



Science Inspired Beauty™

**Bonigel is the first science-backed, probiotic-derived personal care ingredient that has been shown to significantly improve the appearance of seven common signs of aging.**

Bonigel is the trademarked name for the supernatant produced during the fermentation of GanedenBC<sup>30</sup> (*Bacillus coagulans* GBI-30. 6086), Ganeden Biotech's popular shelf-stable probiotic ingredient, and is optimized to contain the perfect combination of naturally derived metabolites.

#### USE

- Incorporates easily into topical formulations
- Use level - 5%
- For external use only

#### PROPERTIES & STORAGE

- Water soluble liquid
- Light amber color
- pH range 4.0-4.5
- Store at room temperature not to exceed 70 degrees

#### APPLICATIONS

- Anti-aging creams, gels, masks, serums and body lotions
- Skin care and cosmetics
- Hair care products
- Soaps

#### NO PRESERVATIVES ADDED

Our proprietary process protects the metabolic activity of the probiotic without the use of synthetic preservatives.

**INCI Name: Bacillus ferment**



## Backed By Science

Bonigel has powerful antiaging benefits. In recent double-blind, placebo-controlled human clinical trials Bonigel was shown to:

Increase Moisturization

**19.10%**

Increase Skin Elasticity

**5.22%**

Decrease the Appearance  
of Fine Lines and Wrinkles

**62.99%**

Decrease the Appearance  
of Roughness

**19.44%**

Decrease the Appearance  
of Pore Size

**48.10%**

Decrease the Appearance  
of Redness

**33.33%**

## Ganeden Biotech

### INNOVATIONS IN PROBIOTIC TECHNOLOGY

Ganeden Biotech is a science driven organization with extensive research on its branded ingredients. Ganeden's anti-aging ingredient, Bonigel, is the newest innovation to spring from Ganeden's labs. Ganeden offers a successful history of bringing new ingredients to the marketplace. Always on the forefront of probiotic innovations, Ganeden is active in the science, research & development and marketing of novel, branded ingredients. Ganeden's innovations lead to your products' success.

For more information on Bonigel visit

**[BonigelForBeauty.com](http://BonigelForBeauty.com)**.

To learn more about Ganeden's probiotic technology, patents and clinical data visit **[GanedenBiotech.com](http://GanedenBiotech.com)**.



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# CLINICAL STUDY CONFIRMS CLEANSING BAR WITH BONIGEL REDUCES FACIAL REDNESS

**Summary of Findings** Bonigel was added at a 5% inclusion rate to a cleansing bar (Bradford Soap Works) which then demonstrated a 35% reduction in facial redness in 14 days.

**Background** Three previous trials demonstrated that when Bonigel is included at 5% there are many anti-aging benefits, including reduction in redness. These three previous trials were conducted in leave on creams. This study was conducted to demonstrate that Bonigel would have positive effects, even when used in a wash off product.

**Design** Subjects were given a moisturizing bar that contained Bonigel at a 5% inclusion rate and were instructed to wash their face twice daily for 14 days. Subjects were instructed not to use any other daily moisturizers, and were allowed to apply normal make-up. High-resolution photographs were taken at baseline and day 14 for analysis.

## High Resolution Photography

- Detailed, high resolution before and after treatment digital photographs were taken, with a fixed camera
- Background, distances, angles, settings, lighting, panelist positioning, color bars and white balance were standardized
- Digitally certified as being un-retouched.

**Conclusion** Bonigel at a 5% inclusion decreases redness, even in a product that is applied and washed off.



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## Follow-Up Study

**Summary of Findings** A second study was conducted on a bar that did not contain Bonigel. It is known that these type of products can cause skin irritation. As expected, this study demonstrated a 31% increase in facial redness over 14 days.





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# CLINICAL STUDY CONFIRMS BONIGEL IMPROVES MULTIPLE ANTI-AGING ENDPOINTS

## Clinical Pilot Study

Ganeden Biotech performed an 8 week study to evaluate and compare the effectiveness of a topical anti-aging product containing *Bacillus coagulans* ferment (Bonigel) versus placebo to improve skin hydration & moisturization, improve skin elasticity, reduce the appearance of fine lines & wrinkles around the eyearea, decrease the appearance of under-eye puffiness and decrease the appearance of dark circles.

The test group consisted of female subjects in the age range of 35-60 years with at least 25% having under eye puffiness and 25% having dark circles.

