

# **L22: A Novel Lipid Complex That Promotes Skin Hydration and Barrier Function**

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# A Novel Lipid Complex That Promotes Skin Hydration and Barrier Function

Poster # 7813

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## Abstract

**BACKGROUND:** A novel lipid complex,<sup>1</sup> designed to mimic human skin lipids, derived from botanical sources consisting of jojoba (*Simmondsia chinensis*), macadamia (*Macadamia integrifolia*), and olive (*Olea europaea*) oils, was evaluated for skin hydration and restorative barrier function properties in healthy individuals.

**METHODS:** Two small, IRB approved, randomized, double blinded, vehicle-controlled studies (12 to 15 subjects each) were carried out under controlled environmental conditions in order to evaluate the effectiveness of this lipid complex on increasing skin hydration and restoring barrier function. The following lotion test articles were evaluated in both studies: vehicle, vehicle + lipid complex, vehicle + Ceramide 2, and vehicle + lipid complex + Ceramide 2. The first study involved one application of each of the test articles to the lower legs of subjects with dry legs, and Corneometer measurements were taken at baseline and every hour for four hours post test article application. The second study used acetone extraction of the stratum corneum on forearm skin sites to produce a defective skin barrier. Transepidermal water loss (TEWL) was determined at baseline, after completion of the extraction process, and 30 and 60 minutes post test article application.

**RESULTS:** The skin hydration data show that vehicle + lipid complex produced a statistically significant increase in skin hydration over vehicle and vehicle + Ceramide 2 at all time points. Vehicle + lipid complex + Ceramide 2 also produced a statistically significant increase in skin hydration over all of the other test articles at all time points. With regard to barrier function, vehicle + lipid complex produced a statistically significant increase in barrier recovery at both time points over vehicle and vehicle + Ceramide 2. Vehicle + lipid complex + Ceramide 2 also statistically significantly increased barrier recovery and showed an added benefit over that of vehicle + lipid complex. Vehicle + Ceramide 2 alone did not increase skin hydration and produced only a slight increase in barrier recovery over vehicle.

**CONCLUSIONS:** This research has shown that a unique complex of botanically-derived lipids can have a positive effect on skin hydration and barrier recovery, and that Ceramide 2 may potentiate the effect. More research into the specificity of the Ceramide 2 is underway.

## Additional Information

**SKIN LIPID COMPONENTS<sup>2</sup>:** triglycerides, sterols, wax esters, squalene, and sterol esters.

Additional research was completed evaluating the barrier recovery potential of the novel lipid complex in conjunction with Ceramide 1, as well as the effects of the novel lipid complex on skin that is aged and sun-damaged. The results can also be seen to the right.

## References / Footnotes

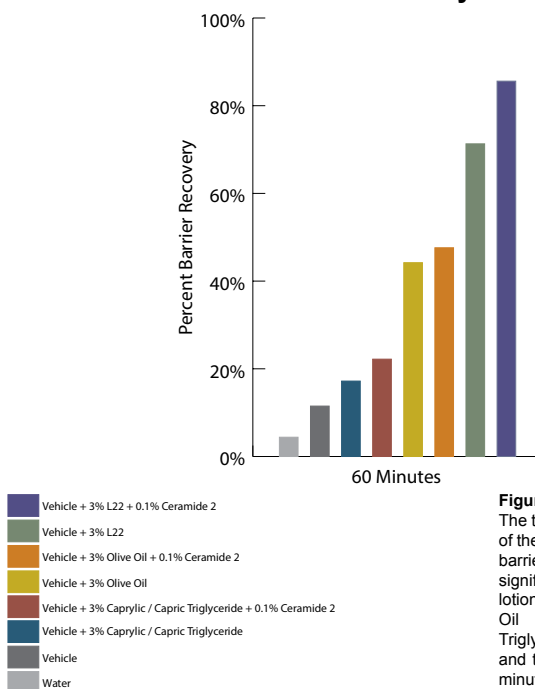
1. L22 [INCI: Jojoba Oil/Macadamia Seed Oil Esters (and) Squalene (and) Phytosteryl Macadamiate (and) Phytosterols (and) Tocopherol] was supplied by Floritech (Chandler, AZ, USA).
2. Cotterill JA, Cunliffe WJ, Williamson B, and Bulusu L. Age and Sex Variation in Skin Surface Lipid Composition and Sebum Excretion Rate. *British Journal of Dermatology* 1972; 87: 333-40.
3. Tewameter is a product of Courage + Khazaka Electronic GmbH, (Köln, Germany).
4. Corneometer is a product of Courage + Khazaka Electronic GmbH, (Köln, Germany).
5. Cutometer is a product of Courage + Khazaka Electronic GmbH, (Köln, Germany).

