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CANNABINOID CHRONICLES

Medical Cannabis News and Information

Medical Cannabis 101: Cannabinoids and the Endocannabinoid System

Cannabis. The enduring plant that has been used by humans as a medicine and intoxicant for thousands of years has had a rough go over the last century or so. Prohibited in many countries, it has been the target of a protracted, expensive, and virtually useless drug war. So it's ironic that the original goal of studying a psychotropic cannabinoid found in cannabis, to figure out how people get "high", has led to the fairly recent discovery of a novel physiological control system in the human body, the **endocannabinoid system** (ECS). This chemical signalling system is now recognized as playing a significant role in regulating our physiological and neurological systems; it has been shown to regulate sleep, appetite, psychological well-being and other vital functions, and also help reduce the likelihood of certain kinds of diseases. Who would have thought? Certainly not Anslinger.

Cannabinoids, first identified in the 1940's, are a class of diverse chemicals that produce various physiological and behavioural effects by interacting with an organism's cell membrane at specific cannabinoid receptor sites. THC, the principal psychoactive cannabinoid in cannabis, was first identified and synthesized in 1964 by Drs. R. Mechoulam and Y. Gaoni. We now know that there are at least 67 known natural cannabinoids found in the cannabis plant i.e. *Cannabis sativa L.*, *Cannabis indica Lam.* or *Cannabis ruderalis*; there are also several other plants that produce cannabinoids, such as *echinacea purpurea*. These plant-based cannabinoids are called phytocannabinoids.

Cannabinoid receptors, discovered in 1988, are known to exist in the nervous system of animals more advanced than hydra and mollusks. Genetic research of

cannabinoid receptors in different species has led scientists to estimate that the endocannabinoid system evolved over *500 to 600 million years ago*. So contrary to the belief that a plant, in isolation, produces compounds that exert an effect upon specific cell membrane receptors, our cannabinoid receptor response occurs because we produce our own cannabinoids as well and our receptors recognize both types, whether from within or without. These endogenous (made in the body) compounds are called **endocannabinoids** and differ from phytocannabinoids and synthesized cannabinoids (manufactured e.g. Dronabinol and HU-331). There are at least 5 known endocannabinoids in the body, and over a dozen synthesized cannabinoids.

Two types of cannabinoid receptors have been discovered throughout the body, designated as CB₁ and CB₂ (cannabinoid receptor 1 and 2 respectively), with growing evidence of others. The CB₁ receptors are found primarily in the central nervous system (brain, cerebellum) and male and female reproductive systems; CB₂ receptors are found largely in the immune system, with high concentrations in the spleen. Even cartilage tissue has cannabinoid receptors. The receptors are activated (an action is imparted) by any of the three types of receptor proteins, or cannabinoids, as described above. Substances that activate cell membrane receptors are called agonists.

The endocannabinoid system includes: various lipids (e.g. anandamide, 2-arachidonoylglycerol) known as endocannabinoids; enzymes that synthesize and degrade the cannabinoids; and the cannabinoid receptors (CB₁ and CB₂). The endocannabinoid system performs different tasks in each tissue but the goal is always the same: **homeostasis**, the maintenance of a stable internal environment despite fluctuations in the external environment.

Link between alcohol use, but not cannabis use, and domestic violence

Alcohol use, but not cannabis use, increases the risk of violence between partners, according to studies done at the University of Tennessee in Knoxville, USA. The two studies among college students found that men (n=67) under the influence of alcohol are more likely to perpetrate physical, psychological or sexual aggression against their partners but not men under the influence of cannabis. Women (n=173), on the other hand, were more likely to be physically and psychologically aggressive under the influence of alcohol but, unlike men, they were also more likely to be psychologically aggressive under the influence of cannabis. The studies are among the first to investigate the timing of alcohol and cannabis use and intimate partner violence in college students. The two studies included male and female college students who were at least 18 years old, had been a relationship for at least a month that involved two days a week of face-to-face contact, and had consumed alcohol in the previous month. The subjects completed an online diary once a day for 90 days.

