

PCA SKIN® Acne Gel

Enhanced Dermal Penetration of Salicylic Acid with OmniSome delivery system

Introduction

Salicylic acid is one of the most effective topical skincare ingredients in the prevention and treatment of acne. Despite its proven bioefficacy, the low water solubility of salicylic acid makes it extremely challenging to formulate with, which can ultimately limit its penetration into the skin when applied from a topical skincare product. **PCA SKIN®'s Acne Gel** combines the clinical efficacy of 2% salicylic acid with the proprietary OmniSome delivery system to properly stabilize salicylic acid and boost its overall penetration into the skin. ATR-FTIR imaging reveals that the incorporation of the OmniSome delivery system significantly enhanced the penetration of salicylic acid in skin compared to a control formula with an equivalent level of salicylic acid without the OmniSome delivery system.

Objective

To compare the skin penetration of 2% salicylic acid from topical skincare formulations with and without the OmniSome delivery system.

OmniSome Delivery System

PCA SKIN®'s Acne Gel combines 2% salicylic acid with the proprietary OmniSome delivery system. OmniSome delivery system, which has already been incorporated into **PCA SKIN®'s** retinol and resveratrol products, contains an “onion” like structure to slowly peel off layers over time, allowing for deep and sustained active release. In this experiment, the penetration enhancement of the OmniSome delivery system was tested for the acne gel formula.

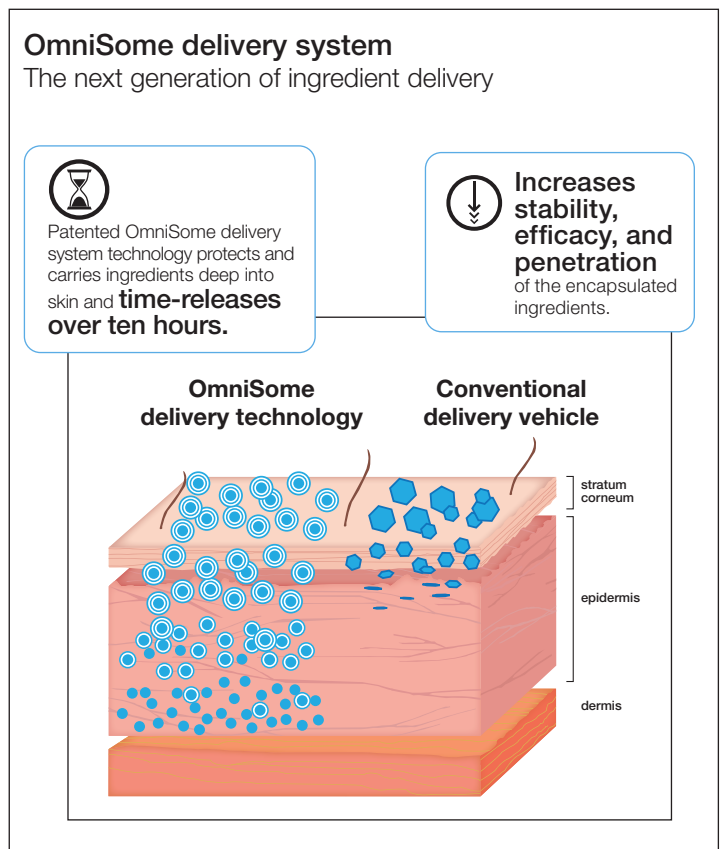
Experimental Design

Salicylic acid penetration was qualitatively analyzed using ATR-FTIR (attenuated total reflectance Fourier transform infrared) imaging - a powerful approach to visualize the overall level and extent of active penetration into skin samples by targeting a unique “chemical signal” of the active of interest. Human skin explants were either untreated, treated with the 2% salicylic acid formula encapsulated in OmniSome delivery system, or treated with the control formula (2% salicylic acid in free form), then placed on Franz cells for a 24-hour diffusion experiment (N=3). Following the diffusion experiment, skin samples were cross-sectioned and subsequently analyzed via ATR-FTIR imaging.

By targeting a unique “chemical signal” of salicylic acid the levels of penetrated salicylic acid were compared quantitatively between the three samples.

