

Tradename: AC Biopolymer Chia PF

Code: 21005PF

CAS #: 61788-47-4 & 93384-40-8

Test Request Form #: 10030

Lot #: 9237700

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

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Principal Investigator: *Hannah Duckett*

Test Performed:

Sebum & Shine Reduction Study

Introduction

Sebum is the oily, waxy secretion of sebaceous glands helping to moisturize and protect the skin from bacterial and fungal pathogens. An insufficient amount of sebum can trigger dry, red, and itchy skin whereas an overproduction of sebum leads to oily skin, can block pores resulting in acne, and has a visible shine. The shiny and greasy appearance associated with excess sebum and oily skin is undesirable and reducing these attributes through cosmetic applications is highly sought after.

Accordingly, a sebum and shine reduction study was conducted to evaluate the ability of **AC Biopolymer Chia PF** to decrease sebum values on the skin and visibly suppress shine.

Study Principle

Initial photographs of participant faces were obtained, and initial sebum values were recorded from the forehead, nose, and chin. Following baseline measurements, participants applied a control base foundation to one half of their face and the test article on the other half. After six hours of application, photographs and sebum measurements were obtained. The presence of sebum on the skin results in higher readings than sebum lacking skin. Additionally, higher sebum values are indicative of more shine from the skin.

Materials

- A. Equipment:** DermaLab Skin Combo (Sebum Module) with Sebum Collecting Strips; VISIA Complexion Analysis System (Canfield Scientific., Fairfield, NJ, USA)
- B. Products:** Maybelline Fit Me, Matte + Poreless Foundation Shade #220 (Base Foundation)
- C. Software:** Excel Analysis ToolPak (Microsoft)

Methods

This study was conducted with 14 participants between the ages of 24-36, free of any skin known pathologies, with Fitzpatrick skin types II to IV (Table 1). As demonstrated in Table 2, each participant was asked to classify their skin type on a scale of 1 – 10 (extremely dry to extremely oily). The DermaLab Sebum Module analyzed sebum levels on a participant's forehead, nose, and chin utilizing Sebum Collecting Strips. The Sebum Collecting Strips were applied to each test location with equal pressure for 15 seconds. Each test location was measured twice, and an average was recorded. Photographic assessments were performed using the VISIA Complexion Analysis System (Canfield Scientific., Fairfield, NJ, USA) to ensure consistent positioning of each participant's head. The photographic images were captured with standard, cross-polarized, parallel polarized, and ultraviolet light.

Sebum measurements and photographs were obtained at baseline (prior to any product application) and after 6 hours of product application. Each participant had half their face randomly assigned as a control side and a test article side. The control side applied a Base Foundation (Maybelline Fit Me, Matte + Poreless Foundation Shade #220) and on the other side, 1.0% **AC Biopolymer Chia PF** in the Base Foundation was applied. Each participant applied roughly 75 mg of the Base Foundation or 1.0% **AC Biopolymer Chia PF** to the specified forehead, nose, and chin areas. Percent change was calculated by the following formula:

$$\text{Percent Change (\%)} = \frac{\text{Sebum Values}_{\text{After 6 hours}} - \text{Sebum Values}_{\text{Baseline}}}{\text{Sebum Values}_{\text{Baseline}}} \times 100$$

Table 1. The Fitzpatrick Classification of Skin Types Chart¹

Fitzpatrick Skin Type Descriptions*	
Skin Type	Description
I	Always burns, never tans
II	Burns easily, tans minimally
III	Burns moderately, tans to light brown
IV	Burns minimally, tans to moderate brown
V	Rarely burns, tans to dark
VI	Never burns, least sensitive to changes
*Adapted from The Surgeon General's Call to Action to Prevent Skin Cancer	

Results

The data obtained for this study met criteria for a valid study as the Base Foundation performed as expected. However, 1.0% **AC Biopolymer Chia PF** reduced sebum on the forehead, nose, and chin.

