



Vol. 11, Issue 3  
April 2019

# CANNABINOID CHRONICLES

## Medical Cannabis News and Information

### Crystal Structure of Cannabinoid Receptor 2 Published

Understanding the diverse effects that cannabis has on the human body is imperative if we hope to take advantage of its medicinal properties to treat various disorders. As such, elucidating the molecular structure of the receptors that bind endocannabinoids is a critical step toward developing selective drugs that can differentiate between the two known receptors—CB1 and CB2—for these molecules.

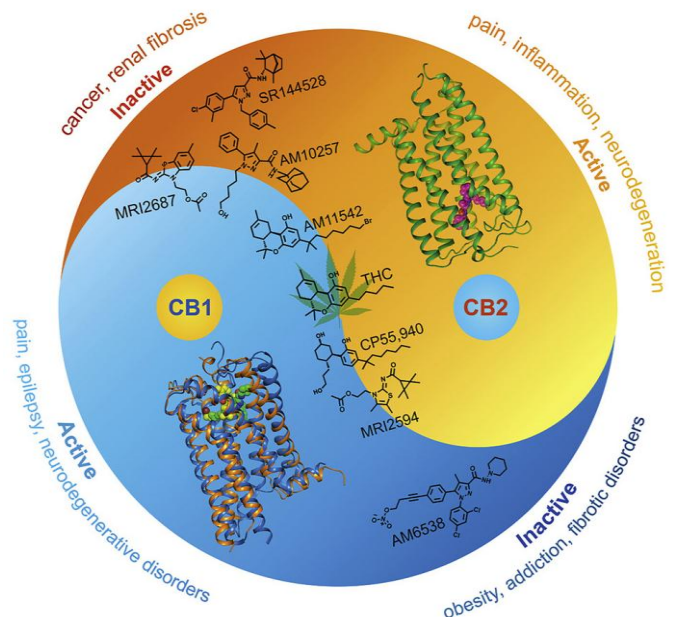
Since the structure of the CB1 receptor was resolved a few years ago, an international team of researchers led by scientists at the iHuman Institute within ShanghaiTech University has published the crystal structure of the human type 2 cannabinoid receptor, CB2.

Findings from the new study, published recently in *Cell*, should be helpful in the development of drugs against inflammatory, neurodegenerative, and other diseases. The study authors compared the newly discovered structure to that of the CB1 receptor, deeming the two receptors to be the “yin and yang” of the human endocannabinoid system.

The endocannabinoid pathway is a signaling system in the human body that regulates biological processes such as metabolism, pain sensation, neuronal activity, immune function, and so on. It has been shown that the cannabinoid receptors can be targeted to alleviate certain pathological conditions, including chronic pain. While the CB1 receptors are mostly found in the nervous system and are responsible for psychoactive effects, the CB2 receptors are predominantly present in the immune system.

Studies indicate that CB2 is a promising target for immunotherapy, as well as treating inflammatory and neuropathic pain, and neurodegenerative diseases. It has also been shown that molecules blocking CB2 can reduce tumor growth. To effectively treat pathological

conditions, drugs need to specifically target CB1 or CB2. However, the two receptors are very much alike. The amino acid sequences that encode them are 44% identical. Thus, developing selective medicine requires knowing the structure of both targets in great detail. Unlike CB1, the structure of CB2 had remained unknown.



Conditions that can be affected by activating or inhibiting type 1 (CB1) or type 2 (CB2) cannabinoid receptors independently.  
[Xiaoting Li et al./Cell]

Interestingly, the research team concluded that substances activating one of the receptors can actually weaken or inhibit the other, and vice versa. This opens up a possibility not just for drugs that target exclusively one receptor, but those that affect both receptors, but in different ways.

**Sources:** <https://www.genengnews.com/news/second-cannabinoid-receptor-has-the-yin-to-the-first-receptors-yang/>  
[https://www.cell.com/fulltext/S0092-8674\(16\)31385-X](https://www.cell.com/fulltext/S0092-8674(16)31385-X)  
[https://els-jbs-prod-cdn.literatumonline.com/cms/attachment/11f4b415-4ecd-48c2-8dc2-934be31a5c5e/fx1\\_lrg.jpg](https://els-jbs-prod-cdn.literatumonline.com/cms/attachment/11f4b415-4ecd-48c2-8dc2-934be31a5c5e/fx1_lrg.jpg)

## ***Human: Medicinal effects of cannabis are mainly based on THC and cannabis flowers were most effective***

An analysis of 19,910 self-administered cannabis sessions by 3341 people who used a mobile device running ReleafApp software revealed that dried cannabis flowers were the most commonly used products and were generally associated with greater symptom relief than other types of cannabis products. Researchers of the University of New Mexico in Albuquerque, USA, recorded the type of cannabis products, mode of intake, cannabis strain and major candidate contents (THC and CBD), effect on symptoms and side effects.

