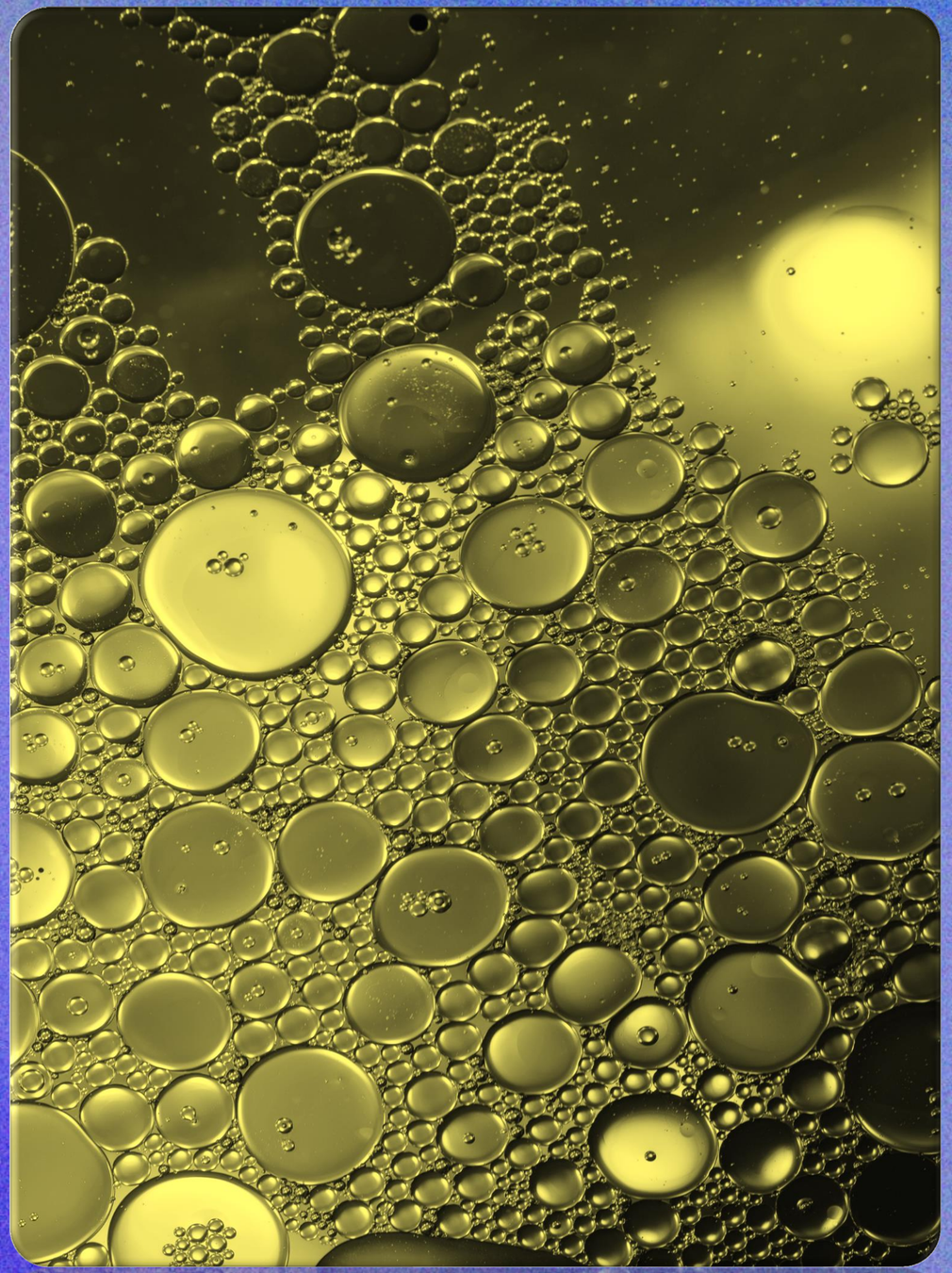
Optidel Biosystems

The technological revolution in personalized cosmetic ingredients

SOPHORA_10



Cutting-edge solutions for a technologically demanding sector.