Table 2. Self-Assessment of Each Participants (n=14)

	Self-Assessment Rating 1 (very dry) – 10 (very oily)
Average	5.71

Table 3. Average Sebum Readings for Individual Test Sites

	Forehead		Nose		Chin	
	Baseline	After 6 hours	Baseline	After 6 hours	Baseline	After 6 hours
Base Foundation	30	26	31	30	28	25
1.0% AC Biopolymer Chia PF	30	20	31	27	28	21

Changes in Sebum After 6 Hours AC Biopolymer Chia PF

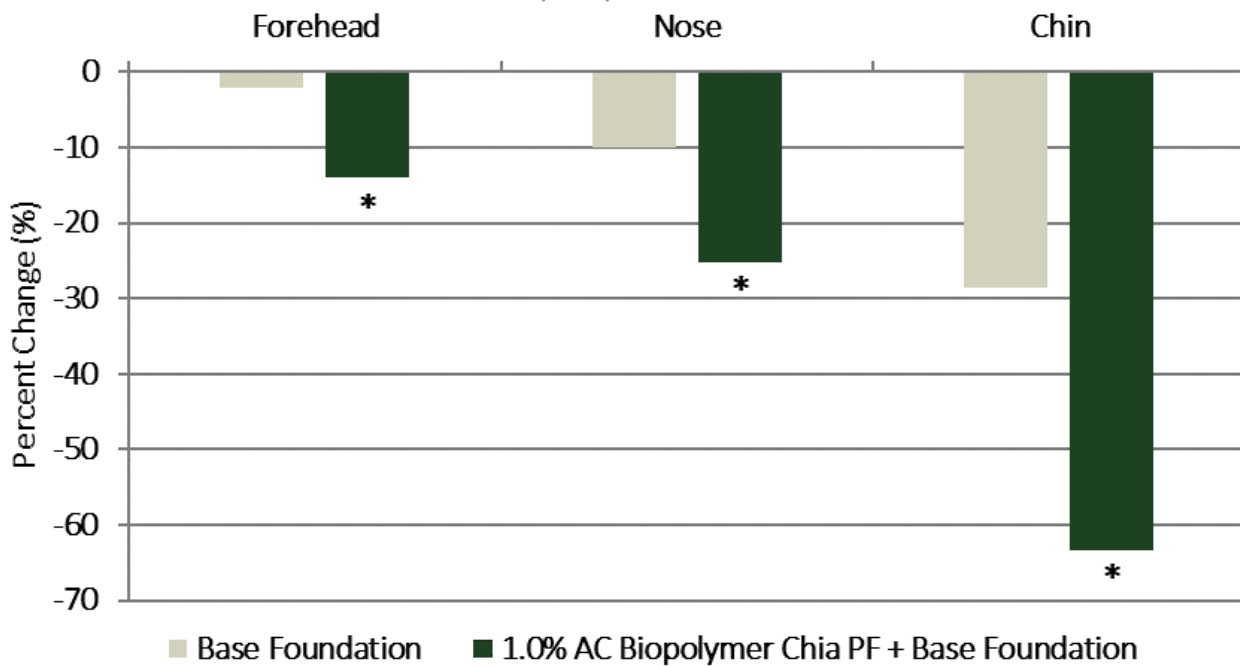


Figure 1. Percent Change in Sebum After 6 Hours at Each Test Site. * indicates significance ($p \leq 0.05$) compared to Base Foundation.

Table 4. P-values of two-tailed T-test Analysis between Base Foundation and 1.0% AC Biopolymer Chia PF Sebum values after 6 hours on the Forehead, Nose, and Chin. * indicates significance ($p \leq 0.05$) compared to Base Foundation.