### The inclusion of Bonigel was found to:

- Increase moisturization by 19.1%
- Increase skin elasticity by 3.11%
- Decrease the number of coarse skin lines by 20.57%
- Increase skin smoothness by 4.33%
- Decrease skin shadows by 7.09%
- Have 17% increase in the number of subjects showing improvement of eye area fine lines and wrinkles
- Have 8.33% increase in the number of subjects showing improvement of under eye puffiness

## Clinical Confirmation Study

Ganeden Biotech performed a 28 day study to confirm the findings of previous studies that demonstrated the multiple benefits of using a cream with 5% Bonigel.

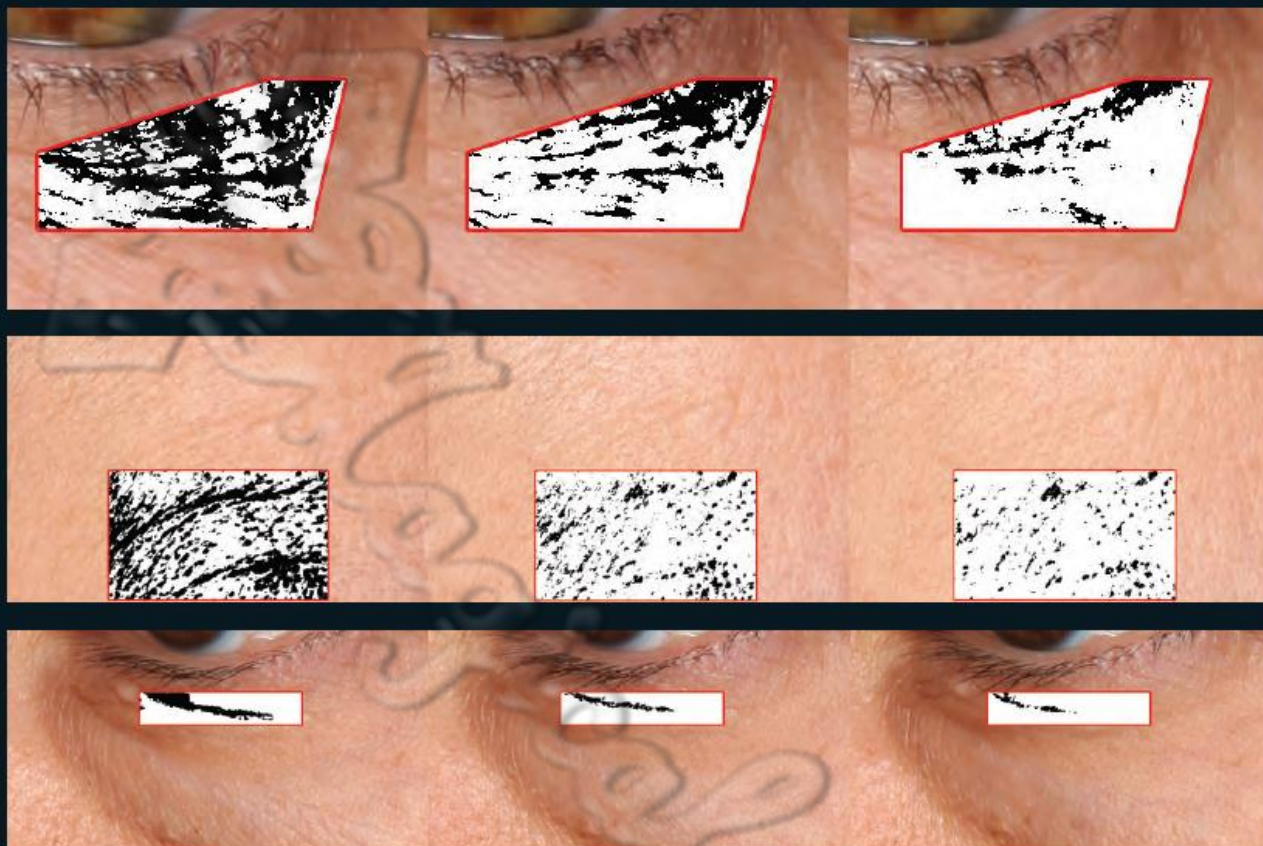
The study was randomized, double-blind and placebo controlled. The subjects were females in the age range of 35-60 with mild to moderate fine lines and wrinkles. Subjects were not using anti-aging products, nor had used them within 30 days of the start of the trial.

### The inclusion of Bonigel was found to:

- Decrease the appearance of roughness by 19.4%
- Increase hydration by 19.1%
- Increase elasticity by 5.2%
- Decrease the appearance of fine lines & wrinkles by 62.9%
- Decrease the appearance of pore size by 48.1%
- Decrease the appearance of redness by 33.3%



## Reduction in the Appearance of Fine Lines and Wrinkles



## Reduction in the Appearance of Pore Size





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# Bonigel® Gene Regulation Therapy Study Supports Anti-Aging Endpoints



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## Summary Of Findings

Treatment of full thickness in vitro skin cultures with 5% Bonixel produced statistically significant changes in genes related to hydration, epidermal barrier integrity and structural proteins. This supports results seen in multiple human trials, that Bonixel® at 5% inclusion, has positive effects on multiple endpoints related to skin aging.

