# PHORMISKIN BIOPROTECH G

## YOUTH BRIGHTNESS

**CHARACTERISTICS**
Water soluble
Marine origin

**INCI NAME**
Glycerin (and) Water
(and) Hydrolyzed alga extract

**% OF USE: 2%**

ECOCERT: approved
COSMOS: approved
**CHINA: OK**

# THE ESSENTIAL

*3 SLIDES TO CATCH THE ESSENTIAL OF PHORMISKIN BIOPROTECH G*

# THE ESSENTIAL

## DESCRIPTION & IN-VITRO EFFICACY

### MAIN CHARACTERISTICS:

-Concentrate of Phormidium persicinum: blue-green micro-alga producing photoprotective pigment BIOPTERIN

-Stimulates the synthesis of the most elaborate photo-protective system: THIOREDOXIN

### 1- PHOTOPROTECTION ACTIVITY:

- 62% against UV induced DNA damages
- Stabilizing action on SPF against DNA damages
- 73% protection against cellular death
- 98% protection against Sun Burn Cells

### 2- SKIN REDENSIFICATION

+134% cellular division

### 3- BRIGHTENING ACTION

-40% melanin synthesis

**CONCENTRATE OF THE PRIMITIVE BLUE MICRO-ALGA: PHORMIDIUM PERSICINUM**

This cyanophyceae is a primitive micro-organism that appeared about 3.8 billion years ago. It is part of the species which were behind the expansion of life on Earth.

**EXTREME SURVIVOR**

*Phormidium* lives practically everywhere, including under extreme conditions, from the polar ice caps to the sands of the desert. It survives in the very hot and acidic lakes of volcano craters as well as in geysers.

CODIF R&N

# THE ESSENTIAL

## IN-VIVO EFFICACY

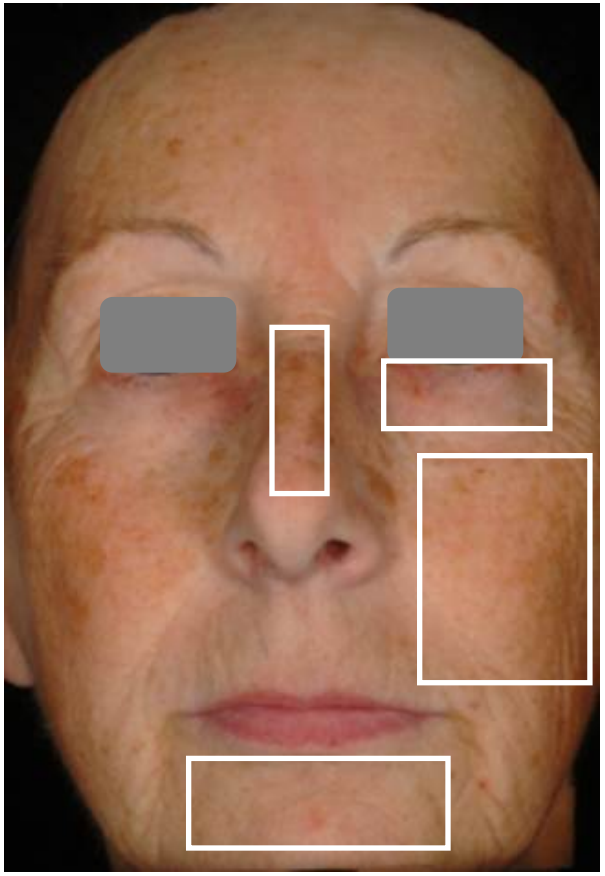
### PHORMISKIN BIOPROTECH G HOMOGENISES SKIN COLORATION BETWEEN DIFFERENT AREAS OF THE FACE

**PROTOCOL**

15 volunteers aged between 45 and 65 years - Phormiskin Bioprotech G 2% - Twice daily application during 28 days

ANALYSIS: multi-zone analysis in order to conclude to a global homogeneity of the complexion. Photos of the entire face using cross-polarized light and color analysis and pairwise comparison of different areas on the face.

*Before treatment*



Pigmentation difference between eye ring and nose:
T0: 3.88 → T28: 3.04

Pigmentation difference between cheek and chin:
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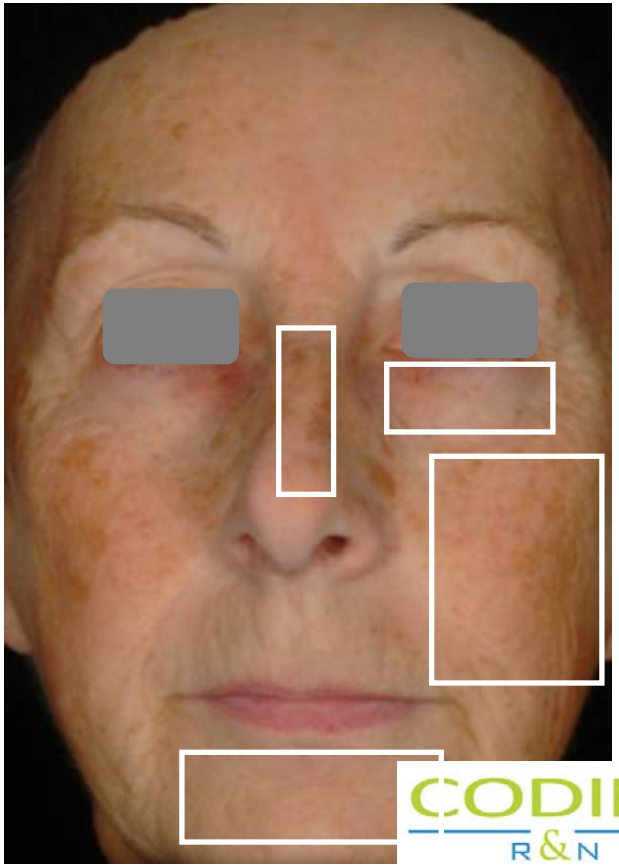
**GLOBAL IMPROVEMENT OF COMPLEXION HOMOGENEITY**

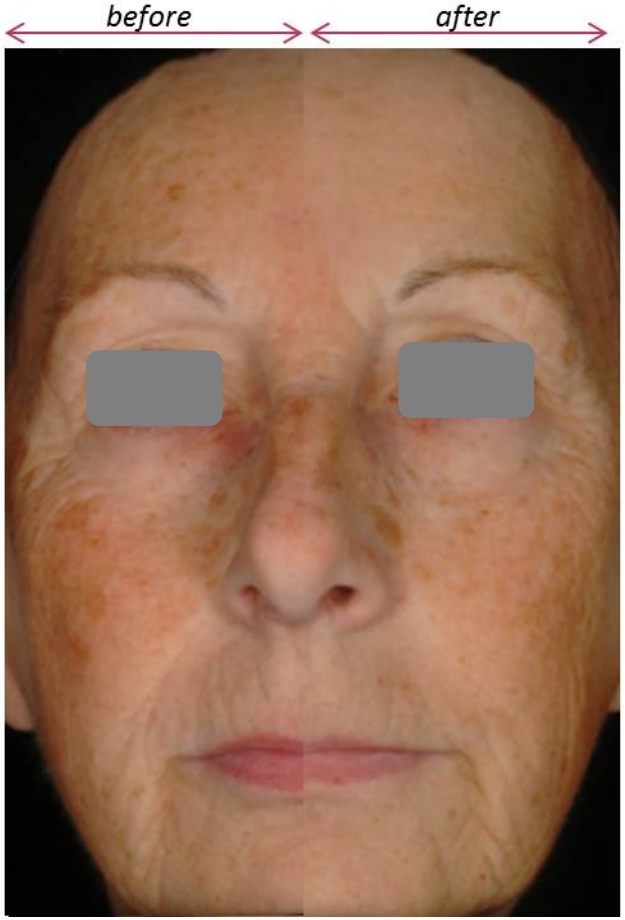
*After treatment*



# THE ESSENTIAL

## IN-VIVO EFFICACY

PHORMISKIN BIOPROTECH G IMPROVES SKIN TEXTURE HOMOGENEITY
+2.1% on average ($p<0.05$ Student Test) and up to 7%




TOP 5 volunteers satisfaction:

- My skin is softer
- My skin is smoother
- My skin is brighter
- My skin is lighter
- Imperfections are less visible

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# CONCEPT & CONTEXT

# Prevents Photo-Ageing to answer the Trend of Perfect Tone & Flawless Skin



More than ever perfect tone, ideal skin, homogenous complexion is of main interest in anti-ageing strategies.

*As examples:*
Perfectionist -Estee Lauder
Idealia -Vichy
Skin Perfection -L'Oreal Paris
Idealist -Estee Lauder

## CONCEPT

Achieve the skin tone of your dreams through multiple action technology: correct the appearance of dark spots, **provide even skin tone**, and **correct irregularities such as dull skin**, skin redness and blemish marks.

