

Known as CANN, we are the new Cannabis Chemistry Subdivision of the American Chemical Society! AMA!

AmerChemSocietyAMA¹ and r/Science AMAs¹

¹Affiliation not available

April 17, 2023

Abstract

Hi Reddit! We are CANN, a subdivision of the ACS Division of Chemical Health and Safety. Within the last year we have petitioned from initial formation, to committee, to our current subdivision status. We believe that with the exponential growth of the legal cannabis industry, offering a scientific community of professionals, researchers, and academics will improve safety standards and industry practices. A part of the American Chemical Society, we at CANN use our resources to develop workshops, training sessions, symposium and general sessions on cannabis health and safety-related topics at national, regional and other meetings of the American Chemical Society. We aim to support future chemists with training, mentoring programs, research opportunities, and other resources. Today our group is open for discussion to help educate a broader audience. Thank you all for your participation and for the CANN volunteers that fielded questions. We received more than 820 questions and more than 3000 upvotes. We hope that we were able to shed some light on this popular topic and that you will reach out to us again if we can be of any assistance. We would also like to encourage membership and volunteerism as there is always lots to do. Email us at tweetcannabis@gmail.com. Thanks to Ezra Pryor, Jahan Marcu, Ph.D., Erika Oltermann, Melissa Wilcox, Guillermo Moreno, Christopher Hudalla, PhD and Jeff Raber, PhD for answering questions.

[REDDIT](#)

Science AMA Series: Known as CANN, we are the new Cannabis Chemistry Subdivision of the American Chemical Society! Comprised of academic professionals, distinguished researchers, and eager volunteers o

AMERCHEMSOCIETYAMA [R/SCIENCE](#)

ABSTRACT

Hi Reddit!

We are [CANN](#), a subdivision of the ACS Division of Chemical Health and Safety. Within the last year we have petitioned from initial formation, to committee, to our current subdivision status. We believe that with the exponential growth of the legal cannabis industry, offering a scientific community of professionals, researchers, and academics will improve safety standards and industry practices. **A PART OF THE AMERICAN CHEMICAL SOCIETY, WE AT CANN USE OUR RESOURCES TO DEVELOP WORKSHOPS, TRAINING SESSIONS, SYMPOSIUM AND GENERAL SESSIONS ON CANNABIS HEALTH AND SAFETY-RELATED TOPICS AT NATIONAL, REGIONAL AND OTHER MEETINGS OF THE AMERICAN CHEMICAL SOCIETY. WE AIM TO SUPPORT FUTURE CHEMISTS WITH TRAINING, MENTORING PROGRAMS, RESEARCH OPPORTUNITIES, AND OTHER RESOURCES. TODAY OUR GROUP IS OPEN FOR DISCUSSION TO HELP EDUCATE A BROADER AUDIENCE.**

Thank you all for your participation and for the CANN volunteers that fielded questions. We received more than 820 questions and more than 3000 upvotes. We hope that we were able to shed some light on this popular topic and that you will reach out to us again if we can be of any assistance. We would also like to encourage membership and volunteerism as there is always lots to do. Email us at tweetcannabis@gmail.com.

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Are there any indications that Cannabis is appropriate for use for pain management with joint diseases such as rheumatoid arthritis?

[Owl_B_Hirt](#)

THC stimulates CB1 receptors, which decrease pain signalling and CB2 receptors which decrease inflammation. CBD acts on TRPV channels to decrease pain from swelling and inflammation. Please see this excellent review for more detailed information: <http://theroc.us/images/Russo-Hohmann%20of%20cannabinoids%20in%20pain%20management%20from%20Deer%202013.pdf> While cannabinoid receptors are the most abundant receptors in the human brain - they do not control breathing. The addiction potential of THC is much lower than that of opiates such as heroin. And scientists have proposed treating marijuana dependence with pure THC (<http://www.ncbi.nlm.nih.gov/pubmed/16769180>). However, cannabis-based medicine may be able to treat opiate withdrawal or be combined with opiates in the clinic. Cannabinoid receptor activity may decrease the untoward effects of drug withdrawal in animals, enhance the pain-attenuating effects of morphine in humans, and have a prophylactic effect on developing opiate or other drug addiction-related disorders (Abrams, Couey, Shade, Kelly, & Benowitz, 2011; Bachhuber, Saloner, Cunningham, & Barry, 2014; Ledent et al., 1999). THC, the endocannabinoid system (ECS), and the endorphin/opiate system can interact in remarkable ways. Animal research has demonstrated a potential prophylactic effect on developing opiate dependence, as adolescent exposure to chronic THC blocks opiate dependence in maternally deprived rats (Morel 2009). The ECS is proposed to interact with endorphins, through the release of opioid peptides from CB receptor activation and the synthesis of endocannabinoids induced by opiate receptor stimulation (Abrams, 2011; Russo et al., 2008). Clinically, THC may enhance the pain-relieving effects of opiates, lowering the amount of an opiate necessary for relief. Surveys suggest Cannabis is used to decrease the use of other drugs (alcohol, nicotine, and opiates) (Reiman, 2009). In the United States, the state governments that have passed commercial Cannabis/marijuana laws report lower opiate overdose and related death statistics; these populations may reflect what has been observed in surveys and clinical studies of THC and opiates (Bachhuber, 2014). -Jahan Marcu

Have there been any studies done about the absorption rates of fertilizers, herbicides and pesticides? What about the health effects of smoking/vaping these chemicals?

[i_said_goodday_sir](#)

We published on this in 2013. <http://dx.doi.org/10.1155/2013/378168> What we found was up to almost 70% of the pesticide present on plant material could enter the vapor stream and be inhaled through combustion. It is quite concerning to see this. Next to nothing is known about this type of exposure as oral consumption Allowable Daily Intake values have been established, but since inhalation by-passes the liver and enters the bloodstream directly, considerably different limits will most likely need to be established. Absorption through the airways is quite different than absorption through the gut via oral consumption, and currently very little research on inhalation impacts exists. Best to have regulators design systems that limit, or completely eliminate, the use of pesticides and other chemicals on this plant. A good healthy plant in a good environment has enough of its own protection, and when coupled with other plants growing nearby and integrated pest and mold management techniques no external chemicals should be required to be used. -Jeff

There is a lot of dispute about the health effects of marijuana, with people's opinions about what greater or minor effects it might have with continued use. I personally am in favor of full legalization, but I think it's worth knowing how much is too much, and why (just as we know with something like drinking: some is certainly fine for most people, but it's useful to know the health effects of frequent and heavy use.).

What is the real scientific consensus issue here, to the best of our knowledge? What "dangers" of marijuana use are actually just bunk rumors, and what might be the health considerations if someone (against better judgement) overused marijuana?