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## Improved Barrier Recovery

The objective of this study was to determine if the lipid complex improves the recovery of skin barrier function better than other common emollients with skin-lipid-like components. In two separate studies, subjects' forearms were exposed to acetone to partially extract the natural skin lipids. One application of each lotion test article was made (3 mg/cm<sup>2</sup>) to randomized locations on the forearms of fourteen (Figure 1) or fifteen (Figure 2) male and female subjects. Transepidermal water loss (TEWL) was measured using a Tewameter TM300<sup>3</sup> at baseline on normal/untreated forearm skin, 30 minutes after acetone extraction, and 60 minutes after test article application. The percent barrier recovery (i.e., reduction in TEWL as compared to the same site after acetone treatment but prior to test article treatment) was then determined for each test article.

### Barrier Recovery



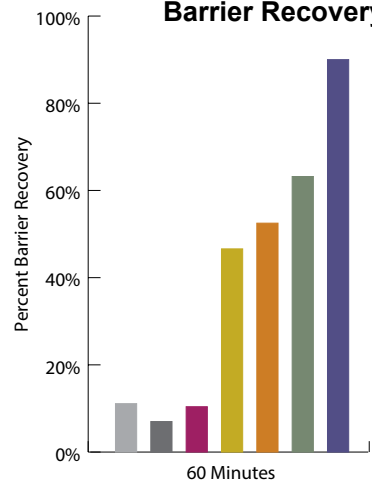
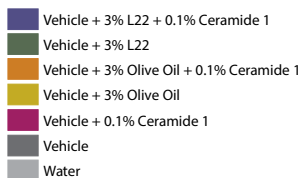
**Figure 1.**

The test article containing 3% of the lipid complex increased barrier recovery statistically significantly better than the lotions containing 3% Olive Oil or Caprylic / Capric Triglyceride Oil ( $p < 0.001$ ) and the vehicle ( $p < 0.001$ ) 60 minutes after the test article application.

### Barrier Recovery

**Figure 2.**

The test article containing 3% of the lipid complex increased barrier recovery statistically significantly better than the test article containing 3% Olive Oil ( $p < 0.001$ ) and the vehicle ( $p < 0.001$ ) 60 minutes after the test article application. The lipid complex displayed an enhanced effect with the inclusion of Ceramide 1.



# A Novel Lipid Complex That Promotes Skin Hydration and Barrier Function

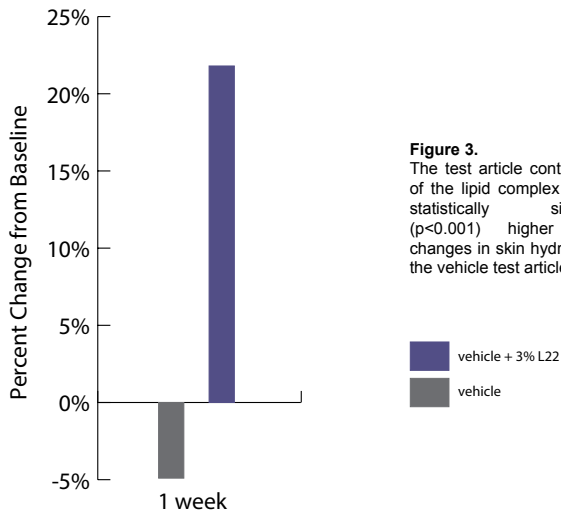
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## Increased Skin Hydration, Elasticity, and Firmness