Patients showed an average symptom improvement of 3.5 on an 11-point scale across the 27 measured symptom categories. Across product characteristics, only higher THC levels were independently associated with greater symptom relief and prevalence of positive and negative side effects. In contrast, CBD levels were generally not associated with significant symptom changes or experienced side effects.

**Sources:** <https://www.ncbi.nlm.nih.gov/pubmed/30804402>

## ***Human: Cannabis may be an effective treatment of delayed gastric emptying according to a survey***

Many patients with gastroparesis (delayed gastric emptying, stomach cannot empty itself of food) and related symptoms may profit from a treatment with cannabis. Of the 197 patients who filled out a questionnaire on their symptoms and current treatments, nearly half reported current or past cannabinoid use including THC and CBD. Doctors of the Section of Gastroenterology at the Department of Medicine of Temple University School of Medicine in Philadelphia, USA, asked their patients with symptoms suggestive of gastroparesis, among them nausea, vomiting, heartburn and stomach pain. Of the 92 patients using cannabinoids 93.5 percent perceived improvement of symptoms by THC and 81.3 percent with CBD. Cannabinoids were used most commonly via smoking. Patients taking cannabinoids were younger (41 vs. 48 years on average) and had a higher Gastroparesis Cardinal Symptom Index total score (3.4 vs. 2.8 on average) compared with patients with no history of cannabinoid use.

**Sources:** <https://www.ncbi.nlm.nih.gov/pubmed/30865015>

## ***Science: CBD can help to bring nanocapsules through the blood-brain barrier into the brain***

Researchers showed that the transport of nanomedicines through the blood-brain barrier into the brain can considerably be improved by CBD (cannabidiol). They wrote that these combinations may “represent auspicious platforms for the design and development of novel therapies for CNS diseases.”

**Sources:** <https://www.ncbi.nlm.nih.gov/pubmed/30865462>

## ***Human: Cannabis use may increase satisfaction with orgasm in women***

“Marijuana appears to improve satisfaction with orgasm,” researchers of the Department of Obstetrics, Gynecology, and Women’s Health of Saint Louis University School of Medicine, USA, wrote in an article for Sexual Medicine. Patients were given a questionnaire at their visit and asked to complete it anonymously and place it in a locked box after their visit.

Of the 373 participants, 34% reported having used cannabis before sexual activity. Most women reported increases in sex drive, improvement in orgasm, and decrease in pain. Women who reported cannabis use before sexual activity had 2.13 higher odds of reporting satisfactory orgasms than women who reported no cannabis use. Authors wrote that a better understanding of the endocannabinoid system may “could help lead to development of treatments for female sexual dysfunction.”

**Source:** <https://www.ncbi.nlm.nih.gov/pubmed/30833225>

## ***Human: Cannabis may reduce complications of Crohn’s disease***

An analysis of 43,317 patients with Crohn’s disease from the USA, of whom 615 were regarded as cannabis users, showed that cannabis users were less likely to have the following complications: active fistulising disease and intra-abdominal abscess (12% versus 16%) and colectomy (4% vs. 8%) among others. Authors concluded that “cannabis use may mitigate several of the well-described complications of Crohn’s disease among hospital inpatients.”

**Source:** <https://www.ncbi.nlm.nih.gov/pubmed/30825109>

## ***Human: Young people may use less cannabis in the US states with medical cannabis laws***

When medical cannabis becomes legal in a US state, teenagers there may be slightly less likely to use the drug, a US study suggests. Even though medical and recreational cannabis laws restrict use to adults, access for adults may influence how easily teens can get the drug and whether they use it.

Among the states included in the study, 11 had legalized adult cannabis and 18 had legalized medical cannabis by April 2015. “Adjusting for numerous other substance use policies, medical marijuana laws were associated with small declines in current marijuana use among adolescents, lead study author Rebekah Levine Coley, a psychology researcher at Boston College, told Reuters.

