# DL Goji Prebiotic™

A DERMAL SUPERFOOD PREBIOTIC FOR A BENEFICIAL MICROBIOME AND ANTI-AGING SKINCARE BENEFITS





### **Creating the Ideal Prebiotic Cosmetic Technology**

Your skin and digestive system

- Host major population of commensal microorganisms
  - Provide crucial support for vital functions
- Beneficial microbiota colonization decreases due to competition with infectious pathogen colonization
  - Contributing to a diverse range of diseases

### A range of inflammatory conditions to the skin

Dermatitis to psoriasis + serious skin infections

Simple sugars - the nutrient source for microbiota colonization

 Presence promotes proliferation and colonization by pathogenic bacteria





### **Creating the Ideal Prebiotic Cosmetic Technology**

#### Invasive species

- Cannot readily utilize complex peptidoglycans
- Presence of peptidoglycans reduces nutrient availability

### Ideal prebiotic composed of complex peptidoglycans

- Benefits the commensal microorganisms
  - >Staphylococcus epidermidis
- Does <u>not</u> benefit invasive species
  - ➤ Staphylococcus aureus





# The Goji Berry

Goji, goji berry or wolfberry

- Lycium barbarum / Lycium chinense
- High mountain (Himalayas) + desert zones
- Rich in phytonutrients, vitamins + trace minerals
- Glycans such as inulin are known to exhibit prebiotic effects
  - ➢Promote the growth of beneficial bacteria

### Fruits shield genomic material

- Combination of phytochemicals that provide:
  - Antioxidant defenses + regenerative properties





# DL Goji Prebiotic™

Deveraux Specialtie

est. 100.

### A multi-modal dermal superfood prebiotic for a beneficial microbiome and anti-aging skincare benefits



# How Does It Work?

IN-VITRO TESTING





### **Commensal and Infectious Bacterial Growth**

### Supporting S. epidermis but <u>not</u> the S. aureus metabolism



Commensal and infectious bacterial growth in 0.1% DL Goji Prebiotic ™ (DB) in a phosphate-buffered saline (PBS).

- SE: Darker colored wells represent the metabolism of a healthy skin resident bacteria Staphylococcus epidermidis.
- SA: Lack of color in wells represents no proliferation of infectious Staphylococcus aureus.



# **A Selective Prebiotic Effect**



- Even at very low concentrations DL Goji Prebiotic supports metabolism of a beneficial microbiome resident bacteria *S. epidermidis*.
- Phosphate-buffered saline (PBS) alone does not promote growth of *S. epidermidis* (SE) or *S. aureus* (SA).
- DL Goji Prebiotic does not promote the metabolism of the infectious S. aureus as does bacterial broth.



### Anti-Aging - In-Vitro Human Gene Expression

#### LAMC1 – COMPONENT OF THE LAMININ COMPLEX

- Essential for the structural integrity of the dermal-epidermal junction
- Laminin expression decreases with age

### MMP1 - EXTRACELLULAR MATRIX DEGRADING ENZYME

- Degrades the ECM and Type III collagen thereby reducing dermal structural integrity
- MMP1 expression increases with age





### Anti-Aging - In-Vitro Human Gene Expression

Method: EpiDerm Skin Substitutes + PCR	
Micro Array	
Gene Symbol	Fold Change
LAMC1	4.6
MMP1	-1.5

LAMC1 and MMP1 consistently found to be modulated by DL Goji Prebiotic ™ (2% dilution)

- Enhances gene expression of gene coding of LAMC1 for the essential component of the laminin network
- Decreases the expression of gene coding of MMP1



# Free Radical Quenching - DPPH Assay

0.5% DL Goji Prebiotic



Blank

Water Control

- DPPH (2,2-diphenyl-1-picrylhydrazyl): stable free radical
- Assay uses the reduction of the DPPH radical (purple) to diphenylpicrylhydrazine (yellow) as an indication of free radical scavenging capacity

Produced significant free radical quenching in a DPPH (2,2-diphenyl-1-picrylhydrazyl) model capable of 44% DPPH reduction at a 0.5% dilution (p<0.001)



# **Antioxidant Benefits – ORAC Assay**

Test Material	ORAC µmoles TE/g
H <sub>2</sub> O	0
DL Goji	258
Prebiotic ™	

Demonstrated powerful antioxidant activity in the ORAC assay model.