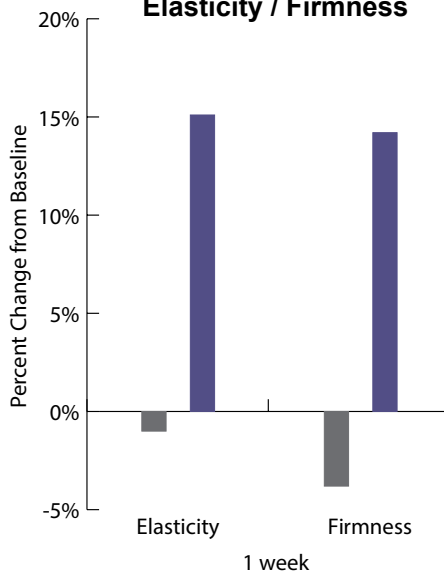
The objective of this study was to determine if the lipid complex improves skin hydration, elasticity, and firmness in skin that is aged and sun-damaged skin. One application of each lotion test article was made (2.7 mg/cm<sup>2</sup>) to the forearms of thirteen male and female subjects between the ages of 60-80 years. Skin hydration (Figure 3) and skin elasticity / firmness (Figure 4) were measured using a Corneometer<sup>®</sup> CM 825<sup>4</sup> and MPA Cutometer<sup>®</sup>, respectively, at baseline and after one week of twice-daily test article use. Percent change was determined for each parameter for each test article.

### Skin Hydration



**Figure 3.** The test article containing 3% of the lipid complex produced statistically significantly (p<0.001) higher percent changes in skin hydration than the vehicle test article.

### Elasticity / Firmness



**Figure 4.** The test article containing 3% of the lipid complex produced statistically significantly (p<0.001) higher percent changes in skin elasticity and firmness than the vehicle test article.

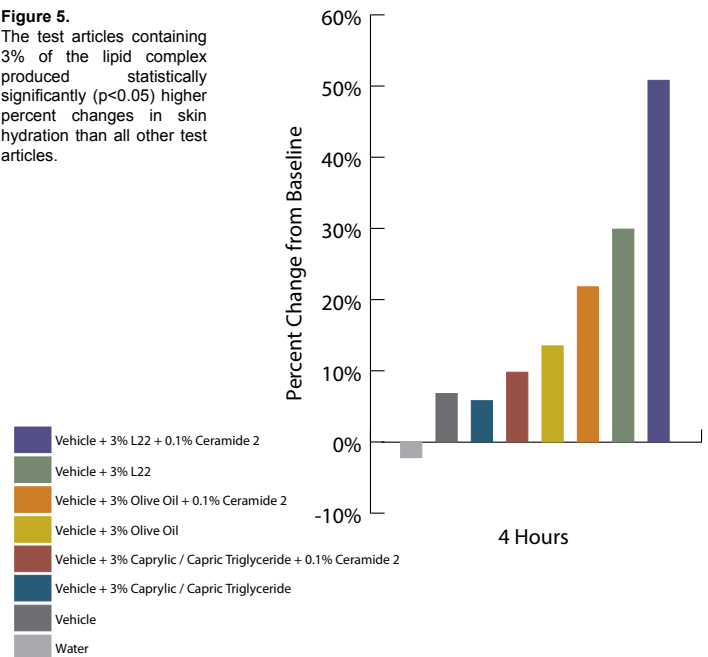
## Increased Skin Hydration

The objective of this study was to determine if the lipid complex improves skin hydration better than other common emollients with skin-lipid-like components. One application of each lotion test article was made (2.5 mg/cm<sup>2</sup>) to randomized locations on the legs of twelve female subjects. Skin hydration (Figure 5) was measured using a Corneometer CM 825 at baseline and four hours post test article application. Percent change in skin hydration was determined for each test article.

### Skin Hydration

**Figure 5.**

The test articles containing 3% of the lipid complex produced statistically significantly (p<0.05) higher percent changes in skin hydration than all other test articles.



## Conclusions


- The novel lipid complex **improved the recovery of skin barrier function** more effectively than other skin-lipid-like emollients.
- The novel lipid complex **enhanced skin barrier recovery** effects when used in combination with Ceramides 1 or 2.
- The novel lipid complex **increased long- and short-term skin hydration**.
- The novel lipid complex **increased elasticity and firmness** in aged and sun-damaged skin.

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