The Cannabigerol Connection

Officer Dick Downey's Re-education Protocol

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We're always being bombarded with everything THC & CBD while many of the other phytocannabinoids in marijuana sometimes take a back seat. This document takes a close look at the Cannabigerol (CBG) to understand its important role in the cannabis plant, its chemistry and its medicinal potential.

Why Cannabigerol (CBG) is Important

Cannabigerol, aka CBG, is often referred to as a 'minor' phytocannabinoid in the cannabis plant, but its role is significant. CBG was discovered in 1964 by scientists as a constituent of hashish. A bigger scientific discovery happened in 1975 when researchers identified CBGa (i.e., Cannabigerolic Acid form of CBG) as the first cannabinoid formed in the cannabis plant (*source: Hightimes.com*). In other words, CBGa is the first expression of a cannabinoid in cannabis. Furthermore, CGBa is an important precursor to THCa, CBDa (Cannabidiolic Acid) and CBCa (Cannabichromene Acid).

The Chemical Properties of CBG

Like all phytocannabinoids, CBG is a hydrophobic lipid (i.e., the carbon-hydrogen bonds are nonpolar, meaning they are not water soluble) consisting of a 21-carbon chain attached to an aromatic hydrocarbon ring. The chemical formula of CBG is C21H32O2; that of THC is C21H30O2, as is that of CBC (Cannabichromene) and CBD. CBC and CBD are both isomers of THC, meaning that they share the same molecular formula but have different structures (*source: sensiseeds.com*).

Definitions: A 'nonpolar chemical bond' is a type of chemical bond which has no positive or negative 'ends'. When atoms bond together to form molecules, they share or give electrons. If the electrons are shared equally by the atoms, then there is no resulting charge and the molecule is nonpolar. Polar molecules are the opposite and have a positive or negative charge. (*source: study.com*)

CBG is closely related to several other cannabinoids including its precursor CBGa (C22H31O4). CBG itself degrades to CBD and CBC. And it is also possible for CBG to degrade directly to THC through the actions of the acid synthase enzyme unique to each cannabinoid. This process is relatively new to the scientific community, as it was previously believed that THC was an end-product of CBD degradation (*source: sensiseeds.com*). "The presence and relative quantities of these specific enzymes are what controls which cannabinoid is produced by a specific strain of cannabis. These enzyme differences are responsible for the different phenotypes of cannabis strains. This is the reason for the variability of concentrations of each of these substances in different cannabis strains" (*source: hashmanriver.wordpress.com*).

