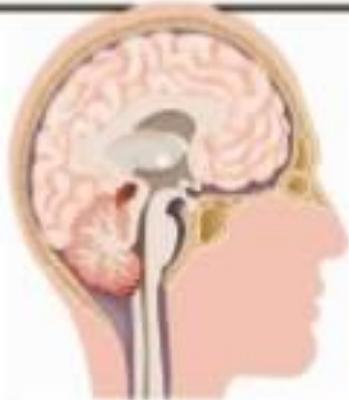
- ECS receptors get stimulated and bound to by:
 - ~ **Endocannabinoids** (endogenous chemicals)
 - ~ **Phytocannabinoids** (plant sources)
 - ~ **Synthetic cannabinoids** (pharma drugs)
- Most fundamental and physiologic system involved in establishing & maintaining our health
- In each tissue, organ, system, the ECS performs different tasks
- Goal is always the same...**HOMEOSTASIS**
- Human body strives to maintain stable internal environment despite fluctuations in external environment



- Cannabinoids - whether formed in your brain or inhaled via vape — fit neatly into a series of specialized receptors located throughout the human body, with their greatest concentration in the hippocampus (which regulates memory), the cerebral cortex (cognition), the cerebellum (motor coordination), the basal ganglia (movement), the hypothalamus (appetite), and the amygdala (emotions).
- Cannabinoid receptors are similarly found in every animal species down to the sponge.
- Fundamental physiology



How cannabis works



ENDOCANNABINOIDS (Brain derived)

Foods: Omega-3s and Omega-6s
Anandamide (AEA)



PHYTOCANNABINOIDS (Plant derived)

Buds, Tinctures, extracts
THC, CBD



SYNTHETIC CANNABINOIDS (Pharmaceutical lab)

Patented synthesized compound
THC only

ENDOCANNABINOID RECEPTORS (Brain Receptors)

CB1, CB2 etc

The endocannabinoid system (ECS) is involved in regulating a variety of physiological processes including appetite, pain and pleasure sensation, immune system, mood and memory.



CANNABIS AND THE BRAIN

- Cannabis is complex
- Over 480 chemical compounds identified
- 60 of these are cannabinoid compounds
- Major compounds are THC (tetrahydrocannabinol) and CBD (cannabidiol)
- THC and CBD have opposing effects
- Cannabis is most widely used drug in the world
- Stigma and negative associations are impediments
- Resurgence of interest in medicine is due to discovery of the ECS
- Recent identification of CBD receptors has triggered exponential growth in research



- 1st compound isolated in cannabis was CBN (cannabinol)
- 2nd was CBD (cannabidiol)
- 3rd was THC (tetrahydrocannabinol)
- Other lesser known, but powerful compounds include:
 - ~ CBC (cannabichromene)
 - ~ CBG (cannabigerol)
 - ~ CBGA (cannabigerolic acid)
 - ~ CBDA (cannabidolic acid)
 - ~ THCA (tetrahydrocannabinolic acid)
 - ~ THCV (tetrahydrocannabivarin)
 - ~ CBCA (cannabichromenate)