# PHORMISKIN – SKIN SAVER

It is possible to create and recreate ideal skin complexion by focusing on the factors that affect skin appearance.

Protection against free radicals is a key, but photo-protection is the most crucial skin saver.

Phormiskin Bioprotech G is a concentrate of a primitive blue micro-alga that has survived for billion years thanks to a powerful photo-protection system : THIOREDOXIN.


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# PHORMISKIN BIOPROTECH G
# THE ORIGINS

*Blue Micro-Alga*

## CONCENTRATE OF THE PRIMITIVE BLUE MICRO-ALGA: PHORMIDIUM PERSICINUM

This cyanophyceae is a primitive micro-organism that appeared about 3.8 billion years ago. It is part of the species which were behind the expansion of life on Earth.

*Pr. Luigi Provasoli*

## DISCOVERY

*Phormidium persicinum* was discovered by Luigi Provasoli. During the 1940s while he was working for the Pasteur Institute in Paris he started to take an interest in the growing conditions of algae and protozoa. He then discovered a primitive blue microalga: - *Phormidium persicinum.*

His name is attributed to the Provasoli-Guillard National Center for Culture of Marine Phytoplankton and to the Luigi Provasoli Award, given each year by the Journal of Phycology which he edited from 1965 to 1974.

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# THE INCREDIBLE ADAPTABILITY OF PHORMIDIUM

*Stromatholites in Shark Bay-Australia*

## STROMATOLITES ORIGINS

By organizing itself into mucilage producing colonies, for billions of years *Phormidium persicinum* has been producing geological formations called stromatolites, from the Greek stroma, meaning a carpet and lithos meaning stone. These are rocky domes in the shape of cushions or columns which took part in de-acidifying the oceans. Mucilage synthesis played several fundamental parts in the survival of *Phormidium* in a wide range of ecosystems.

*Identification of Phormidium in Spitsbergen, Svalbard in Arctic*

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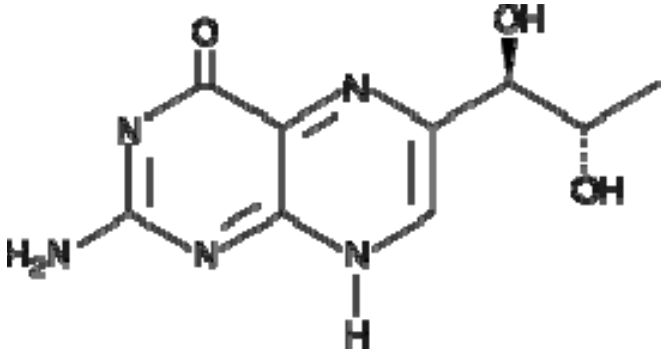
# THE SECRET OF PHORMIDIUM ADAPTABILITY

## BENEFITS OF BIOPTERIN

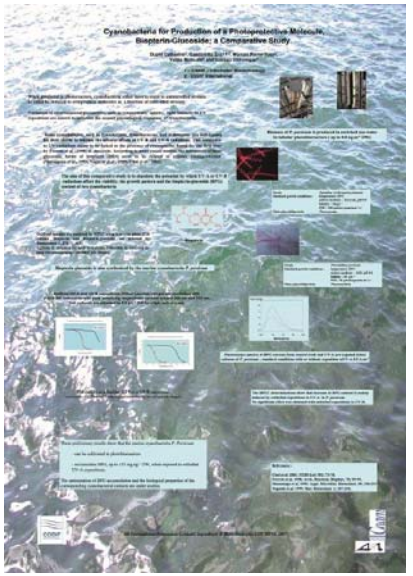
Phormidium persicinum is part of the few blue-micro algae who have developed specific photo-protective pigments able to protect itself from harmful UVs.




This UV-protecting molecule is called Glucoside Biopterin (GBP). Litterature described that the cellular content of this compound can be raised by exposure of the cells to UVA, in a manner proportional to its intensity (1).

This is a 60 kDa protein that not only protects against UV rays, but also acts as a co-factor of a powerful antioxidant and photo-protective molecule: thioredoxin. The ability of *Phormidium* to withstand high doses of UVs is due to its capacity to synthesis both BIOPTERIN and THIOREDOXIN.

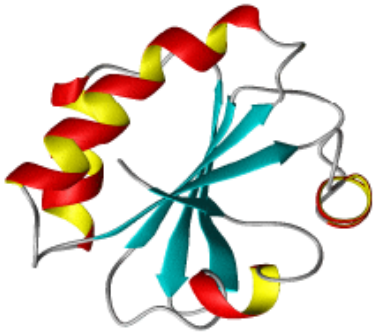
PUBLICATION:
Cyanobacteria for Production of a Photoprotective molecule, biopterin-Glucoside: a Comparative Study.
CNAM – Codif International.
Cosm'ing 2007.



*(1) The Ecology of Cyanobacteria: Their Diversity in Time and Space. B.A. Whitton,M. Potts*

CODIF R&N

# THE SECRET OF PHORMIDIUM ADAPTABILITY



## BENEFITS OF THIOREDOXIN

Thioredoxin is a 12 kDa protein found extensively in animals, plants and marine bacteria. This is one of the major constituents of the thiol reduction system that gives it powerful antioxidant properties.

Thioredoxin protects mitochondrial membrane against oxidation and cells against the cytotoxicity produced by free radicals.

**PROTECTION**

+

Thioredoxin plays multiple roles in cell processes such as: cell division, differentiation and cell repairing.

**CELLULAR ACTIVITY**

+

Thioredoxin has also an important role in the regeneration of ascorbic acid (vitamin C), which is a natural inhibitor of melanogenesis.

**MELANOGENESIS**

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# MECHANISM

*1- PHOTOPROTECTION: DNA damages – cellular death – SPF stabilizer – Sun Burn Cells*

*2- SKIN REDENSIFICATION*

*Cellular division*

*3- BRIGHTENING ACTION*

*Inhibition of melanogenesis*

# PHOTOPROTECTION – BIOPTERIN - THIOREDOXIN

PHOTO-PROTECTION SYSTEM is the common name given to the global epidermal antioxidant network.

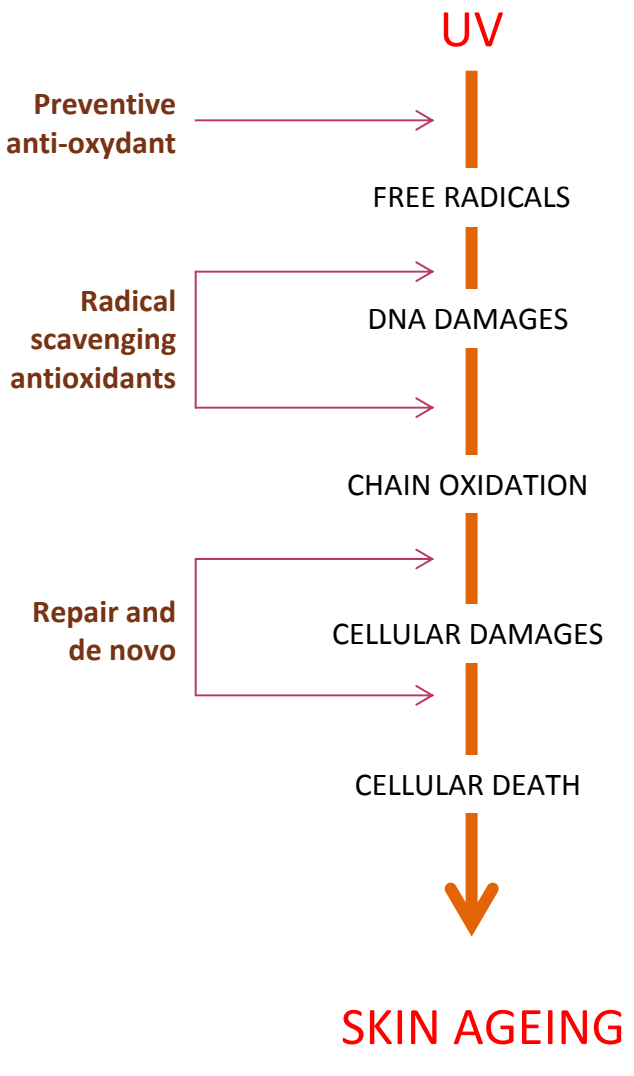
It consists of a complex defense system against oxidative stress including:

-Preventive antioxidant capable to neutralize the formation of free radicals

-Scavenging antioxidants able to regenerate oxidized molecules

-Repairing and de novo enzymes capable to activate cellular reparation system.

