



# The Next Generation of Cannabinoid Production

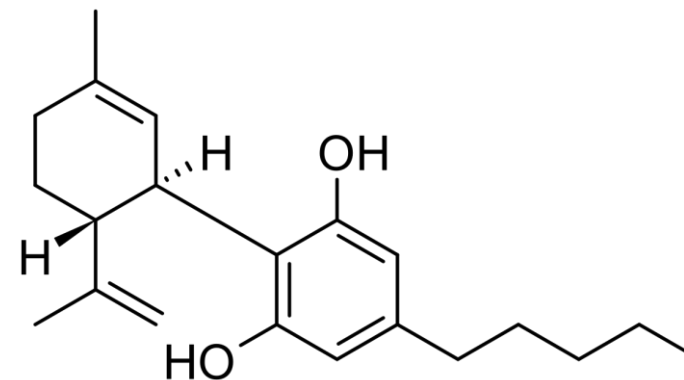
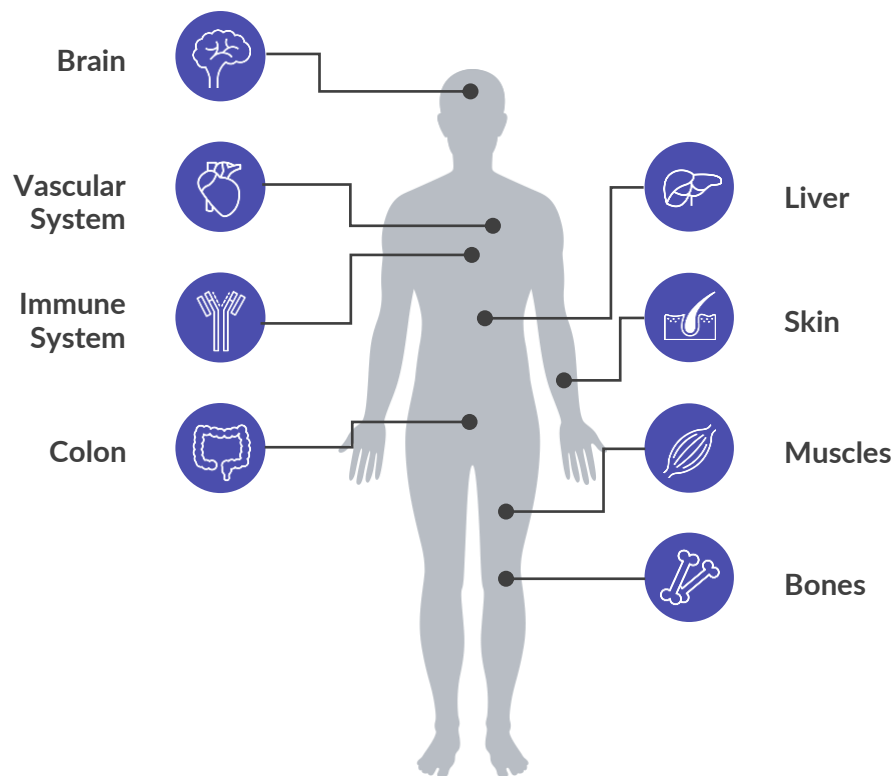
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BD & Partnerships Associate

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[HYASYNTHBIO.COM](http://HYASYNTHBIO.COM)



# Endocannabinoid System: The future of beauty and wellness



**Cannabidiol (CBD)**  
**CAS Number: 13956-29-1**

Cannabidiol is recognized by the Personal Care Council and the International Nomenclature of Cosmetic Ingredients (INCI)

1. Oláh, Attila et al., 2014. Cannabidiol exerts sebostatic and antiinflammatory effects on human sebocytes.
2. Hampson et al., 1998. Cannabidiol and (-)-Δ<sup>9</sup>-tetrahydrocannabinol are neuroprotective antioxidants.
3. Gęgotek, Agnieszka et al., 2021. The Effect of Cannabidiol on UV-Induced Changes in Intracellular Signaling of 3D-Cultured Skin Keratinocytes.
4. Baswan, Sudhir M et al., 2020. Therapeutic Potential of Cannabidiol (CBD) for Skin Health and Disorders.
5. Bergamaschi et al., 2011. Safety and Side Effects of Cannabidiol, a Cannabis sativa Constituent.

