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View inside FCM Global La Ceja's Greenhouse

Researchers Smoke Out
the Genes That Give
Cannabis Its Kick

PG. 5

Runners Share Which
Cannabis Strains Help
Them Go the Distance

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10 Major Market Trends:
MJBizCon & the Future
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Craft Brewers Say They Aren't Threatened by Cannabis, They're Threatened by iPhones

Craft beer is growing in America. But it isn't growing nearly as fast as it used to. Production is slowing. One possible culprit is cannabis.

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Researchers smoke out the genes that give cannabis its kick

REPOST: Joseph Hall / The Toronto Star / November 24, 2018

Teams of Canadian and U.S. scientists have located the genes responsible for the sought-after kick of cannabis — genes that had been hidden to researchers amid vast stretches of the “junk” DNA deposited in the plant’s genome by viruses during its evolution.

The discovery will make it much easier to manipulate the levels of intoxicating THC and medicinal CBD contained in the plant to suit varied customer preferences in the newly legalized Canadian market, the researchers say.

“You can only manipulate a gene when you know where it is located,” says Harm van Bakel, one of the key research contributors. “And you also need to know something about the rest of the sequencing in the genome so that you can uniquely target the gene of interest and not be sidetracked by ... other things that look similar,” says van Bakel, a genomic expert at the Icahn School of Medicine at Mount Sinai in New York City.

The chemical makeup of the genes that produce THC and CBD — the plant’s two main cannabinoids — had been known to scientists for decades. Researchers had previously isolated the RNA those genes created — the molecules that actually manufacture the active cannabinoid components.

Yet even though the plant’s 10-chromosome genome had been sequenced in 2011, the location of these key genes remained hidden in a sea of viral DNA.

It’s not unusual for the genome of any species — humans included — to be peppered with DNA from viruses. Indeed, 70 to 75 per cent of the DNA of marijuana and hemp plants — which share a common ancestor — is derived from retrovirus sources, says Tim Hughes, a molecular geneticist at the University of Toronto’s Donnelly Centre for Cellular and Biomolecular Research.

Retroviruses — such as HIV — are able to insert their DNA into the genomes of other species, says Hughes, who was another key member of the study team.

“Humans, plants, virtually all organisms have something like this,” says Hughes, adding about half the human genome traces back to viral sources.

But the viral DNA in cannabis did much more than hide the genes from prying scientists. It likely helped create them, Hughes says. He says the random genetic rearrangements that produced the active forms of THC and CBD in the formerly inert plant would likely not have occurred had the genes not been surrounded by the viral DNA.

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Although the plant's genome had been sequenced in 2011, the location of some genes remained hidden in a sea of viral DNA. (STEVEN SENNE / THE ASSOCIATED PRESS)

Hughes says cellular mechanisms that would normally keep genetic order can be foiled by the lengthy and repeated sequences of the surrounding viral DNA. And instead of maintaining the genes in their original form, the faulty mechanisms would have rearranged their sequencing to produce the current genetic configurations.

The machinery “that’s normally responsible for keeping things tidy and organized gets confused when it sees multiple copies of the same thing, and it makes mistakes,” Hughes says. “That is almost certainly what has happened” with the THC and CBD genes, he says.

The study, an early version of which which was released online this month by the journal *Genome Research*, also showed:

- Definitely that THC and CBD are produced by separate genes.
- The existence of another active gene that produces a product known as cannabichromone, or CBC, which can have both medicinal and slightly intoxicating effects in humans.
- The location of a gene that helps determine the potency of different cannabis strains.

Hughes says another one reason the genes had eluded scientists was the plant’s illegal status.

“Until the last couple of years it’s been extremely difficult to work with it legally,” he says. “The repercussions of being caught with a huge number of marijuana strains in order to do genetic experiments ... nobody would risk that.”

Van Bakel says Canada’s Oct. 17 legalization will make the country a hotbed for research on the plant and its effects. But he says locating the THC and CBD genes — on the plant’s sixth chromosome — was facilitated by improved genetic scanning technology.

He says the latest scanners can capture tens of thousands of the base pairs that make up the twisting DNA molecule; older technology could sequence only a few hundred at a time.

Ironically, while it is fairly well understood how THC and CBD affect humans, it’s not known what the genes that produce them do for the plant itself, Hughes says.

He says research will likely now focus on locating the genes that create the components that give different strains of cannabis their distinctive tastes and smells. 🌿



A cannabis plant approaching maturity is photographed at the CannTrust Niagara Greenhouse Facility during the grand opening event in Fenwick, Ont., on June 26, 2018. THE CANADIAN PRESS/Tijana Martin

Cannabis still has mystery, Canada's first weed-only academic researcher says

REPOST: The Canadian Press / November 26, 2018

Yang Qu hopes to lead the way in unlocking the full potential of cannabis — both commercially and medicinally — just as he did as one of Canada's foremost anti-cancer drug researchers.

The 35-year-old will soon be the country's first academic researcher focused solely on the cannabis plant. "Legalization just liberated the research on this plant," said Qu, who will start in January at the University of New Brunswick. There are still a lot of things we don't know about cannabis, he said.

"The industry is rapidly growing, as we all know," said Qu. "I'm sure that the exciting biological activities in the future that we would gather from this plant would help to grow the industry."

Qu said one of his major goals is to look into the medical capacity of cannabinoids and devise new ways of manufacturing them. While there are more than 90 different types of cannabinoids — chemical compounds in cannabis — he said we only really know about two of them: tetrahydrocannabinol, the primary psychoactive compound in the plant, and cannabidiol, a compound typically used for pain relief.

Studying the remaining types of cannabinoids could help scientists tap into previously unexplored medicinal potential, said Qu. "Once we have more information about the individual activity of the cannabinoids, we can try to produce these cannabinoids in cannabis plants," he said.

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Qu also aims to improve the genetics of cannabis plants to reduce production costs and make them easier to grow both in colder climates and in greenhouses.

He also wants to explore the possibilities of synthetically producing cannabinoids instead of extracting them from a plant.

For the past few years, Qu, who has a PhD in biochemistry from the University of Calgary, led a research team at Brock University in St. Catharines, Ont., where he studied the biosynthesis of anti-cancer drugs: specifically, those derived from the Madagascar periwinkle, a type of flowering plant.