In this system, BIOPTERIN will help to protect against UVs and thus to decrease the generation of free radicals, while THIOREDOXIN will preserve scavengers integrity and activate repairing and *de novo* mechanisms.




http://www.alluredbooks.com/sample_pages/anti_and_the_skin_ch3.pdf

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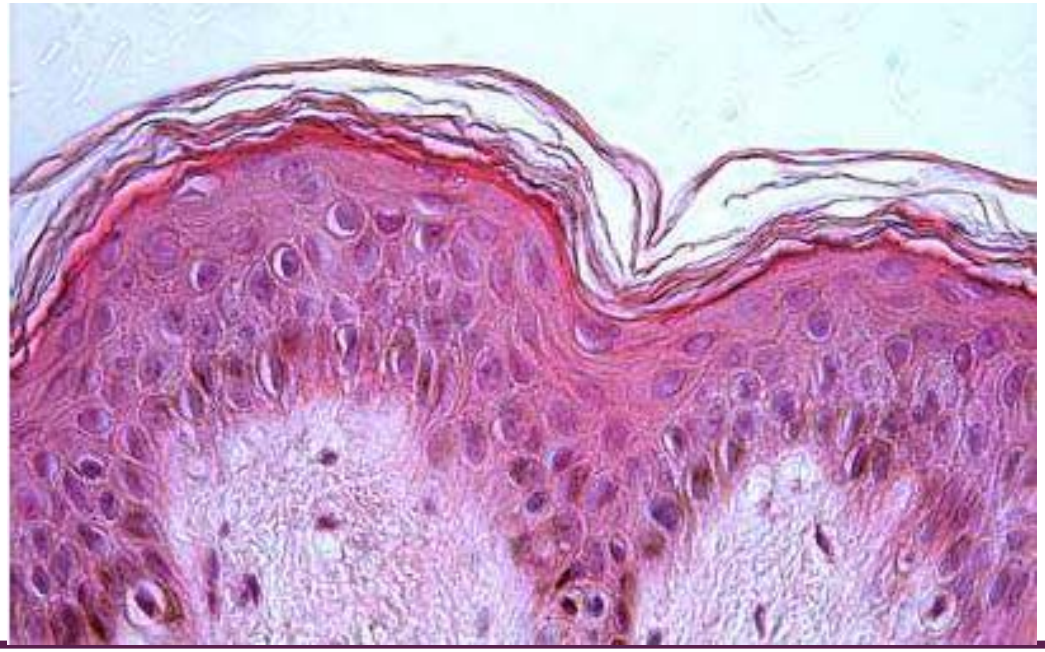
# IN-VITRO EFFICACY



2%

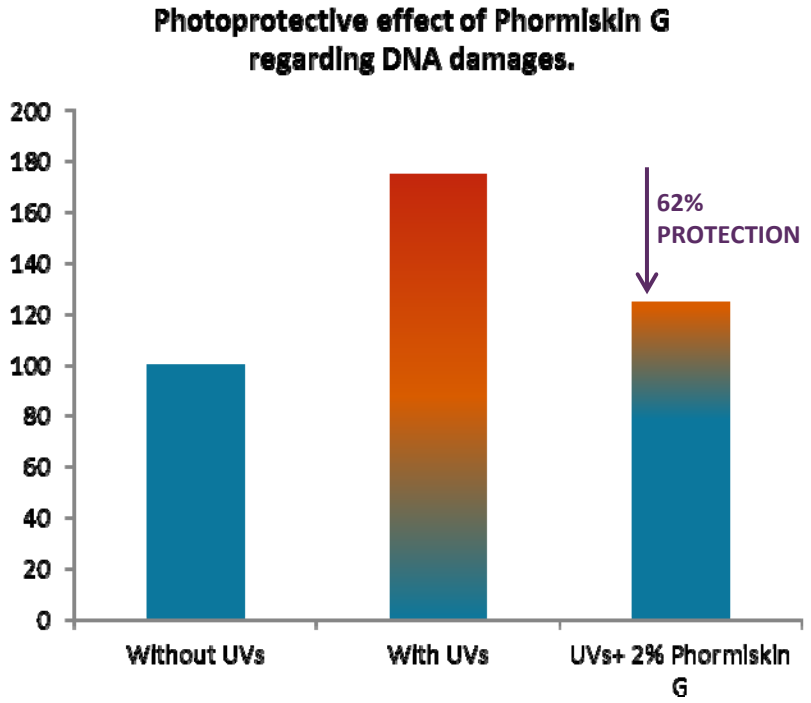
# 1- PHOTO-PROTECTIVE EFFECT OF PHORMISKIN BIOPROTECH G ON DNA DAMAGES

Protocol:

Human skin explants treated for 24H with 2% Phormiskin Bioprotech G before and after UVs stress (50J/cm2 UVA + 500mJ/cm2 UVB). Identification of pyrimidin dimers by immunolabelling.

## RESULTS

2% Phormiskin Bioprotech G offers 62% photo-protection against DNA damages induced by UVs exposure.




CODIF R&N

# 1- SPF STABILISER OF PHORMISKIN BIOPROTECH G ON DNA DAMAGES

2%

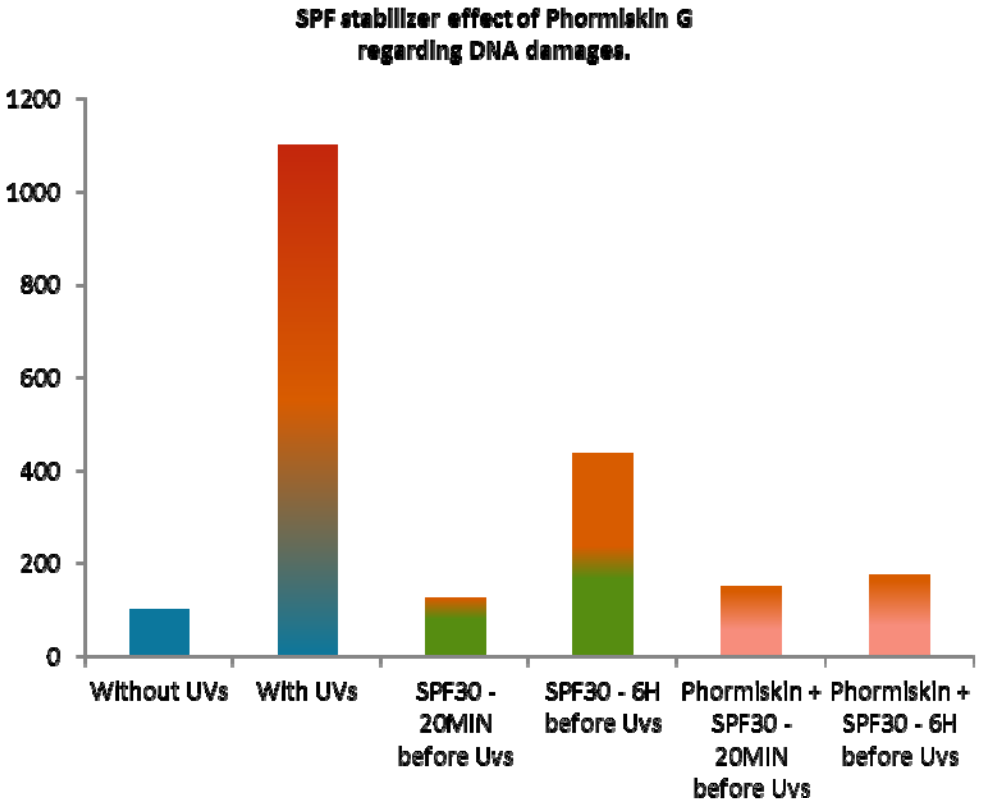
Protocol:

Human skin explants treated for 24H with 2% Phormiskin Bioprotech G and or SPF30 20min or 6H before UVs stress (50J/cm2 UVA + 500mJ/cm2 UVB). Identification of pyrimidin dimers by immunolabelling.

## RESULTS

When applied 20min before Uvs irradiation, SPF provides a good protection against DNA damages. However, if applied 6H before irradiation, SPF30 is no more efficient to protect the cells.

Used in synergy with SPF30, 2% Phormiskin Bioprotech will stabilize its protecting efficacy even if applied 6H before irradiation. This is directly linked to its Biopterin content.




