September 8, 2021

Mayor, Council, and Staff,

Thank you for allowing public comment and input into the writing of new cannabis regulations in the City of Billings. This is a monumental task and one that was forced upon our community by actions of the state legislature. I relish the opportunity to help educate on the subject matter, as CM Ronning said last night, and help provide meaningful feedback to this critical and time sensitive process.

As the Mayor alluded to last night, very few good decisions are made quickly. Access to quality information is one of the factors that can alleviate poor decision making. My goal is to provide you factual data, as well as my insights, into these issues from experience in the industry. I approach this process with a unique perspective of being a licensed landscape architect with a strong understanding of zoning regulation and land use economics. I am also an entrepreneur who owns and manages three totally unrelated businesses, one of which is a vertically integrated cannabis farm.

This letter reflects the five bulleted points (zoning restrictions, comprehensive licensing and screening of marijuana businesses, product testing, cultivation regulations and caps, and dispensary regulation and caps) that were discussed at length in the working session on Tuesday September 7, 2021.

<u>Zoning Restrictions</u>

There is a lot of value in seeing all the buffers presented in one map, as the remaining area of allowable properties will likely be quite small and specific. The few properties that will fall into these zoning islands are likely currently occupied being used by existing businesses. The likelihood of them being available for rent/lease/purchase is low.

This limited zoning approach is not the best path forward for our community. Our city currently contains a plethora of vacant properties that seem to grow every month. Vacant properties are not only detrimental to the aesthetic of our community, but they also affect the business climate, employment, and the all-important tax base. Supporting cannabis businesses and their ancillary businesses can be one of the tools in your toolbox to begin to provide anchor tenants and create jobs throughout our city.

The same rules should not apply for a retail dispensary as for a manufacturing or grow production facility. We should not exclude retail from properties that are designed to provide retail service. Conversely, we do not want to have a manufacturing or grow facility located in a retail area. Testing laboratories are a white coat professional type business – do we really want to discourage those businesses from locating here because the zoning requires them to locate

in a heavy commercial or industrial area where employees have no access to walkable distance services?

I strongly encourage staff and council to consider a much more refined approach, with independent and sensible zoning restrictions for each type of cannabis business. There should be a provision allowing for a special review process for properties located outside the determined zoning boundary that wish to be a cannabis business. The zoning regulations need to reflect the seven types of businesses that have previously been identified: cultivation, manufacturer, adult use dispensary, medical use dispensary, combined use dispensary, testing laboratories, and transportation. One additional field should be recognized for this effort – medical research and development – which is potentially the largest and most lucrative type of cannabis businesses. Medical research and development is a growing field that attracts high paying jobs. Billings would be wise to provide an attractive home for these new and burgeoning businesses, as they complement our existing high quality medical services. A recent Wall Street Journal article that explains a little bit about the cutting-edge research and development that is beginning to occur is attached.

<u>Comprehensive Licensing and Screening of Marijuana Businesses</u>

The state of Montana completes a thorough background investigation into all owners of every licensed cannabis business. Before any license is issue or renewed, every shareholder of the business is required to undergo a full FBI background check that includes fingerprinting of all parties. This application process also includes state checks into the following for each shareholder: custody or supervision of the department of corrections or a youth court; no felony convictions; no convictions for a drug offense; no convictions for fraudulent representation; failure to pay taxes, interest, penalties or judgments due to any government agency; stay out of default on a government student loan; pay child support; remedy an outside delinquency for child support or for taxes judgments owed to any government agency. Verification from applicants include that no portion of the property in use by the applicant shall be shared with, rented, or leased to another provider or registered cardholder. Financial disclosures are also included the application process. I have my most recent application to the state that I would be happy to share with you if you feel it would be helpful.

The DPHHS and now Department of Revenue Cannabis Control Division highly regulate all aspects of the business. Seed to sale tracking allows the department to track all aspects of every process involved from planting a seed or clone, through the growing process, harvest, drying, curing, and eventual sale of flower or manufacturing. This system is complicated and comprehensive. Regional inspectors are assigned to perform announced and unannounced audits of the product inventory, plant counts, worker certification, and overall compliance with state law.

If the city deems this process inadequate, I'd be interested to know what additional measures would allay the fears or misgivings of cannabis business owners. Duplicate regulations and unnecessary expansion of our local government is generally not a value supported in our community.

Product Testing

All testing labs are required to be independent of cannabis businesses, and provide unbiased, science-based, results that can be repeated with accuracy. I have provided you with a login and password for accessing the Green Bee testing records with the laboratory that we utilize.