There, he identified the genes responsible for making those drugs and transferred them to a microorganism, like yeast, which can catalyze the same reaction as the plant.

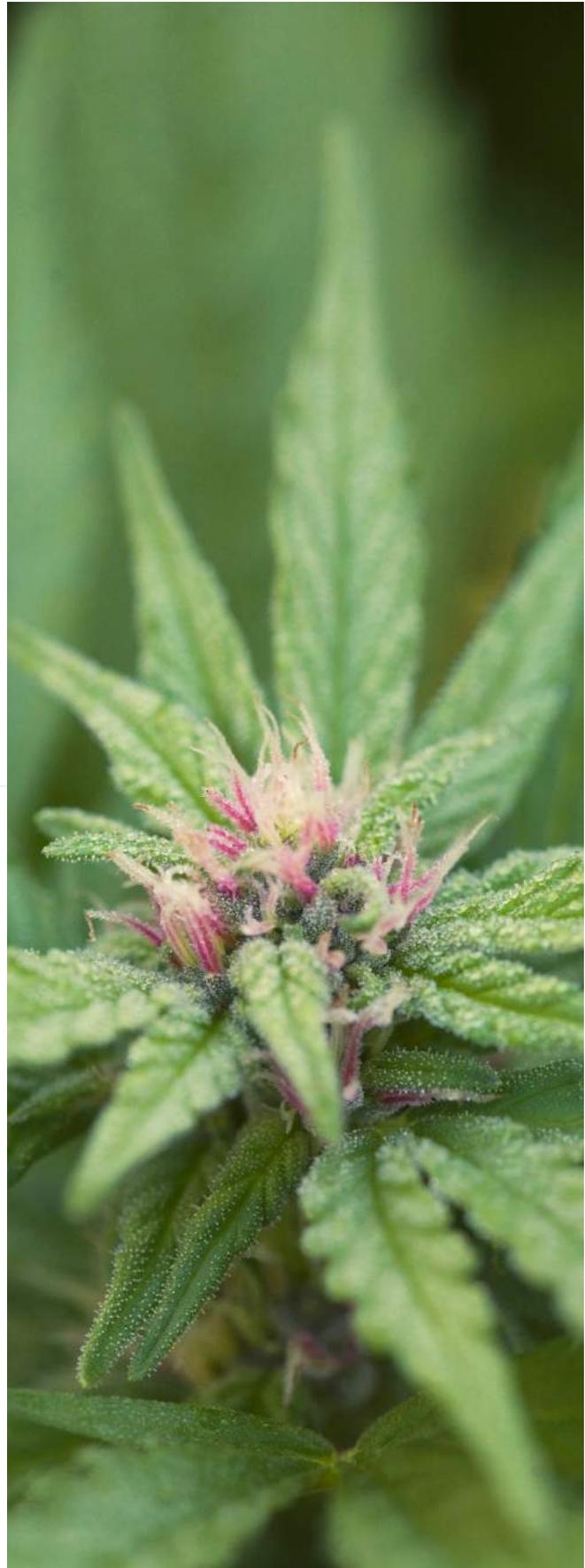
Qu said his work with the Madagascar periwinkle can be directly applied to his research into the cannabis plant.

“From a scientific perspective, they’re not really closely related at all. But, you know, a plant is a plant,” he said.

“The research tools are basically transferable from one plant into another plant.”

He believes this method can be used to synthetically produce cannabinoids, which he said would result in higher quantities and a purer compound.

But before Qu gets to work in January, he said he’ll consult with both government agencies and the private sector to see where exactly research is lacking so he can narrow down his focus. 🌿





HERE'S WHY MOST PHARMACISTS WON'T TOUCH MEDICAL CANNABIS

REPOST: BRUCE KENNEDY / LEAFLY / NOVEMBER 26, 2018

With the midterm elections behind us, there are now 33 states, as well as Washington, D.C., that have legalized medicinal cannabis in some form. And earlier this year the U.S. Food and Drug Administration (FDA) approved Epidiolex, the first prescription drug made from cannabis. With all these advancements, should we expect our neighborhood pharmacists to be dispensing whole-plant cannabis and cannabis extracts across their counters at some point in the near future?

The short answer is no.

According to industry experts, that scenario probably won't happen for some time. But the number of trained medical marijuana pharmacists is growing, and they are establishing their legitimacy in the medical community.

While five states have formally “established a role” for registered pharmacists in the medical marijuana dispensing process, state-authorized pharmacists must deal with a wide variety of challenges—including some that could potentially affect both their livelihood and their freedom.

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Along with monitoring the constantly-evolving state and federal cannabis policies, druggists in cannabis-legal states must also keep watch on a patchwork quilt of local health and safety regulations.

And there are disputes about how to best educate the 300,000 or so pharmacists across the U.S. regarding the medicinal properties of cannabis.

One issue continues to dominate the medical cannabis discussion among pharmacists: The fact that cannabis in all its forms remains a Schedule One controlled substance under federal law. Under that classification, cannabis is defined as a substance that has no “accepted medical use.”

Angelo Cifaldi is a registered pharmacist in New Jersey. He’s also an attorney who specializes in pharmacy law. And he’s very aware of the legal tightrope walk that pharmacists in cannabis-legal states must endure if they are to work with medical marijuana.

To date, the federal government has not enforced its laws against such pharmacists, Cifaldi said. Nobody has been arrested or charged. But there are still risks, he added. Pharmacists aren’t personally licensed by the US Drug Enforcement Administration (DEA). Instead, the pharmacies they work in are required to obtain and hold DEA licenses.

“Technically any pharmacy, if they’re dispensing a (Schedule One) controlled substance, is at risk of being cited as a violation of a federal law,” Cifaldi told Leafly. “That pharmacy would lose its DEA license, which is in effect a death blow to any pharmacy.”

Some states have worked around this issue when it comes to medical marijuana. In New Jersey, for example, “pharmacists aren’t involved in the chain of custody at all,” Cifaldi said. “(Medical marijuana is) dispensed by a facility that’s approved by the state, and pharmacists aren’t even involved in it.”