CODIF R&N

2%

# 1- PHOTO-PROTECTIVE EFFECT OF PHORMISKIN BIOPROTECH G ON CELLULAR DEATH

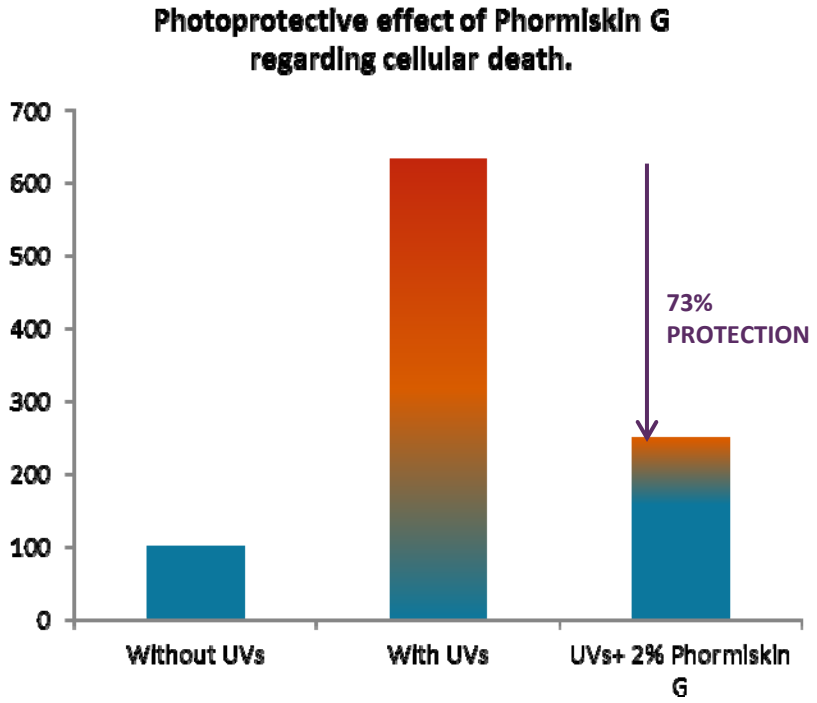
Protocol:

Human skin explants treated for 24H with 2% Phormiskin Bioprotech G before and after UVs stress (50J/cm2 UVA + 500mJ/cm2 UVB). Quantification of Caspase 3 by immunolabelling.

## RESULTS

2% Phormiskin Bioprotech G offers 73% photo-protection against the triggering of cellular death.

By stimulating the synthesis of Thioredoxin in the skin, Phormiskin Bioprotech G ensures the constant regeneration of natural scavengers and thus avoid the activation of chain oxidation.




CODIF R&N

2%

# 1- PHOTO-PROTECTIVE EFFECT OF PHORMISKIN BIOPROTECH G ON SUN BURN CELLS

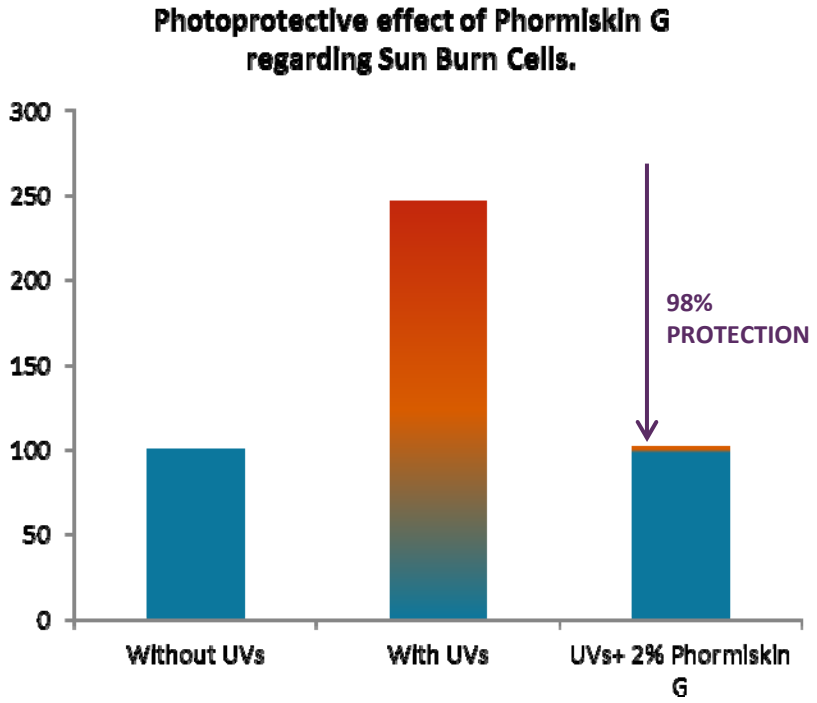
Protocol:

Human skin explants treated for 24H with 2% Phormiskin Bioprotech G before and after UVs stress (50J/cm2 UVA + 500mJ/cm2 UVB). Quantification of Sun Burn Cells by immunolabelling.

## RESULTS

2% Phormiskin Bioprotech G offers 98% photo-protection against the formation of Sun Burn Cells.

By stimulating the synthesis of Thioredoxin in the skin, Phormiskin Bioprotech G promotes cellular repairing process and de novo mechanisms, thus avoiding the accumulation of too much damages and the formation of Sun Burn Cells.

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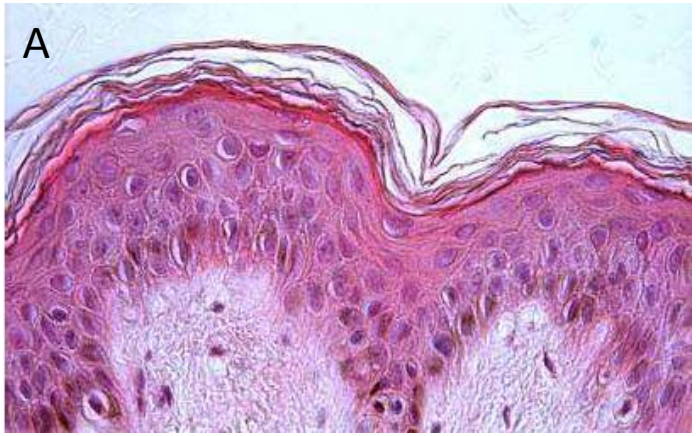