OPTIDEL offers an advanced solution to dissolve and concentrate natural active ingredients with low stability and insolubility, significantly enhancing their bioavailability and efficacy.

Ready-to-use technology for formulation:

Versatile solutions for both hydrophilic and hydrophobic ingredients, even the most unstable or poorly soluble compounds.

Enhances bioavailability and efficacy:

Maximizes stability by up to 90%, increases skin bioavailability by up to 60%, and multiplies efficacy up to fourfold.

Sustainability driven by innovation:

Technological solutions that enable cleaner, more efficient formulations with a lower environmental impact.

Adapted to today’s market:

Protects actives from degradation and enables the development of customized formulas aligned with the latest trends.

Sophora_10

Repairing and protective bioflavonoid

Quercetin can help treat **skin conditions** such as eczema and dermatitis due to its unique combination of anti-inflammatory, antioxidant, and immunomodulatory properties.

The Skin: A Living and Sensitive System in Constant Defense

The skin functions as a living and sensitive barrier, defending the body from external aggressors such as microbes, radiation, allergens, and chemical agents.. Made up of specialized cells and an interconnected immune network, its function can be affected by factors like stress, pollution, or excessive sun exposure, which may trigger inflammation and conditions such as dermatitis or rosacea.

🔬 CELLULAR CONSEQUENCES

- Alteration of the lipid barrier
- Activation of the immune system
- Damage to collagen and elastin fibers
- Keratinocyte disfunction

👁️ VISIBLE CONSEQUENCES

- Dry and dehydrated skin
- Redness and skin inflammation
- Hyperpigmentation
- Loss of radiance

1. Beken, B. et al. (2020) 'Quercetin improves inflammation, oxidative stress, and impaired wound healing in atopic dermatitis model of human keratinocytes', Pediatric Allergy, Immunology, and Pulmonology, 33(2), pp. 69–79. doi:10.1089/ped.2019.1137.

2. Shen, P. et al. (2021) 'Potential implications of quercetin in autoimmune diseases', Frontiers in Immunology, 12. doi:10.3389/fimmu.2021.689044.

3. Okselni, T. et al. (2024) 'Quercetin as a therapeutic agent for skin problems: A systematic review and meta-analysis on antioxidant effects, oxidative stress, inflammation, wound healing, hyperpigmentation, aging, and skin cancer', Naunyn-Schmiedeberg's Archives of Pharmacology, 398(5), pp. 5011–5055. doi:10.1007/s00210-024-03722-3.

4. Weng, Z., Zhang, B., Asadi, S., Sismanopoulos, N., Butcher, A., Fu, X., Katsarou-Katsari, A., Antoniou, C., & Theoharides, T. C. (2012). Quercetin is more effective than cromolyn in blocking human mast cell cytokine release and inhibits contact dermatitis and photosensitivity in humans. PloS one, 7(3), e33805. https://doi.org/10.1371/journal.pone.0033805

5. Zaborowski, M.K. et al. (2024) 'The role of quercetin as a plant-derived bioactive agent in preventive medicine and treatment in skin disorders', Molecules, 29(13), p. 3206. doi:10.3390/molecules29133206.

Description

Sophora_10: Biological anti-inflammatory and antioxidant shield

Quercetin ($C_{15}H_{10}O_7$) is a flavonoid, a type of plant pigment found in many fruits, vegetables and in flowers of plants such as *Sophora japonica*.
It acts as a powerful soothing and reparative bioactive, helping to restore balance in skin affected by eczema or rosacea. It visibly reduces redness and irritation through mast cell stabilization and by supporting cellular regeneration.

