# Endocannabinoid System and CBD-Cannabidiol

# The Science of Cannabis

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## The Endocannabinoid System

Cannabis has been used for thousands of years, both recreationally and medically. People all over the world know the effects of cannabis, yet until 20 years ago, no one knew how it worked within our bodies. In the early 1990s, research scientists identified a system they named "the endocannabinoid system”.  This system is located in our brains and bodies.  The system is made up of cell receptors and of the chemicals that bind to these receptors. This system has been identified in the some of the most primitive creatures on earth. It has been found to be the most widespread receptor system in the human body, explaining why cannabis has so many different effects. The endocannabinoid system appears to regulate many important physiologic pathways in the human body, including gastrointestinal activity, cardiovascular activity, pain perception, maintenance of bone mass, protection of neurons, hormonal regulation, metabolism control, immune function, inflammatory reactions, and inhibition of tumors cells.

The cannabinoid receptor system has two kinds of receptors:

•     CB1 receptors – found mostly in the brain, spinal cord and other parts of the body including the heart, uterus, testis, liver, small intestine and peripheral cells

•     CB2 receptors – found mostly on cells of the immune system, including the spleen, T-cells, B-cells and macrophages

A group of compounds, called cannabinoids, bind to the receptors. Cannabinoids come from three different places:

•     Endocannabinoids – these are produced by the body on demand, usually in tesponse to injury; five different endocannabinoids have been identified, including anandamide and 2-AG

•     Synthetic cannabinoids – these are produced by scientists in a laboratory and  include dronabinol (Marinol) and nabilone        (Cesamet)

•     Phytocannabinoids – these are produced by the cannabis plant; there are over 85 cannabinoids in the cannabis plant, including THC and cannabidiol as the main two

The cannabinoids interact with the receptors, much like a lock and key. The receptor is the lock and the cannabinoid molecule is the key. When the cannabinoid "key” attaches to the receptor "lock” (located in the cell wall), a reaction is triggered resulting in an effect on the brain and body. For instance, the area of the brain that controls memories is called the amygdala. When cannabinoids bind to the receptors on the cells of the amygdala, memory is affected. For those that suffer from past traumatic events who relive horrible memories (such as those with Post Traumatic Stress Disorder), the triggering of the cannabinoid receptor appears to change the brain function and memories are minimized.

Since the discovery of the endocannabinoid system, researchers have been working on developing synthetic cannabinoids, hoping to find a compound that gives the benefits of cannabinoids without the psychoactive effects. This is still an ongoing project and most synthetic cannabinoids do not have the same effects as the cannabinoids in the cannabis plant.

Many researchers are concentrating on studying the endocannabinoids (the cannabinoids produced in the body), in order to understand why our bodies make these compounds and how they regulate the many different physiologic processes in the body.

**References**

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## CBD – Cannabidiol

Cannabidiol, the second most common cannabinoid in cannabis, is a non-psychoactive compound with many beneficial effects.