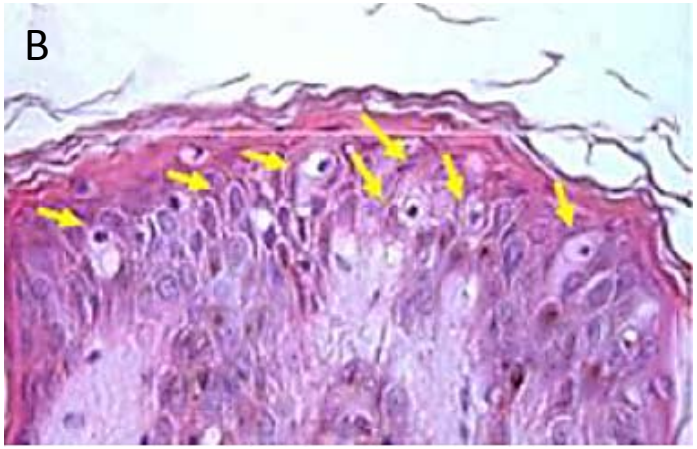


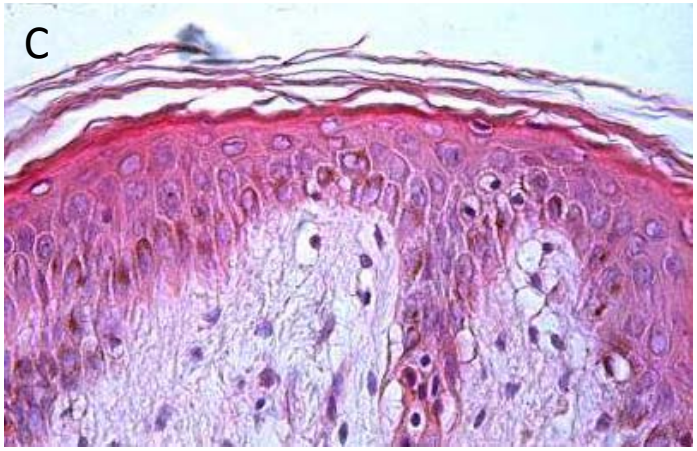


A- Untreated explant

B- Explant exposed to UVs; Sun Burn Cells are identified by yellow arrows

C- Explant exposed to UVs after treatment with Phormiskin Bioprotech G

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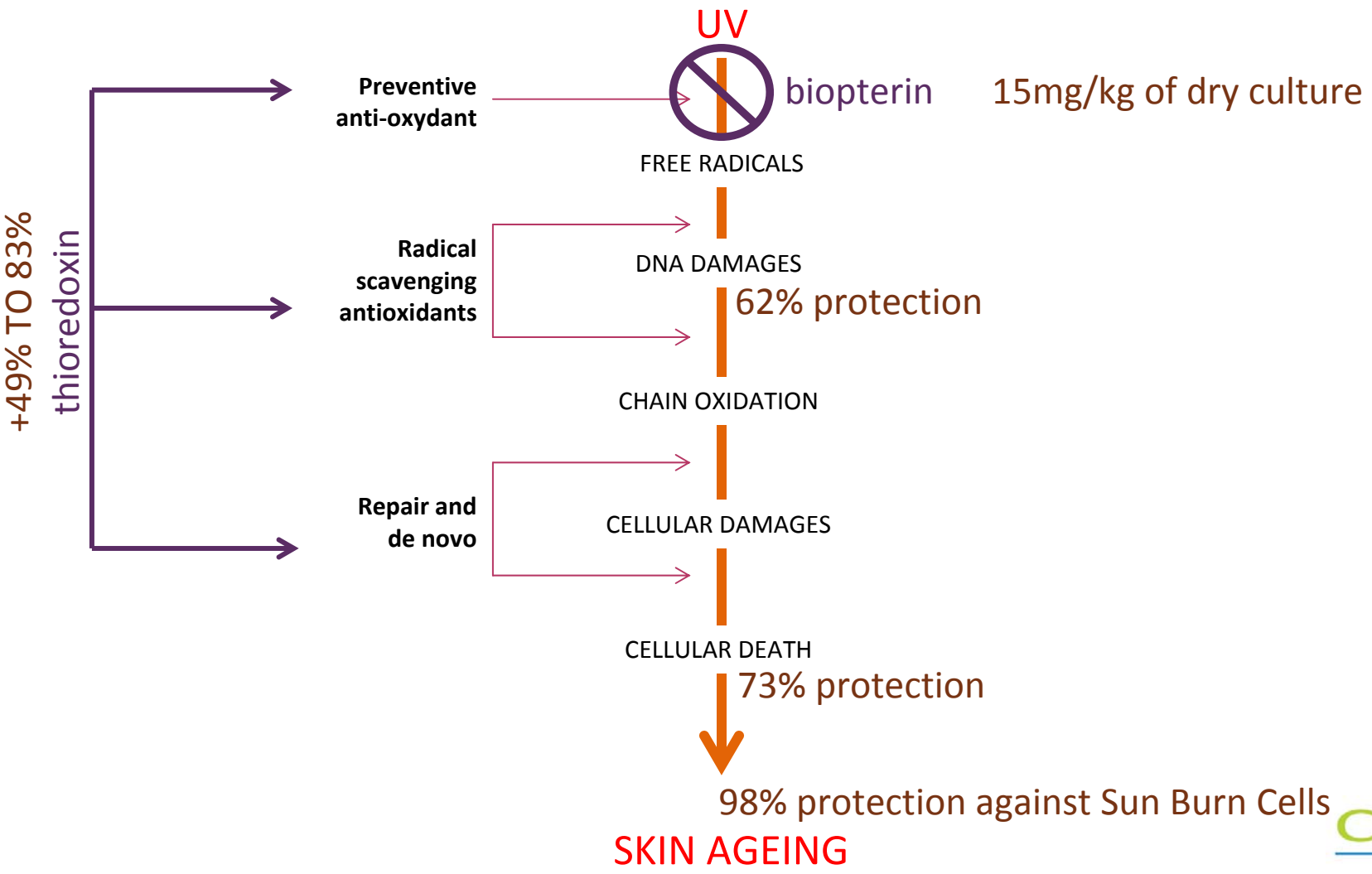
# PHOTOPROTECTION – BIOPTERIN – THIOREDOXIN & PHORMISKIN BIOPROTECH G

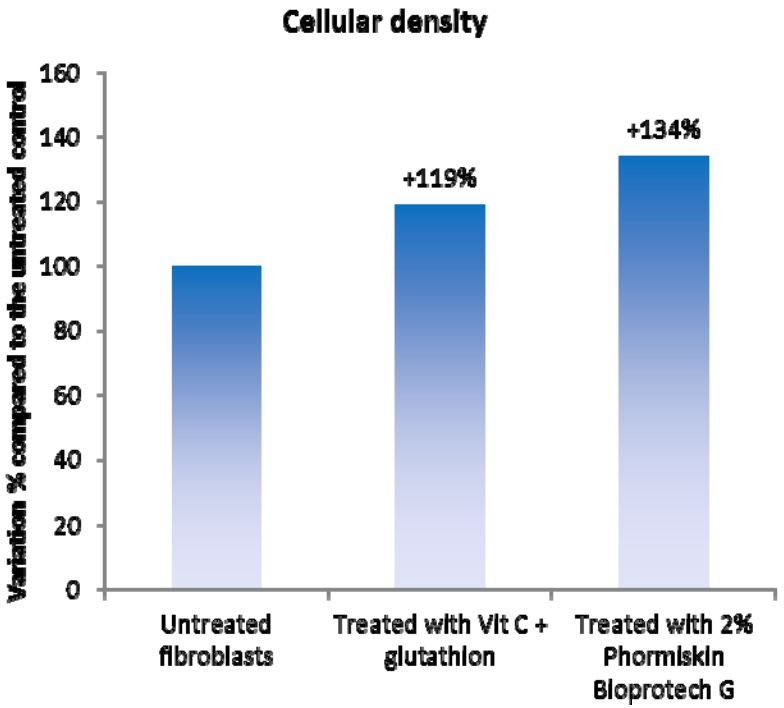


2%

# 2- REDENSIFICATION : EFFECT OF PHORMISKIN BIOPROTECH G ON CELLULAR DIVISION

Protocol:

Human dermal cultivated fibroblasts with 2% Phormiskin Bioprotceh G or 5µg/ml Vit C + glutathion for 48H. Analysis of cells density by Hoechst coloration.




## RESULTS

2% Phormiskin Bioprotech G increases cellular density by +134%**.

**p<0.01 Student test

By stimulating the synthesis of Thioredoxin in the skin, Phormiskin Bioprotech G promotes cell division, differentiation and repairing thus increasing cellular density in the tissues.

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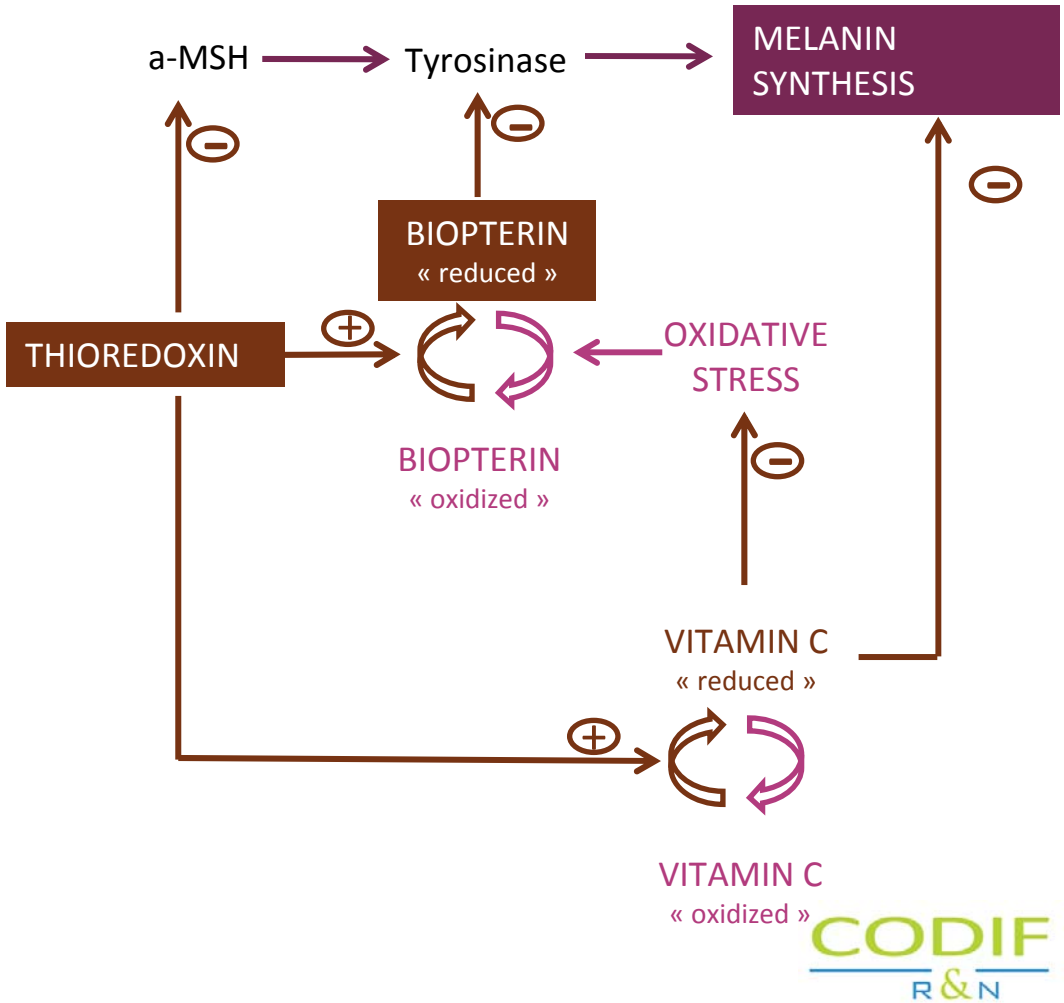
# 3- BRIGHTENING ACTION : ROLE OF THIOREDOXIN AND BIOPTERIN IN MELANOGENESIS REGULATION

Tioredoxin acts on different pathways involved in melanogenesis regulation:

-Thioredoxin is a natural inhibitor of a-MSH and thus inderectly inhibits melanogenesis activation.