In other words, what's the honest answer to someone asking the question "What are the health effects of regular, heavy marijuana use amongst otherwise healthy adults?"

[down_with_whomever](#)

This research by Pope demonstrates that negative effects from cannabis on cognition are temporary, and these effects on cognition reverse with abstinence (~30 days):
<http://www.ncbi.nlm.nih.gov/pubmed/11576028> (Jahan Marcu)

With the growing acceptance of Cannabis in the United States and progression towards legalization, do you see derivations of THC arising that could be potentially dangerous such as how heroin is derived from opium? My second question involves having seen many places on the Internet where people swear by cannabis oil and its ability to combat cancer types such as melanoma. Is there any materiality to these claims or are they pseudoscience? Thank you for taking the time to conduct this AMA!

[dmwe225](#)

THC-acetate would be one such derivation that causes concerns. It has different solubilities and may cause more rapid effects leading to a propensity to be abused. Most states are currently not allowing the use of this compound and I think that is a good idea for now. Leave the natural components alone and stay as close to the Whole-Plant composition as possible and we will be better off there. -Jeff

Is vaporising cannabis significantly healthier than smoking a joint or bong? And if so, are there still any long term physical effects of vaporising?

[AnOriginalUsername12](#)

There is a significant reduction in the stress on ones lungs with true vaporizing when compared to smoking whole cannabis. It has been demonstrated that cannabis smokers have a lower incidence of lung cancer compared to tobacco smokers and non-smokers as 2)
<http://www.ncbi.nlm.nih.gov/pubmed/24862082>

What are the biggest myths associated with cannabis that you want to dispel?

[Jobediah](#)

I would love to dispel the myth that CBD is the medical cannabinoid and THC is not medical or just

recreational. THC has a whole host of medical value but there are also many other cannabinoids which are not as well studied that show therapeutic promise. these include THCV, CBG, CBN, CBC and so on. -Ezra

What do you know about natural compounds that interact with cannabinoids, such as terpenes, that impact the effects of cannabis? Is there a possibility of manipulating these chemical interactions to target certain ailments in medical marijuana patients?

[nazarethgrizzly](#)

Yes, this has long been a clinical strategy. The combination of THC:CBD in a 1:1 ratio as the pharmaceutical drug known as Sativex, has recorded about 1,000 patient/years of data. Please see this review on the endocannabinoid system and its modulation by phytocannabinoids for more information: <http://www.ncbi.nlm.nih.gov/pubmed/26271952> -Jahan

Are strains of cannabis really THAT different from one another or is the community really slicing hairs over it?

[brutalmeethonesty](#)

There can be considerable differences!! Not only will they look different, but their chemical composition can be wildly different. Take for example one high in THC and another high in CBD with almost no THC present. Not all cannabis is the same! <http://www.esciencecentral.org/journals/cannabinoids-and-terpenes-as-chemotaxonomic-markers-in-cannabis-2329-6836-1000181.php?aid=57624> -Jeff

As a bud tender, I find myself wondering what my directive should be when introducing patients to cannabis and cannabis infused products. So what do you think, should the industry continue with the whole indica and sativa classification? Or should the focus move toward terpene profiles and further processed forms of cannabis? I attempt to introduce terpenes, and other terminology into a patients vocabulary but most are set in the ways of old with sativas being the more energetic strains and indicas being more sedative. Out with the old, in with the new, I say. Vaping is most certainly healthier than smoking, and processing your cannabis into concentrates and vaping those is healthier than ingesting whole plant material via vaping or smoking.

[krombopulismichael](#)

Find the right strain or medicinal form for the patient. Out with the indica-sativa designations for medicinal effects, there is no merit to that as it is chemical composition that matters most. Mis-naming and mis-identification a rampant currently. You should seek to offer consistent and standardized products the patients can receive every single time they come in to your dispensary. <http://www.esciencecentral.org/journals/cannabinoids-and-terpenes-as-chemotaxonomic-markers-in-cannabis-2329-6836-1000181.php?aid=57624> -Jeff

As a 2nd year University student (Age 19) should I be concerned that smoking has become a nightly thing? I've found myself to be perfectly fine in the morning and my grades have been excellent but, in the long term, could smoking through my University years have a detrimental effect on my cognitions? Thank you

[PolarBearsAreOP](#)

What is the reason for the nightly consumption? Would you be concerned with that type of alcohol use? While it may be causing no ill effects to you immediately being at your age is a concern as you are still developing considerably and we do not know how you may be impacted in the long term. Habits of any type aren't good and moderation is always the best approach. -Jeff

What have your struggles been to overcome the cultural stereotypes and biases associated with cannabis? What steps have you taken to overcome these?

[DrunkPanda](#)

I can tell you as a professional in the Cannabis Industry (President of EZ Chem Consultancy Inc.) that I face these issues all the time. My company provides scientific council and does not break any laws. People learn that I serve the Cannabis Industry and make wild assumptions without ever talking to me about it. Almost everyone that has a sense of what I do, does not understand exactly what it is that I

do. This has been most frustrating, people making assumptions and my not having the opportunity to defend my consultancy in person. When I have the chance to discuss it with interested parties there is significantly less issue with what I do. _EZRA

Why is medical cannabis smoked ? Shouldn't we extract the molecules of interest and make it into a more suitable form of medication ?

[BBQsausagewallet](#)

Rate of physiological impact is the primary difference and some prefer to titrate themselves through inhalation. Oral ingestion leads to different molecules causing the action, primarily 11-OH-THC when consumed orally, and this can cause different effects and not be as desired by the patient. There are many forms available, no one is better than the other, it is an individual patient choice with their doctor to select which is best for them and their condition. -Jeff

Thanks so much for doing the AMA guys :D

I have a masters in biology and am looking for lab work currently. I have been considering getting into the research/industry of medical marijuana, but I have some hesitations about making such a career move. So my question is, what is your perception of the stigma of working in this industry? Do you feel there is potential for discrimination against you if you were to seek another job? What about my husband, who might want to apply for government work or become a professor - would he be at a disadvantage if an employer knew what I did?

My second question is, with the explosive growth of this industry, what is the best way to get into it? Who do I need to know?

The work and research itself is fascinating and appealing to me as a career, I feel I could be really passionate about it. I would just also really appreciate your perspective on these questions. Thanks!

[d000kin_d000kster](#)

The best way to get into the industry is to volunteer with us.

learn more at: <http://dchas.org/wordpress/cann/>

There have been reports that synthetic cannabis (spice) has caused seizures, and some other pretty nasty side effects. Is there any fear that as we continue to increase the potency of cannabis, that we will see similar issues?