## Background

The objective of this study was to understand how a topical material influences gene expression in the skin. It was conducted using a full thickness in vitro skin model (EFT-400, MaTek). One hundred µL of test material was applied to the surface of each test culture and collected 24 hours post application. Tissues were collected in RNA later for gene expression analysis. The active group contained Bonixel® at a 5% inclusion rate, and was compared to a water control group.

## Results

Statistics were carried out using StatMiner software v4.2 (unpaired t-tests,  $p < 0.05$ ,  $N = 4$ ) to compare each treatment to the water control group. qPCR data was normalized using GAPDH as an endogenous control gene. Changes in gene expression are reported as linear fold change (FC) differences between the groups treated with test material and the control group. Positive values indicate increased gene expression; negative values indicate decreased gene expression. The statistically significant genes with FC values greater than 2.0 (increased or decreased) are shown in the Table below. Changes in excess of 2.0 are considered biologically significant.

**Table 1. Statistically Significant data for 5% Bonixel® vs Water Control**

Gene ID	Gene Name	5% Bonixel	Biological Function
AQP1	Aquaporin 1	3.06x	Hydration
COL3A1	Collagen 3a1	2.04x	Structural Protein
DSC1	Desmocollin 1	2.48x	Barrier
KLK6	Kallikrein 6	-2.05x	Protein Degradation & Desquamation
SMPD1	Sphingomyelin Phosphodiesterase 1	17.78x	Ceramide Synthesis

## Hydration/Barrier Integrity

- AQP1** Aquaporins are a water channel molecule located on many cell types. It plays a major role in regulating trans-cellular water transport. In the skin, aquaporin expression is associated with trans-epidermal water loss (TEWL). Several AQPs have been identified in the skin, including AQP1. While, there is a large amount of research describing the role of the glycerol transporter aquaporin 3 (AQP3) in the skin, less is known about AQP1. Studies have shown that decreased AQP3 expression is associated with intrinsic and extrinsic aging of the skin, as well as a variety of skin diseases.
- DSC1** Desmocollins are calcium dependent cadherins that regulate cell-cell adhesion of desmosomes. DSC1 is required for strong adhesion and barrier maintenance in the epidermis and contributes to epidermal differentiation. A strong intact epidermal barrier is important for protecting the skin from environmental insults and preventing TEWL. Studies have shown reductions in DSC1 occur in aging skin. Bonigel<sup>®</sup> increased expression of DSC1, supporting the idea that it may promote the maintenance of a healthy, epidermal skin barrier.
- KLK6** Kallikreins are serine proteases that play an integral role in the desquamation process. An appropriate balance of desquamation is required for maintaining epidermal barrier formation and integrity. Desquamation is also a key factor in the stimulation of keratinocyte cell proliferation and differentiation. Cell renewal and turnover are key components of anti-aging products. Excess protein degradation via an increase in KLK expression has been associated with intrinsic and extrinsic skin aging. Exposure to Bonigel<sup>®</sup> produced a decrease in the expression of KLK6 – this may help balance protein degradation disequilibrium that occurs as the skin ages.
- SMPD1** Acid sphingomyelinase (SMPD1) converts sphingomyelin into ceramide. Ceramides are lipids present in the stratum corneum. They are important for maintaining skin moisture and a healthy epidermal skin barrier. Ceramide synthesis declines with aging and in response to harmful extrinsic stimuli, such as UV irradiation. Ceramide synthesis has been a focal point for anti-aging products for many years. This report shows a large increase in the amount of SMPD1 after exposure to Bonigel<sup>®</sup>.

## Structural Proteins

- COL3A1** Collagens are structural protein produced by fibroblasts in the dermis and cells in the epidermal basement membrane. Type I and Type 3 collagens are the most prevalent connective tissue proteins in the skin. Reductions and disorganization of type I and type 3 collagen fibers are a characteristic of aged and photo-damaged skin. This results in a loss of firmness and the appearance of wrinkles. Bonigel<sup>®</sup> increased expression of COL3A1, providing further support of clinical data that shows the material has skin firming and anti-wrinkle activity.

## Conclusions

Treatment of full thickness skin cultures with 5% Bonigel<sup>®</sup> produced statistically significant positive changes in genes related to hydration, epidermal barrier integrity, structural proteins and skin repair.

## References

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### COL3A1

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