

## Tetrahydrocannabinol (THC):

THC has the property to suppress the nervous and immune system functions in the body. Research has shown that THC may aid in autoimmune disease but, should not be used in high doses due to its impairing effects on both nervous and immune system. A small amount of THC is needed to help maintain the stability of all cannabinoids and allows the body to break down them down efficiently. It's been shown that THC has the following benefits:

- Pain
- Lack of Appetite
- Nausea
- Depression
- Diabetes
- Cancer and Tumors

## What are Terpenes?

ETST's products are also high in Terpenes. Terpenes are essential oils found in plants. They are what create the smell, for instance, linalool, found in lavender oil. Research is showing that certain terpenes work synergistically with cannabinoids. Interactions between terpenes and cannabinoids counter a host of conditions, such as inflammation, pain, epilepsy, depression and even cancer. One study demonstrated the use of an essential oil created from black pepper reducing nicotine cravings in cigarette smokers. Black pepper is high in the terpenes myrcene, pinene and caryophyllene and so is cannabis. It stands to reason that cannabis oils or flower could yield similar results.



It is not fully understood how all the chemical compounds in cannabis work together, or how they interact with human body. Certain compounds in combination produce various effects in the body. Take for example limonene, a terpene found in lemons as well as cannabis. In combination with CBD, limonene is an effective anti-depressant medicine. The science, however suggests that whole plant extracts are more effective.



## What is the Entourage Effect?

First described in 1998 by Israeli scientists Shimon Ben-Shabat and Raphael Mechoulam, the basic idea of the entourage effect is that cannabinoids within the cannabis plant work together, or possess synergy, and affect the body in a mechanism similar to the body's own endocannabinoid system. The entourage effect theory has been expanded in recent times by Wagner and Ulrich-Merzenich, who define the four basic mechanisms of whole plant extract synergy as follows:

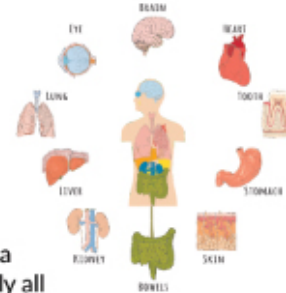
- Ability to affect multiple targets within the body
- Ability to improve the absorption of active ingredients
- Ability to overcome bacterial defense mechanisms
- Ability to minimize adverse side effects.

## What is a true Full Spectrum profile?



A true Full Spectrum product will have CBD as well as other detectable cannabinoids as part of the plants total profile, including CBDa, CBDV, CBN, CBC, CBGa, THC and THCV. It will have other compounds like terpenes, amino acids, proteins, enzymes, fatty acids, esters and flavonoids. These constituents of the whole plant interact with multiple receptors sites in the body, which are part of the endocannabinoid system creating homeostasis and balance.

## What is the EndoCannabinoid System?



The Endocannabinoid System is a master control system of virtually all physiology, regulating homeostasis and preventing disease and aging. Cannabinoids taken from the plants interface with this system through multiple receptor sites. The two main receptors are CB1 and CB2. CB1 receptors are located in the brain and in the central nervous system. CB2 receptors are located in the peripheral organs and cells associated with the immune system.



## High Grade Full Spectrum Cannabinoids



## Cannabinoid Science Guide



**Earth Science Tech, Inc., (ETST)** high potency full spectrum cannabinoid oils are derived from industrial hemp plants, (*Cannabis Sativa*) and are CO2 super critically extracted using high pressure CO2 and very minimal heat insuring that the plant's naturally occurring nutritional properties remain intact. These properties include CBD, CBN, CBC, CBG, CBDV, CBDa, CBGa, & THC.

Many companies are selling CBD isolates and focusing on the benefit of CBD only. Earth Science Tech has a cannabinoid profile with higher content and detectable amounts of other important cannabinoids than most other products on the market that call themselves "Full Spectrum".

We have put together a glossary for you to refer to on the cannabinoids that we are testing for and highlighting in our products. Working together, they create what has been called the Entourage effect in the body.

Here are some of the highlights of these Cannabinoids.

## Cannabidiol (CBD)

CBD is the most prevalent naturally occurring cannabinoid in the industrial hemp plant.