**Sources:**

[www.tandfonline.com/doi/full/10.1080/00952990.2018.1559847](http://www.tandfonline.com/doi/full/10.1080/00952990.2018.1559847)

**More info: [www.cannabis-med.org/](http://www.cannabis-med.org/)**

## Study: Anti-Inflammatory Properties of Terpenoids from Cannabis

Cannabinoids are well known to have anti-inflammatory effects in mammals; however, the cannabis plant also contains other compounds such as terpenoids, whose biological effects have not yet been characterized. The aim of the study was to compare the anti-inflammatory properties of terpenoids with those of cannabidiol (CBD).

The terpenoids provide the cannabis plant with its characteristic fragrance and it is generally accepted that they provide protection from marauding insects. Although over a hundred different named terpenoids have been identified in cannabis, only about 50 known terpenoids have been identified in a single plant sample, and the profile may be characteristic of a given chemotype. This variety is reflected in the differences noted between the three cannabis chemotypes used in this study.

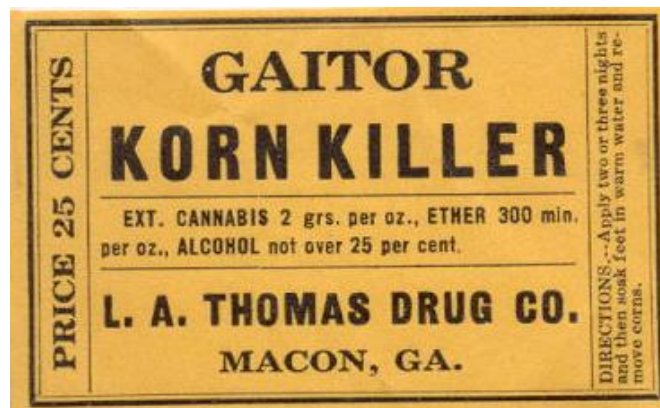
Despite suggestions that differences in the pharmaceutical properties of different chemotypes may be a consequence of the variety of terpenoids present, there is almost no information about the biological and medical properties of cannabis-derived terpenoids.

Essential oils prepared from three monoecious (hermaphrodite) non-psychoactive chemotypes of cannabis were analyzed for their terpenoid content and subsequently studied pharmacologically for their anti-inflammatory properties *in vitro* and *in vivo*. Data show that the three essential oils, which contain various ratios of 48 identified terpenoids, show moderate anti-inflammatory properties in an induced paw swelling model in mice. All three preparations were much less potent than CBD. Also, no correlative dose–response was observed, suggesting that a maximum effect was observed already with the lower dose.

The different cannabis chemotypes showed distinct compositions of terpenoids. The terpenoid-rich essential oils exert anti-inflammatory and antinociceptive activities *in vitro* and *in vivo*, which vary according to their composition. Their effects seem to act independent of TNF $\alpha$  (Tumor necrosis factor, whose primary role is in the regulation of immune cells).

None of the essential oils was as effective as purified CBD. In contrast to CBD that exerts prolonged immunosuppression and might be used in chronic inflammation, the terpenoids showed only a transient immunosuppression and might thus be used to relieve acute inflammation. We suggest that terpenoids may be used to reduce the acute inflammation effect, whereas the cannabinoids to inhibit chronic inflammation symptoms.

**Sources:** <https://doi.org/10.1089/can.2018.0014>  
<https://www.liebertpub.com/doi/10.1089/can.2018.0014>



## Medical Cannabis Use Patterns & Drug and Substance Substitution

A 239-question cross-sectional survey was sent out via email in January 2017 to gather comprehensive information on cannabis use from Canadian medical cannabis patients registered with a federally authorized licensed cannabis producer, resulting in 2032 complete surveys.

The survey gathered detailed demographic data and comprehensive information on patient patterns of medical cannabis use, including questions assessing the self-reported impact of cannabis on the use of prescription drugs, illicit substances, alcohol, and tobacco.

Participants were 62.6% male and 91% Caucasian. The mean age was 40 years old, and pain and mental health conditions accounted for 83.7% of all respondents. Then, 74.6% of respondents reported daily cannabis use and mean amount used per day was 1.5 g.

The most commonly cited substitution was for prescription drugs (69.1%), followed by alcohol (44.5%), tobacco (31.1%), and illicit substances (26.6%). Opioid medications accounted for 35.3% of all prescription drug substitution, followed by antidepressants (21.5%). Of the 610 mentions of specific opioid medications, patients report total cessation of use of 59.3%.

