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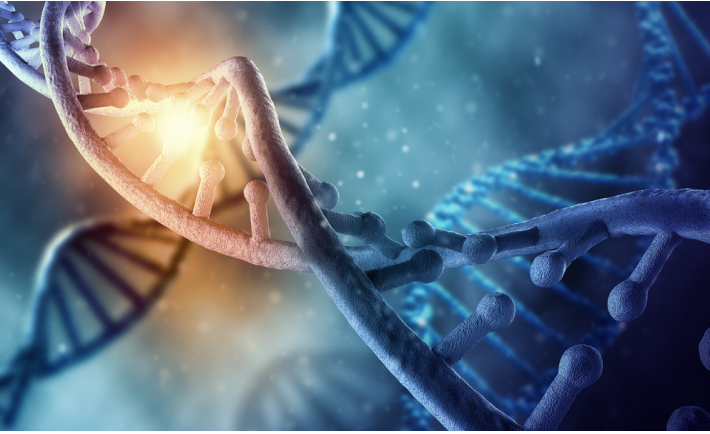
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Scientists Are Trying To Map Out The Marijuana Genome

Unlocking the secrets of cannabis for public good or private profit?



BY ADAM DRURY · JANUARY 17, 2018



The drive to bring cannabis cultivation up to speed with the sophisticated technologies employed by major agriculture companies has prompted something like a research and development arms race. The objective is clear: map the entire marijuana genome.

Scientists Are Trying To Map Out The Marijuana Genome

It's difficult to overstate the significance of knowing the DNA sequence of **cannabis chromosomes**. Future strains, future products, future applications... The fate of **the next era of cannabis** lies in the

still-incomplete map of the marijuana genome.

Yet it's not just the prospect of breeding better, more **specialized strains**. The stakes of the race to map the weed genome are much higher.

Namely, who will *own* the priceless information twisted up in the DNA of cannabis plants? The public? Or private corporations?

At bottom, the possibility of wresting total control over marijuana's genes is an attractive one for major **agriculture companies**. Indeed, they've been doing the same

thing with corn, tomatoes, soy and other crops for decades.

And to make sure they're the first across the finish line, ag companies are recruiting a small army of scientists. At the same time, however, other scientists are racing to place knowledge about the marijuana genome in the public domain, which would help protect it from being patented.

Is There An Ulterior Motive Behind Efforts To Map Weed's DNA?

A recent *Bloomberg* story on the issue frames scientists' work mapping the marijuana genome as motivated by "the prospect of making good on some of the loftier possibilities for legal marijuana."

Yet some of those "loftier possibilities" exceed simply developing new products. Certainly, full knowledge of the

cannabis genome would provide innumerable benefits in that respect.

Obviously, figuring out which genes are responsible for different effects and functions could dramatically improve our understanding of the **medicinal properties of cannabis**. It would help create recreational products better-tailored to customers' unique needs and desires. And on top of that, there's the immense potential for improving and **expanding the use of industrial hemp**.

Of course, mapping plant genomes is hardly a new concept. "At Monsanto, they do the same thing," professor and director of informatics at the J. Craig Venter Institute in California Todd Michael told *Bloomberg*.

But when Monsanto uses these techniques to develop a new strain of corn or wheat, they patent the genome. Infamously litigious, Monsanto has **filed**

thousands of lawsuits against small farmers for infringing on their “copyright” of the DNA.

The result is that communities and individual growers are disempowered, while a powerful transnational corporation gets rich off the exclusive rights to a strain of corn.

Todd Michael previously led the Genome Center at Monsanto. Today, he’s a scientific advisor to a company called Sunrise Genetics. Sunrise, led by CEO CJ Schwartz, is a Colorado company that’s leading the pack on mapping weed’s DNA. Michael’s lab even did a portion of the physical sequencing for Sunrise.

Ultimately, the future of cannabis depends on whose hands the map ends up in. Those of a private and powerful corporation, or in the hands of the public.

Showdown Looms Over Control Of Marijuana Genome

Some scientists want to protect marijuana's genome from ending up locked behind a patent.

Mowgli Holmes and his startup, Phylos Bioscience, don't have access to the coordinated research team Sunrise does. And like all scientists studying cannabis, they're stymied by federal prohibition.

However, Holmes and his team are unique in that they're not concerned about how businesses will use the full genome map.

Instead, they're making all of their DNA sequences and genetic information available to the public as part of a large, interactive database called the Galaxy. Companies can't get a patent on anything that's been in the public domain for more than a year.

Furthermore, a company has to show that the genome of a plant they've bred is significantly different from naturally occurring ones. The more **strains** Phylos can add to the Galaxy, the harder it will be for corporations to patent an individual strain.

"We set out to bring more knowledge and transparency to the industry, and that's still what we're doing," said Phylos Sales and Marketing Manager Carolyn White.

Interest in the genetics of cannabis will only continue to grow. And as it does, competition over control of the marijuana genome is likely to intensify.



Author

Adam
Drury

Adam is a staff writer for Green Rush Daily and High Times who hails from Corvallis, Oregon. He’s an artist, musician, and higher educator with deep roots in the cannabis community. His degrees in literature and psychology drive his interest in the therapeutic use of cannabis for mind and body wellness.

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