Source: University of Tennessee at Knoxville. "Research finds link between alcohol use, not pot, and domestic violence." ScienceDaily. ScienceDaily, 27 January 2014. www.sciencedaily.com/releases/2014/01/140127112733.htm

Changes of the endocannabinoid system (ECS) associated with irritable bowel syndrome

Endocannabinoid and endocannabinoid-like fatty acid amide levels in blood plasma correlate with pain-related symptoms in patients with irritable bowel syndrome (IBS) suffering from diarrhoea or constipation. Patients with IBS and diarrhoea had higher levels of 2-AG and lower levels of oleoylethanolamide and palmitoylethanolamide. In contrast, patients with constipation had higher levels of oleoylethanolamide. Researchers concluded that the "here reported changes support the notion that the ECS is involved in the pathophysiology of IBS and the development of IBS symptoms."

Source: Fichna J, et al. PLoS One. 2013;8(12):e85073. <http://www.ncbi.nlm.nih.gov/pubmed/24386448>

Medical Cannabis 101 Sources (from front page):

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Werner, Clint (2011). *Marijuana, Gateway to Health*. San Francisco, CA: Dachstar Press. pp. 9-15

American Herbal Pharmacopoeia announces finalization of historic cannabis monograph

On 10 December the American Herbal Pharmacopoeia (AHP) announced the finalization of a monograph on Cannabis. Like all AHP monographs, the publication provides standards of identity, purity, analysis, and quality, as well as information on the cultivation and storage of the botanical and its preparations. According to AHP President Roy Upton; "Cannabis has been used medicinally pretty much throughout the entire timeline of written history, and from archeological evidence, far beyond into antiquity." This monograph will be followed by a Therapeutic Compendium, which will present a comprehensive review of the world's historical and scientific data on the use of the plant. The preparation of the monograph was suggested by Americans for Safe Access.

According to Upton: "This monograph is historic in that it is the first formal pharmacopoeial monograph on cannabis developed in the US in more than 70 years. The first monograph was introduced into the United States Pharmacopoeia in 1850 and was removed from the 12th edition in 1942. Considering the widespread use of cannabis, it is important for there to be quality control guidance whether used for medicinal or non-medicinal purposes." Several members of the IACM were involved in the preparation of the book, mainly Mahmoud ElSohly and Ethan Russo, and in addition Vincenzo Di Marzo, Rudolf Brenneisen, Franjo Grotenhermen und Raphael Mechoulam. It is intended to make the monograph available before the end of 2013. To order the AHP Cannabis Monograph, go to: www.herbal-ahp.org/

Source: http://www.herbal-ahp.org/documents/press_releases/Cannabis_Press_Release.pdf

Legalizing medical cannabis reduces suicides

The legalization of medical cannabis in certain states of the USA was associated with a 10.8% and 9.4% reduction in the suicide rate of men aged 20 through 29 years and 30 through 39 years, respectively. Estimates for females were less precise. The negative relationship between legalization and suicides among young men is consistent with the hypothesis that marijuana can be used to cope with stressful life events. However, this relationship may be explained by alcohol consumption. The mechanism through which legalizing medical marijuana reduces suicides among young men remains a topic for future study.

Source: Anderson DM, et al. Am J Public Health. 2014 Jan 16. <http://www.ncbi.nlm.nih.gov/pubmed/24432945>

CBD is neuroprotective after damage of the sciatic nerve

In young rats the consequences of mechanical damage to the sciatic nerve was reduced by CBD (cannabidiol). Authors concluded that “the present results show that CBD possesses neuroprotective characteristics that may, in turn, be promising for future clinical use.” Institute of Biology, University of Campinas, Brazil.

