AC Turmeric Liposome PF

Conditioning Nourishing
anti-inflammatory
delivery system
Antioxidant Protection

Code Number: 60190PF

INCI Name: Water & Curcuma Longa (Turmeric) Root Extract & Phospholipids
INCI Status: Conforms
REACH Status: Compliant
CAS Number: 7732-18-5 & 84775-52-0 & 123465-35-0
EINECS Number: 231-791-2 & 283-882-1 & N/A

Origin: Botanical
Processing:
GMO Free
No Ethoxylation
No Irradiation
No Sulphonation
Additives:
Preservatives: None
Antioxidants: None
Other additives: None
Solvents Used: Water
Appearance: Liquid Liposomal Dispersion
Soluble/ Miscible: Water Dispersible
Microbial Count: < 100CFU/g, No Pathogens

Suggested Use Levels: 1.0 – 10.0%
Suggested Applications:
Anti-Inflammation,
Liposome Technology

Benefits of **AC Turmeric Liposome PF**:

- Anti-Inflammation
- Encapsulation Technology
- Antioxidant Protection

BACKGROUND

Turmeric, or Curcuma longa, is one of the most well-known, widely researched, and commonly used Ayurvedic spices in the world. Curcumin, the main biologically active polyphenolic compound found in turmeric, has a multitude of benefits for skin and hair care, with its historical use as an antiseptic, antioxidant, and anti-inflammatory. However, the application of curcumin is limited due to its water insolubility, instability and poor bioavailability. Using modern encapsulation technology, **AC Turmeric Liposome PF** has been developed to effectively deliver the benefits of turmeric in cosmetic and hair care applications and promote a healthy, glowing aesthetic.

Ayurveda is an ancient wisdom of healing, prevention, and longevity that incorporates natural plant extracts into cosmetic products for the daily care of skin and hair. In Ayurveda, beauty is more than skin deep – the skin is perceived to be a mirror that reflects that health of the body. The plant extracts and natural substances formulated into Ayurvedic cosmetics possess biologically active ingredients to deliver therapeutic benefits such as healing infections, soothing inflammation, and enhancing circulation. Ayurvedic remedies are rooted in herbs, spices and other natural ingredients, with one of the most commonly used ingredients in Ayurveda being turmeric. Curcumin is the main biologically active component of turmeric, responsible for giving the spice its yellow color, and well known for its ability to possess anti-inflammatory and antioxidant effects.

SCIENCE

At the fundamental level, phytonutrients such as curcumin have been shown to up regulate antioxidant gene expression. The multifunctional health benefits of curcumin are well researched and these antioxidant compounds are potentially useful in preventing inflammation and several types of cancer.[7] The antioxidant effects of curcumin combined with its known inhibitory effects on cyclooxygenase 2 (COX-2) render it useful for anti-aging formulations and in topical formulations designed to maintain general skin health and integrity. In addition to its antioxidant capacity, curcumin is useful for brightening and lightening skin tone, and offers protection against the development of melanoma[8,9].

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Oxidative stress and inflammation are major players in the aging process. The anti-inflammatory role of curcumin is well established. Curcuminoids have been shown to inhibit nuclear factor kappa B (NFκB), a transcription factor that triggers inflammatory mediators. NFκB has been implicated in a variety of chronic disease conditions ranging from cardiovascular diseases to cancer. A recent study suggests that curcumin can potentially slow down the aging process, delaying senescence and the onset or progression of many age-related diseases[10].

LIPOSOMES

Liposomes can be used in the delivery of various cosmetic materials, vitamins, and minerals throughout the body, typically to the skin, for an array of advantages. The liposomes may attach and fuse to the cellular membranes, releasing their contents into the target cells. Liposomes are microscopic vesicles that consist of an aqueous center with a phospholipid membrane. Phospholipids contain a glycerol bonded to two fatty acids and a phosphate group with a polar head. The fatty acid portion of this biomolecule is hydrophobic and is located toward the outside of the lipid bilayer whereas the phosphate group is hydrophilic and faces the aqueous interior. These phospholipid walls are identical to those that comprise other human cell membranes. Liposomes act as vehicles to transport nutrients to the cells through layers of skin and enhance delivery of active ingredients.

When non-encapsulated materials are placed on the skin a range of factors determine the fate of the material. Stability, solubility, lipophilicity, and size are all obstacles the active must overcome to penetrate the epidermal barrier. Liposomes, which resemble the basic structures of cellular membranes, create a more beneficial interaction with skin cells. The structure and amphiphilic nature allows the liposomes to penetrate the epidermal barrier and travel deeper than free materials to deliver the anticipated results.