These so-called “alternative treatment centers” in New Jersey—they’re known as dispensaries in most other states—are not licensed by the state board of pharmacy. “

They don’t have a DEA license that they can lose, because they’re licensed by the state,” Cifaldi noted.

This precarious balance between federal and state law still creates legal tensions. Hospital pharmacies in New Jersey, for example, face the dilemma of whether or not to allow a patient with a medical marijuana order (as they are called in the state) to receive treatment in their facility.

“The problem is, if marijuana is brought into a hospital pharmacy, they could potentially lose their DEA license because they have a [controlled] substance in the hospital that doesn’t belong there,” he said.

“There is no means by which you would be able to bring this medical marijuana into the hospital and use it, because they can’t have it checked by the pharmacy.”

And that issue, said Cifaldi, can lead to other legal problems.

“What happens if somebody’s in the hospital for two weeks and they don’t get the medical marijuana that they’ve been using for epilepsy, then all of the sudden they have a seizure and die?” he asked.

“Is the hospital now liable because they didn’t let them use their medication? Clearly that’s not the hospital’s intent.”

What is needed, Cifaldi said, is a uniform approach to pharmacies and medical cannabis. But that can only occur once cannabis is reclassified by the federal government.

The pharmacist community has a reputation for being conservative. But some observers acknowledge that the cannabis legalization movement has a momentum that cannot be stopped.

“It is undeniable that we’re in the midst of a cannabis revolution,” Mary Bridgeman, a professor at the Ernest Mario School of Pharmacy at Rutgers University, said in an email to Leafly.

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Bridgeman also serves on the New Jersey Medical Marijuana Review Panel. Since early 2016 she has included medical marijuana in her freshman elective course on the role of plants as medicines.

And in her personal opinion, “as a healthcare professional, I can either choose to embrace this topic and learn as much as I possibly can to be able to answer questions from patients and colleagues alike, or remain unaware and uninformed of the evidence, including both risks and benefits.”

She also believes that, until the federal government removes cannabis from its Schedule One category, we’re unlikely to see cannabis becoming available in the traditional pharmacy setting.

The federal illegality of cannabis can also “lead to unintended consequences for pharmacists and their businesses,” according to a statement on the National Community Pharmacists Association (NCPA) website.

NCPA calls on pharmacy advocates to “aim for state legislation that preserves the ability of pharmacists legally to dispense medical marijuana should federal prohibitions be overturned, but which does not place the pharmacist or pharmacy in a position of legal or contractual jeopardy in the meantime.”

Even with the current political and legal landscape, Bridgeman believes the pharmacist community has an obligation to school itself on medical cannabis. Especially, she added, since many pharmacists must educate patients on the benefits and risks surrounding their prescriptions.

“Similar to other substances that are highly regulated, pharmacists are well-positioned to ensure safe use, adherence, optimal strategies for self-administration and dosing for a plant-based therapy, like medical cannabis,” she said.

“What we’re doing and have been doing is getting a lot of notice,” Joseph Friedman, the CEO of PDI Medical, a medical cannabis dispensary in suburban Chicago, told Leafly. “People are walking in and being treated by a health care professional.”

Friedman is a certified pharmacist who was formerly on the board of the Medical Cannabis Alliance of Illinois. He’s currently the board of the American Society of Cannabis Pharmacists. He said a growing number of people are being drawn to medical cannabis as they seek alternatives to mainstream pharmaceuticals.

Illinois legalized medical marijuana in 2013. Since then, according to Friedman, the number of medical cannabis patients in the state has jumped from 3,000 when the pilot program began to around 46,000 patients today.

That’s still a pretty small number, considering Illinois has about 13 million residents. But for the past three years, since his pharmacy was established, Friedman has seen a growing number of patients transfer from other dispensaries.

The reason, he said, is that more medical cannabis patients want to work with pharmacists like the ones at PDI. His staff members “have really done their homework on cannabis and have really stepped up their whole technology base of the endocannabinoid system,” Friedman said. “They already have the skill sets and the knowledge of medications, but this has really separated them from many other pharmacists.”

“Similar to other substances that are highly regulated, pharmacists are well-positioned to ensure safe use, adherence, optimal strategies for self-administration and dosing for a plant-based therapy, like medical cannabis,” she said.

“What we’re doing and have been doing is getting a lot of notice,” Joseph Friedman, the CEO of PDI Medical, a medical cannabis dispensary in suburban Chicago, told Leafly. “People are walking in and being treated by a health care professional.”

For example, he said, cannabis can have side effects when taken with blood thinners. It can also increase the effects of steroids. And while many of those drug interactions might be not be life-threatening, “many of them could be potentially tough” on cannabis patients who aren’t aware of the risks.

CONTINUED ON PG. 12



Illinois closely monitors medical cannabis dispensaries, and it requires eight hours' worth of training annually for dispensary employees. But Friedman says a lot of that training is tied to operations and health insurance issues, and not necessarily regarding cannabis as medicine.

So he's trying to step up the education factor for his pharmacists, and for future cannabis pharmacists. As a result PDI has a relationship with two colleges of pharmacy in the state. It has fourth-year pharmacy students come in and do clinical rotations at the dispensary.

"These pharmacy students, while they're on board here for six weeks, one of their tasks is to give two or three presentations to my staff on cannabis and one of the qualifying conditions (for medical cannabis)," he said.

This unique program, Friedman said, also helps bring in new knowledge of drug therapies to the dispensary. And this desire to educate pharmacists on medical marijuana can be found in the broader pharmacist community.

The Pharmacy Times, a publication founded in 1897, recently announced it would present a continuing education video program called "Demystifying Medical Cannabis in Disease State Management: What Clinicians Need to Know."

The program is "intended to represent a 'primer' for the busy professional," said Professor Bridgeman, who worked on the project.

And she believes that, as pharmacists become more educated on issues such as proper dosage, different cannabis strains and THC-to-CBD ratios, the overall medical community will become more comfortable with the medicinal use of cannabis. 🌿

Holidays got you down? A look at cannabis and depression

'Tis the season to be jolly, but some struggle with the winter blues

REPOST: Thomas Green MD / The Fresh Toast / November 26, 2018



Kerkez / iStock / Getty Images Plus

Now that we have passed through another divisive election, we can think about other issues. The month of November has been designated as Movember as a tool to remind men about their health issues including prostate cancer and testicular cancer, but also mental health issues like anxiety and depression.