- **Anti-emetic**
  - Reduces nausea and vomiting.
- **Antibacterial**
- **Anticonvulsant**
  - Suppresses seizure activity.
- **Antipsychotic**
  - Combats psychosis.
- **Anti-inflammatory**
  - Reduces small intestine contractions
  - Reduces joint swelling
- **Anti-oxidant**
  - Combats neurodegenerative disorders.
- **Anti-tumoral/Anti-cancer**
  - Inhibits cancer cell growth
- **Anxiolytic** - Combats anxiety
- **Anti-depressant** - Combats depression
- **Anti-spasmodic**
  - Reduces seizures and convulsions
  - Suppresses muscle spasms
- **Neuro-protective**
- **Promotes bone growth**
- **Reduces blood sugar levels**
- **Improves function in the immune system**
- **Reduces risk of artery blockage**
- **Vasorelaxant**
  - relaxation of smooth muscle cells within the vessel walls, particularly in the large veins (called vasodilators), large arteries, and smaller arterioles

## Cannabidiol Acid (CBDa)

CBDa is the acidic form of CBD. It effective within the human body as it can easily get into muscles as well as organs, such as kidneys, spleen, heart, liver, small & large intestinal tract and lungs. CBDa has been researched and shown to have strong potential to aid cancer, inflammation, fungal conditions, as well as aiding to reduce lactic acid and blood glucose levels. It is also anti-emetic which means that it reduces nausea and vomiting.



## Cannabidivarin (CBDV):

CBDV has not been researched extensively. The only key benefits that CBDV has is that it can increase methylation within the brain which has been shown to have potential anti-epileptic and anti-convulsive effects. There is some evidence that it may assist people with Crohn's and HIV/AIDS.

## Cannabinol (CBN):

This is a major compound that has shown to aid insomnia, anxiety, muscle tension and relaxation. This is due to its strong sedative effects and the fact that it can easily pass the blood brain barrier.

- **Analgesic** (Relieves Pain)
- **Anti-Insomnia** (Aids with sleep)
- **Bone Stimulant**
  - Stimulates osteocytes to promote bone growth.
- **Antibacterial**
  - Slows bacterial growth
- **Anti-inflammatory**
  - Reduces inflammation systemically.
- **Anti-Epileptic**
  - Reduces seizures and convulsions.
- **Appetite Stimulant**
- **Anti-Emetic**
  - Reduces vomiting and nausea.
- **Anti-Proliferative**

## Cannabigerol (CBG):

Cannabigerol is one of more than 120 identified cannabinoid compounds found in the plant genus *Cannabis*. Cannabigerol is the non-acidic form of cannabigerolic acid, the parent molecule from which other cannabinoids are synthesized. Cannabigerol is a minor constituent of cannabis. During growth, most of the cannabigerol is converted into other cannabinoids, primarily tetrahydrocannabinol or cannabidiol, usually leaving somewhere below 1% cannabigerol in the plant.

- **Modest Anti-fungal effects**
- **Psoriasis**
  - Inhibiting keratinocyte proliferation.
- **Breast Cancer**
  - Combined with l-limonene (citrus terpene naturally occurring in hemp) has shown promising results against breast cancer.
- **Inhibit MRSA** (Methicillin-Resistant *Staphylococcus Aureus*)

## Cannabichromene (CBC):

- **Antimicrobial**
- **Anti-Viral**
- **Anti-inflammatory**
  - Fights inflammation without activating cannabinoid receptors.
- **Analgesic** (Reduces Pain)
  - Interacts with several receptors involved in controlling pain.
- **Anti-Depressant**
  - Contributes to the overall mood-elevating properties within the plant.
- **Stimulates Brain Growth**
  - Increases the development of brain cells in a process known as neurogenesis.
- **Anti-Proliferative** (Anti-Cancer)
  - Inhibits the growth of cancerous tumors.
- **Migraines**

## Cannabigerol Acid (CBGa):

This is the parent molecule from which other cannabinoids are synthesized. Without some level of CBGA, no other cannabinoids would exist. Researchers believe that CBGA may treat certain types of cancers and schizophrenia. It has also been shown to reduce inflammation, improve bone growth, and slow certain types of bacterial growth.

- **Analgesic**
  - Pain relief
- **Antibacterial**
  - Slows bacterial growth