



## Cellular Renewal Assay

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**Tradename:** AC Water Kefir PHA

**Code:** 22064

**CAS#:** 7732-18-5 & 90082-21-6 & 1686112-36-6 (or) 68333-16-4 (or) 9015-54-7

**Test Request Form #:** 7351

**Lot #:** N200812H

**Sponsor:** *Active Concepts, LLC; 107 Technology Drive Lincolnton, NC 28092*

**Study Director:** *Maureen Danaher*

**Principle Investigator:** *Jennifer Goodman*

**Test Performed:**

Cellular Renewal Assay

**Abstract:**

**AC Water Kefir PHA** was evaluated for its ability to accelerate cell renewal by means of a traditional skin pigmentation assay protocol.

Skin cells are frequently exposed to ultraviolet light damage and other chemical and environmental aggregates. Their death and replacement through cellular renewal processes minimize the potential longer-term harmful effects of these exposures. Aiding in the processes of cellular renewal can improve the skin's physical appearance as well as function as a protective barrier.

Dermal Dye Max™ was used to induce skin pigmentation. The active ingredient in Dermal Dye Max™ is dihydroxyacetone (DHA), also known as glycerone, and is a simple saccharide.

**Materials:**

**A. Equipment:** DermaLab Skin Combo (Pigmentation Probe) Pipettes

**B. Reagents:** Dermal Dye Max™ (Alpine Valley Naturals); Cetaphil Moisturizing for All Skin Types; Lactobionic Acid (positive control)

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## Methods:

A cohort of 10 volunteers, male and female, between the ages of 20 and 45 and who were known to be free of any skin pathologies participated in this study. Derma Dye Max™ was applied to four identified test patches on the volar forearm. The dye was left to develop for 24 hours prior to baseline readings. A fifth skin patch was identified as the skin baseline control and no dye nor treatment were applied to this site. Post dye development and prior to the initial application, baseline DermaLab pigmentation index readings were taken for all five identified sites.

Approximately 0.2 g of each lotion treatment, 5% lactobionic acid positive control, 5% **AC Water Kefir PHA**, and the base formula were applied to three 2cm x 2cm respective locations on the volar forearm. The fourth test site was left untreated as a dye baseline test site. Readings were taken every 24 hours until the active test site returned to baseline. After each daily reading, treatment of each respective test site was performed following the same parameters listed above.

## Results:

Exfoliation was determined by calculating the pigmentation difference relative to the comparative skin site. Then, the percent difference was determined for each test site to the base and untreated control. The sum of cellular renewal over the course of 6 days is represented as Cumulative Cellular Renewal in Figures 3 & 4 compared to the base and untreated control respectively.

**AC Water Kefir PHA** was able to return the test site to baseline pigmentation readings in six days.

Exfoliation							
5% Lactobionic Acid	10.3	8.1	5.7	4.5	2.6	1.3	0.5
<b>5% AC Water Kefir PHA</b>	10.5	6	4.3	4.4	2.1	1.2	0.4
Base Lotion Control	11	10.8	6.9	6.2	5	3.6	2
Untreated Control	10.5	8.7	7.5	5.9	4.7	3.9	2.5

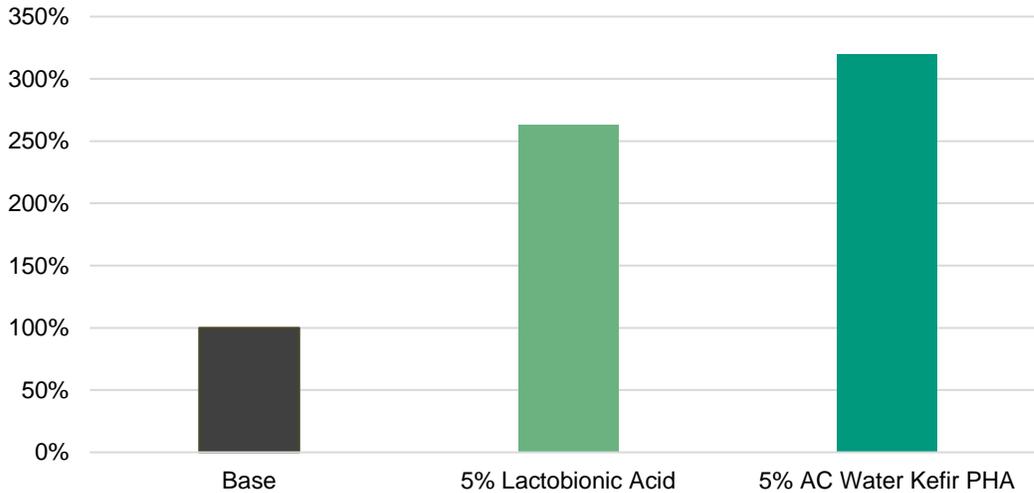
**Figure 1:** Exfoliation (Pigmentation difference relative to the comparative skin site)