-Biopterin is a natural inhibitor of tyrosinase, by ensuring its regeneration after oxidative stress, Thioredoxin strenghten its inhibitory action on melanogenesis

-Vitamin C is also involved in melanogenesis regulation. Once again, by ensuring its regeneration after oxidative stress, Thioredoxin strenghten its inhibitory action.



0.5%

# 3- BRIGHTENING ACTION : EFFECT OF PHORMISKIN BIOPROTECH G ON MELANOGENESIS

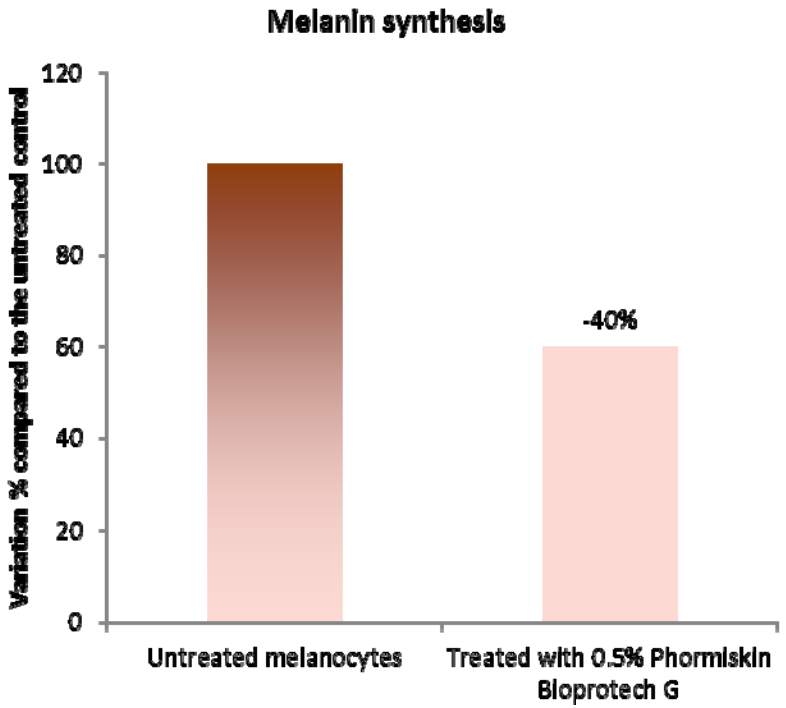
Protocol:

B16 melanocytes cultivated with or without 0.5% Phormiskin Bioprotech G for 72H.

## RESULTS

0.5% Phormiskin Bioprotech G decreases melanin synthesis by -40%.

By stimulating the synthesis of Thioredoxin in the skin, Phormiskin Bioprotech G promotes melanogenesis inhibition.

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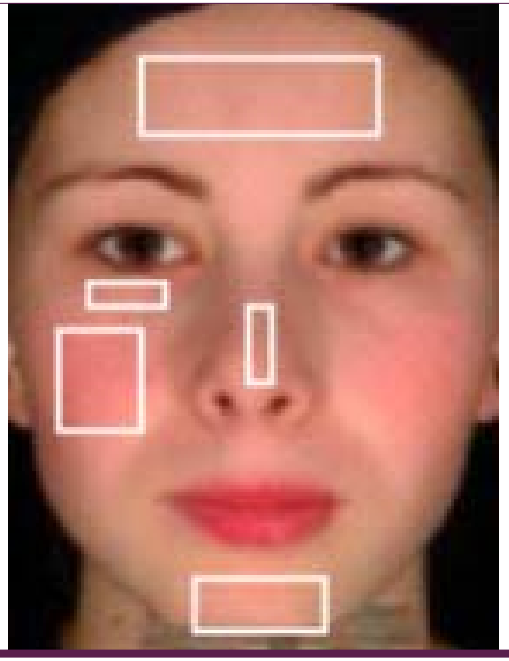
# IN-VIVO EFFICACY



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IN-VIVO TEST

# PROTOCOL

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Phormiskin Bioprotech G 2%
Twice daily application during 28 days

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Multi-zone analysis in order to conclude to a global homogeneity of the complexion.
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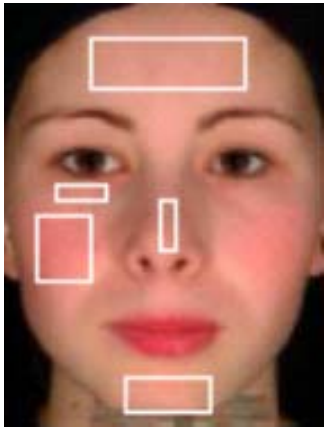

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2%

## IN-VIVO TEST

# PHORMISKIN BIOPROTECH G HOMOGENISES SKIN COLORATION BETWEEN DIFFERENT AREAS OF THE FACE

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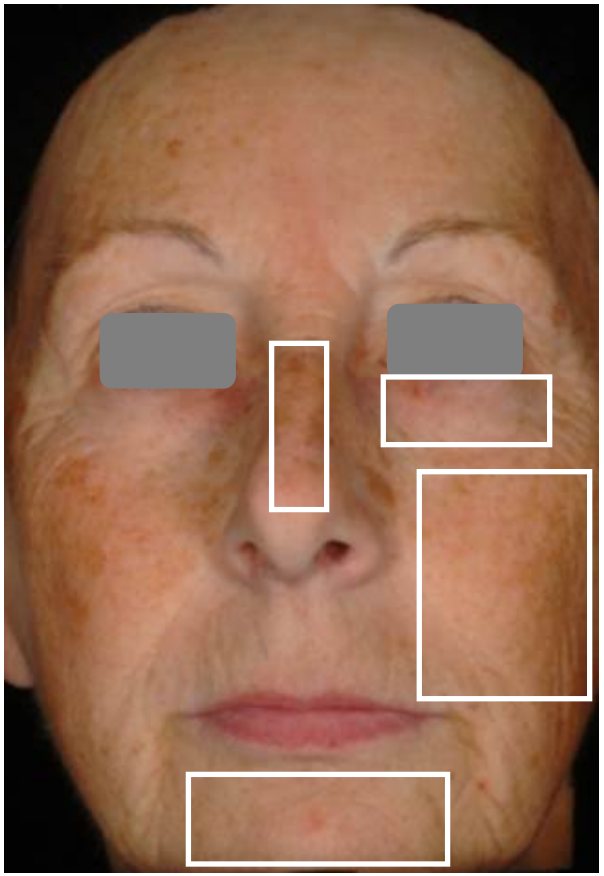

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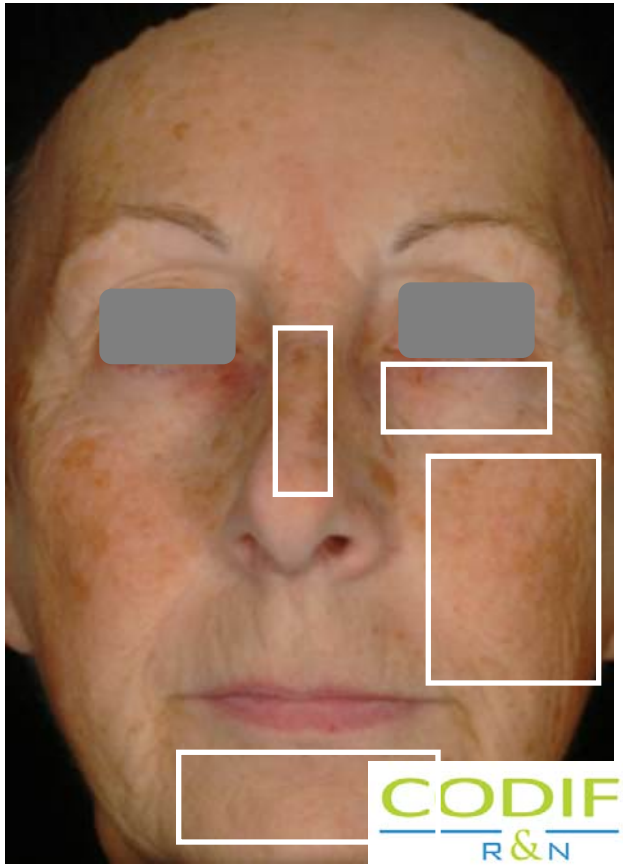
**GLOBAL IMPROVEMENT OF COMPLEXION HOMOGENEITY**