UNDERSTANDING THE RELATIONSHIP BETWEEN CANNABINOIDS

RAW

Fresh, uncured cannabis remains in its acidic form

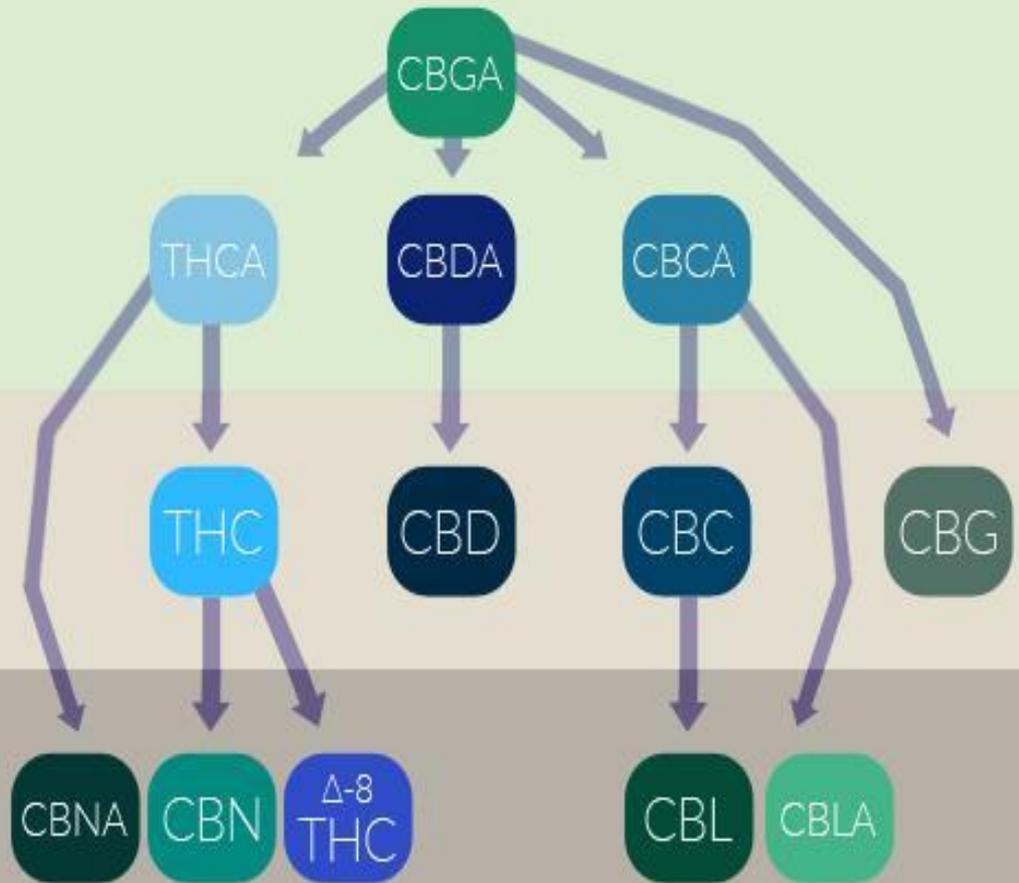
Conversion begins immediately after harvest

DRIED / HEATED

Decarboxylation occurs, converting from an acid to the active compound

AGED

Created over time after exposure to oxygen, heat, and UV light



THC

- Active compound in cannabis is THC (tetrahydrocannabinol)
- THC exerts most of its effects through CB1 receptors, some through CB2
- Mainly GABA neurons in hippocampus, amygdala, cerebral cortex
- THC is what is responsible for the psychoactive effects or the “high”
- Can increase appetite “munchies”



CBD

- 2nd most abundant compound in cannabis
- Does not directly stimulate the CB1 and CB2 receptors like THC
- Non psychoactive
- Activate non-cannabinoid receptors and ion channels
- Binds to TRPV1 receptors which mediate pain perception, inflammation, and body temp



CBC

- Non-psychoactive
- Not too much known at present
- Promising research
- Anti-anxiety
- Anti-microbial
- Normalize GI hypermotility
(diarrhea)



CBN

- Created when THC is exposed to oxygen and/or light
- Milder psychoactive effects than THC
- Not considered medicinal, but used as anti-spasmodic
- Also used for glaucoma and insomnia
- Recreational users experience dizziness and grogginess



TERPENOIDS & FLAVANOIDS

- The 2 other “-oids” of cannabis
- **Flavonoids** – unique smell & flavor
 - ~ Can appear in many plants, like quercetin
 - ~ Flavonoids in cannabis are cannflavins
 - ~ Cannflavin A is 30x more effective than aspirin by binding to PGE-2 receptor to reduce inflammation
- **Terpenes** – naturally appear in plants & animals to deter parasites
 - ~ Over 100 have been identified in cannabis
 - ~ Eucalyptol, limonene, myrcene, pinene, linalool



CANNABIS VS HEMP VS MARIJUANA

- Is cannabis the same thing as hemp?
- Is marijuana the same thing as cannabis?
- **Cannabis** is a *plant family* that includes many species, including both hemp and marijuana.
- **Hemp** is a *variety of cannabis* grown for its tall, sturdy stalks and low THC levels.
- **Marijuana** is a *variety of cannabis* grown for its high levels of THC.



- Hemp and marijuana are two varieties of cannabis grown for different purposes. When people say “cannabis,” they often mean “marijuana.” They don’t realize that cannabis also refers to hemp plants.
- Think of it like squares and rectangles. A square is a type of rectangle with four sides of the same length. All squares are rectangles, but not all rectangles are squares.
- Hemp is a variety of cannabis with low THC levels. All hemp is cannabis, but not all cannabis is hemp. Some types of cannabis are grown for high levels of THC — those are called marijuana.