 Underscores the unique action of Goji peptidoglycans, a non-polyphenolic antioxidant fraction of Goji Berries



### Inhibition of UVA-Induced IL-8 Proinflammatory Cytokine



Demonstrated a strong protective effect against UVA-induced interleukin-8 production in human epidermal keratinocytes.

p=0.0323 DL Goji Prebiotic (0.25%) inhibits IL8 gene expression by 35%

# DL Goji Prebiotic<sup>™</sup> *In-Vitro* Summary

- A complex peptidoglycan that selectively supports metabolism of commensal bacteria, such as S. epidermidis, but not the pathogens, such as S. aureus.
- Boosts LAMC1 and decreases MMP1 gene expression thus promoting dermal structural integrity repair.
- Free radical scavenger that prevents oxidative damage to the cells.
- Inhibits the production of UVA-induced IL-8, a chemotactic and proinflammatory cytokine produced in the skin under inflammatory stimuli.





# How Did It Perform?

IN-VIVO TESTING





# **The Clinical Model**



#### Facility:

 Abich Cosmetic Lab Montréal (Québec) Canada

#### Subjects + Inclusion Criteria:

- 11 healthy female volunteers; 35-55 years old
- Fine lines and wrinkles in the face and/or in the contours of their eyes
- Visible redness on the skin

Formulation Tested:

- Cream with DL Goji Prebiotic<sup>™</sup> (2%)
- Cream without DL Goji Prebiotic™

### Variables

Fine lines and wrinkles, porphyrins

#### Application:

 Everyday use of products on each side of the face – same side, same cream for 60 days

#### Measurement time intervals:

T0 (prior to product application), T2 (2 weeks), T4 (4 weeks), T8 (8 weeks)

#### Equipment:

Generation VISIA<sup>®</sup> Complexion Analysis
System + Standard Laboratory Equipment



# DL Goji Prebiotic™

ANTI-AGING + PORPHYRIN *IN-VIVO* DATA





# **Anti-Aging Efficacy**





## Wrinkle Counts: Subject - ANSO0039



## Wrinkle Counts: Subject - ANVA0551

est. 1008



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# **Porphyrins Reduction Efficacy**







## Porphyrin Counts: Subject - ANVA0551

Deveraux Specialties

est. 1008



## Porphyrin Counts: Subject - GASU0504





# **User Perception After 8 Weeks**

**100%** of users stated their skin felt firmer, more elastic, had a more youthful looking appearance and felt the appearance of their skin demonstrated improvement.

**91%** of users saw a reduction in fine lines, wrinkles and skin redness with a brighter skin appearance.

82% of users were satisfied or very satisfied with DL Goji Prebiotic<sup>™</sup> product.





# DL Goji Prebiotic™

SUMMARY AND INGREDIENT INFORMATION





# Summary

A proprietary 5% active solid fraction of watersoluble goji peptidoglycans extracted from **certified organic** goji berries.

This cosmetic ingredient can be formulated at 1-2% to promote:

- A healthy skin microbiome
- Up regulate gene expression of laminin an essential extra cellular matrix structural protein
- Down regulate MMP1 gene expression subsequently reducing degradation of the ECM and collagen
- Deliver antioxidant protective anti-inflammatory properties





# DL Goji Prebiotic™

**INCI**: Water (and) Propanediol (and) Lycium Barbarum Fruit Extract

**Preservative system**: 1% Geogard Ultra™ (Gluconolactone & Sodium Benzoate & Calcium Gluconate).

Appearance: Slightly colored liquid

Solubility: Water and any polar solvent

Color: Light red

**Odor**: Characteristic

Usage Level: 2%

Approved USA, Europe and China



# References

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