

When Science Goes to Pot

By Larry Gabriel for MetroTimes

Welcome to the [world of science](#). I didn't do well in [high school science](#) and have pretty much avoided addressing scientific subjects formally until now.

That's because I've been delving into the science of [marijuana](#) to try to figure out some of the hows and whys of [medical marijuana's](#) workings.

There are some 20,000 published scientific papers analyzing [marijuana](#) and its parts. So don't let anybody tell you there is too little known about [marijuana](#) to make a call regarding its usefulness.

Most of those papers are beyond my understanding, and making sense of those I could understand came with the help of a [medical dictionary](#). But at least I'm trying.

Most public policy and attitudes about the plant have been formed without the help of science. In fact, when [President Richard Nixon](#) ramped up the drug war in the early 1970s, it was in direct contradiction of the information and recommendations of his own [marijuana](#) task force.

There are probably lots of things we believe without a scientific basis, but maybe we're at a point where more clearheaded inquiry is possible. So here we go. First of all, delta-9-[tetrahydrocannabinol](#), or THC as we commonly call it, is not the only active substance in [marijuana](#). We know about it mostly because it's what gets you high. However it is not the only component that has medicinal value.

In my last column on [medical marijuana](#), I posed questions about what in [marijuana](#) gives you the munchies, what relieves spasm and [what causes memory loss](#) — not to mention numerous other effects such as pain reduction and [nausea relief](#). I can't give you [definitive answers](#) to all of that, but here is an explanation of how our bodies interact with [marijuana](#).

The first thing we need to get a grip on is the [cannabinoid system](#) in the human body. Apparently, most multicellular organisms have a [cannabinoid system](#) and [cannabinoid receptors](#) that process the [endocannabinoids](#) (naturally occurring cannabinoids) that they produce. The system plays a role in regulating things like body temperature, blood pressure, hunger, etc.

Or as is formally stated by Neil Goodman, Ph.D., in “An Overview of the Endogenous **Cannabinoid System**,” research suggests “that the **endocannabinoids** and their receptors constitute a widespread modulatory system that fine-tunes bodily responses to a number of stimuli.”

“It’s a **regulatory system** for things like **appetite**, circulation, pain response and **immune response**,” says **Paul Armentano**, deputy director of the National Organization for the Reform of **Marijuana** Laws and expert witness on **marijuana** science.

*“Cannabinoids seem to regulate or maintain all of these different functions. ... When mice are bred not to have these receptors, a couple of very shocking studies show they die almost immediately. They suffer from failure to thrive and have no **appetite** at birth. If you force them to stay alive, they die of old age long before they become old. If this system doesn’t work right, people don’t survive.” ~ Paul Armentano, Deputy Director of NORML*

A functioning **cannabinoid system** is essential for good health. Cannabinoids are found around injuries stabilizing nerve cells and promoting anti-inflammatory responses. There are cannabinoids in mothers’ milk that give babies the munchies so that they learn how to eat.

Well, now, what are the cannabinoids and how do they affect specific maladies? The best-known is the aforementioned **delta-9-tetrahydrocannabinol**, aka THC. It is the main **psychoactive ingredient** in **marijuana** and produces the euphoria **recreational users** seek. It’s also what gives you munchies.

THC is very similar to the endocannabinoid (naturally occurring) that the body produces to tell you it’s time to eat. Therefore when **marijuana** is eaten, THC binds to the **cannabinoid receptors** and, in addition to the euphoria, you feel like eating. There are further indications that it specifically stimulates taste buds related to sweets in the mouth.

Dr. William Courtney giving a lecture on the Endogenous Cannabinoid System (ECS) at a medical marijuana conference catering to the elderly in Laguna Woods, California. (Photo credit: MedicalMarijuana411.com)

Of up to 100 cannabinoids, a handful are known to show promise as **therapeutic agents**. The second most widely known cannabinoid is cannabidiol, or CBD, the most exciting cannabinoid for **medical science**.

There are indications it's helpful for inflammation, nerve pain in disorders such as **multiple sclerosis** and Crohn's disease; it's an antispasmodic, anticancer, antidiabetic and neuroprotective substance.

“What makes **marijuana** so interesting is that we can explain why we get the results that we get,” says Armentano. “We have this strain that is high in CBD. We know this person has Crohn's disease. We know that CBD interacts with receptors in the **gastrointestinal tract** and it reduces inflammation.”

Most other known cannabinoids have a variety of **healing properties** that support those of THC and CBD. In fact, natural **marijuana** as a whole seems to work better than any of its isolated components.

Cannabinoids as a group have a synergistic effect that produces better outcomes and fewer side effects. And those effects are both palliative (relieving symptoms) and curative (modifying the disease itself).

For instance, laboratory testing has indicated CBD slows down the proliferation of certain cancers, lowers the incidence of **diabetes**, and slows the development of **multiple sclerosis**. Also, some **traditional drugs** seem to work better when used in tandem with **marijuana's** cannabinoids and, over time, some patients have less need to take their **traditional drugs**.

Pharmaceutical companies have taken note of this and, mostly outside the United States, many drugs using **marijuana** are in the pipeline. In the United States, it is almost impossible for a **pharmaceutical company** to even experiment with drugs using any naturally occurring part of **marijuana** because it's listed as a Schedule 1 drug.

There are synthetic cannabinoids such as dronabinol (**marinol**) and WIN 55,212-2 available in the United States. However, a British company, GW **Pharmaceuticals**, has developed an oral spray, **Sativex**, which employs natural parts of **marijuana** and treats MS. It is available in several other countries, including **Canada**.

In the past, most **marijuana** breeding has been to increase the THC level. Now people are thinking about breeding the plant for higher CBD or other

cannabinoid levels. Also, we're learning about cannabinoids in other plants, such as echinacea, that hold some promise for future pharmacological developments.

More is not necessarily better. Some indications show that there is an optimum level of cannabinoids to affect diseases — too little or too much renders it ineffective. The good thing is that no one has ever died from a [marijuana](#) overdose. The same thing cannot be said of many other drugs.

However, one thing prevalent in anecdotal accounts of [medical marijuana](#) use is not playing out under scientific analysis. Patients have reported getting different euphoric effects from [cannabis sativa](#) and [cannabis indica strains](#). Science finds no appreciable difference in the cannabinoids in those plants.