1

Knowing Plant Differences

Although both plants are part of the same species, hemp and marijuana have some **significant differences**.



Hemp is grown in over **30 different countries**.



Marijuana

Rarely exceeds 5 feet height

Grows outwards with more leaves and buds

Each plants needs space to grow



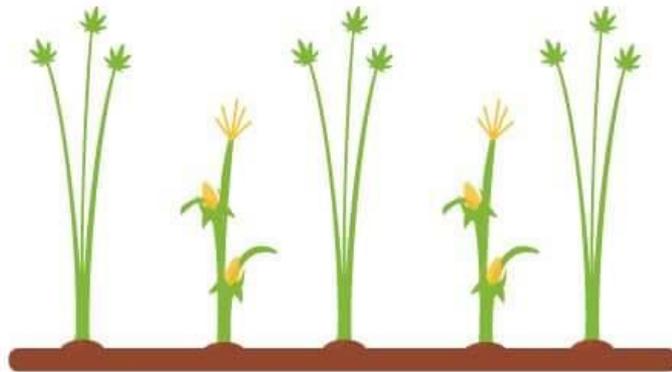
Marijuana remains illegal in most.



Hemp is grown in over **30 different countries.**



Hemp can be **grown in a wide range of areas,** and grows best on fields that produce high yields for corn.



Marijuana remains illegal in most.

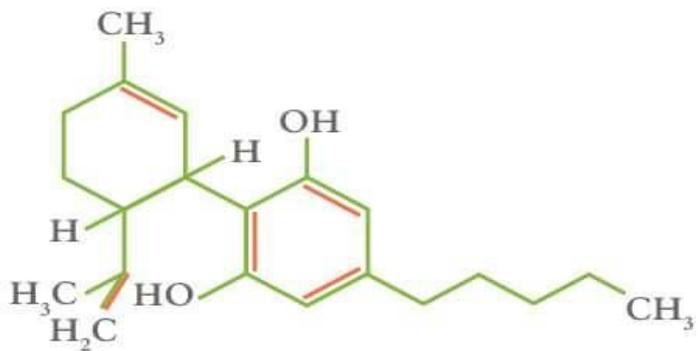


Marijuana **must be grown in generally warm and humid environments** to get the desired quantity and quality of THC-containing buds.



In both marijuana and hemp, **two types of cannabinoids stand out**: Tetrahydrocannabinol (THC) & Cannabidiol (CBD).

CBD

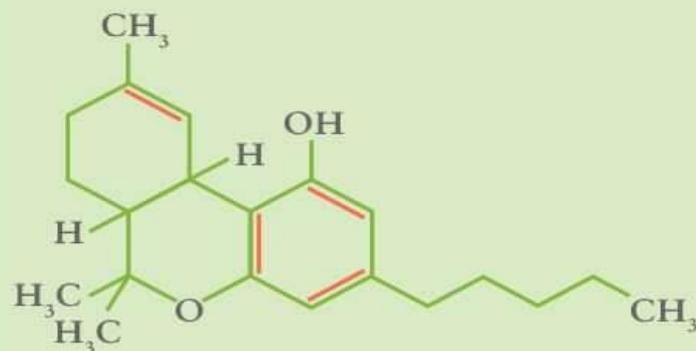


Hemp has barely any THC at all, with average content between 0.05 - 1%.

Hemp contains more CBD than the average cannabis plant.



THC



Flowers of an average marijuana plant contain THC levels of 10-14%.





3

Knowing What Each Oil Contains

Hemp Oil



Marijuana Oil



Concentrations depend on the type of hemp product or marijuana strain used.

Concentrations depend on the type of hemp product or marijuana strain used.

4 Knowing the Uses of Each Oil

High CBD, low THC content



Relaxing



Moisturizing



Soothing



Calming

High THC, low CBD content



Recreational



Psychoactive

HEMP OIL VS CANNABIS OIL

- Hemp oil and Cannabis oil come from different strains of *Cannabis sativa*
- Hemp oil is produced from seeds
- Cannabis oil is produced from flowers, leaves, stalks
- Because hemp oil products are legal in all 50 states, they fill an important role for those who can't access medical marijuana in their state.
- Hemp oil is also an alternative to medical marijuana for those who are interested in using CBD but are looking to avoid the negative effects of psychoactive THC.