Website: Client Portal / swlims.io Login: admin@greenbeedispensary.com

P/W: OurData123!@#

I encourage you to look at the testing information provided to us. Look at the types of agents that all products are tested for – eighteen different pesticides, a variety of molds and microbials, foreign matter, heavy metals, mycotoxins, residual solvents. I think you'll find the list comprehensive. If you'd like more information about what types of tests can be performed, I encourage you to look at the website of Stillwater Laboratories, the company we use for testing. Fast, Reliable Cannabis Testing Results In Montana | Stillwater Labs (stwlabs.com)

Testing is already a substantial cost to cannabis businesses. In fact, at the Green Bee, testing accounts for approximately 10% of all our expenses. The state has established extremely stringent guidelines for how frequent, when, and what types of tests are required. I have concerns that if the city ventures into this arena, the staffing and city's expense of requiring additional testing will be more than anticipated. I again encourage diving into the existing state regulations to understand what is already required. If additional areas of testing are identified, let's discuss what those are and how those measures can be included in the required round of state testing.

The state of Montana has very clear and concise requirements for labeling of all products. In fact, the testing lab provides the label to the retail facility, so that there is no confusion on what data should be included. This system also ensures that the label affixed to a product is consistent with the test that was performed on that product. The information that Ms. Tracy presented indicated that product mislabeling was rampant in other areas, outside of Montana. This may be true, but this is not a failure of testing, but rather incorrect or untruthful labeling. To my knowledge, this is not an issue here.

Cultivation & Dispensary Regulations and Caps

I have combined the last two categories, as my thoughts on them are similar. As previously discussed in this letter, I feel that a more in-depth approach for zoning is the best policy. Limiting the number of businesses that may operate within those allowable zones is not in the best interest of property owners or residents. Retail services, no matter what you sell, are best when distributed throughout commercial districts. Industrial operations, like commercial indoor farming, is best suited for heavy commercial and industrial zones.

Free enterprise values run strong in our community. Allow the market to dictate what the number of, and types of businesses, call Billings home. I think you'll find that the vast majority of cannabis businesses are well run, organized, and clean. They are an asset to a community.

Thank you for your consideration in these matters. I look forward to further discussion on these regulations. If anyone would like to have a personal tour of the Green Bee, including an in-depth look at the state's existing regulatory structure, I welcome the opportunity to provide you access to my business. Knowledge is power.

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https://www.wsj.com/articles/cannabis-researchers-seek-to-unlock-the-healing-power-of-pot-11630674984

| HEALTH

CANNABIS RESEARCHERS SEEK TO UNLOCK THE HEALING POWER OF POT

Cannabis contains dozens of rare and intriguing compounds, but they haven't been easy or cheap to produce. That is changing.

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READING TIME
7 MINUTE READ

The Future of Everything covers the innovation and technology transforming the way we live, work and play, with monthly issues on education, money, cities and more. This month is Health, online starting Sept. 3 and in the paper on Sept. 10.

Cannabis, the leafy group of plants including marijuana and hemp, is best known for the THC that gets people high. But cannabis can contain many other chemicals. Products with the nonintoxicating compound CBD, for example, have proliferated over the past five years. Now, pharmaceutical makers, product researchers and investors are wondering, what else do the plants have to offer?

Scientists say there are at least a hundred cannabinoids, a class of organic compounds found primarily in cannabis and often abbreviated to three or four letters. THC and CBD are abundant, and the Food and Drug Administration has already approved them in some forms. But many other compounds may have therapeutic effects, and not every plant produces every cannabinoid. Rare and intriguing compounds like CBM and CBD-V would require years of strategic breeding of plants to create a stable and inexpensive supply chain.

At Lygos, microbial fermentation generates the desired cannabinoid molecules in a broth.

PHOTO: HELYNN OSPINA FOR THE WALL STREET JOURNAL

Researchers say a technique known as biological synthesis, a method that involves engineering yeast, algae or bacteria to produce compounds in a fermentation tank, will allow them to quickly generate molecules without the expense and complexity of growing hemp or marijuana plants.

This technology could fundamentally alter the way cannabis products are sourced and consumed—and possibly help unlock the plant's potential as a source of medical therapies, say scientists. Early studies show that cannabigerol, or CBG, for example, holds promise as a treatment for neurological disorders such as Huntington's disease.

SHARE YOUR THOUGHTS

What potential do you see in cannabis as a source of medical therapies? Join the conversation below.

Though questions remain about the efficacy of compounds isolated from the rest of the cannabis plant, the rise of biosynthesis will allow for a purified, consistent study drug, hastening scientific understanding of each compound's potential toxicities and benefits, cannabis researchers say. Analysts at the investment bank Raymond James predict the nascent biosynthetic cannabinoid industry will be worth $10 billion globally by 2025. This is despite potential legal complications arising from selling cannabis-related products, even if the compounds were grown in a lab.