	Forehead	Nose	Chin
P-values	0.002*	0.005*	< 0.001*

Changes in Overall Face Sebum After 6 Hours AC Biopolymer Chia PF

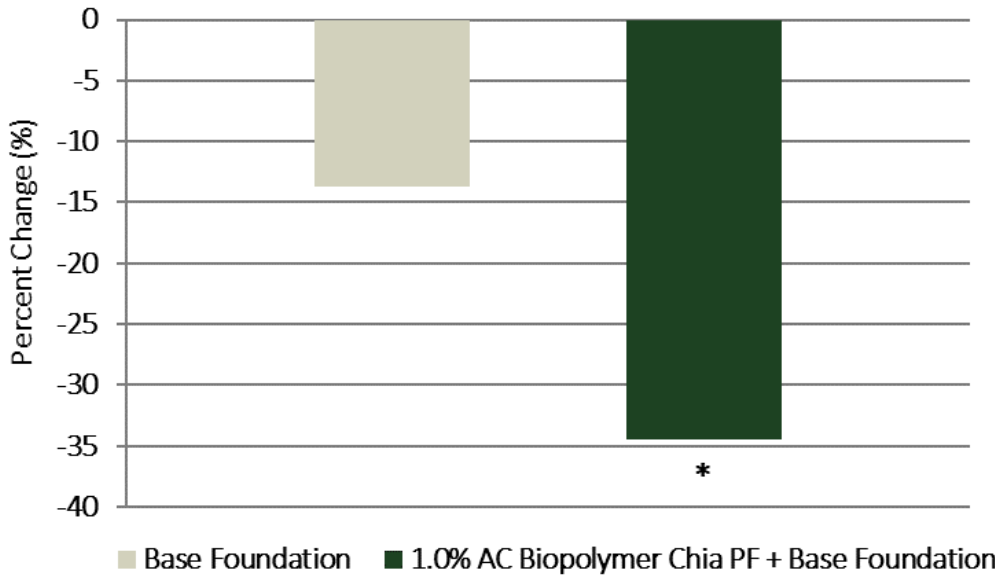


Figure 2. Percent Change in Sebum After 6 hours for the Overall Face. * indicates significance ($p \leq 0.05$) compared to Baseline.

Table 5. Two-tailed T-test Analysis of Percent Change in Overall Face Sebum between Baseline and After 6 Hours of application. * indicates significance ($p \leq 0.05$) compared to Baseline.