I know that both THC and synthetics (JWH/HU/whatever is used in today's formulations) hit the same cannabinoid receptors, but the synthetics bind differently, so maybe that's why it won't be much of a concern. But since THC interacts with POMC neurons, which can release glutamate and GABA, I would think there would be a threshold of potency where this becomes a concern.

Thank you for your time. I find the neuroscience behind cannabinoids to be very interesting.

[Here's the paper on POMC neurons regulating GABA and glutamate for anybody who's interested in it.](#)
[yamaha2k11](#)

THC inhibits glutamate release. In general, activation of CB1 results in inhibition of neurotransmitter release, due to hyperpolarization of membrane potential in the pre- or post-synaptic neuron. Meaning THC has an inhibitory action on pre-synaptic CB1 receptors co-localizing on glutamatergic neurons (Campos, 2009; Di Marzo, 2010). (Jahan Marcu) Here's the paper on POMC neurons regulating GABA and glutamate for anybody who's interested in it.

How far has the research come in determining the potential anti-tumor properties of Cannabis? As I understand it, most of these effects are derived from the CBDs CBD. What is the scientific community's consensus on this, and is there a potential for more research in this area?

[Corky_McBeardpapa](#)

In basic and animal research, cannabinoids such as THC have notable anti-tumor activities. There has been a phase I clinical trial with THC. From my own research experience, I believe THC has the superior antitumor effects on suppressing growth and inducing apoptosis while CBD seems more efficient at suppressing angiogenesis. My work in Sean McAllister's lab has demonstrated that the anti-cancer effects of THC can be enhanced with

the addition of CBD. The mechanism of CBD's anti-cancer effects are somewhat of a mystery, while the mechanism of THC is fairly well documented. Link to research on THC/CBD combinations in human gliomas (in vitro): <http://www.ncbi.nlm.nih.gov/pubmed/20053780> Link to THC/CBD + chemotherapy research in mice: <http://mct.aacrjournals.org/content/13/12/2955.long>

Hey everyone!

I'm finishing up my PhD in analytical chemistry and would love to break into the cannabis field.

What are some good resources for someone looking for a post-doc or research position in this realm of study?

Also, is gas chromatography/mass spectrometry the go-to separation technique for cannabis oil?

Thank you!

[Nidman](#)

Join the CANN subdivision to access resources. Although gas chromatography can be used for separating and quantifying cannabinoids in oil and plant extract, liquid chromatography is a more accurate and widely accepted technique. GC is the preferred method for terpenes.

_Melissa Wilcox

What scientific evidence is there that cannabis helps in relief of cluster headaches? The worst known pain a person can have.

[President-of-Reddit](#)

Cannabinoids effectively control control painful inputs into the central nervous system. Activation of peripheral cannabinoid receptors by the endocannabinoid anandamide has been recently shown effective at controlling migraine in animal preclinical models: Effects of peripheral FAAH blockade on NTG-induced hyperalgesia-evaluation of URB937 in an animal model of migraine. Greco R, Bandiera T, Mangione AS, Demartini C, Siani F, Nappi G, Sandrini G, Guijarro A, Armirotti A, Piomelli D, Tassorelli C. Cephalalgia. 2015 Oct;35(12):1065-76.

A recent review on the effectiveness of cannabis for cluster headaches suggests that : "supporting literature suggests a role for medicinal cannabis and cannabinoids in several types of headache disorders including migraine and cluster headache, although it is primarily limited to case based, anecdotal, or laboratory-based scientific research. Cannabis contains an extensive number of pharmacological and biochemical compounds, of which only a minority are understood, so many potential therapeutic uses likely remain undiscovered. Cannabinoids appear to modulate and interact at many pathways inherent to migraine, triptan mechanisms of action, and opiate pathways, suggesting potential synergistic or similar benefits."

Comprehensive Review of Medicinal Marijuana, Cannabinoids, and Therapeutic Implications in Medicine and Headache: What a Long Strange Trip It's Been Baron EP. Headache. 2015 Jun;55(6):885-916. doi: 10.1111/head.12570. Epub 2015 May 25.

Guillermo-

Does the "resin" that collects inside of cannabis pipes contain significant quantities of psychoactive compounds? How do the harmful components released/generated by this resin burning compare to burning cannabis?

Thank you for considering this important harm reduction topic faced by many regular users!

[aliveoneee](#)

It is mostly THC and some CBN but it doesn't contain the same components as plant material, you are primarily missing terpenes (notice how different it will taste). -Jeff

Are there efforts to make standards for testing cannabis for strength, % of THC and CBD and other components and contamination, etc. in the cannabis production community and ACS? If so where can I get information about this and what are the credentials required to obtain the (potential) standards?

[GigglyHyena](#)

From: <https://cannabistraininginstitute.com/asa-launches-patient-focused-certification-program/>

Americans for Safe Access has a nationwide program to certify high-quality medical marijuana products and businesses. Patient Focused Certification is based on new quality standards issued by the American Herbal Products Association (AHPA) and the American Herbal Pharmacopeia (AHP). In 2012, AHPA issued recommendations and standards for four sectors of the medical cannabis industry: dispensary operations, manufacturing, packaging and labeling, and laboratory testing. AHPA has since issued advisory standards for commercial medical cannabis products, while AHP released a cannabis monograph describing the plant's identity, purity, quality, and botanical properties.

The Patient Focused Certification process, which is overseen by a review board of scientists, doctors, and industry and regulatory experts, includes a scheduled physical audit, a staff training audit, a complaint process and at least one surprise audit annually. PFC-certified products and businesses will exhibit the PFC seal on their marketing, promotions and packaging. -Jahan

Are there efforts to make standards for testing cannabis for strength, % of THC and CBD and other components and contamination, etc. in the cannabis production community and ACS? If so where can I get information about this and what are the credentials required to obtain the (potential) standards?

[GigglyHyena](#)

<http://cannabissafetyinstitute.org/>

The Cannabis Safety Institute is composed of a large group of scientists and policy-makers who have come together to provide the scientific background needed to ensure that the Cannabis industry grows in a way that is safe and sustainable. The CSI Board is committed to providing the rigorous scientific data and expertise necessary to ensure the safety of the legal Cannabis industry.

It would mean everything to me if you could reply. This might be good for Erika or Jahan to answer.

I am at a cross roads in my undergraduate studies. Either I go into medical lab science diploma or degree, or I go into chemistry to pursue my love for organic chemistry (I hate physical chemistry.) or get a chemical science diploma. The former option is more career defining and good pay. But one night I had thought strongly about the role of organic chemistry in the marijuana industry and how much it suited my interests and values. In Alberta, there is huge potential to grow industry here if we get our premier thinking this way.