HEMP OIL



The difference between CBD from Hemp and CBD from Cannabis strains

CANNABIS OIL

HEMP OIL

PRODUCT:
Hemp bi-product.

LABELS:
Must state that is is made from hemp.

TESTING:
Due to lax testing outside the U.S. products may be highly contaminated.

INGREDIENTS
GMO's, tranfats & additives

EXTRACTION:
BHO, propane, hexane or hydrocarbons.

HEMP:
Typically low in cannabinoid content. A huge amount of hemp is required to extract a small amount of CBD, raising the risk of contaminants because hemp, a bioaccumulator, draws toxins from the soil.

CANNABIS OIL

PRODUCT:
High level CBD. For maximum therapeutic impact, choose both CBD and THC product.

LABELS:
Show ratio of CBD/THC, a manufacturing date and batch number.

TESTING:
Tested for consistency.

INGREDIENTS:
No corn syrup, GMO's, tranfats or additives.

EXTRACTION:
Non-toxic, supercritical CO2.

CANNABIS:
The robust terpene profile of whole plant cannabis enhances the therapeutic benefits of CBD and THC.







WHERE THE GRASS IS ΔLWAYS GREENER



HEALTH BENEFITS ON THE BRAIN

- May slow brain aging
- May help brain “grow” (neurogenesis)
- May protect brain from chronic stress
- Can help different forms of brain cancer
- May reverse Alzheimer’s effects
- Can treat epilepsy and seizures
- Can improve autism symptoms
- Can restore cognitive function
- May stimulate memory and learning
- May increase cerebral blood flow (prevent stroke)
- May protect brain after concussions