	Base Foundation	1.0% AC Biopolymer Chia PF
P-values	> 0.05	0.005*

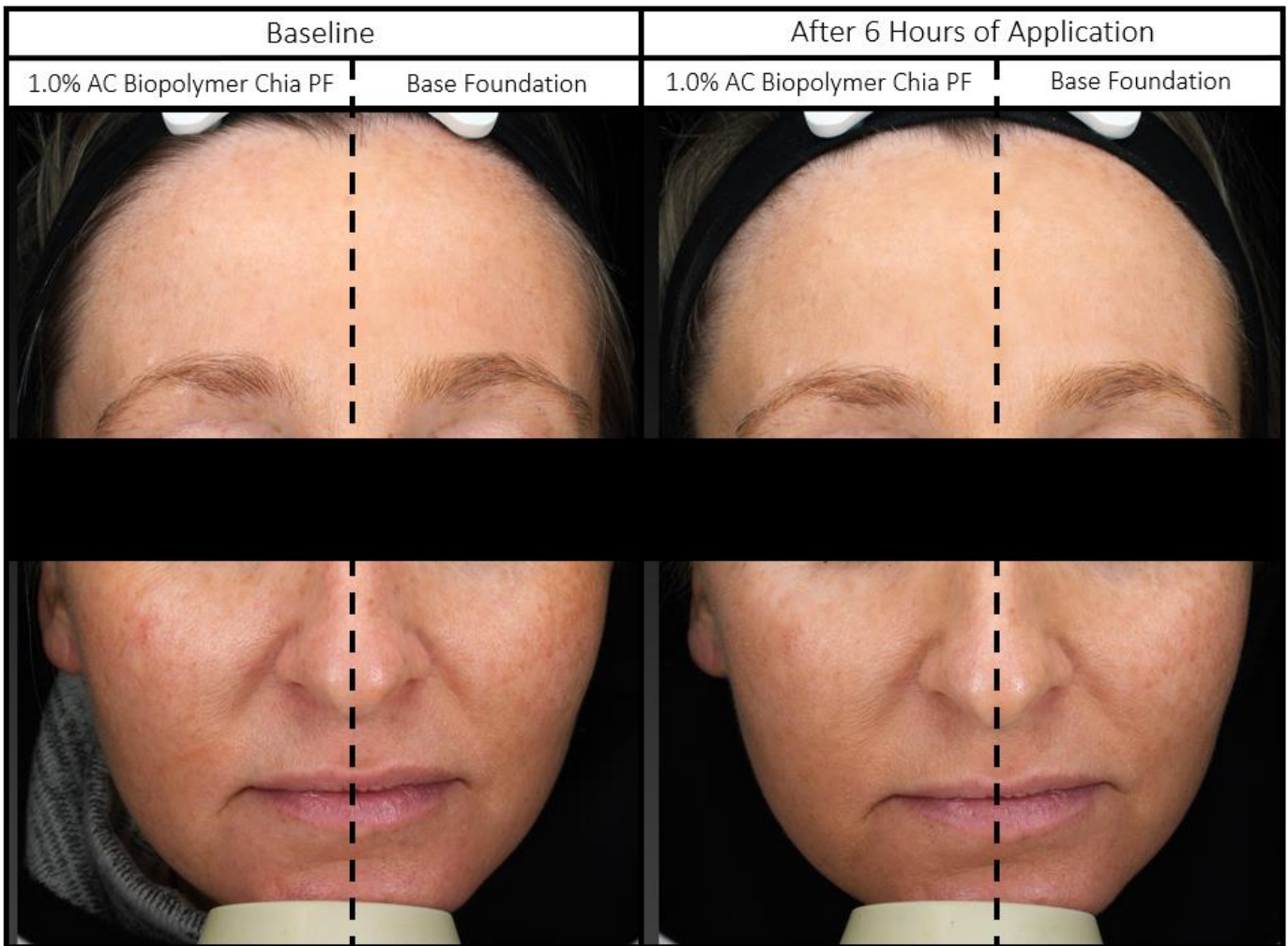


Figure 3. Representative VISIA Images of a Participant at Baseline and After 6 hours of Application.