Anywho. I love seeing you all in these forums because it makes me feel hopeful that maybe I can pursue such a career in organic chemistry.

What is the potential of applying a chemical science technician diploma to the marijuana industry, so I can get my foot in the door sooner?

Do you have any suggestions or information for an aspiring chemist with a passion for organic chemistry?(the lck factor for physical chemistry is strong but I can subdue my distaste)

Where is the work for organic chemists of the pot industry (world wide if you so please) and, How can I try to promote this career type in my province?

What can an organic chemist (in this industry) expect? What is your daily work day and workplace like?

Please answer. Thank you so much.

[smoresgalore15](#)

Let me start by saying how nice it is to see someone else share a love of Organic Chemistry. If there is one piece of advice I can always share, it would be to follow your passion. I had entirely different aspirations until I took Organic Chemistry and fell in love with it. Not only the subject but teaching it. Since then my goals have completely changed to follow a path I want to wake up to in the morning. To a path I am eager to take the next step in. I can't speak much for what the other degree may offer or what obstacles there will be but I believe that perfecting a skill you are passionate in, and given this industry demand, there will be ample opportunities for qualified employees. I must lean towards the Organic degree however with the mindset of better over prepared than underprepared. P.S. I learned to love Physical too. Think of it as 3D organic ;) - Erika

Hi there! Similar to Ms. Oltermann, I'm a senior undergraduate majoring in biochemistry. I was just wondering what sort of stigma your research faces, from both your peers and from the public?

[ZXander_makes_noise](#)

I am anticipating quite a bit. First from the federal and state legislature fighting us at every turn, then from peers and public. When I engage in a conversation and state I'd like to research Cannabinoids, most people jump to lazy pot head. In reality my dream research career would not involve the plant at all. What the public doesn't often realize is that medication can all be broken down to carbons and electrons with a few other atoms here and there. Whether it's from a plant, pill, bacteria, or made endogenously, the goal for the greater good is then too discover the capabilities and applications we are unaware of. Within the past 15 years we have revealed the capabilities to heal bone fractures at an increased rate, display neuro-protective activities, help prevent Graft-Vs-Host-Disease of certain transplants, just to name a few. Although completely aware of the opposition, speculation, and challenges my career path will have, I can honestly say I am excited to dive forward. If we have progressed and discovered this much already, I can only imagine what we will accomplish when the government, society, and our peers are behind us. <https://www.researchgate.net/full-text> <http://www.ncbi.nlm.nih.gov/pubmed/18725316> <http://dx.doi.org/10.1016/j.bbmt.2015.05.018> <http://www.ncbi.nlm.nih.gov/entrez/eutils/elink.fcgi?dbfrom=pubmed&retmode=ref&cmd=prlinks&id=20053780> ---Erika O.

There are few effective pain relievers available for the neuropathy associated with fibromyalgia. However, recent research from McGill found that 60% of patients report significant pain relief from those who have tried cannabis, suggesting more research is needed on this topic. Any new research on pain management and fibromyalgia? I just got diagnosed.

[YesNoMaybeNevermind](#)

In clinical studies, the use of cannabis was associated with beneficial effects on some fibromyalgia (FM) symptoms. Further studies on the usefulness of cannabinoids in FM patients as well as cannabinoid system involvement in the pathophysiology of this condition are warranted.

Cannabis use in patients with fibromyalgia: effect on symptoms relief and health-related quality of life. Fiz J, Durán M, Capellà D, Carbonell J, Farré M. PLoS One. 2011 Apr 21;6(4):e18440.

Guillermo-

Cannabis use in patients with fibromyalgia: effect on symptoms relief and health-related quality of life. Fiz J, Durán M, Capellà D, Carbonell J, Farré M. PLoS One. 2011 Apr 21;6(4):e18440. doi: 10.1371/journal.pone.0018440.

Characteristics of patients with chronic pain accessing treatment with medical cannabis in Washington State. Aggarwal SK, Carter GT, Sullivan MD, ZumBrunnen C, Morrill R, Mayer JD.

Delta-9-THC based monotherapy in fibromyalgia patients on experimentally induced pain, axon reflex flare, and pain relief. Schley M, Legler A, Skopp G, Schmelz M, Konrad C, Rukwied R. Curr Med Res Opin. 2006 Jul;22(7):1269-76. Erika O.

In your opinions, is driving while under the influence of marijuana as dangerous as people think?

[dominantseventh](#)

No. The issue is that blood THC levels do not correlate to impairment in the way that Alcohol does. Small amounts of cannabis can improve -Ezra

Hello everyone, thank you for talking out a moment of your time to talk to the public. I have a question. My friend when she consumes sativa dominant. She says her blood pressure drops, feels weak and tunnel vision sometimes can't see at all. If she consumes indica dominant she is alright and happy as can be. My question what could be causing this?

[TheCaptainPlanet](#)

Indica and Sativa dichotomy is useful for growers that want to know about how tall a plant will be and how long it takes to flower.

As a measure of how it affects the body, it is an outdated and relatively useless dichotomy.

What can you tell me about heavy use of cannabis' affect on decreasing libido in men?

[Redeyedcheese](#)

Available data regarding this issue seem controversial. On one hand, chronic intake of cannabinoids has been reported to cause severe impairment of sexual functions in humans and animals (Russo et al., 2002). The decrease in libido, sperm count and fertility, induced by chronic Cannabis consumption in male species seems to be reversible upon stopping cannabis consumption. However, the endocannabinoid anandamide has been shown to rescue copulating behavior in male rats (Canseco-Alba et al., 2013). Muscle relaxation, increased blood flow and sensorial arousal caused by cannabis consumption might also affect sexual responses in different individuals.

RUSSO E., MATHRE M.L., BYRNE A., VELIN R., BACH P.J., RAMOS J.S., KIRLIN K.A. Chronic cannabis use in the compassionate investigational new drug program: an examination of benefits and adverse effects of legal clinical cannabis. *J. Cannabis Therapeutics*. 2002;2:3–58.

J Sex Med. 2013 Mar;10(3):686-93. doi: 10.1111/j.1743-6109.2012.02890.x. Epub 2012 Aug 20. Anandamide transforms noncopulating rats into sexually active animals. Canseco-Alba A1, Rodríguez-Manzo G.

Guillermo-

Is it safe to smoke marijuana everyday. For example smoking a bowl before going to bed every night. Do we know the long term effects of marijuana yet?

