Cannabidiol, a non-psychoactive component of the cannabis plant, has generated significant interest among medical scientists in recent years, but researchers are still sorting out how CBD exerts its therapeutic impact on a molecular level.

**CBD and FAAH**

CBD has little binding affinity to either the CB1 or CB2 cannabinoid receptors. Instead, CBD indirectly stimulates endogenous cannabinoid signaling by suppressing fatty acid amide hydrolase (FAAH), the enzyme that breaks down anandamide.

Anandamide is an endogenous cannabinoid compound that activates the CB1 receptor, which is concentrated in the mammalian brain and central nervous system. Less FAAH means more anandamide is present for longer duration in the body. And more anandamide means greater CB1 signaling.

By inhibiting the enzyme that metabolizes and destroys anandamide, CBD enhances the body’s innate protective endocannabinoid Российской. At the same time, CBD powerfully opposes the action of THC at the CB1 receptor, thereby muting the psychoactive effects of THC.

CBD also stimulates the release of 2-AG, a major endogenous cannabinoid compound that activates both CB1 and CB2 receptors. CB2 receptors are predominant in the peripheral nervous system and the immune system.

**The Vanillid Receptor**

Whereas CBD does not bind to either of the two known cannabinoid receptors, it directly interacts with other G-protein-coupled receptors to confer a medicinal effect. CBD binds to the TRPV-1 receptor, which mediates pain perception, inflammation, and body temperature.

If high concentrations of CB1 are present in the body, anandamide levels are said to be reduced. CB2 receptors also play a significant role in the brain. They down-regulate the release of other neurotransmitters such as dopamine and glutamate.

Jose Alexandre Crippa and his colleagues at the University of Sao Paulo in Brazil and King’s College in London have conducted pioneering research into CBD and the neural correlates of anxiety.

**5-HT**

5-HT is a member of the family of 5-HT receptors, which are activated by the neurotransmitter serotonin.

In both the central and peripheral nervous systems, 5-HT1A receptors trigger an intracellular cascade of chemical messages to produce an excitatory or inhibitory response. CBD triggers an inhibitory response that slows down 5-HT1A signaling.

LSD, mescaline, magic mushrooms, and several other hallucinogenic drugs activate a different type of 5-HT receptor that produces an excitatory response.

**GPR55**

Whereas cannabidiol activates the TRPV-1 vanillid receptor and 5-HT1A serotonin receptor, CBD functions as an antagonist that blocks or deactivates another G-protein-coupled receptor known as GPR55. GPR55 may actually be a third cannabinoid receptor. Scientists are still not sure if it belongs to a larger family of cannabinoid receptors.

**CBD: How It Works**

By Martin A. Lee

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<th>Cannabinoid Mechanism of Action</th>
<th>Summary of What Scientists Have Learned</th>
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<td><strong>Endocannabinoid Synthesis</strong></td>
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<td><strong>Phytocannabinoid Synthesis</strong></td>
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<td><strong>Therapeutic Impact on a Molecular Level</strong></td>
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<td><strong>Highly effective free radical chemicals are produced when animals use oxygen to burn food for fuel.</strong></td>
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<td><strong>A great deal of data suggests that many problems associated with aging stem from the inability of the organism to protect itself against free-radical-induced inflammation and oxidative stress, which provides a fertile field for the development of neurodegenerative and other age-related illnesses.</strong></td>
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<td><strong>Cardiovascular, autoimmune, neurological disorders, cancers, and the aging process itself are all thought to have free radicals as causative agents.</strong></td>
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<td><strong>Free radicals are implicated in the formation of protein amyloid plaques, which attack neural synapses and prevent normal chemical and electrical signaling activity in the brain.</strong></td>
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<td><strong>By binding to free radicals, antioxidants can break the pathological cycle that is associated with the progression of Alzheimer’s disease. Several studies have shown that CBD blocks Alzheimer’s plaque formation by a mechanism not involving the cannabinoid receptors.</strong></td>
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<td><strong>The antioxidant properties of CBD exceed the antioxidant potency of vitamins C and E. When combined with THC, the antioxidant properties of cannabis are even stronger.</strong></td>
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<td><strong>Once again, whole-plant cannabis therapeutics is greater than the sum of the herb’s individual medicinal components.</strong></td>
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Martin A. Lee is the cofounder of the media watch group F A R, the author of three books, including Acid Dreams, and the cofounder of Project CBD. He is currently writing a social history of cannabis, which will be published next year by Scribner’s. He can be reached at martin-lee@projectcbd.org
CBD-rich Cannabis

The High Times Medical Cannabis Cup has instituted a new award category: “CBD-rich.” First place (9.23% CBD) went this year to a strain called “Alaskan Thunderfuck,” entered by the Master Control Unit Collective. The MCUC is at an undisclosed location, on the lam from the Word Police.

Second place went to “Jamaican Lion,” entered into the competition by Elemental Wellness of San Jose. “Jamaican Lion comes from Rock Bud, which won the Cannabis Cup in 2003,” the grower told the Center, and the Berkeley Patients Group. Trusted growers will now produce clones so that patients will be able to grow their own Omritas by next spring, for sure.

By allowing others to grow out the plants — instead of remaining the sole source of Omrita flowers — Miguel gives up the opportunity to charge top dollar for his herbs and products made from it.

Based on anecdotal reports reaching Project CBD, demand for Omrita will be strong from patients. It is said to quell pain and intestinal disorders, while sharpening focus. "Giving it away seemed like the right thing to do," says Miguel. "Of course I need to make a living, but if something is helping people this much, it needs to be available." Miguel is 38 and does not have a family to support (yet). His dream is to have some arable land to farm.

Clones are also being provided to edible- and tincture makers. "The more patients that use CBD and report the effects, the more we'll know what it's good for," says Miguel.

Miguel has sought advice from California Botanicals laboratory about creating Omrita-based tinctures and salves. He has already created one for veterinary use. This spring Miguel’s beloved 12-year-old Chocolate Labrador Retriever, Samantha, was diagnosed with a cancerous mass in her jaw. He had eaten away the main TMJ joint and the vet didn’t recommend chemo because if the mass shrunk, there wouldn’t be anything to hold the jaw in place. There have been no studies examining the effectiveness of CBD on cancer in dogs, but Miguel thought it couldn’t hurt to give his Omrita a try.

He used ethanol to make an extract with 3:1 CBD-to-THC ratio. He gave her one dose (15 milligrams CBD, 5 THC) per day in her food, and occasional sublingual doses. These, he says, “definitely onset much quicker than digestive. Her behavior while medicated is similar to humans — seeking out crumbs of food, kind of like the munchies... Hiding out in long-lost corners... playful and energetic.”

The vet is aware of Miguel’s unusual treatment plan and impressed by the big old Lab’s response. Dogs with sarcomas don’t usually have Samantha’s healthy appearance, or high energy and spirits, he told Miguel. Miguel advises that Omrita grows very well from cuttings, both outdoors in soil and indoors in coco, and he suggests using “Less nutrients and a slightly higher pH than normal.”

Omrita is a very stout plant with strong side branching and large cola.