This study offers a unique perspective by focusing on the use of a standardized, government-regulated source of medical cannabis by patients registered in Canada's federal medical cannabis program. The findings provide a granular view of patient patterns of medical cannabis use, and the subsequent self-reported impacts on the use of opioids, alcohol, and other substances, adding to a growing body of academic research suggesting that increased regulated access to medical and recreational cannabis can result in a reduction in the use of and subsequent harms associated with opioids, alcohol, tobacco, and other substances.

**Sources:** <https://harmreductionjournal.biomedcentral.com/articles/10.1186/s12954-019-0278-6>





## Not Your Average “Pot Shop”

“Is that all?”

That’s how an acquaintance replied when I told them that I worked for a compassion club. Or, rather, that I worked for a non-profit society which distributes cannabis for medical purposes to persons with a doctor’s specific recommendation.

The fact that a doctor’s specific recommendation for medical cannabis was necessary to permit access was unimportant. The reality that many of the clients are very ill, have tried countless pharmaceutical options, and are looking for a gentler and safer approach to their well-being, was overlooked. The human side of the story was ignored in judgement. The non-profit in question, the Vancouver Island Compassion Society (VICs), was seen simply as another “pot shop” that pushes drugs.

It’s not the first time that the VICs and its staff have been described this way. And, in a sense, they’re not wrong. The Society has always existed in a grey area, as determined by the courts, as were all the early compassion clubs formed in the ‘90’s and 00’s. However, unlike most other non- or for-profit “medical” (or not) cannabis storefronts, the VICs has been providing whole plant cannabis products for medical purposes for nearly 20 years. It has been meeting that need, and only that need for over 3,000 members.

Chronic pain, including arthritic pain and fibromyalgia, is the most common condition, followed by Hep-C, anxiety, cancer, HIV/AIDS, Crohn’s/ IBD/IBS, MS, and depression; these 8 conditions make up 70% of the total membership. At this moment, physicians are still referring their patients specifically to the VICs,

My acquaintance was not aware of the clients and their

stories, many heartbreaking. My acquaintance was also not aware of the personal interaction that develops over the years as staff sits face-to-face across a desk from an ill human – a connection is made, with laughter, or tears, or maybe both. Over time, people become friends. What our members have learned over the years is that the VICs is a non-judgemental, safe space to gain knowledgeable access to an herbal medicine that can work safely.

The fact that cannabis can be used medicinally is indisputable, and further necessary research may be more readily pursued with current cannabis legalization. We are slowly getting beyond the hysteria, or the nod, nod, wink, wink factor. Indeed, there are many legitimate benefits of medical cannabis as we have highlighted over the years in the “*Cannabinoid Chronicles*”. It’s not going away.

There is a legal medical cannabis program (ACMPR) available, but it is, arguably, still not fully accessible because all sales are only performed online and delivered via post or courier.

The VICs is a model that the members have held up as a possible future. It’s not your average “pot shop”.



Visit us at [www.thevics.com](http://www.thevics.com)

### **RESOURCE DIRECTORY:**

**AIDS Vancouver Island**  
3rd Fl- 713 Johnson St, Victoria  
250-384-2366

**VIPWA**  
101-1139 Yates Street, Victoria  
250-382-7927

**The Action Committee of  
People with Disabilities**  
948 View Street, Victoria  
250-383-4105

**Victoria Brain Injury Soc.**  
830 Pembroke St., Victoria  
(250) 598-9339

**HepC BC**  
2642 Quadra Street, Victoria  
250- 595-3892

**BC Cancer Agency**  
2410 Lee Ave, Victoria  
(250) 519-5500

**Canadians for Safe Access**  
[www.safeaccess.ca](http://www.safeaccess.ca)

**John W. Conroy, Q.C.**  
1-877-852-5110 (toll free)  
[www.johnconroy.com](http://www.johnconroy.com)

**Kirk Tousaw, Barrister**  
604-836-1420  
[www.tousawlaw.ca](http://www.tousawlaw.ca)

**DrugSense**  
[www.drugsense.org](http://www.drugsense.org)

**BC Coalition of People  
With Disabilities**  
1-800-663-1278

**Health Canada**  
<http://www.hc-sc.gc.ca/dhp-mps/marihuana/index-eng.php>

**Drug Policy Alliance**  
[www.drugpolicy.org](http://www.drugpolicy.org)

**Media Awareness Project**  
[www.mapinc.org](http://www.mapinc.org)

**Together Against Poverty  
Society**  
302-895 Fort Street, Victoria  
250-361-3521

**“No one knows what’s next, but everybody does it.”**

**-- George Carlin (stand-up comedian, author, 1937 - 2008)**