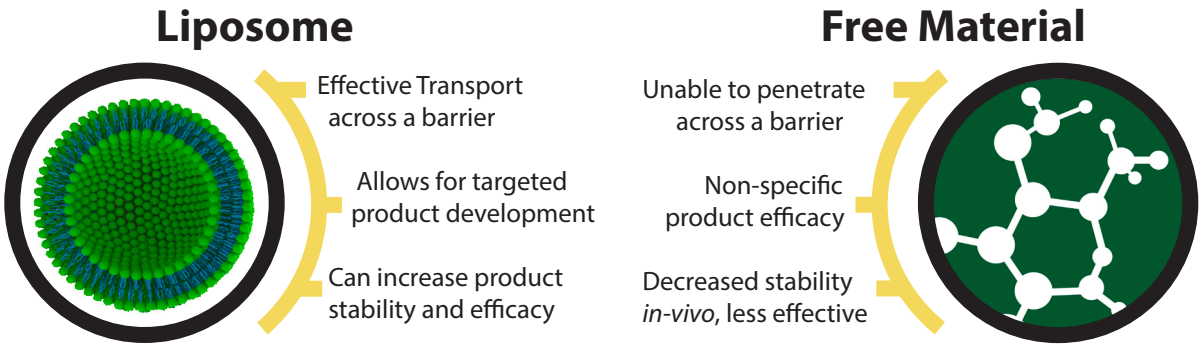

Figure 1. Comparison of liposomal encapsulation vs. free material.

Liposomes are readily compatible with epidermal surface lipids, the skin's primary moisture barrier, as these epidermal lipids exist as lamellar bilayers. Lamellar bilayers require less moisture to maintain their structure. When a liposome fuses with the epidermal lipids, the epidermal lipid structure becomes overloaded with water and out of equilibrium. To restore equilibrium, the water and phospholipid, as well as the active loaded, are rapidly churned through the top cell layers of the stratum corneum. Enhanced delivery of the active occurs as it is rapidly carried down through the stratum corneum. Liposomes' proven delivery system yields a multitude of benefits; enhancing the penetration of actives yielding increased efficacy, offering time release mechanisms, protecting and delivering otherwise unstable ingredients, and the ability to target specific cells.

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BENEFITS

Incorporate **AC Turmeric Liposome PF** into finished formulas to minimize inflammation while allowing the skin to readily absorb potent antioxidant properties for increased functionality. Reveal the natural glow of your skin with the purifying properties of turmeric. This ancient spice can be used to promote healthy looking skin and leave you with a flawless complexion. **AC Turmeric Liposome PF** is an innovative ingredient that effectively delivers the benefits of turmeric and curcumin in cosmetic and personal care applications.

EFFICACY

AC Turmeric Liposome PF exhibited anti-inflammatory effects in an *in-vitro* Interleukin-6 ELISA model. Cytokines are the signaling proteins synthesized and secreted by immune cells upon stimulation. They are the modulating factors that balance initiation and resolution of inflammation. During chronic inflammation, Interleukin-6 (IL-6) suppression can decrease tissue injury. IL-6 is a pro-inflammatory cytokine known to play an active role in inflammation, immunology, and aging. IL-6 signals through the nuclear factor-kappa B (NF-κB) pathway that results in the transcription of inflammatory mediators, including matrix metalloproteinase-1(MMP-1). MMP's are responsible for breaking down the extracellular matrix and collagen in the skin leading to wrinkles, fine lines, and loss of skin elasticity. Reducing the level of IL-6 and other inflammatory mediators is believed to slow down degradation of the skin matrix and stimulate its replenishment.

An IL-6 ELISIA assay was conducted to assess the changes in IL-6 levels in cultured human dermal fibroblasts treated, in-vitro, with **AC Turmeric Liposome PF**. As shown in Figure 2, **AC Turmeric Liposome PF** exhibited anti-inflammatory effects on LPS-treated fibroblasts. This decrease in IL-6 production indicates a reduced inflammatory environment.