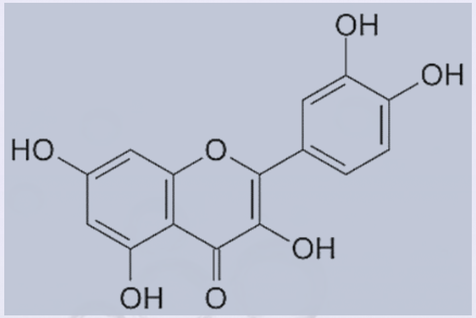
Sophora_10 strengthens and protects the skin barrier, restoring its natural equilibrium. Its innovative formulation calms, regenerates, and improves the skin's immune response, leaving it more resilient, healthier, and visibly more radiant.)

The Optidel technology makes it possible to concentrate a high amount of active ingredient while keeping it stable and bioavailable, thereby enhancing its efficacy.

Thanks to its structure, it is the easiest way to incorporate *Sophora japonica* quercetin into a wide range of cosmetic formulations.

It is a multifunctional ingredient, combining anti-inflammatory, antioxidant, and immunomodulating properties.

An excellent ally for treating and/or supporting various skin conditions.



The quercetin used at Optidel Biosystems is extracted and purified from the flowers of *Sophora japonica*.

How does it work?

Mechanism of action of Quercetin:

Quercetin acts as a **powerful antioxidant and anti-inflammatory** agent.

- It effectively neutralizes **free radicals (ROS),** preventing oxidative damage and preserving the **skin's integrity and youthful appearance**.
- It **modulates the inflammatory response** by inhibiting pro-inflammatory mediators and key enzymes, promoting a **calmer and more balanced skin** state.
- It **reduces histamine release** from mast cells, helping to **minimize irritation, redness, and sensitivity**, making it ideal for **reactive or sensitive skin**.

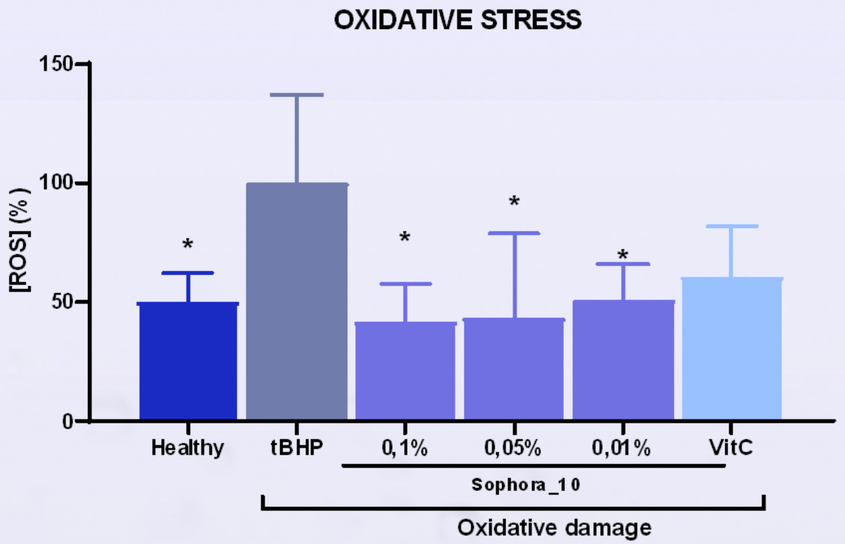
1. "Quercetin as a therapeutic agent for skin problems: a systematic review and meta-analysis on antioxidant effects, oxidative stress, inflammation, wound healing, hyperpigmentation, aging, and skin cancer". *[PubMed].* Esta revisión muestra que la quercetina reduce ROS, mejora enzimas antioxidantes, inhibe mediadores inflamatorios (NF-κB, AP-1, etc.) en contexto de salud de la piel. PubMed
2. "Quercetin Improves Inflammation, Oxidative Stress, and Impaired Wound Healing in Atopic Dermatitis Model of Human Keratinocytes". *[PubMed].* Estudio en queratinocitos humanos que demuestra reducción de IL-1β, IL-6, IL-8; incremento de SOD1, catalasa, GSH-peroxidasa. PubMed
3. "Quercetin Directly Targets JAK2 and PKCδ and Prevents UV-Induced Photoaging in Human Skin". *[PubMed].* Evidencia directa de que la quercetina puede inhibir quinasas implicadas en envejecimiento cutáneo mediado por UV, reduciendo MMP-1 y COX-2. PubMed
1. "Quercetin inhibits Mrgprx2-induced pseudo-allergic reaction via PLCγ-IP3R related Ca^{2+} fluctuations". *[PubMed].* Este estudio muestra que la quercetina inhibe liberación de histamina y desgranulación de mastocitos en reacciones pseudo-alérgicas, mecanismo PLCγ-IP3R. PubMed
4. "Quercetin inhibits histamine-induced calcium influx in human keratinocyte via histamine H4 receptors". *[PubMed].* Evidencia de que la quercetina modula la señalización del receptor H_4 de histamina en queratinocitos, lo que liga al efecto anti-picor/sensibilidad