*After treatment*



2%

## IN-VIVO TEST

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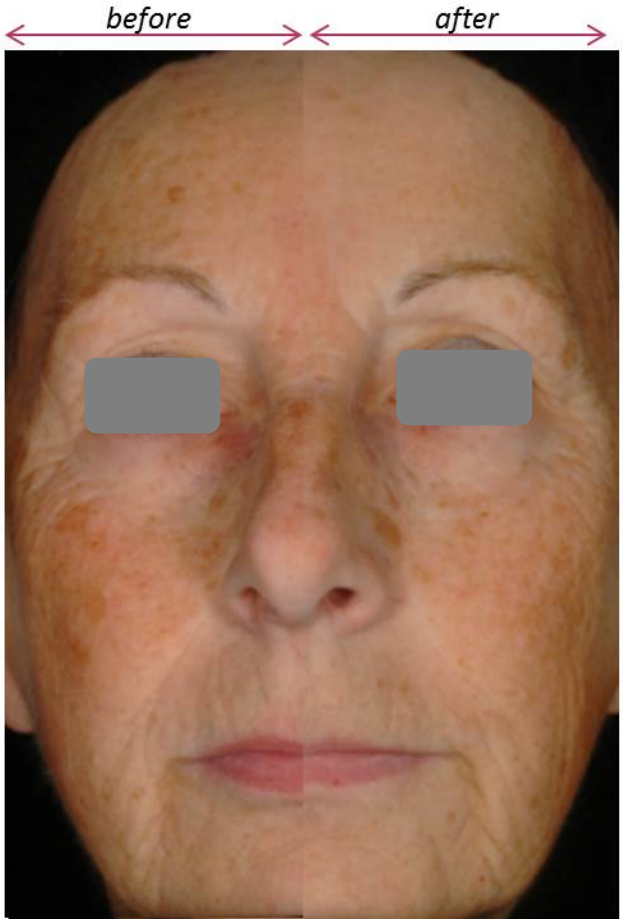


TOP 5 volunteers satisfaction:

- My skin is softer
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CODIF R&N

# CONCLUSIONS

## SLOW-DOWN THE PROCESS OF SKIN AGEING

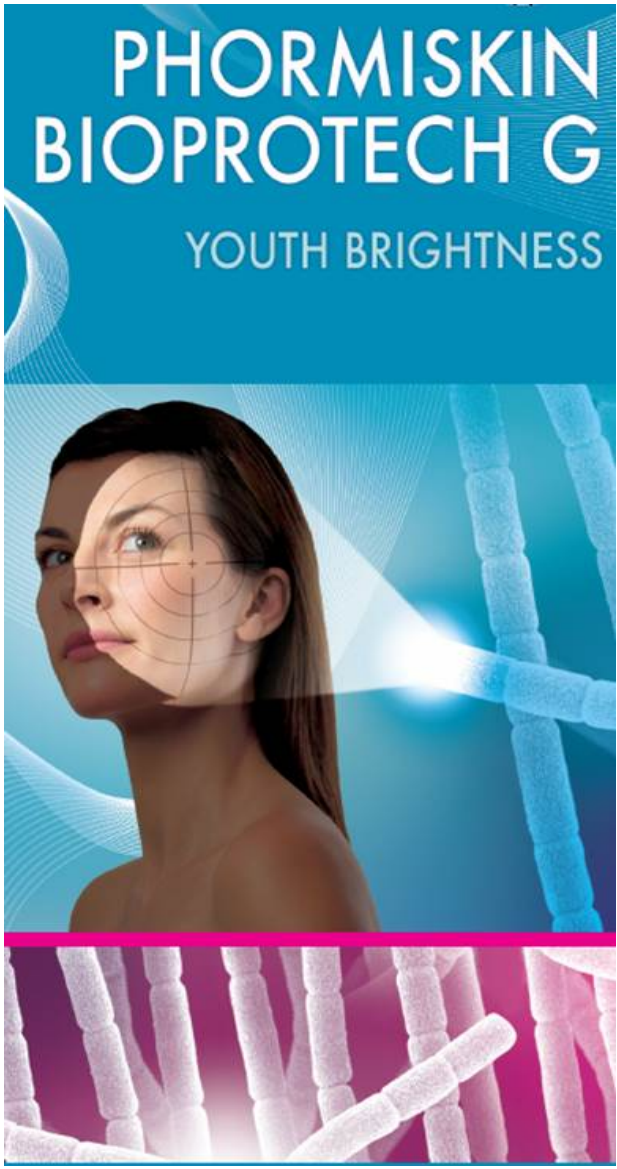
- Protection of cellular DNA
- Stabilizing effect of SPF efficacy
- Inhibition of cell death processes
- Reduction in the number of sunburn cells

## IMPROVES CELLULAR DIVISION

## PROMOTES MELANOGENESIS REGULATION

## INCREASES THE HOMOGENEITY AND LUMINOSITY OF THE COMPLEXION.

## REFINES THE TEXTURE OF THE SKIN.




CODIF R&N

# FORMULATION

## CONCEPT PERFECT-SKINIST

Combines 3 perfectionist raw material to perfect skin grain and erase imperfections.

**NEUROLIGHT 61G:** an extract of pure white flower to treat dark spots.

**EPIDERMIST 4.0:** a pure Marine Exopolysaccharide to hide pores and improves skin renewal:

**PHORMISKIN BIOPROTECH G:** a concentrate of ancestral blue microalga to homogenize skin complexion and texture:

# SURGICAL CREAM SERUM ASPECT

This cream is formulated with:

MATRIGENICS.14 G: rich in Wakamic Ester, this new active ingredient reactivates genes that have gone to sleep in order to restructure the Extracellular Matrix.

NEUROLIGHT.61 G: significantly reduces the size and the pigmentation of dark spots by inhibiting cellular stress molecules and the action of Substance P.

PHORMISKIN BIOPROTECH G: delays cutaneous senescence for a visibly younger and brighter skin.

## Product Aspect

White glitter bi-gel

## Product Properties

pH = 6.50 ± 0.3. Stable one month at 40°C and 55°C

## Operating Method

- Prepare A in deflocculating. Check that the mixture is homogeneous and clear
- Heat the water to 70°C; disperse Carbopol into it under emulsifier 1500 rpm during 15 min
- Add the Elestab CPN. Mix during minutes. Cool down to around 35°C
- Then, add the mixture C under emulsifier 2000 rpm during 10 min
- Neutralize with D under emulsifier 2000 rpm during 10 min
- Slowly add A into B under emulsifier 2500 rpm, then let shake in these conditions during 15 min
- Add E

## Formula

| Phase | Raw mareriał / Trade name | INCI Name | % |
|---|---|---|---|
| A | EMULFREE CBG (1) | Isostearyl Alcohol & Butylene Glycol Cocoate & Ethylcellulose | 4 |
| | CRODAMOL GTCC / MIGLYOL 812 / WAGLINOL (2) | Caprylic/Capric Triglyceride | 3 |
| | DPPG CG (1) | Propylene Glycol Dipelargonate | 3 |
| | LEXFEEL D5 (3) | Neopentyl Glycol Diheptanoate & Isododecane | 4 |
| | PHENOXYETHANOL (4) | Phenoxyethanol | 0,8 |
| B | DEMINERALIZED WATER | Aqua | 70,48 |
| | CARBOPOL ETD 2020 (5) | Acrylates/C10-30 Alkyl Acrylate Crosspolymer | 0,3 |
| B' | ELESTAB CPN (6) | Chlorphenesin | 0,27 |
| C | BIDISTILLED GLYCERIN CODEX (7) | Glycerin | 7,4 |
| | XANTHAN GUM (8) | Xanthan Gum | 0,2 |
| D | SODA (SOLUTION 5 N) (9) | Aqua & Sodium Hydroxide | 0,45 |
| E | SYMDIOL 68 (10) | Caprylyl Glycol & 1,2-Hexanediol | 0,5 |
| | FRAGRANCE VELVET PETAL 0828225 (11) | Fragrance | 0,1 |
| | **MATRIGENICS 14 G (12)** | **Glycerin & Aqua & Undaria Pinnatifida Extract** | **2** |
| | **NEUROLIGHT 61 G (12)** | **Glycerin & Aqua & Pancratium Maritimum Extract** | **1,5** |
| | **PHORMISKIN BIOPROTECH G (12)** | **Glycerin & Maris Aqua & Phormidium Persicinum Extract** | **2** |

Formulation Code: 1464A.02

CODIF R&N

## NUDE SKIN EFFECT CREAM

This cream is formulated with:

PHORMISKIN BIOPROTECH G: delays cutaneous senescence for a visibly younger and brighter skin.