Source: Perez M, et al. EUR J Neurosci. 2013 Aug 25. <http://www.ncbi.nlm.nih.gov/pubmed/23981015>

The number of CB2 receptors is increased in certain joint cells in rheumatoid arthritis (RA)

In certain joint cells (fibroblast-like synoviocytes) of patients with rheumatoid arthritis the number of CB2 receptors is increased. Proinflammatory mediators up-regulate the number of CB2 receptors, which in turn reduce the production of proinflammatory cytokines. Authors conclude that these “data suggest that CB2R may be a potential therapeutic target of RA.” Department of Rheumatology, Guanghua Hospital, Shanghai, China.

Source: Gui H, et al. Rheumatology (Oxford). 2014 Jan 17. <http://www.ncbi.nlm.nih.gov/pubmed/24440992>

Cannabis may improve sleep of patients with post traumatic stress disorder

According to an analysis of 170 patients with post traumatic stress disorder of a medical cannabis dispensary in California those with high PTSD scores were more likely to use cannabis to improve sleep, and for coping reasons more generally, compared with those with low PTSD scores. Authors wrote that “sleep improvement appears to be a primary motivator for coping-oriented use.”

Center for Innovation to Implementation and National Center for PTSD, VA Palo Alto Health Care System, USA.

Source: Bonn-Miller MO, et al. Drug Alcohol Depend. 2013 Dec 31. <http://www.ncbi.nlm.nih.gov/pubmed/24412475>

Cannabis use usually does not enhance physical performance

In a review scientists investigated whether caffeine, nicotine, ethanol and THC have a performance-enhancing effect. Only caffeine has enough scientific evidence indicating an ergogenic effect. There is some preliminary evidence for nicotine as an ergogenic aid, but further study is required; cannabis and alcohol can exhibit ergogenic potential under specific circumstances but are in general believed to be ergolytic for sports performance. Exercise and Metabolic Disease Research Laboratory, School of Nursing, University of California, Los Angeles, USA.

Source: Pesta DH, et al. Nutr Metab (Lond) 2013;10(1):71. <http://www.ncbi.nlm.nih.gov/pubmed/24330705>

THC changes brain waves in patients with obstructive sleep apnea

THC treatment yielded a shift in EEG (electroencephalogram) power toward delta and theta frequencies and a strengthening of normal rhythms in the sleep EEG of 15 patients with obstructive sleep apnea. This is the result of research at the University of Illinois in Chicago, USA. Obstructive sleep apnea is characterized by repetitive pauses in breathing during sleep, despite the effort to breathe.

Dronabinol (THC) was associated with significantly increased theta power, which may be seen in drowsiness or arousal or in meditation. At increasing THC doses, there was a greater fraction of EEG power variance in the delta band. Delta is the frequency range up to 4 Hz, which is seen normally in adults in deep sleep. Authors wrote that THC causes “a strengthening of ultradian rhythms in the sleep EEG,” the 90-120 minute cycling of the sleep stages during human sleep. Previous animal studies suggest that THC may be a treatment option for sleep apnea.

Source: Farabi SS, Prasad B, Quinn L, Carley DW. Impact of Dronabinol on Quantitative Electroencephalogram (qEEG) Measures of Sleep in Obstructive Sleep Apnea Syndrome. J Clin Sleep Med 2014;10(1):49-56. <http://www.ncbi.nlm.nih.gov/pubmed/24426820>

CBD inhibited cancer of the colon

Both a cannabis extract rich in CBD and pure CBD reduced cell proliferation in tumour cells, but not in healthy colon cells. The effect of the extract was counteracted by selective CB1 and CB2 receptor antagonists. Pure CBD reduced cell proliferation in a CB1-sensitive antagonist manner only. Researcher concluded that CBD-rich cannabis extracts “attenuates colon carcinogenesis and inhibits colorectal cancer cell proliferation via CB1 and CB2 receptor activation.”