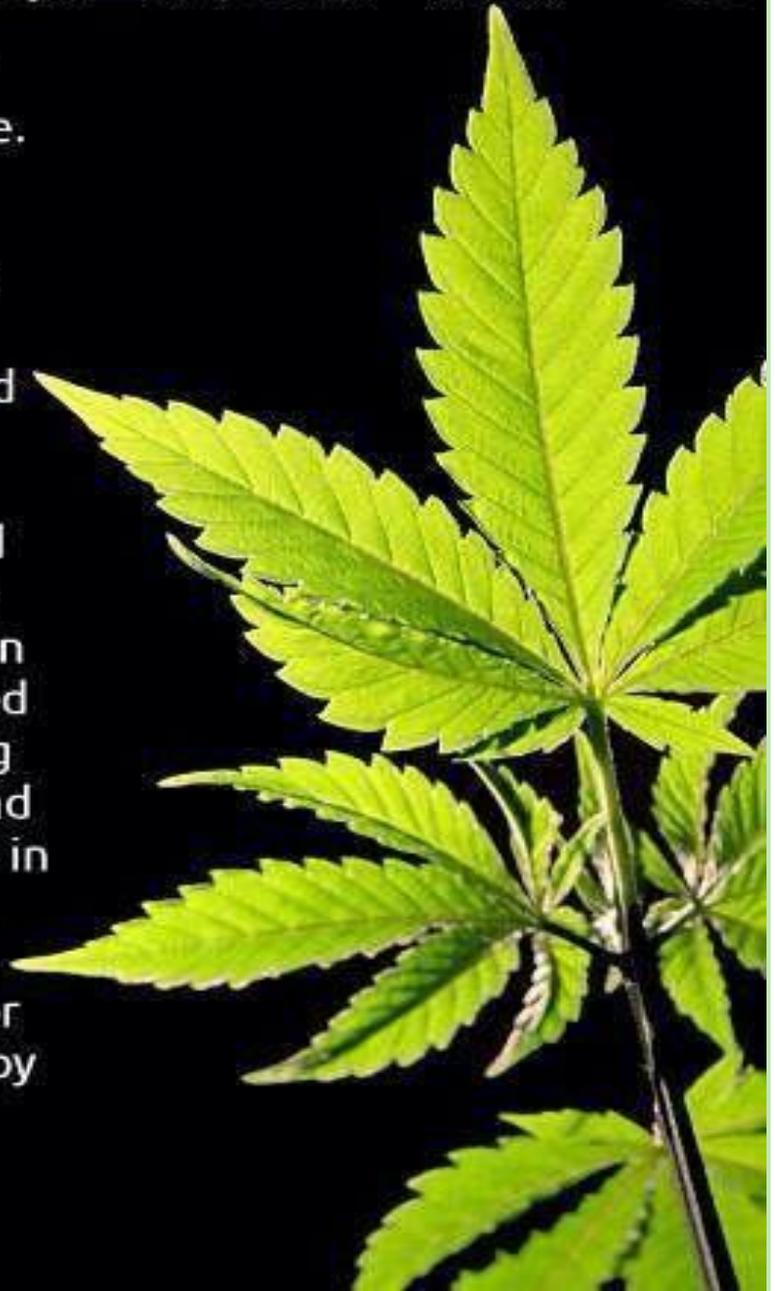
cannabis and alzheimer's

Cannabinoids found in cannabis prevent or inhibit the progression of Alzheimer's disease.

Research done by the Scripps Research Institute in California shows that the active ingredient in cannabis, THC, prevents the formation of deposits in the brain associated with Alzheimer's.

THC was found to prevent an enzyme called acetylcholinesterase from accelerating the formation of "Alzheimer plaques" in the brain more effectively than commercially marketed drugs. THC is also more effective at blocking clumps of protein that can inhibit memory and cognition in Alzheimer's patients, as reported in *Molecular Pharmaceutics*.

Cannabinoids can also potentially prevent or slow the progression of Alzheimer's disease by reducing tau protein phosphorylation, oxidative stress, and neuroinflammation.



AREAS OF THE BRAIN AFFECTED BY CANNABINOIDS

CEREBRAL CORTEX

PLAYS A ROLE IN
MEMORY, THINKING,
PERCEPTUAL AWARENESS
AND CONSCIOUSNESS

HYPOTHALAMUS

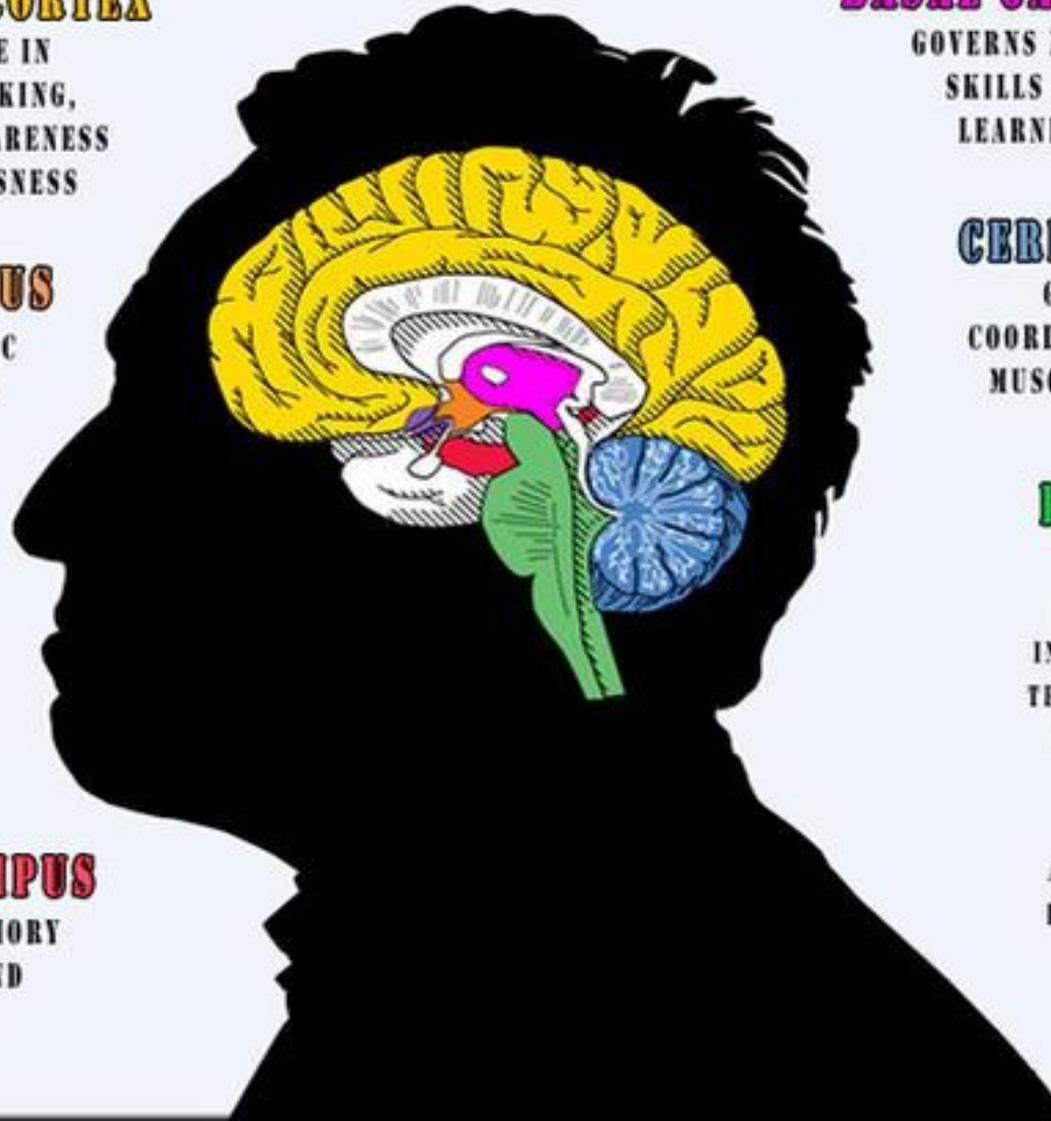
GOVERNS METABOLIC
PROCESSES SUCH
AS APETITE