Now that men have had a few weeks to grow beards and goatees to show off Movember manliness, let's think about the role of a man. A bearded man riding a 30-foot wave on a surfboard seems very macho, but the reality of being a man should also include taking care of the people you love.

In order to do that properly, they need to be in their best physical and mental state. Men need to take care of themselves and in some cases need help in doing so.

Typically in this month we focus on prostate and testicular cancer, but we also have to consider the very dark side of depression and anxiety.

As we enter the final week of November, and the burden of holidays and parties and expectations fast approaches in December, it's never a better time to reflect on this topic.

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Men have many choices in addressing anxiety and depression. They can deny its existence or treat it with:

- Psychotherapy
- Pharmaceuticals
- Exercise
- Meditation
- Yoga
- Alcohol
- [Cannabis](#)

Some of these options can delay improvement or worsen the depression. Others may improve the symptoms and the depression itself. Some are done under the guidance of a health care provider and others are performed with self-medication/regulation. Previously cannabis was used primarily as a self-regulating medication without the help of outside guidance. The dosages were variable as were the responses.

Medical marijuana allowed for greater study, however we still don't have complete information regarding dosage, type of cannabis, percentage of improved patients and side effects.

We do have a great amount of knowledge about the anecdotal improvement in PTSD. We need further studies to evaluate improvement, dosage and side effects. We know in smaller dosage anxiety can be lessened and in larger doses it can worsen anxiety. But where is the cut-off point? This probably differs for each person based upon physical size, type of chemical imbalance, and pharmacodynamics. Do we even know what chemical imbalance the cannabis treats?

We need a fuller understanding of the pharmacokinetics of the types of cannabis and their interactions in order to determine dosage on a scientific, rather than anecdotal, basis. We have to make sure that there is quality control from company to company to make sure they are all selling equal medications or that we understand the differences.

Treating anxiety and depression is difficult and generally has a better success rate with a combination of psychotherapy. It is a difficult and slow processes because we are trying to unwrap old problems while the patient is given new issues on a daily basis. The medications, whether pharmaceuticals or cannabinoids, are absorbed at different rates with an effect within minutes to hours.

Since much of the treatment includes self-regulation of therapy, it can be difficult on a day-to-day basis to determine the correct dosage with all the variabilities of absorption, types of medications and outside influences.

Cannabis can improve the lives of those suffering from anxiety and depression. We need more clinical studies to determine how we can make this type of treatment more effective. 🌿

Runners Share Which Cannabis Strains Help Them Go the Distance

For many runners, training for distance can have a grueling impact on the mind and body. This is why many long-distance runners have been turning to cannabis for its anti-inflammatory and pain reduction qualities.

Repost: Amanda Scriver / Leafly / November 28, 2018

(Izfi/Stock)

While there are no statistics available on just how many athletes are now using cannabis as part of their training regimes, we spoke to four runners across Canada who candidly shared their own stories of using the plant for its anti-inflammatory and pain reduction qualities, as well as offer advice to those who are interested in introducing cannabis to their training schedules.

During her career as a Muay Thai fighter, Angelina Musicco suffered from many injuries during both her training and during competition. When the doctors kept trying to push painkillers on her, she knew that was not the route she wanted to take.

She began to explore cannabis to aid in her athletic recovery, decrease anxiety, and help with relaxation. After a concussion, Musicco knew her fighting career was over and took to running as part of her daily regime to stay active.

“I would use cannabis and go for a run, and that’s when I noticed that my runs improved.” She developed cannabis butter and oils, using strains that were high in CBD and low in THC when she first started out, but as she began to develop a tolerance, she moved onto sativa strains that gave her more energy, specifically Silver Haze adding that it was “I found it really great for energetic creativity.”

Musicco finds that she will most often smoke before leaving the house for a run, with her shoes on so that she has no excuses but to run sharing that once she’s out the door, even if her legs hurt, or if she got a stitch in her side, “all of that kind of stuff kind of just goes away once you find your flow.”

With her experiences as an athlete, Musicco has now developed Blessed, an edibles company that is specifically for athletic recovery. The low-dose edibles, which won’t be available in the market until next year sometime, plans to offer runners the right doses of medicine for pre and post-runs.

Phil Depault, was once a member of the Canadian mountain bike team, and biking was not just his passion, but his full-time job. When he became diagnosed with fibromyalgia, his life suddenly changed and he had to not only stop competing but he had to reevaluate just how he could continue to have his high-level athletic lifestyle.

As someone who was anti-cannabis up until this point, his doctor prescribed medical cannabis to treat his symptoms, which included chronic pain and sleep issues. “As soon as I started incorporating cannabis into my life I was learning how it worked and I couldn’t stop just making the parallel with when I was an athlete.”

CONTINUED ON PG. 16

Depault noticed that the plant was a great option for inflammation, stress, and sleep, and it encouraged him to start exploring his options as an athlete once again. He was drawn to running as he felt like, “it was easy to bring your running shoes in your luggage [...] it basically became a lifestyle.”

From there, he began to use the strain Green Crack, a sativa strain, during his runs which kept him “super uplifting, super focused and while running it just brings super mindful focus—I love this strain.”

For post-run recovery, Depault has taken to popping one or two CBD oil gel caps, which has helped particularly with helping his mind and the muscles relax. Because of his own experiences, Depault has now decided to launch a brand new company geared towards athletes that may be interested in CBD related recovery products.

The line, which plans to launch in 2019, hopes to “provide people products that fit their lifestyle, fit what they are looking for, the kind of products that they want to use while they are training or while they are in recovery.”

Although Vancouver-resident Bethany Rae runs the fitness and cannabis friendly community Flower and Freedom, she considers herself an amateur runner. While Rae has always been drawn to outdoor adventure sports like running, they just caused pain in her body.

With different terrains in Vancouver, Rae experienced everything from sore knees, hips, and ankles post-runs and turned to cannabis as a way to reduce her pain.