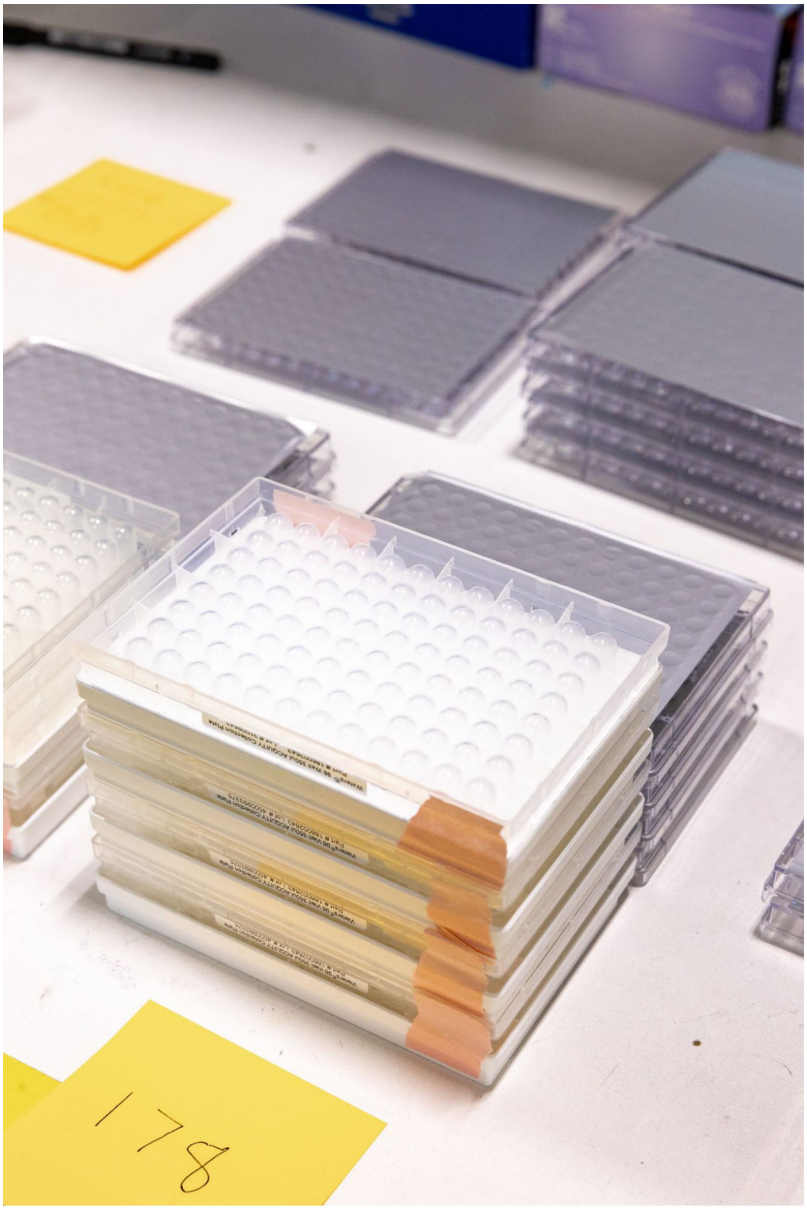
"The marijuana plant has tremendous potential, so the more access we have to the constituents of marijuana, the more we can continue to move the science forward," says Dr. David Shurtleff, the deputy director of the National Center for Complementary and Integrative Health at the National Institutes of Health.

The recent surge of research and development at biotech companies around molecular biosynthesis has implications beyond cannabis. A McKinsey analysis from 2020 predicted that this kind of "biomolecule" will soon have an annual global direct economic impact in the trillions of dollars, for industries ranging from agriculture to health to energy production. Some vitamins are already produced biosynthetically.

In the cannabis industry, the technology has been particularly alluring, researchers and entrepreneurs say, due to the breadth of potentially therapeutic compounds, the dearth of existing research on those compounds, and the difficulty and expense of producing the compounds through either chemical synthesis or conventional plant breeding.

Here's how it works: First, scientists identify the enzymes in a cannabis plant that contain the chemical blueprint to produce the desired compound. Next, they sequence those enzymes to find their DNA, and then insert the genes into a microorganism like yeast, using gene-editing technology such as Crispr or a more traditional technique called homologous recombination. From here, the yeast is fed oxygen, sugar and nutrients, and mixed with water in a fermentation tank, in a process similar to brewing beer. Within a few days, the yeast begins to secrete the cannabinoid. Finally, scientists add an organic solvent like oil to the fermentation tank,

attracting the newly produced compounds and leaving a cannabinoid solution that can be further manipulated.