AMYGDALA

PLAYS A ROLE
IN EMOTIONS

HIPPOCAMPUS

IS KEY TO MEMORY
STORAGE AND
RECALL



BASAL GANGLIA

GOVERNS MOTOR
SKILLS AND
LEARNING

CEREBELLUM

GOVERNS
COORDINATION AND
MUSCLE CONTROL

BRAIN STEM

CONTROLS MANY
BASIC FUNCTIONS
INCLUDING AROUSING,
THE VOMITING REFLEX,
BLOOD PRESSURE
AND HEART RATE

ALSO PLAYS A ROLE
IN PAIN SENSATION,
MUSCLE TONE
AND MOVEMENT

OTHER HEALTH BENEFITS

- May prevent diabetes
- Anti-inflammatory
- Can reduce tumor growth in cancer
- Can relieve anxiety and PTSD
- Can provide pain relief (analgesic)
- Can treat glaucoma
- Can treat neuropathic pain (MS)
- Can treat IBD
- Can relieve arthritis
- May help with metabolism and weight loss
- May improve autoimmune conditions
- Can help with insomnia and nightmares
- Can decrease nausea associated with chemo
- May help with alcohol problems



10 MAJOR HEALTH

1 TREATS MIGRAINES

Doctors in CA report that they have been able to treat over 300,000 cases of migraines with medical marijuana.

2 PREVENTS ALZHEIMER'S

THC found in marijuana works to prevent Alzheimer's by blocking the deposits in the brain that cause the disease.

3 SLOWS TUMOR GROWTH

The American Association for Cancer Research has found marijuana works to slow tumor growth in lungs, breasts, and the brain.



4 RELIEVES SYMPTOMS OF CHRONIC DISEASES

Research shows marijuana can help relieve nausea associated with Irritable Bowel Disease and Crohn's.

5 TREATS GLAUCOMA

The use of marijuana has been shown to reduce intraocular eye pressure in glaucoma patients.



BENEFITS OF MARIJUANA

6 PREVENTS SEIZURES

Marijuana is a muscle relaxant, and contains "antispasmodic" qualities which have shown to be very effective in the treatment of seizures.



7 HELPS THOSE WITH ADD&ADHD

Marijuana is not only a perfect alternative for Ritalin, it treats the disorder without the negative side effects of the pharmaceutical.

8 TREATING MULTIPLE SCLEROSIS

Works to stop neurological symptoms and muscle spasms caused by multiple sclerosis by protecting nerves from damage caused by the disease.

9 CALMS THOSE WITH TOURETTE'S AND OCD

Marijuana slows down the tic's in patients with Tourette's, and relieves the obsessive neurological symptoms in patients with OCD.

10 HELPS RELIEVE PMS

Anecdotal evidence shows that marijuana may relieve pain in severe cases of PMS.

