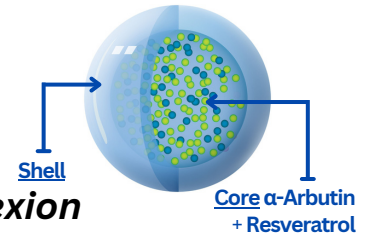




Unique&amp;Easy Micro-Encapsulation Solutions

## SalSphere® Light

*Enhanced delivery of skin toning for improved complexion*



### Why do you need this technology?

SalSphere® Light is a delivery system designed to tone the skin and treat hyperpigmentation, dark spots, and melasma.

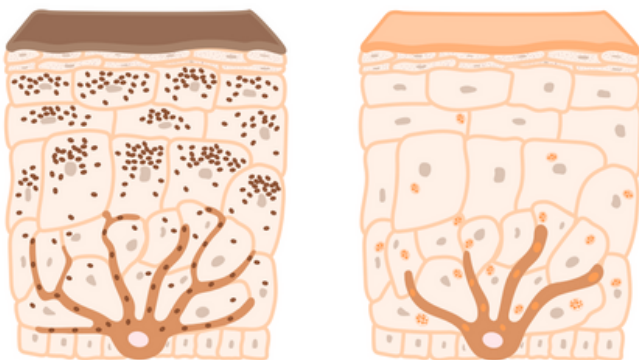
$\alpha$ -Arbutin is an ideal naturally-derived alternative to hydroquinone. The combination of natural  $\alpha$ -Arbutin with the potent polyphenol Resveratrol creates a powerful skin-brightening botanical blend for a luminous complexion.

### Unique natural delivery technology

$\alpha$ -Arbutin is known to eliminate the formation of melanin and hyperpigmentation at its source without damaging or compromising the health of your skin. However,  $\alpha$ -Arbutin is water soluble, and it exhibits poor skin penetration.

Encapsulation into the SalSphere® carrier enables enhanced deposition onto the skin and increased bioavailability at the deeper layers of the skin.

Everyday elements, such as regular UV exposure and some medications, can trigger the skin into producing a reddish-brown pigment called melanin. In the deeper layers of the skin, melanin is formed by a protein called tyrosinase. Once made, melanin is transferred to keratinocytes, which migrate to the surface of the skin (Fig 1). This causes the observed uneven skin pigmentation, including freckles, post-inflammatory hyperpigmentation (PIH), melasma, and age spots.



**Fig 1:** In the deeper layers of the skin, melanosomes are transferred from melanocytes to neighboring keratinocytes to be visible just under the skin's surface.

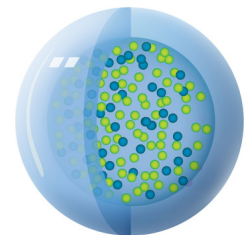


One of the most effective ways to brighten skin is to target melanosomes and block the activity of tyrosinase. SalSphere® Light was developed to treat this cause of discoloration at its source, directing functional ingredients for efficacy and results deep within the skin.

SalSphere® Light is a sub-micron sphere with a hydrophilic shell and a lipophilic core (Fig 2). The lipophilic core contains  $\alpha$ -Arbutin and resveratrol.

The bio-availability of  $\alpha$ -Arbutin at the deeper layer is critical to achieving the needed results. SalSphere technology is designed to enhance the penetration and bio-availability of the active ingredients at a deeper layer where the melanosomes are active.

**Fig 2:** The sub-micron structure of SalSphere® Light, with the  $\alpha$ -arbutin and resveratrol infused within the core.