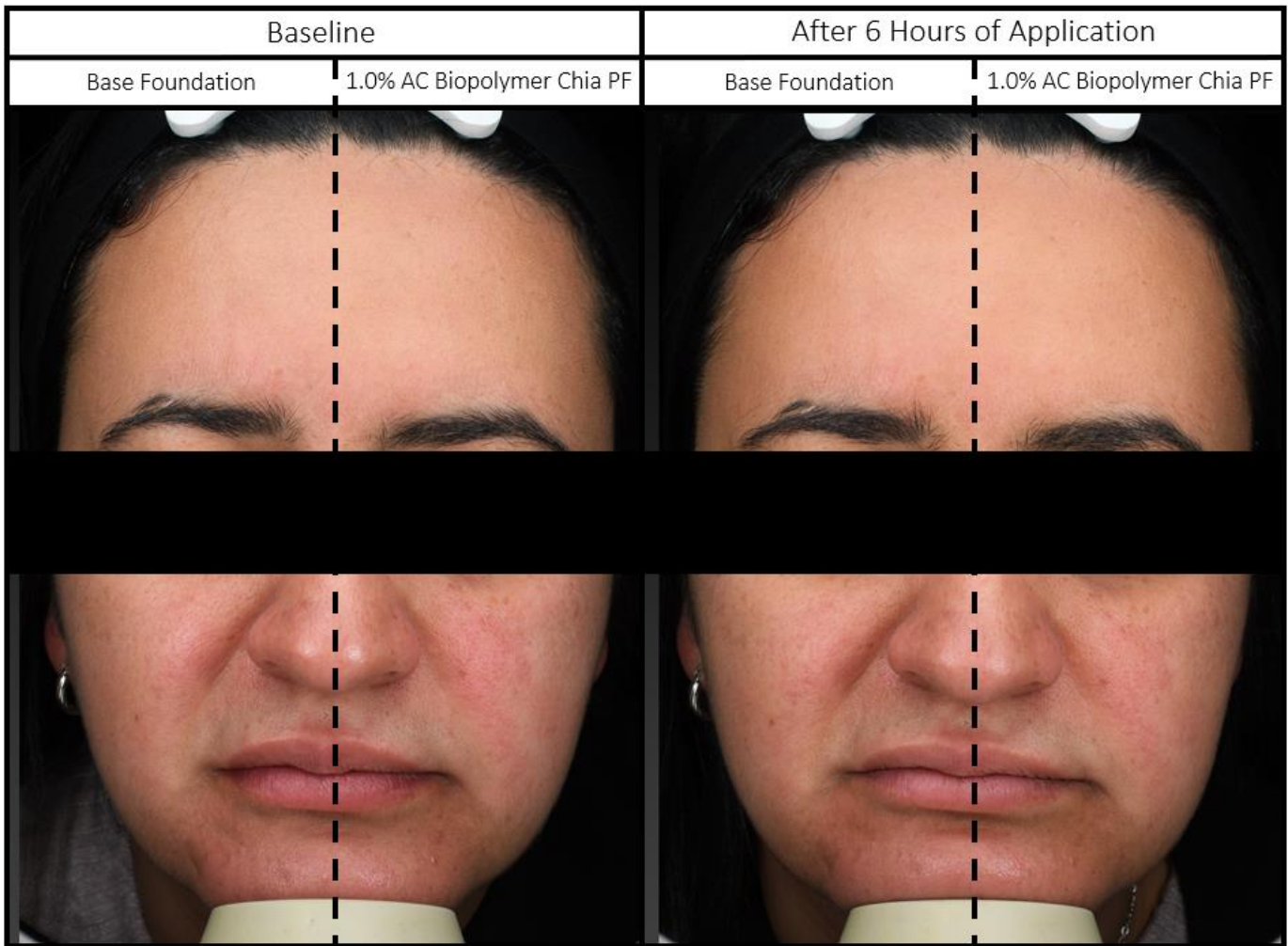


Figure 4. Representative VISIA Images of a Participant at Baseline and After 6 hours of Application.

Discussion

This study was conducted to evaluate the sebum and visible shine reducing properties of **AC Biopolymer Chia PF**. The Base Foundation decreased overall sebum levels by 14% after six hours of application with the forehead, nose, and chin decreasing by 2%, 10%, and 29%, respectively (Figures 1, 2; Tables 3, 4, 5). Conversely, **1.0% AC Biopolymer Chia PF** significantly reduced overall sebum levels on the face by 34% after six hours of application, compared to baseline measurements (Figures 1, 2; Tables 3, 4, 5). Specifically, **1.0% AC Biopolymer Chia PF** significantly decreased sebum on the forehead, nose, and chin by 14%, 25%, and 63%, respectively (Figure 1; Tables 3, 4). These results indicate **1.0% AC Biopolymer Chia PF** effectively suppresses excess sebum levels present on the skin after six hours.

Prior to product application participants rated the oiliness of their skin, and on average the participants perceived their skin to be classified as oily rather than dry (Table 2). However, **1.0% AC Biopolymer Chia PF** appeared to elicit visibly less shine after six hours of application compared to Base Foundation (Figures 3, 4). Taken together, these results indicate **AC Biopolymer Chia PF** visibly decreases shine from skin perceived to be oily after six hours of application.

The present study indicates **AC Biopolymer Chia PF**, when utilized at the recommended use-levels, alleviates the undesirable results of sebum overproduction. Collectively, **AC Biopolymer Chia PF** suppresses sebum, while mitigating the shiny and greasy appearance, from oily skin.

References

1. Sharma AN, Patel BC. Laser Fitzpatrick Skin Type Recommendations. [Updated 2022 Mar 9]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK557626/>