



What Are Terpenes? [Explainer & Infographic]

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By Selene Angier

When you open a jar of fresh cut hemp buds, what's the first thing you're going to do? Whether seasoned or newbie, that's right, you are going to take a big whiff of those pretties. That smell, those aromas? The pine, sweet lemon, lavender, grass, gas, musk, skunk, and funk — those aren't trendy buzz words, those are terpenes.

What are terpenes?

Terpenes are organic compounds that give the cannabis plant their unique smell, taste, and euphoric effects. Found in nearly all plants and fruits (and some other living organisms), these essential oils are part of the chemical makeup that define a strain's top notes — the aroma and flavor — and they also contribute to the medicinal benefits of hemp (and, for THC strains, the psychoactivity).

What do terpenes do exactly?

The cannabis plant's 100+ terpenes work synergistically, along with its 60+ cannabinoids, to create a strain's one-of-a-kind formulation and "entourage effect."

A given strain can have dozens of terpenes — some are sedating or maybe uplifting, some help quell anxiety, some are appetite stimulants, some are appetite suppressants.

No strain has just one terpene, but may lean heavily in one direction or another. Often we think of strains in terms of sativa (up), indica (down, in-da-couch), or hybrid. But the [growing trend](#) in choosing strains (and in [research](#)) is terpene concentration. Instead of binary thinking (sativa/indica), think gradient or color wheel.

"Most people are totally clueless as to how the cannabinoid comes to life in the plant," says Mike Robinson, founder of the [Global Cannabinoid Research Center](#) and editor of [Mike's Medicines](#) blog.

"What really amazes me are the number of people that actually grow either small scale or large that simply don't know how that beautiful cannabinoid is birthed. A concert of biological events occurs as the terpenes create the trichome and CBG_a appears — which starts the whole cannabinoid clock ticking!"

"These valuable plant elements cause the endocannabinoid system to light up with activity like it's the 4th of July." — Mike Robinson, Global Cannabinoid Research Center

How do terpenes contribute to the entourage effect?

What's your favorite meal? Maybe it's spaghetti or tikka masala or barbecue ribs. A lot of ingredients come together to make that dish what it is. If your sauce is bland — or "one note" — it's because it's not balanced with the five tastes (sweet, sour, salty, bitter, umami). It's the same for terpenes and cannabinoids — dozens of them come together to make the strain what it is, and produce its "entourage effect."

And to know your terpenes is to know what your chef Mother Nature is cooking up for you. Myrcene, the most common terpene in hemp, contributes to the calming lean of many indica strains. But once it buddies up — there's that entourage effect — with uplifting terpinolene or buzzy humulene, the chill effect is balanced out and you're no longer in couch-lock mode. Similarly, myrcene or caryophyllene, the

second most dominant terp in cannabis, can mediate a sativa-dominant strain and keep you from heading into a palpating orbit.

“What we’ve found at GCRC is the synergy between cannabinoids and terpenes is so significant that the well-known ‘entourage effect’ can occur merely by having multiple terpenes, even with only one cannabinoid involved,” Robinson says.

“What we’re learning is that these valuable plant elements cause the endocannabinoid system to light up with activity like it’s the 4th of July. So many thought it took the whole plant and all cannabinoids, but what we’ve found is there’s much more than cannabinoids involved in maintaining homeostasis.”

Where else are terpenes found?

Terpenes have many everyday uses and if you go open your cupboard right now, you’ll find a ton — in the spice rack alone you’ve got rosemary, oregano, thyme, basil.

Terpenes are found in thousands of household products, pantry staples, beauty products, lotions and [sunscreens](#), essential oils, [sleep](#) aids, herbal remedies, insecticides, and industrial items — everything from black pepper to laundry detergent to bubble bath has terpenes in it. They are what help [calm our anxiety](#) when we do aromatherapy, and if you love the smell of fresh cut flowers in the house, you can thank terpenes.

Sometimes terpenes give us an emotional kick or medicinal benefit, too. You might not know linalool (yet!), but you do know lavender. That sleepy waft that hits you and makes you feel like you are sitting on a cloud in the south of France? That’s linalool. Does the smell of bright lemon oil perk you up? That’s limonene working on those olfactory receptors.

What are the benefits and effects of terpenes?

We’ll get into some specific terpenes in a bit — and you can [download this handy infographic](#) — but there are many [benefits of terpenes](#).

Terpenes have been shown to have beneficial properties for body and mind, and can act as an:

- anti-inflammatory
- anti-depressant
- anti-anxiety
- sedative
- analgesic
- antioxidant
- anti-cancer
- appetite stimulant
- mood enhancer
- antifungal
- anti-epileptic
- antibiotic
- antimicrobial
- antibacterial
- anti-viral
- antiseptic
- appetite suppressant
- decongestant
- expectorant

Mother Nature provides, indeed.