Results

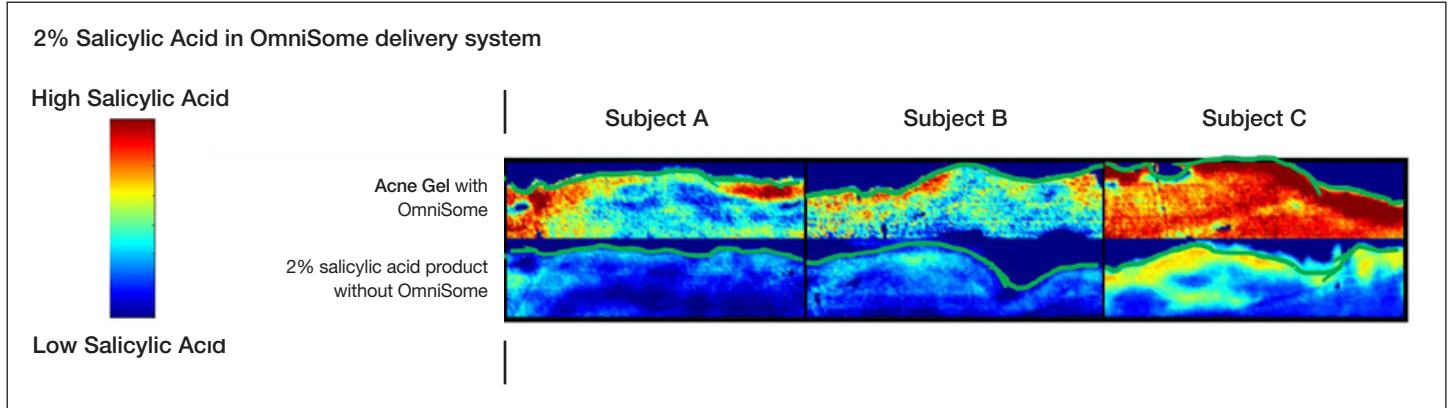
In the resulting ATR-FTIR images, stronger chemical signals for salicylic acid result in a more yellow/red image (Figure 1), while weaker chemical signals correspond to a more green/blue image. As expected, no salicylic acid is observed in the untreated skin samples. The skin samples treated with the acne gel formula with 2% salicylic acid in OmniSome delivery system have a much stronger signal for salicylic acid (top images) than the control sample that contains 2% salicylic acid without OmniSome delivery system (bottom images). This indicates that a deeper and overall greater level of salicylic acid is delivered into the skin when combined with the OmniSome delivery system.



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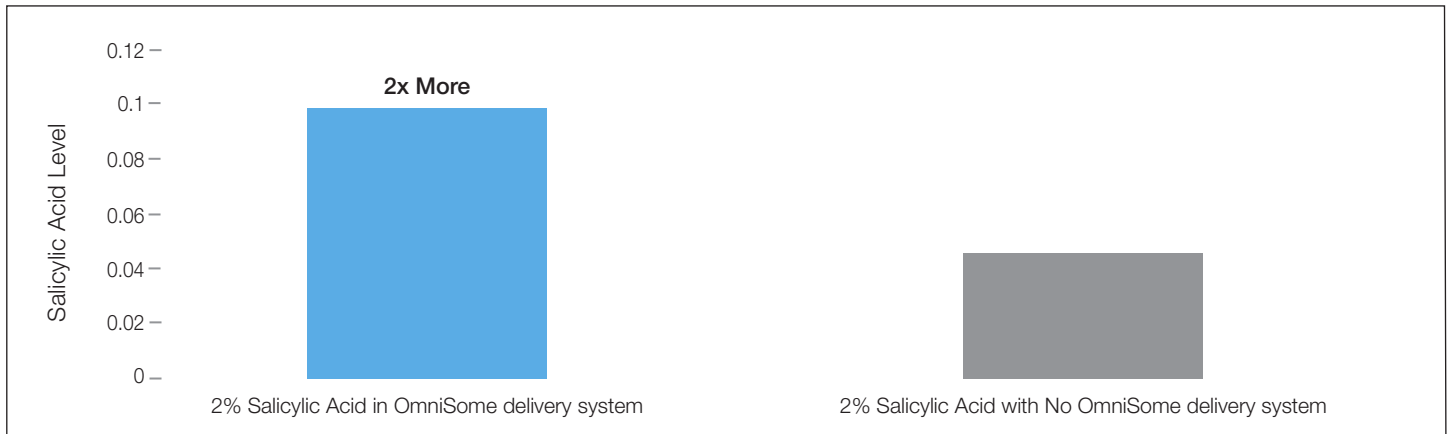
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Figure 1: Salicylic acid penetration and depth



The average numeric values were extracted from the ATR-FTIR images (N=3) for each treatment and plotted in the bar chart (Figure 2). The acne gel with OmniSome delivery system roughly doubled the level of salicylic acid delivered to skin as compared with the control.

Figure 2: Salicylic acid delivery into the skin (quantitative data)



Conclusion

PCA SKIN®'s Acne Gel combines the proven anti-acne bioefficacy of 2% salicylic acid with the OmniSome delivery system for enhanced dermal penetration. ATR-FTIR imaging, and subsequent quantitative analysis of the resulting images, revealed that the use of the OmniSome delivery system doubled the overall penetration of salicylic acid when compared to a control product with an equivalent level of salicylic acid but no OmniSome delivery system. This experiment provides further evidence for the overall efficiency of the OmniSome delivery system to formulate and deliver a wide array of powerful skincare actives for the highest level of performance.