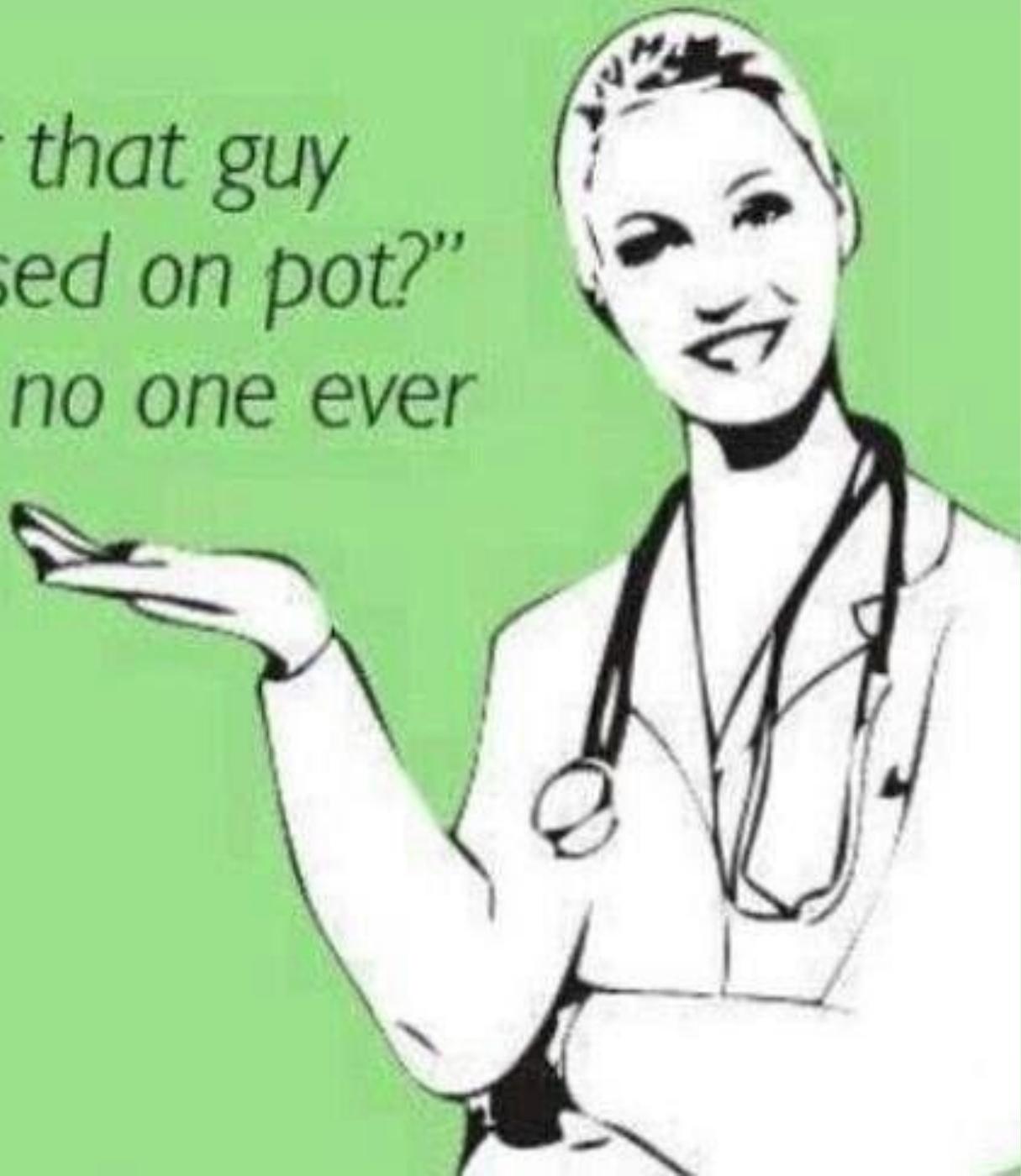


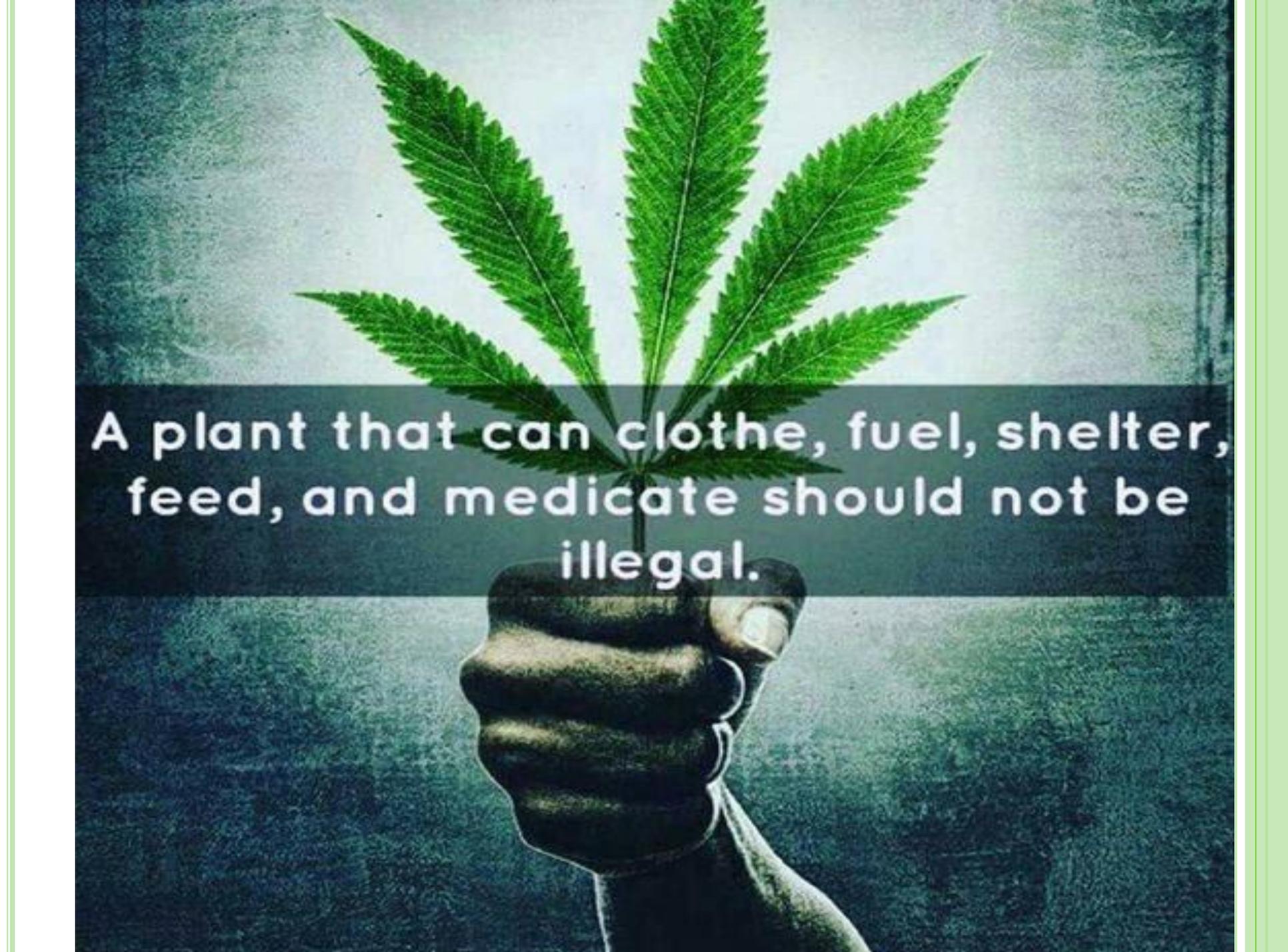
THE ENTOURAGE EFFECT

- The concept that the totality of the therapeutic constituents of the cannabis plant acting together are more effective than any single isolated compound acting alone



*“Remember that guy
who overdosed on pot?”
-Said no one ever*



A close-up photograph of a hand holding a cannabis leaf. The hand is positioned at the bottom, with the thumb and index finger gripping the stem of the leaf. The leaf is bright green and has several serrated, fan-shaped leaflets. The background is a textured, mottled green color. A dark horizontal band is overlaid across the middle of the image, containing white text.

A plant that can clothe, fuel, shelter,
feed, and medicate should not be
illegal.



THE
SACRED
PLANTTM

HEALING SECRETS EXPOSED





**KEEP
CALM**

ITS JUST

**THE END OF MY
PRESENTATION**



That's it

Thank you for your time and attention!

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