Source: Romano B, et al. Phytomedicine. 2013 Dec 24. <http://www.ncbi.nlm.nih.gov/pubmed/24373545>

Member Seeks Feedback From Community

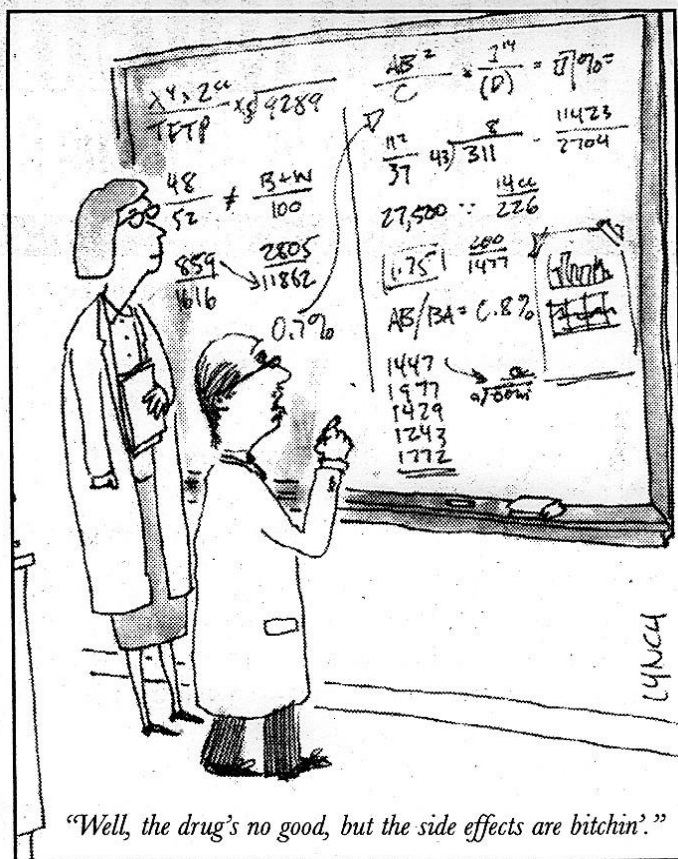
A VICS member who is a freelance writer is seeking stories and experiences from fellow members.

Jon has suffered two heart attacks and a stroke during bypass surgery, and now uses cannabis, under doctor’s advice, to manage/relieve his symptoms. If you use cannabis to treat any aspect of stroke and/or depression and want to tell your story, contact Jon at:

<http://www.myblogdammit.net/?p=14404>

Or you can reach Jon at **250-710-7929**. Jon plans to publish the results so spread the word.

*This issue is dedicated to Barney, the little white dog.
The VICS & members will miss his loving, soulful way.*



The Endocannabinoid System Controls Food Intake Via Olfactory Processes

A French study, published in *Nature Neuroscience* in February, has come to the conclusion that cannabis-induced 'munchies' are due to an enhanced olfactory (sense of smell) system.


"The 'munchies' effect of cannabis depends on cannabinoid receptors. The number and the activity of these receptors can determine their effects," said study author Giovanni Marsicano. "Our study shows that both exogenous and endocannabinoids can disinhibit circuits of the olfactory bulb, which is the primary brain region mediating the sense of smell. Like that, the odours appear stronger to the subject."

Researchers already knew that fasting from food for brief periods can increase the level of natural cannabinoids in the mammalian brain, which in turn triggers us to eat more when we're hungry — the natural stomach-rumbling response to smelling mom's apple pie baking in the oven. During the study, however, Marsicano and colleagues at Neurocentre Magendie in Bordeaux, France, discovered that it's the presence of these natural cannabinoids in the human nose, and their activation, which increases the amount of food eaten. They also discovered that the receptors' activation by external cannabinoids, such as those found in cannabis or hashish, can further up the ante of appetite, and caused the mice to increase their fast-induced food intake.

Researchers say the study's results are important since it shows how the body reacts specifically when it's hungry, and why people overeat, and therefore drugs to target the cannabinoid receptors in the human nose may be able to be developed to help treat obesity patients and others with binge-eating susceptibility.

Source: Jason Rehel, National Post, Feb 12, 2014-02-13
<http://www.nature.com/neuro/journal/vaop/ncurrent/full/nn.3647.html>

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**"Love and compassion are necessities, not luxuries. Without them, humanity cannot survive."
 -- Dalai Lama**