TERPENES 101

Terpenes are organic compounds that give the cannabis plant—and all plants and fruits!—their unique smell, taste, and euphoric effects.

The cannabis plant's 100+ terpenes work together to create a strain's one-of-a-kind formulation and "entourage effect."

- 1 MYRCENE**

The most dominant terpene in commercial cannabis strains, myrcene has an earthy, musky scent.

CALMING/RELAXING
ACTS AS anti-inflammatory, antibiotic, anti-depressant, sedative, analgesic
ALSO FOUND IN hops, lemongrass, thyme, mangos
POPULAR STRAINS OG Kush, Cannatonic
- 2 CARYOPHYLLENE**

Spicy, woody caryophyllene is the only terpene known to activate our cannabinoid receptors. Found in many pantry staples and cooking ingredients like spices, liquor, and (mmm) beer.

CALMING/RELAXING
ACTS AS anti-inflammatory, anti-depressant, antioxidant, anti-cancer, appetite stimulant
ALSO FOUND IN black pepper, cinnamon, clover, oregano
POPULAR STRAINS Death Star, GSC
- 3 LINALOOL**

Does flower with a fresh, lavender scent call to you? That's the linalool terpene, and its relaxing and soothing properties, saying — ahhhhh — come hither.

CALMING/BALANCING
ACTS AS sedative, anti-inflammatory, anti-epileptic, anti-anxiety, analgesic
ALSO FOUND IN lavender, jasmine, rosewood, laurel
POPULAR STRAINS Lavender, Master Kush
- 4 PINENE**

The most prolific terpene in nature, pinene boasts a top note of (spoiler alert!) pine. It's often used in natural remedies, including expectorants, bronchodilators, and topical antiseptics.

CALMING/FOCUSING
ACTS AS anti-inflammatory, anti-cancer, antimicrobial, anti-anxiety
ALSO FOUND IN pine, rosemary, cedar, eucalyptus
POPULAR STRAINS OG Kush, Harlequin
- 5 LIMONENE**

Limonene is found in the citrus peels of oranges, limes, and (yup!) lemons. With a fresh, bright aroma, this common terpene is also used to flavor food, gum, and beverages.

ENERGIZING/BALANCING
ACTS AS antibacterial, anti-depressant, antioxidant, anti-anxiety, anti-inflammatory
ALSO FOUND IN citrus fruits, mint, juniper, fennel
POPULAR STRAINS Berry White, Sweet Kush
- 6 TERPINOLENE**

Are lilac lotions and tea tree oil relaxing staples for you? You can thank terpinolene. Both floral and woody, this terpene is calm-dominant, but combined with certain terp BFFs, it can have an energizing effect, too.

UPLIFTING/CALMING
ACTS AS sedative, mood enhancer, anti-anxiety, antifungal, antibacterial
ALSO FOUND IN lilacs, apples, cumin, fir
POPULAR STRAINS Sour Tsunami, Pineapple Kush
- 7 HUMULENE**

If you're into double IPAs, then you've likely indulged in some buzzy humulene. Found in hops, this natural energy booster is also the foundation of many ancient remedies, like sage oil and ginseng.

ENERGIZING/UPLIFTING
ACTS AS mood enhancer, anti-inflammatory, anti-cancer, antibacterial, appetite suppressant
ALSO FOUND IN hops, sage, ginger, tobacco
POPULAR STRAINS White Widow, Sour Diesel
- 8 OCIMENE**

This sweet, woody terpene is used in natural insecticides and found in common household items like antiperspirants, shampoo, soap, and cleaners.

ENERGIZING/UPLIFTING
ACTS AS anti-viral, antifungal, antiseptic, decongestant, expectorant
ALSO FOUND IN mint, parsley, orchids, mangos
POPULAR STRAINS Jack Herer, Strawberry Cough

SOURCES | BIG THANK YOU TO >
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Are terpenes being studied and researched?

Oh, [yes](#). It's also a key focus for Robinson and his team at the Global Cannabinoid Research Center.

“Although it appears we're very advanced scientifically, we've truly just started to learn over the past few decades what cannabinoid medicine can do and how it works – with many of the more intense discoveries on potential being in last few years. In our studies, we find the same type of magic occurring when terpene profiles (multiple terpenes) are combined with a singular cannabinoid constituent,” says Robinson.

“Literally the same type, or even better, of a dose response, is coming from the patient from terpenes and only one cannabinoid than when only THC and CBD are combined,” Robinson continues. “This is occurring at an even greater level when minor cannabinoids such as CBG, CBGA, CBC, and CBL are used in correlation with specific terpene profiles, which is extremely promising for the future of cannabinoid medicine and nutraceuticals.”