[thewildfapper](#)

The effects of cannabis are temporary and reversible regardless of the amount of use. In this study participants had to use cannabis a minimum of 5,000 times to be studied:

<http://www.ncbi.nlm.nih.gov/pubmed/11576028> There was “no significant associations between cumulative lifetime cannabis use and test scores” (Jahan Marcu)

What is your professional opinion about the notion of Cannabis causing psychosis, insanity, or other mental issues? There seems to be a notion that a large percentage of institutionalized individuals are former marijuana users, but do numbers bear that out, and if so does there seem to be a causal relationship between Cannabis and mental illness?

[OrneryOldFuck](#)

This research by Pope demonstrates that negative effects from cannabis on cognition are temporary, and these effects on cognition reverse with abstinence (~30 days):

<http://www.ncbi.nlm.nih.gov/pubmed/11576028> (Jahan Marcu)

What do you see as the greatest benefit of increased and widespread legalization? What challenges are you most concerned about? How do you think increased regulation will help/damage access and therapeutic efficacy.

[p1percub](#)

Many safety public health issues are specific to cannabis being in the black or grey markets. Legalization of cannabis means that we will have
I am concerned about the laws being based on personal opinions and not on science. Many unreasonable laws are already in place and I can only see good coming from increased access, and oversight. We could see varieties with cannabinoids other than THC becoming popular as research is less prohibited. -Ezra & Jahan

Do you plan on doing any research on, or at least what's your opinion on the improved efficiency of chemical extractions (bho, pho, co2, iso, etc.) and solventless extractions (dry ice, cold/hot water, high pressure [rosin]) and in turn it's health effects on humans, both positive and negative. What are the pros and cons of different temperatures of extractions and it's effects on the chemical make up of the final product (terpenes, thca, thc, cbd, fat and lipid content. People strive for a clean extraction with less than 20ppm contaminant. Is working for something that clean necessary or is it having a negative impact on extraction quality and terpene content? Others say 100ppm is safe. What in your opinion is a safe amount for human consumption? And is the removal of fats and lipids necessary for safe consumption (winterizing)? Cannabis extraction is blowing up worldwide and sadly is wanna be chemists in their garages making most of the breakthroughs. We have 20 year old uneducated kids buying closed loop systems, 20 ton hydraulic presses, and much more. Once all this can move to the real labs with educated scientists the REAL breakthroughs will be made. Thank you.

[GlassInTheWild](#)

Residual solvent quantity should depend on what the solvent is. I would recommend using either CO2 or Ethanol since CO2 is safe for consumption and Ethanol is safe for consumption at low levels. In addition to residual solvent there is a significant health issue associated with contaminants what may be included from impure solvents. See MSDS files for recommendations on limits for different solvents.
-Ezra

Do any compounds in cannabis effect GABA A or B receptors?

[Knosis](#)

Cannabinoids receptor activation by cannabinoids or endocannabinoids have been shown to reduce the release of GABA neurotransmitter, thus affecting GABA receptors in an indirect manner.

Guillermo-

What are your thoughts on the bad parts of cannabis? Like the increase levels of tar and the present carcinogens in leaf and extract form?

[redditforgotaboutme](#)

Carcinogens and other maloeffect are overrepresented. The anti-cancer properties of cannabis are strong enough that the carcinogens in th
<http://www.ncbi.nlm.nih.gov/pubmed/16054989>

Glad that you're doing this AMA.

I'm a young professional in the chemistry field. Is it almost necessary to have a PhD in order to find a profession in your field of cannabis research? I'm very interested in the field and would like to contribute as much as I can.

[ern435](#)

Cannabis research is open to many people. You will find that academic researchers will almost certainly require a PhD. Industrial research however may not require any advanced degree. Presumably this will change with time to require more PhDs. _Ezra

What kind of jobs(and how many) can the chemical engineers of America expect to see arise from legalization across the nation?

[bdoubleD](#)

Medical cannabis advocacy for product safety standards are creating jobs in this industry. National standards for the cannabis industry have been created and are being adopted thanks to the work of activists and patient advocates. Patient Focused Certification (PFC) is an oversight and compliance programs for cannabis operators. The structure of the American Herbal Pharmacopeia (AHP) Cannabis monograph has been adopted by several states (MD, NV, NM, AZ, CT, etc) and is cited as the standards of quality control in pending legislation (PA). The need to meet these industry standards has created a number new jobs including vocational and specialized work. These opportunities include quality control and quality assurance jobs in manufacturing, agriculture, food processing, auditing/compliance checks, and laboratory analysis. -Jahan Marcu

Do you feel the general public will accept your findings and reports as subjective and unbiased?

[beachfootballer](#)

Data should speak for itself and it is the duty of the scientific community to inspect and review the findings of other scientists. In this way we can use heard intelligence to move forward. - Ezra

Would it be possible to synthesize the psychoactive compounds in a lab, thereby skipping over the plant altogether? I'm not talking about Spice or K1, but rather the synthesis of the actual chemicals present in nature in the cannabis plant.

[astit2](#)

Cannabis is an exceptional plant in its production of cannabinoids. Cannabinoids are considered a secondary metabolite and can constitute more than 20% of the dry weight. To put it in perspective, willow bark is harvested for an aspirin starting molecule and salic acid which constitutes less than a percent of the weight of the tree. -EZRA

You use the acronym CANN when referring to the Cannabis Chemistry subdivision. Is there a reason its not CCSACS (other than its a mouth full)?

[chatrugby](#)

CANN was available. CCS was not.

We could go with CANNCHASACS but its way too much to do.

I like that it sounds empowering. Perhaps we may some day adopt the slogan "Yes we CANN!"

Hey, thanks for doing this ama. What is your opinion on CBD Oil and other cannabinoid extracts vs "Whole plant" consumption?

[DeusEntitatem](#)

The value of whole plant cannabis has a value known as the entourage effect. When the components of the effect are unclear, the whole plant has a greater value. As we learn what components are involved in this entourage effect, medicines can be formulated to include each relevant compound. _EZRA Please see this research article on cannabis, terpenes, and the entourage effect: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3165946/> (Jahan Marcu) Whole-Plant products are superior to single molecule isolates when aiming to impact the endocannabinoid system. -Jeff

What makes certain strains have significantly more THC than other strains? Is it genetic factors, Nutrition and lighting or both? If it is due to genetics is there a theoretical limit to THC content? Thanks!

[Warlock420](#)

It is indeed both. Additionally, there is the issue of curing the plant in a particular way. growth habits that leave the plant emaciated or dried. Some have reported low 30 weight percent but 20% is more reasonable. _EZRA

What is the legitimacy for using medicinal marijuana for treating asthma? Is it a bronchodilator and isn't smoking counterproductive towards helping irritable lungs?