Sophora-10: Advanced protection against environmental stress.

With its potent activity, it helps maintain the skin looking younger and healthier.

- **Over 110% ROS reduction**
  Sophora-10 at concentrations of 0.05% and 0.01% eliminates oxidative damage and restores antioxidant levels to values below the initial baseline, effectively reversing stress-induced oxidation.

- **Superior antioxidant performance**
  Sophora-10 not only reduces ROS to levels lower than those of healthy, untreated cells, but also exceeds the efficacy of Vitamin C by 20%.



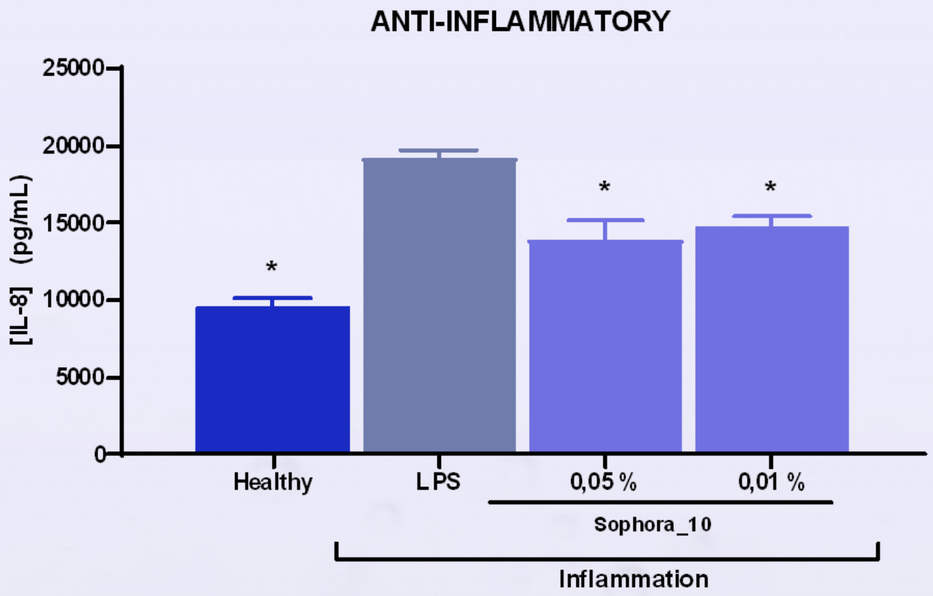
ROS production (%) in HaCaT keratinocyte cell line obtained from the antioxidant assay after 4 hours of exposure to tBPH with the test ingredient at the indicated concentrations. The positive control (tBPH insult) represents cells treated only with the oxidative agent tBPH. Bars represent the mean of six technical replicates from one independent experiment. Error bars indicate standard deviation. Statistical significance * $p < 0.005$.

Anti-inflammatory Activity

Demonstrated Anti-Inflammatory Action

- **−45% IL-8 reduction at 0.01% concentration**
- **−56% IL-8 reduction at 0.05% concentration**

Sophora_10 effectively reduces the production of IL-8, a key marker in the inflammatory process, validating its use as a **soothing and anti-inflammatory active** ingredient in advanced cosmetic formulations.