# Endocannabinoid System: The future of beauty and wellness

## Sebaceous Glands

CB1r, CB2r, TRPV1

Regulates production of excess sebum

## Nerve Cells

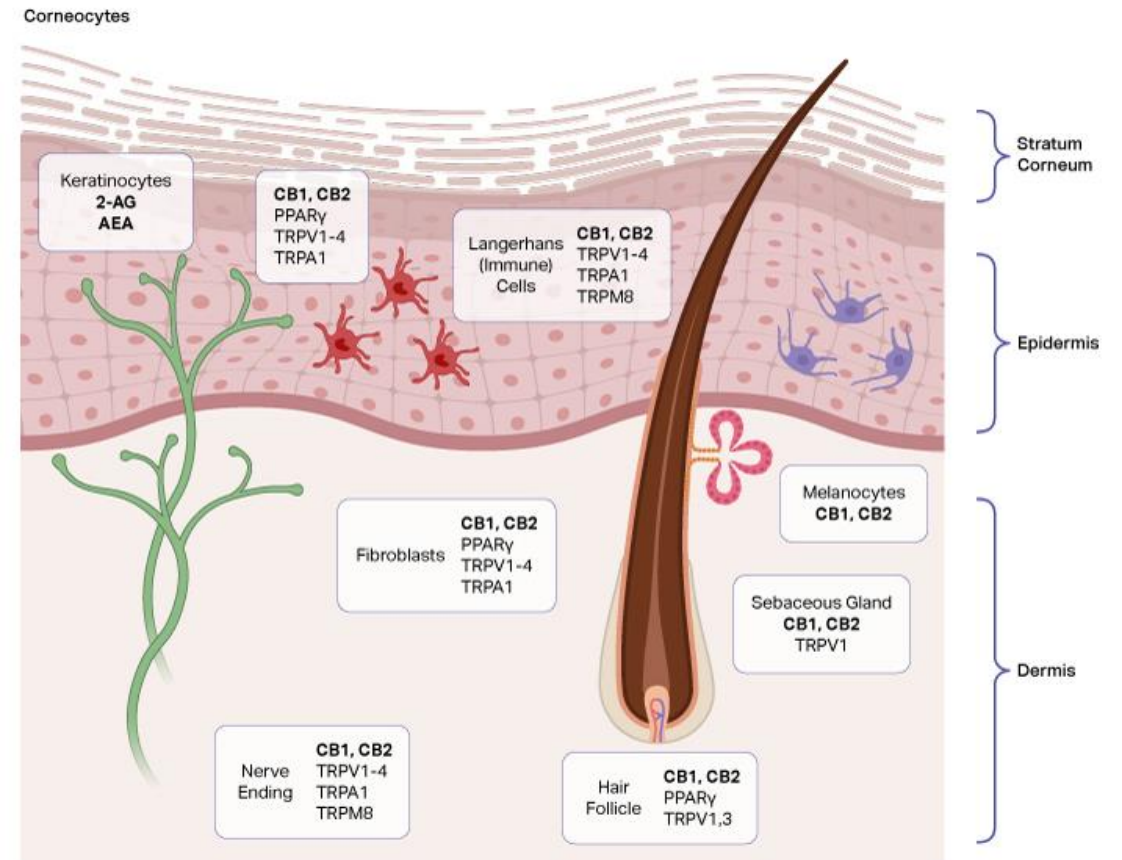
CB1r, CB2r, TRPV1-4, TRPA1, TRPM8

Decreased stimulation of pain and itch

## Langerhans

CB1r, CB2r, TRPV1-4, TRPA1, TRPM8

Reduced redness, decreased pro-inflammatory cytokines, decreased damage from ROS





CBD is present in 0.09% of skincare products globally<sup>5</sup>, TAM for CBD infused skincare is \$450.8M in 2022<sup>6</sup>.

# Applications in Skincare: Science-backed evidence

## CBD is a well characterized ingredient

- **Regulates skin sebum production** and can help treat oily skin<sup>1</sup>.
- A potent anti-inflammatory agent and exhibits **30–50% more antioxidant activity than vitamin C**<sup>2</sup>.
- Supports to skin barrier defense, protecting the skin from harmful external stimuli like UV radiation<sup>3</sup>.
- Acts as an anti-microbial and **regulates the skin microbiome**. Can be effective for treating acne, eczema and psoriasis<sup>4</sup>.
- Safe, non-toxic, **non-addictive and non-psychoactive**.