Terpene combinations are becoming a fast-track focus of scientific studies in the MMJ industry and beyond. Robinson points to a study focused on [natural terpenoids](#) (*Molecules*, 2020), which found that terpenes play an effective role in, according to the abstract, “immune-mediated inflammatory and infectious diseases, neuroinflammatory, neurological, and neurodegenerative diseases, as well as in cancer and autoimmunity by itself.”

“It's our hope at the GCRC that someday we'll see store shelves filled with easily accessed hemp and other plant medicines, while at the pharmacy there will be the new products that contain plant medicine just like we had 100 years ago,” says Robinson. “Without a doubt, we strongly believe that terpenes will play a key role in developing the most effective ones.”

What are the most common terpenes?

There are 200+ known terpenes in nature, and 100+ in the cannabis plant. But about 10 to 20 terpenes dominate CBD and MMJ strains, including: myrcene, b-caryophyllene, linalool, pinene, limonene, terpinolene, humulene, ocimene, valencene, geraniol, eucalyptol, camphene, nerolidol, delta 3 carene, borneol, bisabolol.

Let's get into the 8 most common terpenes you might see listed when choosing a [CBD oil](#) on Irie Bliss or getting a pre-roll at the dispensary.

1. Myrcene

The most dominant terpene in commercial cannabis strains, myrcene has an earthy, musky scent.

Effects profile Calming/relaxing

Acts as anti-inflammatory, antibiotic, anti-depressant, sedative, analgesic

Also found in hops, lemongrass, thyme, mangos

Popular strains OG Kush, Cannatonic

2. Caryophyllene

Spicy, woody caryophyllene is the only terpene known to activate our cannabinoid receptors. Found in many pantry staples and cooking ingredients like spices, liquor, and (mmm) beer.

Effects profile Calming/relaxing

Acts as anti-inflammatory, anti-depressant, antioxidant, anti-cancer

Also found in black pepper, cinnamon, clover, oregano

Popular strains Death Star, GSC

3. Linalool

Does flower with a fresh, lavender scent call to you? That's the linalool terpene, and its relaxing and soothing properties, saying — ahhhhh — come hither.

Effects profile Calming/balancing

Acts as sedative, anti-inflammatory, anti-epileptic, anti-anxiety, analgesic

Also found in lavender, jasmine, rosewood, laurel

Popular strains Lavender, Master Kush

4. Pinene

The most prolific terpene in nature, pinene boasts a top note of (spoiler alert!) pine. It's often used in natural remedies, including expectorants, bronchodilators, and topical antiseptics.

Effects profile Calming/focusing

Acts as anti-inflammatory, anti-cancer, antimicrobial, anti-anxiety

Also found in pine, rosemary, basil, cedar, eucalyptus

Popular strains OG Kush, Harlequin

5. Limonene

Limonene is found in the peels of citrus fruits like oranges, limes, and (yup!) lemons. With a fresh, bright aroma, this common terpene is also used to flavor food, gum, and beverages.

Effects profile Energizing/balancing

Acts as antibacterial, anti-depressant, antioxidant, anti-anxiety, anti-inflammatory

Also found in citrus fruits, mint, juniper, fennel

Popular strains Berry White, Sweet Kush

6. Terpinolene

Are lilac lotions and tea tree oil relaxing staples for you? You can thank terpinolene. Both floral and woody, this terpene is calm-dominant, but combined with certain terp BFFs, it can have an energizing effect, too.

Effects profile Uplifting/calming

Acts as sedative, mood enhancer, anti-anxiety, antifungal, antibacterial

Also found in lilacs, apples, cumin, fir

Popular strains Sour Tsunami, Pineapple Kush

7. Humulene

If you're into double IPAs, then you've likely indulged in some buzzy humulene. Found in beer hops, this natural energy booster is also the foundation of many ancient remedies, like sage oil and ginseng.

Effects profile Energizing/uplifting

Acts as mood enhancer, anti-inflammatory, anti-cancer, antibacterial, appetite suppressant

Also found in hops, sage, ginger, tobacco

Popular strains White Widow, Sour Diesel

8. Ocimene

This sweet, woody terpene is used in natural insecticides and found in common household items like antiperspirants, shampoo, soap, and cleaners.

Effects profile Energizing/uplifting

Acts as anti-viral, antifungal, antiseptic, decongestant, and expectorant

Also found in mint, parsley, orchids, mangos

Popular strains Jack Herer, Strawberry Cough

Have questions about which terpene-forward CBD is best suited for you? [Talk to a Green Network Provider](#) registered nurse today.

Connect with Mike Robinson on [LinkedIn](#) and follow the GCRC on [Instagram](#).

SOURCES

Big thank you to the many sites and research sources that did all the heavy textbook lifting:

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