In vitro assay performed on differentiated human monocytic cells (THP-1), stimulated with LPS to induce inflammation. The compound was applied at different concentrations for 24 hours and its effect was evaluated by measuring IL-8 levels using ELISA. The reduction in this pro-inflammatory cytokine confirmed its anti-inflammatory activity.

Sophora_10

Repairing and protective bioflavonoid

🌿 Anti-inflammatory power

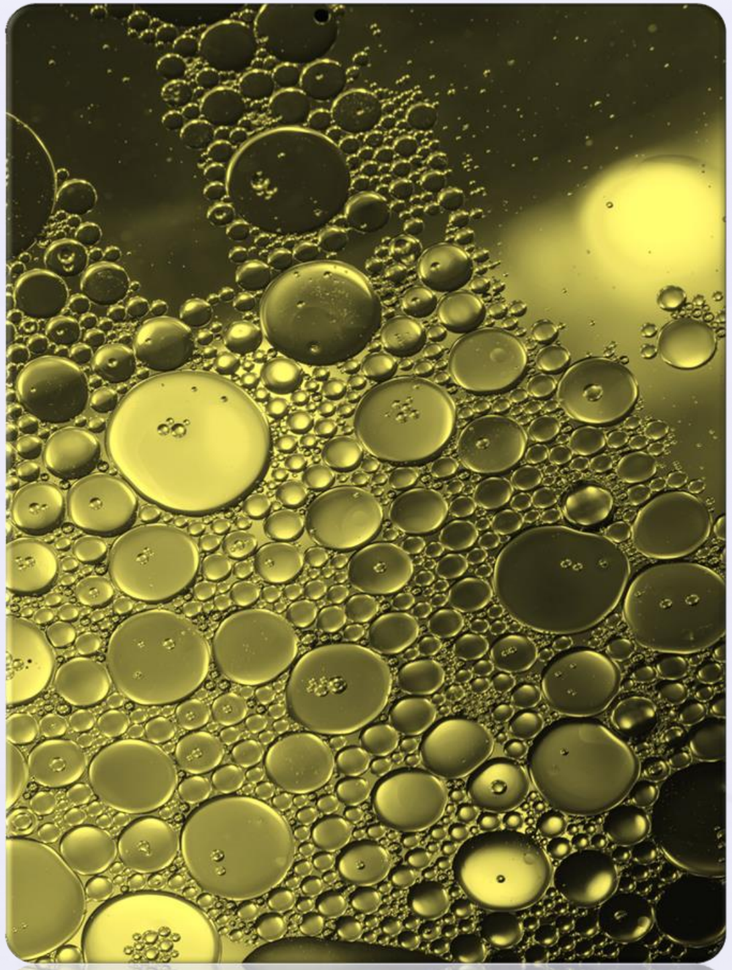
It helps reduce substances that trigger inflammation in the skin, such as TNF-α, IL-6, and IL-8, and relieves symptoms such as swelling, redness, and itching.

🛡️ Restorative and Protective Antioxidant Power

It combats free radicals caused by oxidative stress, preserving the integrity of the skin. It protects essential components — lipids and proteins — prevents cellular damage, and helps repair the skin barrier, providing comfort to dry or flaky skin.

⚖️ Smart Immunomodulating Power

It reduces mast cell activation and histamine release, helping to control inflammatory processes. It regulates the immune response, typical in atopic dermatitis, and gently restores the skin’s immunological balance in a natural and harmonious way.



SOPHORA_10: C2SQ_10

Application:

Sophora_10 is a unique and distinctive ingredient for creams, serums, toners, and soothing products, specially formulated to relieve sensitive skin, as well as skin affected by atopic dermatitis or rosacea.

Recommended Dosage:

0,5% - 2%

Formulation Advice:

Add in bulk during the final stage of the production process, ensuring the temperature does not exceed 40°C.
Add to the mixture and maintain under stirring until fully homogeneous.

Active content (% w/w):

Quercetin at ≥ 8.5%

INCI name

INCI name: Dimethyl Isosorbide, Propylene Glycol, Sophora Japonica Flower Extract.
CAS: 57-55-6, 5306-85-4, 90131-19-4

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