“Different types of cannabis consumption would help me in different ways for running,” explaining that if she wanted to manage joint pain, muscle pain, or mental blocks—there were different consumption for different purposes.

Rae typically uses a sublingual spray under her tongue that has a 25:1 CBD to THC ratio. With four sprays, Rae is able to get to a better state of mind and the ability to push through any joint pain she’s experiencing with her joints sufficiently lubricated.

“I do have a very low tolerance to THC, so I don’t need much to feel it and anyway, during the day, I didn’t want too much euphoria. Without it, I would otherwise want to stop and walk 10 to 15 minutes in.”

For her post-run recovery, Rae also has used a THC and CBD topical that have helped with muscle tightness. “I actually find that it is really effective and I often have to stop running because my knees are so sore, but I don’t have that problem when I applied a topical.”

Thanks to many of the Flower and Freedom events she has hosted, Rae believes she is opening up a dialogue on what it’s like to use cannabis in the wellness and fitness space. “It’s about conversation and being open and comfortable with cannabis consumption and learning from each other.” Rae shares “I consume cannabis as part of an active lifestyle and kind of encourage others to share theirs, as well.”

Alana Armstrong of Toronto has been running since she was twelve years old. What started as a casual hobby with her mom, developed into a more serious habit as she grew older. Training for her first half marathon when she was sixteen, Armstrong admits she became ‘addicted’ to long distance running. But her foray into cannabis and running happened somewhat organically.

As an adult, she found herself experiencing some anxious self-talk before races and post-race pains. She went to speak with her general practitioner about what she was experiencing, who recommended she try cannabis.

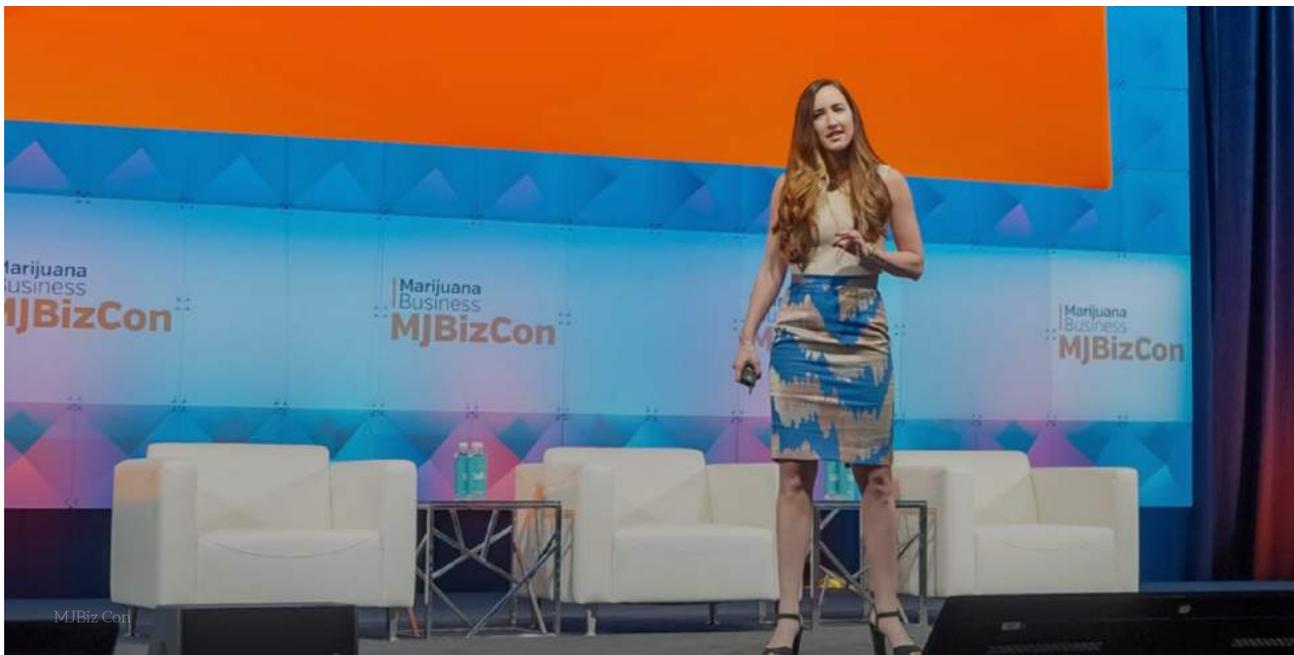
“She then sent me to a cannabis clinic to go through the process,” and it was not long afterward that Armstrong read a feature in Runner’s World that talked about athletes using cannabis and she felt like she didn’t have to feel ashamed about her use. “I had no idea that I could possibly use it functionally for that.”

Armstrong likes to use the dried flower in her vaporizer post-run, to ease her muscles. She has recently been playing around with the Canadian-bred indica strain called Nuken. “I find that it just really hits the spot, it’s not too heavy but it’s very beautiful, it’s got that sleepy feeling to it.” 

10 Major Market Trends: MJBizCon & the Future of Cannabis

What were some of the trends, products, and services that caught the most attention in Las Vegas?

Repost: Robert Kachelriess / November 28, 2018



It seems like Las Vegas has a trade show for everything—and that includes cannabis. MJBizCon recently hit the Las Vegas Convention Center for three days, showcasing vendors, seminars, conferences, and exhibits dedicated to squeezing dollars out of cannabis plants.

The event fosters a sense of community, all united in the feeling the pot business has gone legit. Yet despite all the progress, signs of trepidation still exist. While scouring the exhibit floor, I interviewed a business owner eager to discuss his handcrafted edibles—at least until I pulled out my digital audio recorder. “Oh no... I don’t want to be out there,” he said, waving me away.

Isn’t being out there what MJBizCon is all about? Fortunately, not only were most attendees eager to talk, they appeared to thrive on the excitement that surrounds an industry no longer in the shadows. Laws and regulations seem like worn out topics. MJBizCon is more interested in how to make money in what continues to be a growing economic boom period for cannabis.

What were some of the trends, products, and services that caught the most attention in Las Vegas?