Thousands of strains are generated and tested for Lygos's desired production characteristics.

PHOTO: HELYNN OSPINA FOR THE WALL STREET JOURNAL

The whole process takes about a week, compared with up to six months to grow and harvest a single plant. It is cheaper, more accessible and, without the need for entire fields of cannabis and energy-intensive extraction processes, more sustainable, says UCLA Cannabis Research Initiative founder Dr. Jeff Chen.

"This platform is a game-changer for research," he says. "It enables the study of what the individual cannabinoids are doing, which is very difficult if not impossible to tease apart when you're working with the plant material itself, or plant extracts."

Cannabinoid biosynthesis companies are generally not interested in THC because state marijuana markets are so tightly regulated.

Instead, they are looking at mysterious compounds that few humans have tried, with names like CBE and CBC. Each cannabinoid seems to have a unique effect. Where THC has a propensity to induce hunger, also known as "the munchies," THC-V seems to take away appetite, according to early research. Other cannabinoids seem to influence everything from blood pressure to bone density, according to research done mostly in mice.

At Lygos, petri dishes containing genetically modified yeast are selected and then screened for the production of cannabinoids.

PHOTO: HELYNN OSPINA FOR THE WALL STREET JOURNAL

Cannabinoids "may have therapeutic potential in almost all diseases affecting humans," wrote NIH researchers Pál Pacher and George Kunos in 2013, citing early evidence of the comprehensive nature of how various compounds from the cannabis plant affect the body.

If that is true, biosynthesis may be the technology that allows researchers to puzzle out which compounds help, which hurt, and how they can be combined to treat various ailments.

Clinical research involving cannabis in the U.S. remains stymied by federal restrictions. It is very difficult to gain permission to do trials in human beings, and it has been even more difficult to access a variety of cannabinoids from the University of Mississippi, home to the country's sole legal source of pot for research. More thorough research on cannabis and cannabinoids tends to come from other countries, such as Israel and the Netherlands. While it isn't yet clear how regulatory agencies would handle the legal status of biosynthetic cannabinoids, researchers are optimistic.

Lygos hopes to mass produce cannabinoids for some of the biggest corporations and research institutions in the world. PHOTOS: HELYNN OSPINA FOR THE WALL STREET JOURNAL(2)

So far, products containing biosynthetic cannabinoids are few and far between. The skin care brand High Beauty sells an acne treatment that contains biosynthetic CBG, which early research suggests has anti-inflammatory properties, at Macy's. The CBG is made by the Berkeley, Calif.-based biotechnology company Lygos.

Other companies working on biosynthetic cannabinoids include the Vancouver, Canada-based Willow Biosciences, which is partnered with Curia Inc., and the Boston-based Ginkgo Bioworks, a synthetic biology company which is partnered with the Canadian cannabis producer Cronos Group.

Back in 2014, when Lygos bioengineer Jason Poulos started working with biosynthetic cannabinoids, friends joked that he was a stoner; now, he is hoping to mass produce cannabinoids for some of the biggest corporations and research institutions in the world.

"We want to be the supplier of these ingredients to everybody," Dr. Poulos says.

Lygos produces CBG for an acne treatment from skin care brand High Beauty.

PHOTO: HELYNN OSPINA FOR THE WALL STREET JOURNAL

To be sure, some of these compounds may have negative effects at certain doses. “It’s a drug that is metabolized, and if it is overdone it will tax on your liver,” Dr. Poulos says. “We should expect all the cannabinoids to have a similar toxicity window to CBD.”

And for many cannabis researchers, activists and businesspeople, the quest to manufacture, understand and sell single-cannabinoid products is a waste of time. No isolated cannabinoid, they say, will ever be able to replicate the benefit of the entire plant, with its mix of major and minor compounds—a theory known as “the entourage effect.”

“I’m still a believer that the whole plant is more therapeutically beneficial than any one cannabinoid by itself,” says Dr. Malik Burnett, an addiction medicine physician at the University of Maryland Medical Center, who has experience in cannabis business and policy. “The concept of using biosynthesis to increase production of lesser cannabinoids is not a scientific breakthrough, but there is a significant amount of potential to create products that can be marketed, and can convince people that they need to use them.”

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Corrections & Amplifications

Cannabinoid biosynthesis companies are looking into compounds with names like CBE and CBC. An earlier version of this article incorrectly said that one of the names was CDD, but there is no cannabinoid by that name. (Corrected on Sept. 3)