Thanks for doing this AMA

[ProcrastinationCity](#)

There are bronchodilating components found in some Cannabis strains and a few may be helpful for that, however it may be offset by inhaling hot air or being potentially irritating to the patient depending upon how it is inhaled. Cool, moist air from a vaporizer or through a water pipe may minimize the irritation. New delivery methods may also offer a better solution as well. -Jeff

Would you guys happen to have any tips to push the potency of my edibles? I've started using coconut oils because of the higher saturated fat content and adding dehydrated mangos in my recipes to push the potency of thc. Anything else I can do?

[ThatlowanGuy](#)

Add pure THC.

Ezra

It is unfathomable that we live in a society that values the dollar over the human life . Speaking strictly on facts , how can alcohol and tobacco be promoted , sold, taxed with no issues, even though they are responsible for a lot of death? Where as marijuana harms no one?

Is it possible the president and congress are keeping it illegal because of the amount of money the medical and insurance agencies /courts make on alcohol related deaths and injuries ?

What exactly are you doing at CANN to help this cause , besides collect a salary ? Thanks for your time !

[ThrowAway4Science12](#)

None of our members collect a salary. We are a volunteer organization and at best we can receive partial travel reimbursement.

CANN is supporting the industry by giving researchers a stage to present their work, fostering new talent and creating new opportunities for collaboration through networking.

Ezra

What are some of the non-legal industry challenges to producing consistent and reliable product for either medicinal or recreational use on a large scale?

[firedrops](#)

Natural products or those substances derived from plants are highly variable. It is a consistent challenge to work with plant based materials because they vary greatly from variety to variety and also from plant to plant. -Ezra

Have you heard of a hexane extraction of THC? Anything too share?

[WesStrikesBack](#)

Hexane is an effective solvent for extraction but it is not safe for consumption. Best extraction solvents are safe for consumption such as ethanol and CO2. I don't mean to say that Hexane cannot be used safely, it is just not the best option. -Ezra

Since THC and other cannaboidss are lipophilic, could we potentially piggy back drug molecules on them, so they can cross the BBB easier?

[SchoolboyP](#)

Rather unlikely as you would change the properties and most likely end up not crossing the BBB. -Jeff

Is CANN's main focus on the consumable product? Are you part or aware of research in production e.g. sustainability, environmental impacts, soil health, water, pesticide, herbicide use? Worker injustices are common in production of legal Ag. products, are you aware of any research on injustices specifically in the cannabis industry? What hurdles do you face due to cannabis' current legal status? In your opinion, where is more research needed outside chemistry? Thank you!

[kbbgg](#)

We support the presentation of researchers in the field of cannabis. Though we do not do research at the ACS we would welcome any findings on health issues specific to the cannabis industry.

Ezra

Do you think this medication can be applied to military veterans with moderate to successful results ?

[mreg215](#)

There is promise for those suffering from PTSD. Cannabis can help with sleeping, forgetting. Look up Sue Sisley.

<http://www.medicalcannabis.com/about/faculty/suzanne-sisley/>

Ezra

How do I get into the field? I'm in a nonlegal state, should I move? Wait? What types of opportunities

can present themselves to someone with a Comp Sci degree?

I post at FuckCombustion and Vaporent all the time, I'm all about the healthy consumption of cannabis (NO SMOKE) and have shelled out a few grand in assorted vaporizers :) I'd consider myself pretty knowledgeable on the subject, absolutely moreso than the average smoker.

[HellsWindStaff](#)

You can join our group to learn more. <http://dchas.org/wordpress/cann/>

There are always opportunities if you are willing to be creative. Ezra

What are effects on the eyes when using Marijuana, hence the "red eyes" that Marijuana users tend to have after use. Can they be used to "treat" anything that might be wrong with the human eyes, or in contrast can they worsen any part of they eyes with constant use?

[eMazing_Eddie](#)

Glaucoma was one of the first conditions we began allowing medical cannabis use for! There are a significant number of cannabinoid receptors in the eye and it is well-known that cannabinoid use can reduce intraocular eye pressures thereby alleviating some conditions associated with the eye. -Jeff Cannabis is provided to (very few) qualified individuals by the federal government. The receive about 300 pre-rolled cannabis cigarettes every month, some use it to treat glaucoma. the program started in the late 1970's and continues to provide cannabis to the original qualified individuals but is not and will not accept new applicants. Links to Federal Marijuana Program:

(<http://www.medicalcannabis.com/patients-care-givers/federal-ind-patients/>)

(<http://www.cbsnews.com/pictures/free-pot-federal-program-ships-marijuana-to-four/>)

Cannabis and the eye research links: Cannabinoids in the treatment of glaucoma.

<http://linkinghub.elsevier.com/retrieve/pii/S0163725802002590> Potential roles of (endo)cannabinoids in the treatment of glaucoma: from intraocular pressure control to neuroprotection. (Jahan Marcu)

What part of the cannabis industry is most faulty/needs the most improvement? What are the big pieces of infrastructure that we are missing?

[shmuffbub707](#)

People who are writing regulations don't have a lot of resources, and in many instances the testing requirements they develop are inappropriate. We see things like residual solvent limits that are set to 1ppm in Massachusetts and 10ppm in Illinois; while colorado has a limit of 800ppm. The resources are not always available to regulators to determine the best and most appropriate limits. . In other areas of regulation for example, transporting 1 gram of cannabis for analysis in many states requires two people, GPS tracking, and drivers can make no stops and cannot take the same route multiple times. Oxycontin and other controlled substances are not required to have as much security as required for delivering 1 gram of cannabis. What do you know about natural compounds that interact with cannabinoids, such as terpenes, that impact the effects of cannabis? Is there a possibility of manipulating these chemical interactions to target certain ailments in medical marijuana patients? Yes, this has long been a clinical strategy. The combination of THC: CBD in a 1:1 ratio as the pharmaceutical drug known as Sativex, has recorded about 1,000 patient/years of data. Please see this review on the endocannabinoid system and its modulation by phytocannabinoids for more information: <http://www.ncbi.nlm.nih.gov/pubmed/26271952> _Jahan & Melissa

Hi, thanks for doing this AMA! Two questions:

1. I'll be graduating in May with BS in chemistry and wish to get involved in industry before heading back to grad school. What opportunities are there in the chemical cannabis industry for fresh BS grads and the best ways to get involved?
2. What's the culture of cannabis science like? Are there any stigmas such as being seen as pot smokers and such?

Thanks again.

[fusionary93](#)

I would suggest joining us as a member and volunteer. <http://dchas.org/wordpress/cann/>

It is an interesting culture. There is less stigma for cannabis users especially in the industrial side. You

will certainly be judged at times from people on the outside of the industry but almost never from within.