SNIFFING OUT SMELLS

After 30 years in the odor control business, OMI Industries launched the Cannabolish line of products in April. The brand is targeted specifically to cannabis users who don’t want their clothes, homes, or cars to smell like smoke. “You’re not getting this weird, funky, fake fragrance on top of cannabis odor,” says Senior Director for Strategic Partnerships and Business Development Melinda Adamec. “We’ve developed a formulation that eliminates the odor molecule from cannabis and tobacco smoke.”

Cannabolish is an alcohol-free, non-synthetic proprietary blend of plant oils with wintergreen as one of the primary ingredients. It comes in 8oz (\$11.99) and 2oz (\$4.99) sprays—the latter is small enough to pass a TSA security check. A soy-based candle with a 30-hour burn time is destined to become a fixture in dorm rooms around the country. “The candle has to warm up, but the oils actually vaporize off of that and into the air,” says Adamec. “The spray is immediate odor control.” We don’t recommend taking a puff while on a work break. But if you do, add some Cannabolish to your stash.

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NEW CONVENIENCE IN LIGHTERS

Sometimes the best ideas are the simplest. The Toker Poker is a small plastic case that fits around a standard Bic lighter and includes a built-in packer and poker.

“It solves the age-old problem of cleaning out your pipes with paper clips, bobby pins, toothpicks, or whatever you have laying around the house,” says Matt Bodenchuk, who began selling the product about five years ago. “Now you have a poker that’s attached to your lighter when you really need it the most.”

The built-in tamper is an easy way to pack down herb without using your fingers or the corner of a lighter. Wrap a hemp wick around the bottom of the case and use it when ready to light up.

“Light that wick, touch the flame to your bowl, pod, or whatever you’re smoking, and then you’re inhaling residual organic hemp rope soaked in beeswax,” says Bodenchuk. “It makes the herb taste better and there are health benefits by not inhaling the butane—it’s a simple, innovative product,” he says. “It’s kind of a shocker that nobody came up with this 20 years ago.”

BIG EQUIPMENT IS GETTING BIGGER

“It’s happening everywhere,” says Pete Patterson, Co-Founder and COO of Vitalis, an extraction technology company. “Bigger, bigger, bigger. There’s more capital to scale up and professionalize operations.”

Patterson notes that GMP (a recognized standard for “Good Manufacturing Practice”) is bringing processing and cultivation to a new level of quality. “There’s a lot more that goes into building a piece of equipment right now,” he adds. “It’s way more complicated than it was two years ago.”

Vitalis makes a point to create machinery at “the highest level” in order to accommodate not only regulations that can vary from country to country, state to state, and even municipality to municipality, but also anticipate new regulations that could take shape in the future.

The largest piece of equipment coming off the company’s production line is the R-400, a 400-liter CO₂ extraction system—with options to go even bigger. Recent custom orders have included a 3,000-liter CO₂ system and 5,000-liter ethanol system. “The market is saying ‘this is great, but can you do bigger?’” says Patterson. “This industry is moving so fast.”

GOING NORTH FOR FINANCING

Even though the cannabis industry is expanding at a rapid rate, federal restrictions remain in place. That’s why US companies and operators are looking to Canada to secure financing. “The money is coming from all over. The ecosystem happens to be in Toronto,” says Scott Hammon, CCO of the MGO-ELLO Alliance.

“You’ve got the investment bankers who are willing to work with cannabis companies when most US investment bankers wouldn’t. Even if they would, there’s been limited demand for such companies in the US markets.”

Some companies are looking to grow from one state to another. Others are simply looking to expand in the same geographic footprint. Either way, you have to spend money to make money—and the MGO-ELLO Alliance is promising A-to-Z services to get finances in order, from audits to taxes and everything in between.

To make these cross-border transactions happen, the alliance works with Calgary-based MNP, one of the leading tax and accounting firms in Canada. “Over the last 12 to 18 months, you’ve seen a large number of US operators go public in Canada,” add Hammon.

PRESERVING PURITY

Decarboxylation is a vital step in modifying cannabis for medical purposes. However, the wrong decarbing process can compromise the overall plant profile and degrade the cannabinoid content. That’s why Harvest Direct invented LACY, a piece of machinery that captures the true medicinal properties of cannabis in pills, topicals, or virtually any other non-smoked form.

LACY won first place in the MJBizConNEXT Innovation Battlefield competition earlier this year. The technology preserves the “entourage effect,” in which major compounds retain and utilize their minor elements to increase positives and decrease negatives. The same principle explains why a concentrated caffeine pill might give you a more jittery sensation than the complete profile found in a cup of coffee.

