



MIGHTY GREEN

MINI GUIDE CBD & CBG

October 2021



The low-down

- CBD (cannabidiol) is one of over 100 plant compounds (including CBG) called cannabinoids that come from the hemp plant.
- CBD is an incredibly versatile ingredient, whether ingested or applied onto the skin. It has benefits ranging from reducing anxiety, alleviating pain to slowing ageing and protecting skin.
- It is safe to use, and is devoid of any psychoactive effect tied to the cannabis plant.
- CBD use is higher amongst women (13%) of females use it vs 9% of men surveyed (1).
- The CBD industry in the UK is expected to reach a £1B by 2025 (2).

References: [1] Cowen's Collective View of CBD 2019, <https://www.cowen.com>

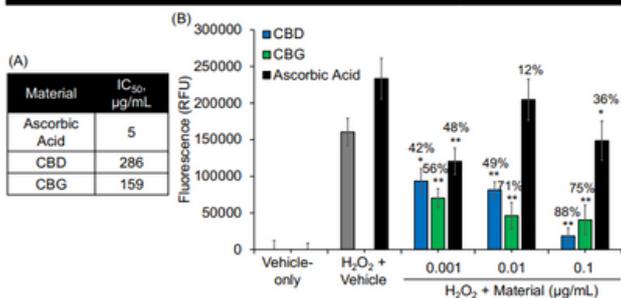
[2] CBD In The UK, 2019, <https://thecmcuk.org>



CBD & CBG for the skin

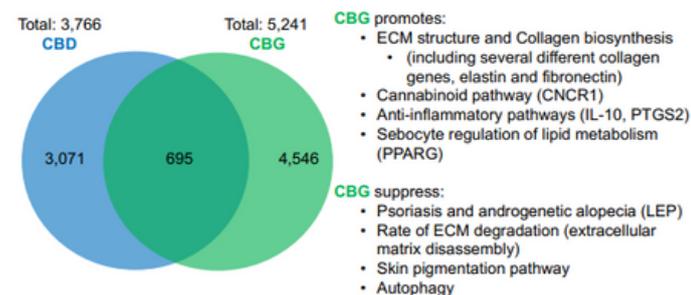
CBD & CBG are both powerful antioxidants, antibacterial and anti-inflammatory. They also support the skin's natural cell cycle, helping to ensure the replenishment of damaged skin, whilst locking in moisture, keeping the skin protected, healthy and youthful. Having them together boosts their overall effects, especially when it comes to supporting tissue repair. They also help control sebum production, and keep the skin surface free of excessive oil and bacteria.

Fig 2. CBG and CBD have antioxidant activity in skin fibroblasts outperforming Vitamin C



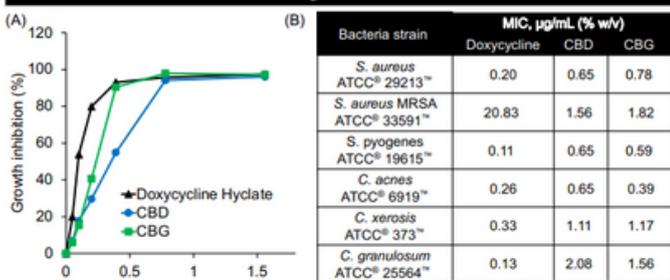
(A) Summary results table in cell-free DPPH reduction assay. IC₅₀ = Test material concentration that produced 50% of DPPH radical scavenging. (B) Primary Human Dermal Fibroblasts (HDFs) were incubated with actives (≤ 0.1 µg/mL) for 3 hours. Control cells received vehicle-only. Intracellular oxidative activity was determined using DCFH-DA as a marker of H₂O₂ induction (0.1 mM) of oxidative stress. Data represents mean ± SE from three independent experiments. *p < 0.05; **p ≤ 0.01 compared to H₂O₂ + vehicle group. Data labels represent mean % inhibition relative to -/+ H₂O₂ control groups.

Fig 7. CBG regulates a different set of genes than CBD in reconstituted 3D skin models



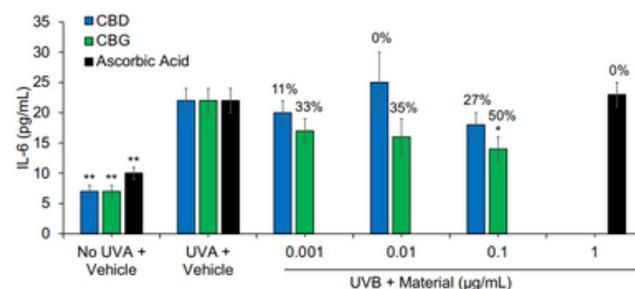
Gene differential expression was quantified using a Clariom[™] S assay microarray system after a 24-hour exposure in 3D skin culture model EpiDerm-FT[™] (CBG & CBD were applied at 0.5%). CBG regulated 5,241 genes (2,530 up; 2,711 down) compared to the untreated group. In contrast to CBD, novel pathways modulated by CBG treatment were collagen biosynthesis (Types I, III, IV, and VI). CBG also reduced pro-inflammatory and differentiation genes, suggesting novel anti-inflammatory and epidermal keratinocyte differentiation activities.

Fig 3. CBG and CBD exhibit potent antimicrobial activity vs "bad" skin bacteria



(A) Growth inhibition for *C. acnes* ATCC[®] 6919[™] (B) Summary antimicrobial results table in skin bacteria strains. Bacteria strains were cultured as recommended by ATCC[®]. Test Materials were incubated at 5% in DMSO vehicle and optical density (OD 595nm) measured to determine >90% growth inhibition by broth turbidity. MIC = minimal inhibitory concentration. Data represents mean from three independent experiments.

Fig 5. CBG inhibits UVA-induced cytokine production better than CBD



Primary Human Dermal Fibroblasts (HDFs) were cultured in the presence of CBD, CBG (0.001-0.1 µg/mL) or ascorbic acid (1 µg/mL) for 6 hours. Later, ingredients were removed, and cells were irradiated with 12.5 J/cm² UVA. Media supernatants were collected after 24 hours and analyzed by ELISA for Interleukin-6 (IL-6). Data represents mean ± SE from three independent experiments. *p < 0.05; **p ≤ 0.01 compared to UVA + vehicle group. Data labels represent mean % inhibition relative to -/+ UVA control groups.

Reference: Cannabigerol (CBG): The Mother of Cannabinoids Demonstrates a Broad Spectrum of Anti-inflammatory, Antioxidant and Antimicrobial Properties Important for Skin Health Mathias Schuetz, Chris Savile, Trevor Peters, Corey Webb, Karl Rouzard, José R. Fernández, Eduardo Pérez

About us

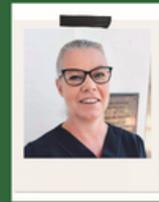
We are a team of health professionals, specialising in Nutrition, Fitness, Medicine, Beauty & Psychology. We are passionate about sharing our expertise in CBD with the world. Our goal is to not only create the highest quality CBD products (that truly work wonders by the way), but also spread awareness and education around CBD.



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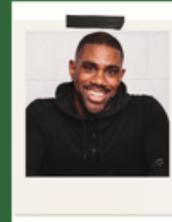
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