1. Oláh, Attila et al., 2014. Cannabidiol exerts sebostatic and antiinflammatory effects on human sebocytes.

2. Hampson et al., 1998. Cannabidiol and (–)Δ9-tetrahydrocannabinol are neuroprotective antioxidants.

3. Gęgotek, Agnieszka et al., 2021. The Effect of Cannabidiol on UV-Induced Changes in Intracellular Signaling of 3D-Cultured Skin Keratinocytes.

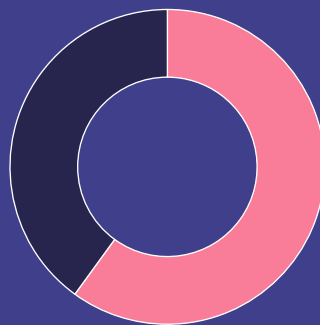
4. Baswan, Sudhir M et al., 2020. Therapeutic Potential of Cannabidiol (CBD) for Skin Health and Disorders.

5. INCI Beauty. "CANNABIDIOL - SYNTHETICALLY PRODUCED ingredient".

6. Grand View Research, 2020. Skin Care Products Market Size, Share & Trends Analysis Report 2022 - 2030.



# Traditional manufacturing methods are unreliable.



— **MORE THAN 50%**  
of CBD products on the market do not contain the quantities as labeled or contain THC containments according to the FDA





# Traditional manufacturing methods are unsustainable.



Growing 1 kg of Cannabis through indoor cultivation releases as much CO<sub>2</sub> as burning 2000L of gasoline<sup>7</sup>.



1 kg of Cannabis requires 1300 litres of water<sup>8</sup>, nearly twice the amount used for beef production<sup>9</sup>.

7. Mills, E., 2012. The carbon footprint of indoor Cannabis production. Energy Policy, 46,58-67.

8. Mekonnen, M and Hoekstra, A., 2010. The green, blue and grey water footprint of farm animals and animal products.

9. Rodriguez et al., 2018. Energy Use in Colorado Cannabis Industry.

We are using  
**the power  
of biology**

to make high quality ingredients

# Fermentation: Production of high quality ingredients



Yeast



Water



Sugar



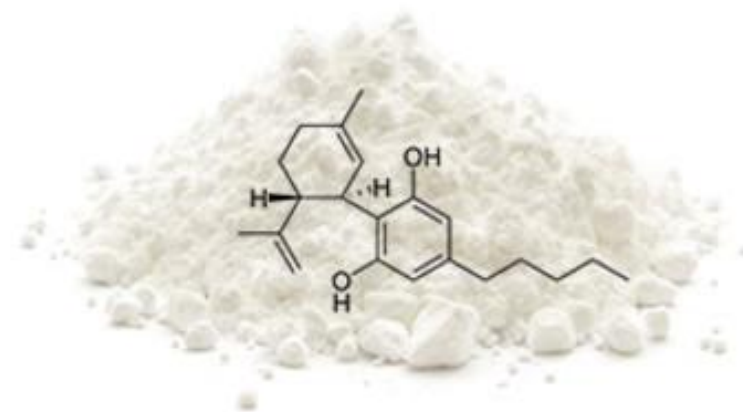
Air



Fermenter



Third party validation  
for samples and  
production process



**Premium  
Cannabinoid Isolates**

No THC, pesticides, heavy metals,  
mycotoxins or other contaminants



# Rare cannabinoid isolates

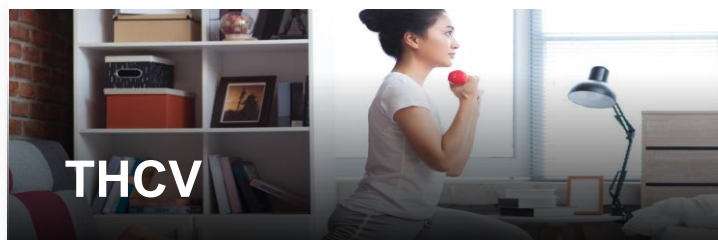
The market is seeking new and innovative products. Hyasynth's drop-in ingredients assist product formulators to achieve more precise and previously untapped formulations to expand product lines.



## A BETTER CBD ALTERNATIVE

**CBDV** has similar pharmacological properties to CBD with additional [neuroprotective properties](#)<sup>10</sup> while [reducing common side-effects](#)<sup>11</sup> such as nausea.