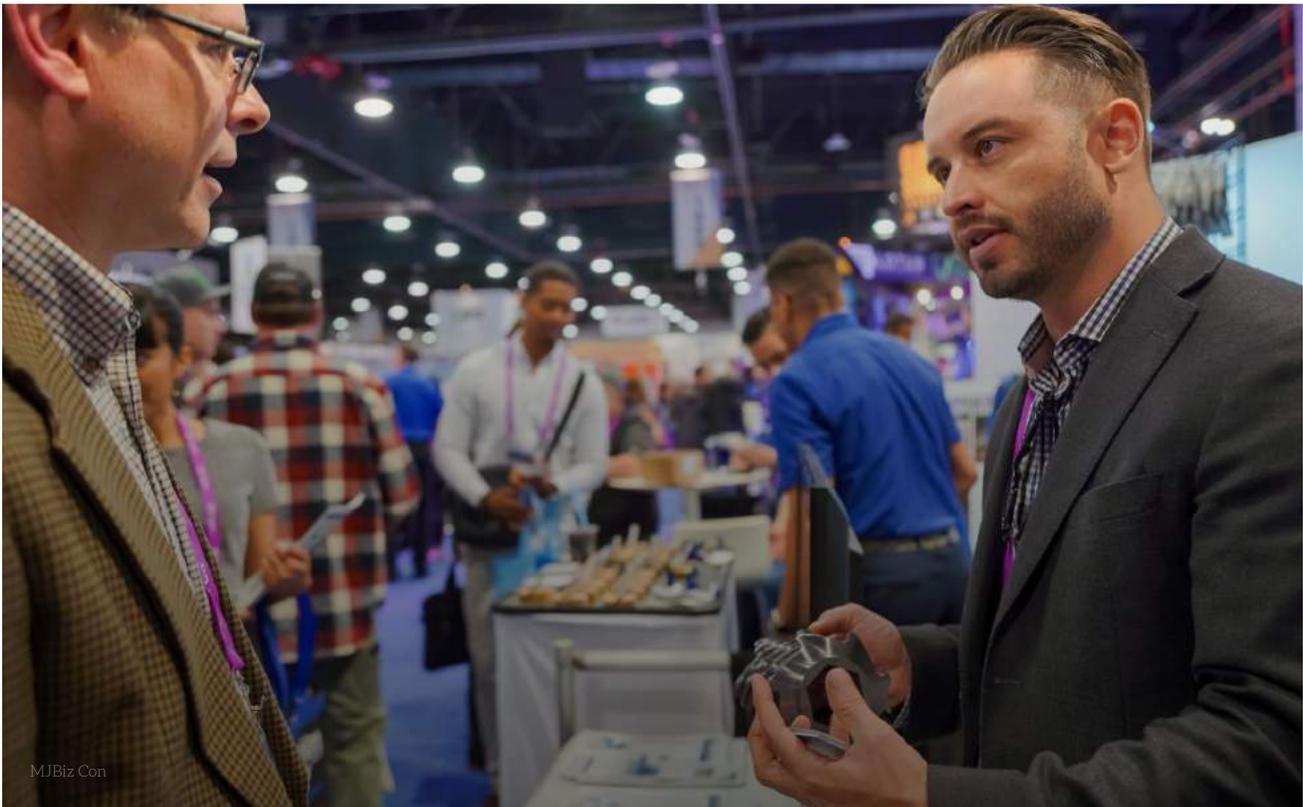
“There is data that shows CBD alone isn’t helping with epilepsy the way it should,” says Gharib. “There’s data about how THC alone deals with pain but can cause paranoia. That’s because those isolated forms are missing out on the entourage effect.” Processors can have LACY all to themselves with a five-year \$300,000 licensing agreement and royalty program. Ongoing support, scientific development, marketing, access to trademarks, and consulting is all included.

VAPES ARE GETTING SMALLER

When you already have a wallet and smartphone in your pocket, it feels like a hassle to carry around a vape pen as well. Los Angeles-based TMA Labs is the inventor of the Roach 1, billed as the smallest fully disposable vape cartridge in the world. With a height of less than 48 millimeters, it’s hard to argue.

“It’s supposed to be fun, and if it gets taken away at the club ... whatever.” says CBDO and Cofounder Mark Hoashi. “Your weekender who comes to Vegas for a show doesn’t need \$80 worth of weed. They just want to buy .3 grams and be done with it.”

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MJBiz Con

TMA Labs customizes cartridge shells based on design, color, shape and texture, which are especially attractive to brands looking to promote themselves. “If you want to make it look like you’re smoking out of a Christmas tree, we can do that too,” says Hoashi.

CANNABIS WITH A SUNTAN

Studies have shown that in greenhouse settings, UVB exposure to plants can increase THC content by 30%. That information was shared by Emil Breza, co-founder and president of AgricUltra Advancements, a company that develops equipment to manipulate UVA and UVB rays in greenhouses.

“We know this works because plants grown in very high altitudes, which get exposure to more UVA and UVB, tend to have higher THC concentrations,” says Breza.

The discovery isn’t new, but the affordability and advancement of LED technology is, opening the door for cannabis growers looking to create premium THC-enhanced versions of familiar strains. AgricUltra’s most advanced product is a high-performance four-channel light fixture, which can be customized for indoor conditions. Fine-tune the lights and discover the sweet spot.

“You can have a tailored cannabis profile that only your grow has,” explains Breza. “It’s your secret and no one is going to know how you did it. And if they want it, they have to come to you. No one can replicate it because only you know the recipe.”

HIGH-TECH COCKTAILS

Kalvara just hit the shelves and is currently available in Las Vegas dispensaries, including partner Exhale. The product is advertised as the first cannabis cocktail, which is more-or-less accurate if you’re looking under the “ready-to-drink” category. “There’s a couple of other drinks on the market, but none with our technology,” says Nevada Brand Manager Tyson Burkett.

Each 2 oz. serving comes with 10mg of THC that’s suspended in nitrogen and instantly infused with the drink once the cap is turned. “It’s called sonic emulsification – that’s how we break the oil down,” explains Burkett. “That way, you don’t have to metabolize it. As soon as (the THC) hits your mouth, it’s applied orally.”

Kalvara comes in a citrus flavor, doesn’t have to be refrigerated, and appears to have an indefinite shelf life. The THC dosage is precise, making the product more consistent and reliable than say, your typical edible.

GROW HOUSES THAT GROW VERTICALLY

The phrase “time is money” can apply to virtually any business. Well, space is money too. That’s why vertical hydroponic farming is becoming more attractive to grow and harvest operations.

“We sell turnkey systems for the cannabis side of things,” says Eric Levesque, co-owner and sales manager of ZipGrow.

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“We’ve been getting approximately 450-675 grams per square foot, compared to the industry average of 39.”

The company’s commercial vertical farming towers tend to be around eight feet high with enough room for 12 plants. After three weeks as a seedling, about an ounce-and-a-half can be harvested from each plant with a quick five-week turnaround.

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“We were talking to a customer who is looking to get a 15,000-square foot building for a license he just got for 1,500 plants,” says Levesque.

“We would be able to grow 2,400 plants in 500 square feet of growing area. So we’re really minimizing that space and we’re saving water.”

FEELING THE FREEZE

If you don’t have \$300,000 laying around for LACY, freeze-drying is an option for extraction on a smaller scale. The process is already widely used for food and pharmaceuticals, but is now being discovered for cannabis—with results in a quick 24 hours.

“If you don’t use freeze-drying, you have to use [an alternative] drying process that takes seven days,” says Dan Neville, CEO of Harvest Right. “And during that process, you’re using heat, which destroys the material. You’re also letting mold, microbes and things like that grow. It compromises the product.”