Cellular Renewal Percent Difference							
5% Lactobionic Acid v base	6%	25%	17%	27%	48%	64%	75%
5% Lactobionic Acid v UC	2%	7%	24%	24%	45%	67%	80%
<b>5% AC Water Kefir PHA v base</b>	5%	44%	38%	29%	58%	67%	80%
<b>5% AC Water Kefir PHA v UC</b>	0%	31%	43%	25%	55%	69%	84%

**Figure 2:** Cellular Renewal Percent Difference Compared to Based and Untreated Control

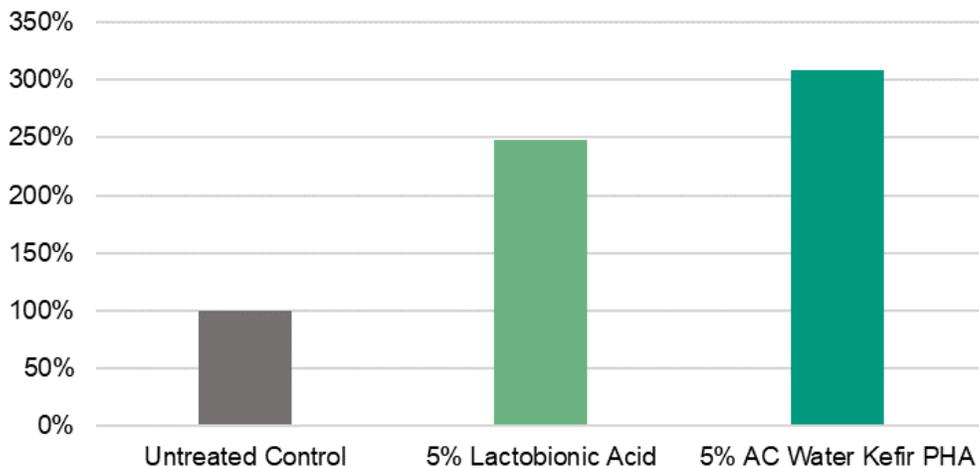
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### Cumulative Cellular Renewal (Relative to Base Control)



**Figure 3:** Cumulative Cellular Renewal Relative to Base Control

### Cumulative Cellular Renewal (Relative to Untreated Control)



**Figure 4:** Cumulative Cellular Renewal Relative to Untreated Control

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### Discussion:

The results indicate that **AC Water Kefir PHA** is capable of increasing cellular renewal when compared to the untreated skin dye control site. Cellular renewal is beneficial for visibly improving skin tone and texture as well as aiding in the skin's function as a protective barrier from harmful chemical and environmental exposure that can lead to premature aging.

As seen in Figure 2, **AC Water Kefir PHA** had the greatest cumulative cellular renewal when compared to all other test controls. **AC Water Kefir PHA** outperformed the lactobionic acid positive control in the induction of cellular renewal and was able to return skin to the untreated baseline pigmentation readings. **AC Water Kefir PHA** induced a 320% cumulative cellular renewal relative to the base lotion over the course of 6 days compared to the lactobionic acid positive control which only induced a 263% cumulative cellular renewal relative to the base lotion. It can therefore be concluded that at normal use concentrations, **AC Water Kefir PHA** contributes to cellular renewal, indicating a healthier, more vibrant skin tone and helping to reverse the signs of aging.

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