I feel as though I have never had the opportunity to be myself as much as I have in the industry.

EZRA

I have a question about oil / wax / dabs.

In short, assuming you know how the product is made, what are the negative respiratory effects of inhaling butane from the "finished" product? Should I just stick to flower as a better alternative or is it really not a big deal (aside from the overall harshness and taste one could still experience)?

I'm wondering if it's overall negative, or if it's not bad when processed properly - something I can assume is happening where it's legal to make & sell, but where I live it's not, so it's most often a down and dirty home-made process.

[Sweet13BlackExpress](#)

That may not be a safe assumption. The issue is not so much inhaled butane as it is concentrated contaminants and pesticides.

If at all possible obtain medication that has been tested.

Ezra

When you look at the mass scale industrial extraction of chemicals from plant matter in the legal world (Stevia to Corn to Coffee) what technologies/techniques are you most excited for sharing?

[rseymour](#)

Carbon Dioxide and Ethanol are my preferred solvents. In addition to being safe for human consumption they are green solvents so they have the least impact environmentally. There are also some very nice separatory methods which can lead to standardized products. I would be happy to discuss this further with anyone willing to become a client of mine at ezchemconsult.com. I would also like to caution anyone against do it yourself equipment that can put people at risk of serious injury. - Ezra

How do you tell an indica from a sativa, on a chemical level?

[iamzelda](#)

You don't. That dichotomy is outdated and inappropriate when discussing the chemical variations in the plant.

Ezra

I am close to graduating as an Environmental Civil Engineer. I was looking to get into the cannabis industry because I have a passion for it and it is also a market ready to explode. Do you have any advice on how to approach getting into the industry from a science standpoint. It seems very difficult to get into with all the regulations and other hoops to jump through.

[jaleonard](#)

There are low or no-legal risk job opportunities. Even in locations where cannabis is illegal, no one is arresting the plumber or electrician. If you were to help people with planning there would be a near zero legal risk.

Do consult a lawyer before taking any risks with your career or person.

Ezra

Hi there,

How was Henry Anslinger able to convince the federal government in the 1940's that THC and other compounds within the cannabis plant have no medical uses?

Do you foresee negative long term health consequences with regards the consumption of solvent based cannabis concentrates such as BHO?

[AssuredlyAThrowAway](#)

Fear mongering and lobbying dollars.

Extracts that have been poorly produced or contain industrial additives pose a whole host of health concerns. _EZRA

What problems do the difference between state law and federal law cause the legal cannabis industry (e.g. banking), and how does this have a wider impact on scientific research and inquiry in this field?

[mrcchapman](#)

As cannabis is still a schedule 1 narcotic, as classified federally by the DEA, it makes doing research, especially clinical trials, much more challenging and typically a lengthy endeavor. There is federal legislation under consideration (CARERS Act http://www.safeaccessnow.org/senators_booker_paul_and_gillibrand_introduce_unprecedented_comprehensive) that would reschedule cannabis to make it easier to do research and receive federal funding. In addition, states with existing medical marijuana programs, cannabis would be completely removed from scheduling. -Melissa Wilcox

What are your thoughts on more reduced firms of cannabis such as dap (wax) or cannabis oils. Are there any benefits or disadvantages to consuming these products instead of traditional cured buds?

[vaelux](#)

There are advantages and disadvantages.

Poorly made extracts may have concentrated pesticides or contaminants from the extraction process.

Extracts have a wider range of administration options and can be more effectively metered.

Ezra

During the curing process we are told to look that the crystals heads are turning amber. I believe this is cbds converting into thc. Is this correct and can you go into more detail about this?

[AbstractLogic](#)

It is not correct. CBD is not a precursor to THC. Instead CBG is suspected to be the precursor to THC and other cannabinoids. You can see the proposed biosynthetic pathway in the link below. As the trichome gland heads take on a deeper color it is an indicator of more complex cannabinoid make up.

<https://openaccess.leidenuniv.nl/bitstream/handle/1887/12297/thesis.pdf?sequence=1>

Ezra

Hello all! A friend of mine with a degree in biochem insists that you cannot decarboxylate marijuana and that decarboxylation is a misnomer. Can you shed any light on this?

[TEYZO](#)

It is not a misnomer. THCA is THC-Carboxylic Acid. Add heat and kick off the carboxylic acid therefore decarboxylating. The mechanism is well documented. other cannabinoids can be decarboxylated as well.

Ezra

Hi, have you studied the role and importance of terpenes in cannabis use?

[priapic_horse](#)

Terpenes and other phytochemicals have shown great promise and shed light on what we do know regarding cannabis. In many cases the cannabinoid is somewhat regulated directly or its activity is enhanced/inhibited indirectly. Research here has helped us discover mechanistic details for cannabinoids in various applications.

<http://libproxy.library.unt.edu:2079/science/article/pii/S0944711304700586>

<http://libproxy.library.unt.edu:2079/science/article/pii/S0968089615001625> Erika O.

What is your professional opinion on marijuana concentrates (dabs/wax)? Dabs are such a recent invention that there seems to be a somewhat alarming lack of info on it's health effects, compared to just cannabis flower. Do you have plans to research the long term health effects of dabs?

[megustawalrus](#)

The health risks are more in association with contaminants from the extracting chemicals when done improperly.

The safest route is to see material that has been tested for pesticides, residual solvent and contaminants.

Ezra

What (if any) is the future of being able to test for potency or microbial presence in-house? Will there ever be household mass spectrometers or vapor analysis?

[bsgospel](#)

Presently, handheld and tricorder-like analyzers are notoriously inaccurate. New technology needs to be compared to existing methodology, (i.e., HPLC) in blinded studies, and all methodology should be validated.(Jahan Marcu)

Hey folks,

What are you planning for 2016? Like the symposium content at the upcoming ACS meetings in San Diego and Philadelphia? Speakers? Topics?

[Jahanmarcu](#)

We have very big symposium planned for March in San Diego. Raphael Mechoulam, Arno Hazekamp, Jutin Fishedick, Jeff Raber, Chris Hudalla and others will be speaking.

We have a dozen networking events planned for 2016 that can put you in front of living breathing Cannabis Scientists.

Ezra

How much experience have you had analyzing the different types of cannabis extracts. CO2 oil versus BHO, shatter or wax as far as effects on lungs? Less plant materials is obviously a good thing, but are there concerns with so much THC in the lungs?

[hotfire4444](#)

The concern is not THC content in the lungs but contamination from impure solvents and pesticides. BHO consistently tests higher in contaminants.

I am a chemist in Colorado with 2 years of qc experience. My big question is "Where do I apply?"