Harvest Right produces freeze-drying equipment specifically designed for the cannabis industry. The units are “smart,” just press a button and you’ll hear a beep when it’s done. The company produces four models, ranging in price from \$2,000 to \$10,000, but can customize larger sizes.

“The marijuana industry is like the brave new world,” adds Neville. “There are a million ways to do things.” 🌿



LAS VEGAS REVIEW JOURNAL



OUTDOOR RESTAURANT RENDERING DESIGN BY M-RAD INC.

HOW CANNABIS COULD BECOME THE NEXT REAL ESTATE DISRUPTER

REPOST: AMY DOBSON / FORBES / NOVEMBER 27, 2018

For a while it looked like the best thing to bring to a neighborhood was a new Whole Foods grocery store. One study showed that homes in these neighborhoods would appreciate at a much faster rate than if they were near a Trader Joe's (and both were better than a Starbucks). Another sign a neighborhood is on the cusp of revitalization is when the yoga studios start vying for space with the arthouses.

Usually it is not long after that the expensive coffee shops and cupcake stores start showing up at street level. But now that so many states have passed laws favorable to the marijuana movement, the next big thing to bring a neighborhood back from the brink just might be the increasing number of organizations that work in the industry.

Downtown Los Angeles could be the first case study to see this phenomenon in action. Next month, a seven-story building in the heart of Los Angeles' Jewelry District will open up, filled with tenants who all have cannabis somewhere in their job description. The 67,000-square-foot Green Street Building (the name is in reference to its anchor tenant, the Green St. Agency, which works solely with clients in the marijuana industry) will house everything from co-working spaces to an art gallery, dispensary, restaurant, law firm, luxury spa and lounge.

Real estate investment company Bow West Capital purchased the property last year for a reported \$14 million. Once open it will be the largest real estate space dedicated to cannabis in the U.S.

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"The buildings in [the Jewelry District] have not received the proper upkeep, allowing for low sale prices of the buildings but also requiring full renovations," said Matthew Rosenberg, CEO and Founder of M-Rad, Inc, the design team behind the project. "With the prosperity and funding in the cannabis industry on the rise, this is a perfect combination for this exciting new industry to make this area their home, with Green St. being the catalyst."

While there are not many residential properties for sale within the Jewelry District itself, data from Realtor.com shows the few that are on the market have a median asking price of \$525,000. Surrounding neighborhoods vary quite a bit with the neighborhood of Florence-Graham about five miles away to the southwest seeing median list prices of \$440,000 compared to Greater Wilshire a few miles to the northeast seeing median list prices of \$1.7 million.

M-Rad took the 1913 building and completely renovated the interiors to create mixed-use spaces that cater both to the requirements of offices and restaurants as well as the unique needs of cannabis companies.

They needed to create the right proportion of an open-plan design matched with a set of cloistered, secluded rooms for those who want privacy. Here are some images of the interior provided exclusively to Forbes.

For example one concept for behind the hidden door of the library bookshelf could be the Bud Bar, with a custom-designed table.

The lounge, MOTA—which if, like me, you didn't know is a Spanish slang term for marijuana (at least one dispensary out there has ascribed the words Medicine Of The Angels to the letters, but the term doesn't have its origins as an acronym) —will complement the restaurant which will prepare cannabis-infused menu items and have a U-shaped bar designed specifically for cannabis tastings.

It will also have fully transparent windows into the kitchen so guests can see the food being prepared. Sound-proof rooms are also available for private meetings and the Flower Room is a designated smoking area.

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"Which will bring in high-level clientele and investors who may feel encouraged to invest in the development of the area. The building itself will host a number of cannabis-related programs such as cultural activities and gastronomic experiences which will attract new clientele."

Some of the big names affiliated with the project are prolific investor Gary Vaynerchuck, who is a 50% stakeholder in Green Street Agency, and Vicente Sederberg LLC, dubbed The Marijuana Law Firm, is one of the tenants.

Typically neighborhood revitalization follows the pattern of stores opening up on a neglected city block one retail space at a time. But this model is different. By bringing a critical mass of companies to the neighborhood all at once, the sudden influx could accelerate the resurgence all the more quickly.

Los Angeles' Jewelry District could become a major player in a matter of months, not years. 🌿



"The companies who are part of the building are some of the biggest players in the industry," says Rosenberg.





A Winning Formula

WHO WE ARE

FCM Global is a Colombian-based producer/supplier of medical grade cannabis extracts, oils, isolates, and microemulsions to pharmaceutical, nutritional, and cosmetic companies, research organizations, product distributors, and wholesalers in legal markets worldwide.

We are proud to serve these critical sectors and to help support our clients as they create new cannabis-based medicines and wellness products that meet the highest international standards for quality at accessible prices.



FCM Global's Co-Sourced Colombia model translates Colombia's unique comparative advantages in medical cannabis into sustainable competitive edges for each of our clients, enabling them to:



LOWER PRODUCTION COSTS



FOCUS ON STRATEGIC PRIORITIES



KEEP PACE WITH CHANGE

FCM'S CO-SOURCED COLOMBIA MODEL

FCM Global is proud to have been Colombia's first fully licensed producer and exporter in non-psychoactive cannabis for medical and research purposes. With our psychoactive license application submitted (anticipated early Q4 approval), FCM Global is well-positioned to produce and supply a wide range of CBD and THC extracts, seeds, and strains for domestic and international distribution.

FCM'S VALUE-ADDED SOLUTIONS INCLUDE:

Every FCM product benefits from rigorous in-house quality testing at each process stage, as well as independent HPLC testing from a leading licensed 3rd party lab. Each shipment includes a comprehensive independent certificate of analysis (CoA) which includes full cannabinoid potency and terpene profiles, as well as testing for residual solvents, microbiology, pesticides, and heavy metals.

FCM also offers complementary R&D services to clients, underpinned by our experienced formulation professionals and modern lab facilities, for collaboration on proprietary and white label product development.



FULL SPECTRUM OILS



PURE CBD ISOLATES



MICRO EMULSIONS



TARGETED CANNABINOIDS (CBN, CBG, ETC)



TERPENES

For more information please send us an email to info@verdecann.com - thank you.

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