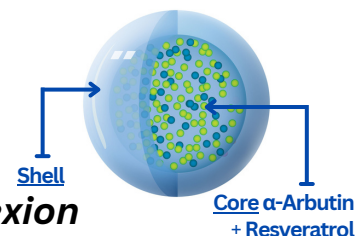


### Core Claims

- Improved stability and extended shelf life from encapsulation
- Reduces pigmentation caused by excess melanin production due to PIH, aging, melasma, etc.
- Addition of resveratrol offers anti-wrinkle and anti-aging benefits

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## Skin Testing

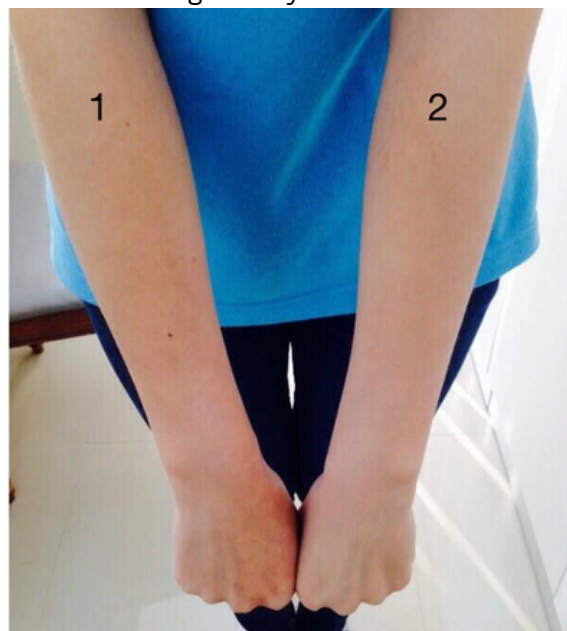
**Method 1:** Bioavailability was measured as the  $\alpha$ -Arbutin concentration in the skin's epidermis. In the following experimental set, Franz Cell (Fig 3) was used to determine the penetration of  $\alpha$ -Arbutin through the stratum corneum of pig skin as a model system. 0.5 mL of a suspension containing 5% SalSphere® Light was applied. The receiving medium was a phosphate buffer at pH 7, at 37°C.



**Fig 3:** Franz Cell used to measure the penetration of free  $\alpha$ -arbutin and SalSphere® Light containing  $\alpha$ -arbutin at the same dosage.

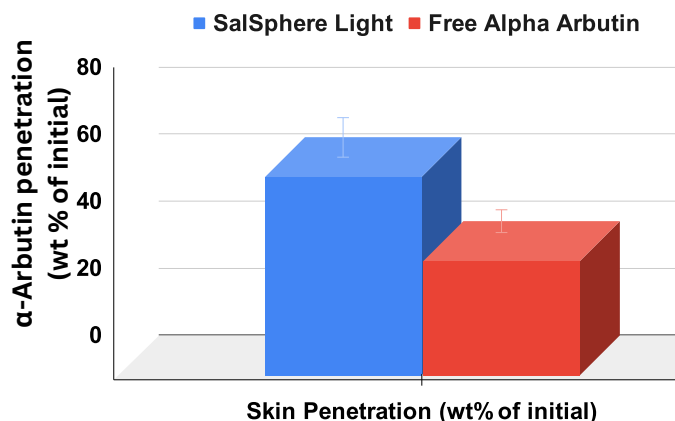
**Results 1:** *Ex-vivo* results, with pig skin as a model, show that SalSphere® Light delivers 60% more  $\alpha$ -Arbutin through the skin compared to free (Fig 4).

**Method 2:** A clinical study was conducted with volunteers (n=5). Each volunteer applied a lotion containing 5% SalSphere® Light daily on one arm. The other arm contained the same lotion with the free functional ingredients at the same loading (equivalent to 5% SalSphere® Light). The volunteers continued their regular daytime activities.



**Fig 5:** The effect of lotion containing 5% SalSphere® Light, applied daily after 14 days. Arm 1 is the control (containing equal %wt of unencapsulated  $\alpha$ -arbutin) and Arm 2 used the experimental 5% SalSphere® Light lotion.

The effect on the skin was evident after 14 days, indicating that the lotion containing 5% SalSphere® Light has sufficient functional, active ingredients to reduce melanin and lighten the skin.



**Fig 4:** Penetration of  $\alpha$ -Arbutin through pig's skin to a buffer solution. SalSphere® enables the enhancement of the penetration of  $\alpha$ -Arbutin. It transforms the hydrophilic nature of  $\alpha$ -Arbutin into a hydrophobic delivery system that is easier to penetrate.