The cannabis chemistry industry is exploding and I really want to get in on it, but it's difficult differentiating the above-board all-legal operations from the grayzone quasilegal ones.

[Laserdollarz](#)

learn more by visiting <http://dchas.org/wordpress/cann/>

we are accepting volunteers and members

Ezra

I am hoping that the level of THC in pot goes down. I miss the days of being able to smoke a joint, a whole joint, without getting too stoned. Do you believe there is a market for low grade pot and do you

think it will come to pass?

[legin2010](#)

Yes there is. its only a matter of time before more variety is available near you.

Ezra

Where do I sign up to volunteer?

[monk3ykid](#)

Check out our Division's webpage. Membership info and how to get involved can be found here!

<http://dchas.org/wordpress/CANN/> Erika O.

So my friend gave me a bottle of CBD lotion. Is there any research showing if this can help back pain? Most of the stuff I find seems to be anecdotal.

[AlCapooter](#)

The issue is rate of absorption through the skin. It's not the most effective method of administration. - EZRA

If I had a major in plant science and minor in chemistry would that appeal to employers in these fields? Is post graduate status a requirement for most jobs in what you do? The research itself must be so thrilling!

[Dave the Chemist](#)

Please join us and perhaps volunteer

<http://dchas.org/wordpress/cann/>

Ezra

CBN is supposed to form when heat is applied to THC.

I have attempted to verify this several times with zero success.

Has anyone tested this theory to determine its validity?

Has there ever been a test conducted to determine the rate at which this transformation from THC into CBN is supposed to take place?

The last test I ran, I floated an extract over water. I boiled the water for five hours. The resulting extract had less CBN at the end than it had before it was boiled.

[Gersh54](#)

The decomposition of THC to CBN is well documented.

[https://www.google.com/url?](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0ahUKewj1rOvrPDJAhVE8mMKHWLaBuAQFggrMAI&url=https%3A%3A)

[sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0ahUKewj1rOvrPDJAhVE8mMKHWLaBuAQFggrMAI&url=https%3A%3A](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0ahUKewj1rOvrPDJAhVE8mMKHWLaBuAQFggrMAI&url=https%3A%3A)

Ezra

Hi members of CANN, and thank you so much for hosting this AMA.

I am curious about best methods to extract and separate terpenes from other plant components, including cannabinoids.

Is there a good way to scale up isolation procedures with such a goal in mind?

To all reddit users, this is important. Terpenes offer the possibility of developing medicinal products from marijuana that are devoid of the common psychoactive features of cannabis.

In addition, some marijuana products could be improved as well both in their medical efficacy and in

their sensory profile, by isolating the fragrant terpenes from some material, and adding back into other material.

[padmakara](#)

This question is more complex than I can answer here. Feel free to reach out to me though through ezchemconsult@gmail.com and we can discuss further.

Ezra

Is there any real difference between medical and homegrown cannabis?

[HintHunter](#)

no. Ezra

I'm a neuroscience major. How do I get a job or internship with you?

[Hey_You_Asked](#)

Join CANN by visiting <http://dchas.org/wordpress/cann/>

Will you also deal with the health effects of things like dabs? Not the perfectly purged dabs but the stuff that might still have butane in it?

[here4thedwnvotes](#)

Please see this recent publication on the topic: <http://www.ncbi.nlm.nih.gov/pubmed/26558460> -Jeff

Thanks so much for taking the time to do this AMA. My question for you is one about education. I am currently a senior applying to graduate school programs and I'm planning on getting my PhD. What area should I look to conduct research in if I want to go into the cannabis field after graduating? Are there schools with cannabis chemistry programs or would you suggest a biochem route?? Thanks again!

[felliinsoccer14](#)

Look into the Universities in MI WA and CO.

If you can't get a position researching cannabinoids or the endocannabinoid system then try studying separation science or analytical chemistry.

Ezra

Hi CANN, I was wondering if you think that the Safety Standards and Practices that you find best in this industry would ever be adopted by the US Government as a standard for those states that vote for legalized Marijuana to follow and regulate?

[patar49](#)

Yes. It is an issue of manpower in my opinion. There are agencies working very hard to establish reasonable standards and when the Federal government needs a method of oversight, I believe it will look to organizations like Americans for Safe Access and the AHP monograph on cannabis.

What is the difference between cannabis and marijuana? I got stoned once when I was younger (and ended up pretty much high for six years, weird how these things happen) and found everyone has differing opinions, but what is the official, scientific word on the matter?

[King_Lewey](#)

Marijuana is the slang term for cannabis. Cannabis sativa L. comes in many different varieties and not all of them have the same effects. They may impact individuals very differently too. -Jeff

One question from me.

Autism + Cannabis do you think it has positive effects or could?

[Kantanomo](#)

It could. Cannabis has shown promise for many brain disorders.

Ezra

Can I volunteer brah, Californian here

[toeachhisownnove!](#)

Join us here and let us know you want to volunteer <http://dchas.org/wordpress/cann/>

Is there any research on Marijuana used as a treatment for IBS?

[Mini Couper](#)

Here are a few resources:

<http://onlinelibrary.wiley.com/doi/10.1038/sj.bjp.0705741/abstract;jsessionid=BE254421504E07D6DF05B7E879AE2466.f04t04>

<http://dx.doi.org/10.1038%2Fsj.bjp.0705741> <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4367210/>

Ezra

[removed]

[\[deleted\]](#)

Some of us do use cannabis within the legal limits of our states of residence.

Ezra

Hello! Overall, is ingesting THC less harmful than inhaling THC?

[ThomWilson](#)

There is less respiratory stress. There is evidence though that cannabis smokers have increased lung capacity compared to non smokers.

Ezra

Are there limits for terpene consumption?

Such as LD50s?

What is known about megadosing these turpenes? Is there "to much of a good thing?"

[Gersh54](#)

Yes. See MSDS files.

Ezra

Few months ago, a group announced its success in engineering yeast to produce a THC precursor. Do you believe that genetic engineering of yeast will make physically growing the cannabis plants obsolete in the future? If so, what would its implications be?

[QuartetOfDissonance](#)

I speculate it would take nearly a decade for the genetic engineering of THC through yeast to completely overtake growing it naturally. Not only are the yeast producing these compounds inside their cells, after meticulous extraction, and modification the final product is less than half a gram. This could be a great medical application in the future once optimized and made cost efficient however

competing with the recreational market and their traditional cultivation would be tough to say the least.
One other application that could be of industry use though is the production of a different precursor.
Synthetically there is a struggle to produce certain aromatic precursors from which entire classes of
natural product compounds can be made. This might be of benefit here.
<http://dx.doi.org/10.1007/s10529-015-1853-x> Erika O.