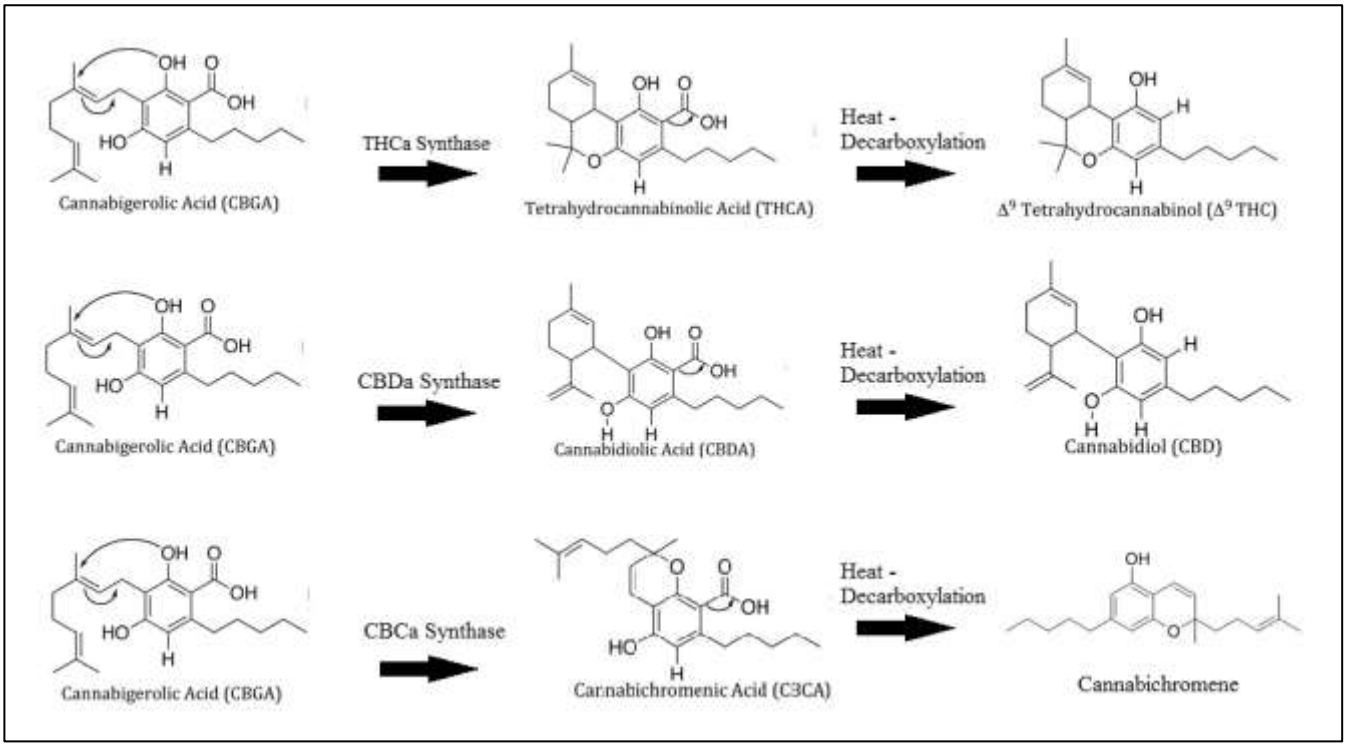

Image recreated from this original source: hashmanriver.wordpress.com

Possible Therapeutic Benefits of CBG

CBG is classified as an antagonist of the CB1 receptor, which affects the central nervous system. The logical hypothesis put forth is that CBG is believed to partially neutralize the uneasiness of the effects sometimes experienced with too much THC. There is some early evidence that suggest CBG might exert influence on the CB2 receptor, but it not clear whether this effect is agonistic or antagonistic.

Definitions: Agonist drugs mimic the effects of neurotransmitters naturally found in the human brain. In contrast to agonist drugs which bind to the neurotransmitters in the brain, antagonist drugs do the opposite: they block the brain's neurotransmitters.

CBG may exert an effect on the 5-HT1 receptor, which assists in the regulation of serotonin release, and the adrenoceptor, which controls expression of adrenaline and noradrenaline throughout the central nervous system. (https://sensiseeds.com/en/blog/cannabinoid-science-101-what-is-cannabigerol/)

Inhibits the uptake of Gamma-Amino Butyric acid (GABA), which is an amino acid that acts as a neurotransmitter in the central nervous system. It inhibits nerve transmission in the brain, calming nervous activity. When GABA is inhibited it can lessen anxiety and reduce muscle tension. (https://www.youtube.com/watch?v=qu1riqdFRg4)

Possible use as a COX-2 inhibitor, similar to the popular non-steroidal anti-inflammatory drugs (NSAIDs). In one study, CBG, THC and CBD all appeared to inhibit COX-2 enzymes, although higher concentrations were required compared to traditional NSAIDs. (https://www.jstage.jst.go.jp/article/bpb/34/5/34_5_774/_article)

Potentially reduces intraocular pressure.
(https://sensiseeds.com/en/blog/cannabis-and-glaucoma/)

May reduce inflammation in the colon for IBD and IBS patients
(http://www.sciencedirect.com/science/article/pii/S0006295213000543)

Important: Often times we see claims in the media that cannabis offers disease-specific therapeutic benefits for humans based on pre-clinical trials in animals. Such a leap in logic is irresponsible, creates false hope and is often used for marketing or public relations purposes by laypersons. A drug that works well or shows promise in animals will not necessarily be effective in humans. Preclinical trials of any drug only answers basic questions about a drug's safety and are not a substitute for studies of ways the drug will interact with the human body.

Sources:

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