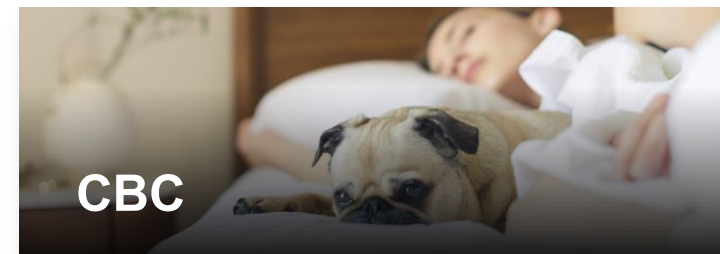
An ingredient that is actively being pursued in clinical studies for therapeutic indications such as the treatment of autism.



## A UNIQUE SUPPRESSANT

**THCV** has shown to bring the benefits THC with slightly [weaker psychoactive effects](#)<sup>12</sup> and manifests a unique experience at higher doses.

Studies suggest it boosts energy and provides [appetite suppression](#)<sup>13</sup>. Like other cannabinoids, research suggests that THCV is safe and [well tolerated](#)<sup>14</sup> by the body.



## THE CANNABINOID AMPLIFIER

**CBC** is non-psychoactive, binds tightly to the CB2 receptor and is a [known analgesic](#)<sup>15</sup>. Known to increase [natural endocannabinoids](#)<sup>16</sup> produced by the body (via TRPV1 and TRPA1), and may work synergistically with other cannabinoids.

A growing consumer application for a variety of [skin conditions](#)<sup>17</sup>.

10. Stone et al., 2020. A systematic review of minor phytocannabinoids with promising neuroprotective potential.

11. Rock et al., 2013. Evaluation of the potential of the phytocannabinoids to produce CB1 receptor inverse agonism symptoms of nausea in rats.

12. Zagzoog et al., 2020. In vitro and in vivo pharmacological activity of minor cannabinoids isolated from *Cannabis sativa*.

13. Abioye et al., 2020. Δ9-Tetrahydrocannabivarin (THCV): a commentary on potential therapeutic benefit for the management of obesity and diabetes

14. Jadoon et al., 2016. Efficacy and Safety of Cannabidiol and Tetrahydrocannabivarin on Glycemic and Lipid Parameters in Patients With Type 2 Diabetes.

15. Davis WM, Hatoun NS., 1983. Neurobehavioral actions of cannabichromene and interactions with delta 9-tetrahydrocannabinol.

16. Maione et al., 2010. Non-psychoactive cannabinoids modulate the descending pathway of antinociception in anaesthetized rats through several mechanisms of action.

17. Oláh et al., 2016. Differential effectiveness of selected non-psychotropic phytocannabinoids on human sebocyte functions implicates their introduction in dry/seborrheic skin and acne treatment.

# Examples of fermentation derived products

## More sustainable ingredients at scale

				
Products	<a href="#">Retinol (Vitamin A)</a>	<a href="#">Hyaluronic Acid</a>	<a href="#">Squalene</a>	<b>CBD</b>
Traditional Source	Chemistry	Chemistry	Sharks	Cannabis
New Host	Yeast	Bacteria	Yeast	Yeast

**Ferver**

Unilever's skin care brand. A collection that use fermented actives.

# Commercial scale supply of sustainable CBD isolate



Pure CBD isolate prepared as an odorless, white powder that is easily formulated with precision.

## Purity Guaranteed

**98%** pure isolate  
**No THC**, Cannabis is never used  
**Zero** pesticides or heavy metals



## Environmentally Friendly

**89%** less land used  
**95%** less water used  
**92%** less time used



## More Accessible

**More affordable** than chemical synthesis  
Available in bulk quantities



# Unique market opportunities: Japan



## COMPLIANT & COST-EFFECTIVE

Only THC-free, synthetic CBD is permitted for consumer products. **Most hemp derived CBD in Japan is likely imported with falsified documentation.** Today, Hyasynth is cost competitive with most synthetic ingredient providers.

## SAFETY & CONFIDENCE

Hyasynth's yeast based CBD process is 100% compliant with Japanese regulations. Standard and highly controlled manufacturing process.

**COSME Week**  
**OSAKA**



Fermentation Derived CBD is compliant with the Japanese regulations and meets the quality specs of product developers and consumers.



YEAST



WATER



SUGAR

# Fermentation Derived CBD Isolate

Bio-based Cosmetic Ingredient.  
Naturally THC-Free.

Get in touch with our specialists to learn more about our ingredients and how we can streamline your supply needs.

[SALES@HYASYNTHBIO.COM](mailto:SALES@HYASYNTHBIO.COM)   [@HYASYNTHBIO](https://www.instagram.com/HYASYNTHBIO)