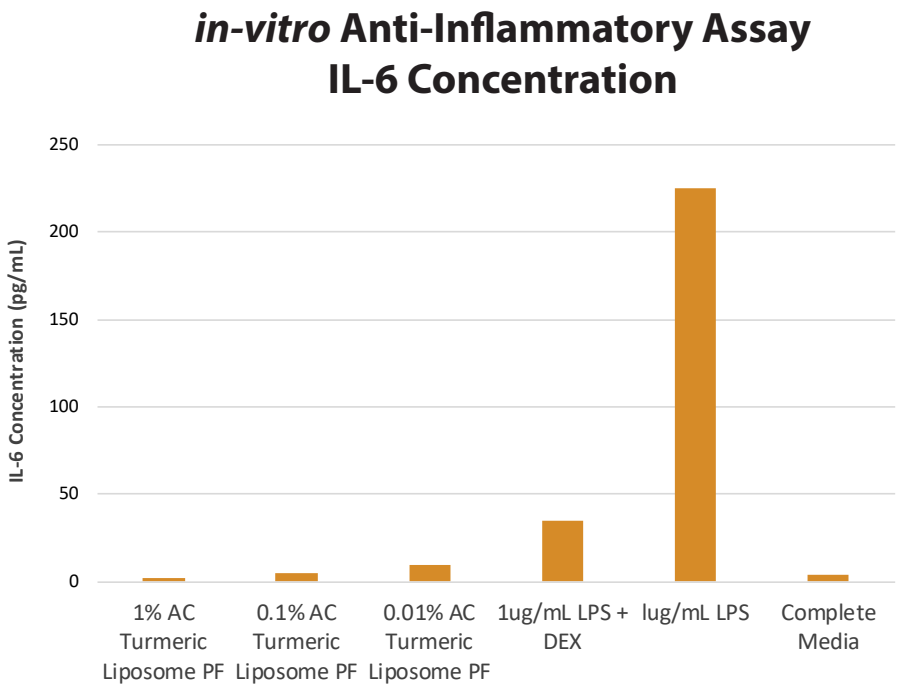

Figure 2. AC Turmeric Liposome PF-treated fibroblasts IL-6 concentrations.

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As shown in Figure 3, an ORAC Assay was conducted to evaluate the ability of **AC Turmeric Liposome PF** to reduce oxidative stress. This assay is based upon the effect of peroxyl radicals generated from the thermal decomposition of 2,2'-azobis-2-methylpropanimidamide dihydrochloride on the signal intensity from the fluorescent probe, fluorescein, in the presence of an oxygen radical absorbing substance. Results indicate that the product provides intense protection against Reactive Oxygen species comparable to Trolox, which is an analogue of Vitamin E.

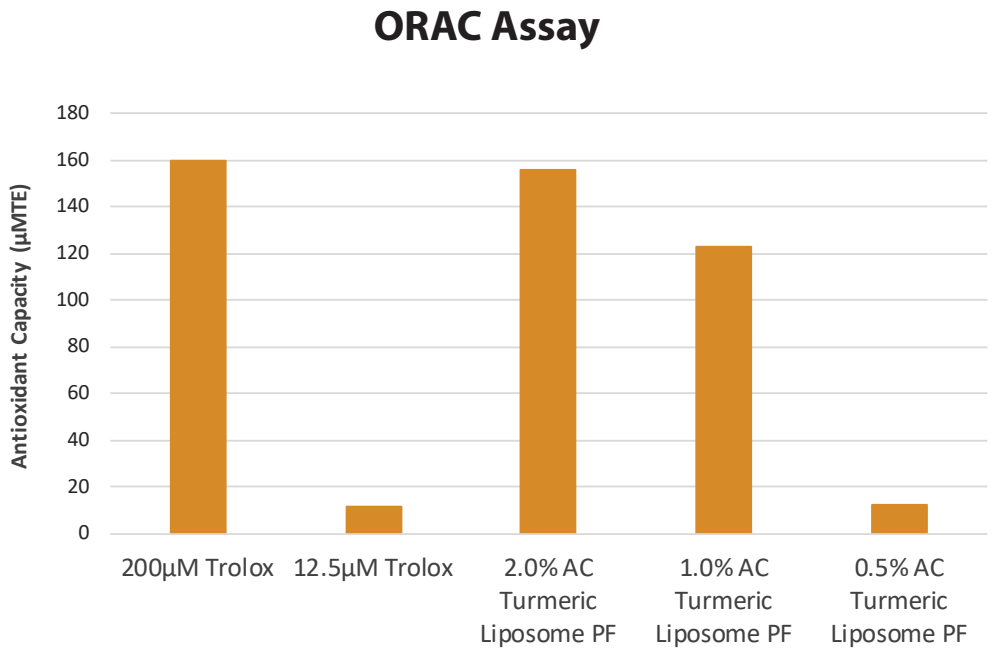

Figure 3. Antioxidant capacity of **AC Turmeric Liposome PF**

References:

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