

# CANNABIS AND HEMP association



## The Endocannabinoid System

1964 Dr. Raphael Mechoulam first isolated THC as the psycho-active cannabinoid in cannabis. 1992 Dr. Mechoulam identified Anandamide, the first cannabinoid.

1988 and 1990 Miles Herkenham was able to successfully bind THC with receptors in the brain and discovered the endocannabinoid system.

Due to its recent discovery the endocannabinoid system is only recently beginning to be understood.

### What is the endocannabinoid system?

- The endocannabinoid system in its normal physiological function regulates all the systems in the body so that no one system in the body doesn't overload another.
- The endocannabinoid system more or less tells your body how it should be functioning in order to maintain homeostasis.
- The endocannabinoid system maintains receptors that bind with lipids (creating a synapse) known as cannabinoids which are located within the body, with a major concentration within the brain. The two main receptors are known as CB<sub>1</sub> and CB<sub>2</sub>, with CB<sub>1</sub> being the most prevalent in the brain and CB<sub>2</sub> located throughout the body and most prevalent in the immune system. CB<sub>2</sub> receptors appear to be responsible for the anti-inflammatory and possibly other therapeutic effects of cannabis.
- The body produces many of its own cannabinoids, the two most popular are 2AG and Anandamide.
- The plant cannabis is known to have 85+ known cannabinoids which easily bind with endocannabinoid receptors which alter the way the body functions. Cannabinoids are also found in the plant Echinacea.

The difference between the endocannabinoid system and cannabinoids is that the endocannabinoid system is located within the body and cannabinoids are the cellular inputs that stimulate and regulate the system.

Endocannabinoids have multiple mechanisms of action, they control appetite, sleep, pain, inflammation, metabolism and storage, cellular cycles and growth, as well as aiding our organs and immune system with their biological roles.

Inactivity of the ECS can lead to a disease called "Clinical Endocannabinoid Deficiency Syndrome" this condition translates into a number of illnesses including migraines, fibromyalgia, multiple sclerosis, irritable bowel syndrome and depression.

When we intake cannabis we are flooding the system with external inputs of cannabinoids that will have an impact one way or the other on the endocannabinoid system. Mostly cannabis has been bred for high 9-delta-tetrahydrocannabinol but with 85+ known cannabinoids available the possibilities of the future of cannabis synthesis is infinite.

The parts of the brain with the highest concentration of CB1 receptors that are impacted:

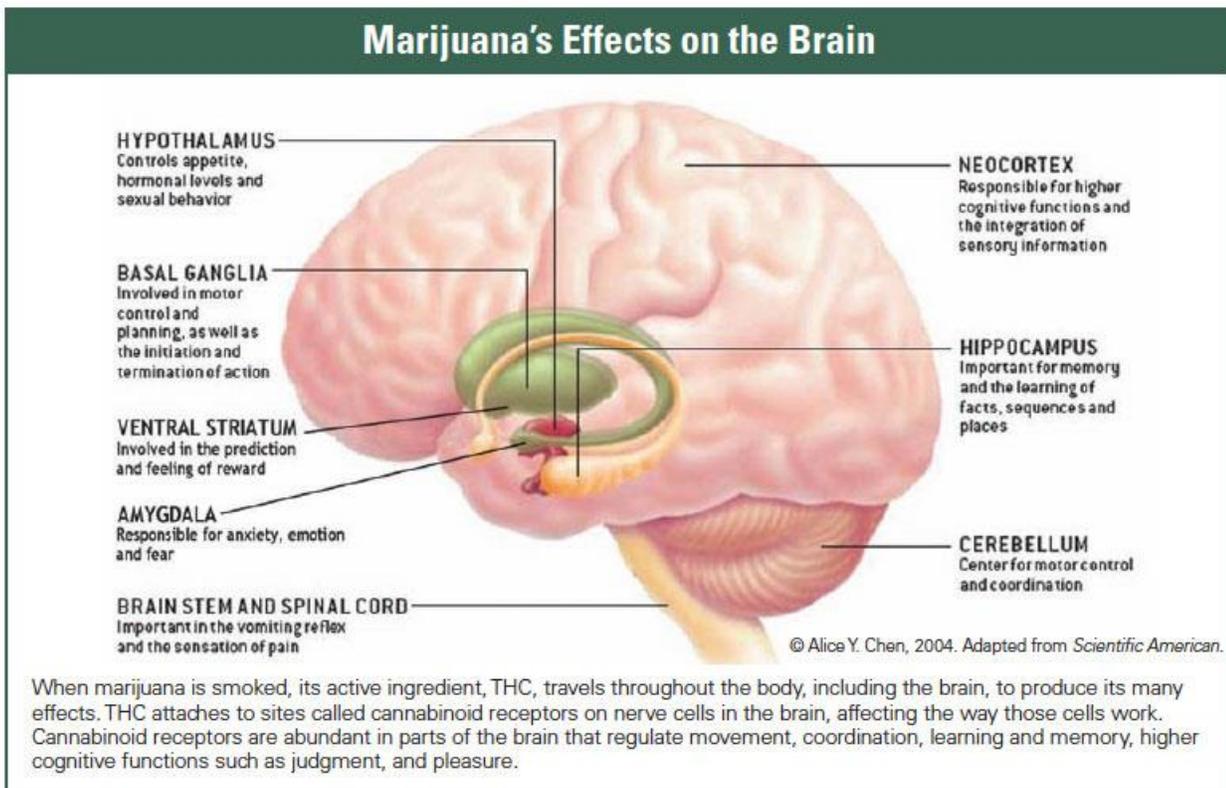


Figure 1.-

Endocannabinoid system is the largest receptor system in the brain.

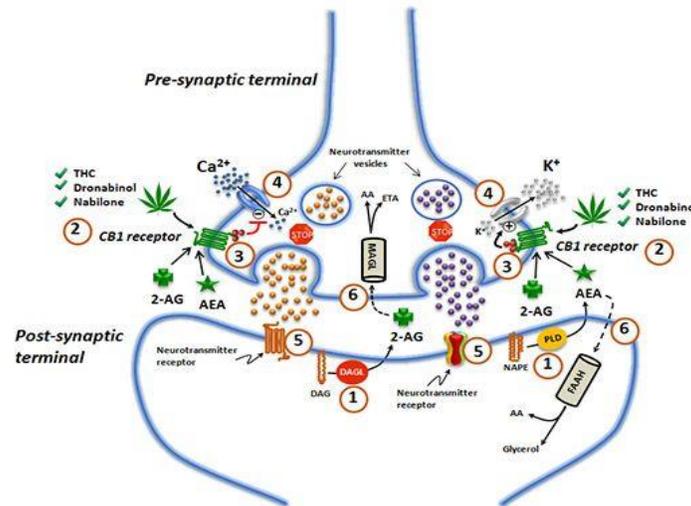
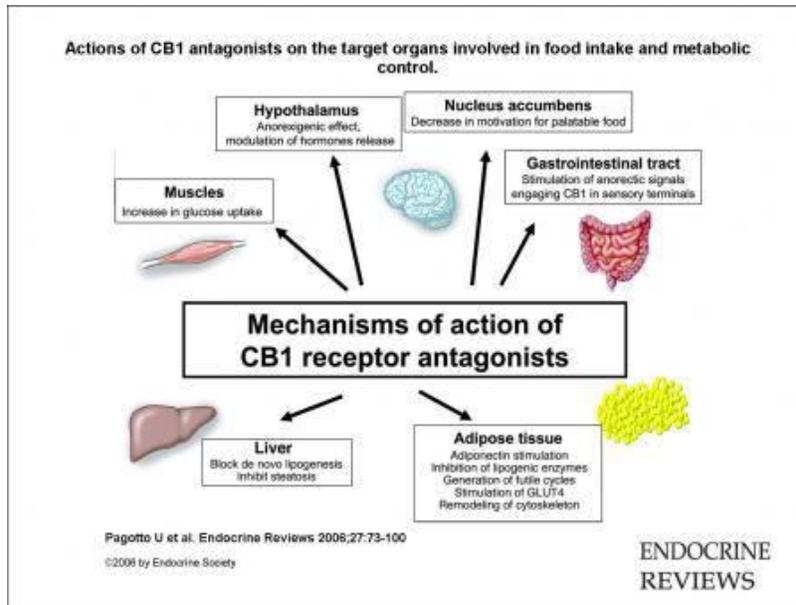


Figure 2-Cannabinoids from cannabis plant bind with neurotransmitters in our endocannabinoid system perfectly, known to fit like “lock and key”.

## Where is the Endocannabinoid System Located in our body?



**Figure 3-Known locations of endocannabinoid receptors**

- When we intake cannabis we are flooding the endocannabinoid system with new inputs.
- Each intake of cannabis represents a different profile of cannabinoids and how that affects our body will be different on each person.
- Overstimulation of the endocannabinoid system can lead to the metabolism speeding up, heart rate can increase, and desire to eat increased instantly by 1000's of times.
- Cannabinoids are lipids and thus fat soluble, they will stay in the body working for 14-30 days per use.
- THC when looked under a microscope closely resembles the endogenous anadamide making the body use THC as a substitute, reacting similarly as this particular compound.
- CBD also exerts a similar effect of 2AG, the body processes it as such.
- All mammals and most living animals have endocannabinoid systems we now know.

Endocannabinoids are also naturally present within breast milk for the purpose of:

- Regular sleeping pattern
- Stable appetite
- Healthy metabolism
- Strong Immune System