EPS SEAFILL: fills in and tightens wrinkles to lift cutaneous relief in 15 min.

EPIDERMIST 4.0: provides skin with an overall perfecting action: cell renewal is optimised, skin reactivity is reduced, skin texture is smoothed, etc.

### Product Aspect

White thick glitter cream

### Product Properties

pH = 5.30 ± 0.3. Stable one month at 40°C and 55°C

### Operating Method

- Heat B to 75°C.
- Heat the phase A to 75°C; add the mixture A´ into it under emulsifier 1500 rpm during 10 min
- Add B into A+A' under emulsifier 2500 rpm, then let shake in these conditions during 10 min
- Add C under emulsifier 2500 rpm during 5 min
- Around 25-30°C, add the phase D

## Formula

| Phase | Raw mareriał / Trade name | INCI Name | % |
|---|---|---|---|
| A | DEMINERALIZED WATER | Aqua | 75,9 |
| | CARBOPOL ETD 2020 (1) | Acrylates/C10-30 Alkyl Acrylate Crosspolymer | 0,5 |
| | ELESTAB CPN (2) | Chlorphenesin | 0,27 |
| A' | DIPROPYLENE GLYCOL (3) | Dipropylene Glycol | 3 |
| | XANTHAN GUM (4) | Xanthan Gum | 0,3 |
| | JURIMER - SJ TOUCH O (5) | Polymethyl Methacrylate & Aqua | 1,5 |
| B | EMULIUM DELTA (6) | Cetyl Alcohol & Glyceryl Stearate & PEG-75 Stearate & Ceteth-20 & Steareth-20 | 4 |
| | ARLAMOL HD (7) | Isohexadecane | 3 |
| | LANOL 99 (8) | Isononyl Isononanoate | 3 |
| | CETYLIC ALCOHOL / LANETTE 16 (2) | Cetyl Alcohol | 1,5 |
| | SILICON (DIMETHICONE (100CS)) (9) | Dimethicone | 0,5 |
| | ANTIOXYGEN WL 3036 (6) | Caprylic/Capric Triglyceride & Propyl Gallate & Tocopherol & Citric Acid | 0,1 |
| | PHENOXYETHANOL (10) | Phenoxyethanol | 0,8 |
| C | SODA (SOLUTION 5 N) (3) | Aqua & Sodium Hydroxide | 0,4 |
| D | FRAGRANCE WHITE LOTUS 0320519 (11) | Fragrance & Hydroxyisohexyl 3-Cyclohexene Carboxaldehyde & Hydroxycitronellal & Linalool & Alpha Isomethyl Ionone | 0,2 |
| | **PHORMISKIN BIOPROTECH G (12)** | **Glycerin & Maris Aqua & Phormidium Persicinum Extract** | **2** |
| | **EPS SEAFILL P (12)** | **Aqua & Phenoxyethanol & Plankton Extract** | **2** |
| | **EPIDERMIST 4.0 P (12)** | **Aqua & Plankton Extract & Phenoxyethanol** | **1** |

Formulation Code: 1463.03

CODIF R&N

# ANTI-AGEING REGENERATING CREAM

This cream is formulated with:

HYDRASALINOL: works on all the fronts of cutaneous dryness: urea protection, NMF, cellular cohesion, lipidic matrix.

MATRIGENICS 14G: rich in Wakamic Ester, this new active ingredient reactivates genes that have gone to sleep in order to restructure the Extracellular Matrix.

PHORMISKIN BIOPROTECH G: delays cutaneous senescence for a visibly younger and brighter skin

## Product Aspect

White thick glitter cream

## Product Properties

pH = 5.39 ± 0.3 - Stable one month at 40°C and 55°C

## Operating Method

- Heat A to 75°C. and add A'.
- Heat the phase B to 75°C and add B´ under emulsifier 1500 rpm during 5 min
- Add A+A' into B+B' under emulsifier 2500 rpm, then let shake in these conditions during 10 min
- Add C under emulsifier 2500 rpm during 10 min
- Around 25-30°C, add the phase D

## Formula

| Phase | Raw marerial / Trade name | INCI Name | % |
|---|---|---|---|
| A | EMULIUM DELTA (1) | Cetyl Alcohol & Glyceryl Stearate & PEG-75 Stearate & Ceteth-20 & Steareth-20 | 6 |
| | LIPOWAX PASTILLES (1) | C10-18 Triglycerides | 5 |
| | SWEET ALMOND OIL (2) | Prunus Amygdalus Dulcis Oil & BHT | 7 |
| | SILICON (DIMETHICONE (100CS)) (3) | Dimethicone | 1,5 |
| | CRODAMOL GTCC/MIGLYOL 812/WAGLINOL (4) | Caprylic/Capric Triglyceride | 5 |
| | CRODAMOL PTIS (4) | Pentaerythrityl Tetraisostearate | 4 |
| | CETIOL SB 45 (5) | Butyrospermum Parkii Butter Extract | 2 |
| | PHENOXYETHANOL (6) | Phenoxyethanol | 0,8 |
| A' | **HYDRASALINOL (7)** | **Caprylic/Capric Triglyceride & Salicornia Herbacea** | **0,25** |
| B | DEMINERALIZED WATER | Aqua | 61,68 |
| | CARBOPOL ULTREZ 10 (8) | Carbomer | 0,3 |
| | ELESTAB CPN (5) | Chlorphenesin | 0,27 |
| B' | BIDISTILLED GLYCERIN CODEX (9) | Glycerin | 1 |
| | SATIAGUM UTC 10 CARRAGHENATE X2 (10) | Chondrus Crispus Extract | 0,8 |
| C | SODA (SOLUTION 5N) (11) | Aqua & Sodium Hydroxide | 0,3 |
| D | FRAGRANCE WHITE COCOON 0511161 (12) | Hydroxyisohexyl 3-Cyclohexene Carboxaldehyde & Parfum & Linalool & Hexyl Cinnamal & Hydroxycitronellal & Alpha Isomethyl Ionone & Benzyl Benzoate & Geraniol & Benzyl Salicylate & Farnesol & Benzyl alcohol & Cinnamyl Alcohol & Eugenol & Limonene & Isoeugenol & Citronellol & Amyl Cinnamal & Citral & Cinnamal | 0,1 |
| | **MATRIGENICS 14G (7)** | **Glycerin & Aqua & Undaria Pinnatifida Extract** | **2** |
| | **PHORMISKIN BIOPROTECH G (7)** | **Glycerin & Maris Aqua & Phormidium Persicinum Extract** | **2** |

Formulation Code: 1488.01

CODIF R&N

# RMI

## *INCI DECOMPOSITION & OTHER REGULATORY ISSUES*

OK CHINA!

1. **TRADE NAME :** **Phormiskin Bioprotech G – ALG205**
   *Item: Alga extract* *Cosmetic application*

## 2. INFORMATION ON THE COMPONENTS

| INCI CTFA | INCI EU | INCI CHINA | Origin | Composition | CAS Number | EINECS Number | REACH Pre-registration number | Japan Ingredient Name | Japan Ingredient Code |
|---|---|---|---|---|---|---|---|---|---|
| Glycerin | Glycerin | Glycerin | Vegetable | 50% | 56-81-5 | 200-289-5 | Exempt | | |
| SeaWater | Maris aqua | Seawater | Mineral | 49% | / | 231-791-2 | Exempt | | |
| Hydrolyzed Algae Extract | Hydrolyzed Algae Extract | Hydrolyzed Algae Extract | Vegetable (alga) | 1% | / | / | Exempt | Plankton extract | 532161 |

3. **% OF USE RECOMMENDED:** 2%

4. **ECOCERT APPROVED: YES** ☒ **NO** ☐

5. **COSMOS APPROVED: YES** ☒ PPAI: 00.00% CPAI: 50.75 % **NO** ☐

6. **CONFORMITY WITH COSMETIC REGULATIONS :**
   EU ☒ USA ☒ JAPAN ☒ JCIC ☐

7. **MANUFACTURING PROCESS** :

   **Process:** biotechnological process: culture of the micro-algae in bio-reactor
   **Starting substances:** Phormidium persicinum and culture medium
   **Solvent:** none
   **Physical form**: liquid

8. **SPECIFIC STATEMENTS :**

   BSE free ☒ GMO free ☒ Animal Testing ☐ *date*

CODIF R&N

# BOTANY & LEGENDS

# Phormidium Persicinum

*Phormidium persicinum* is a primitive microorganism related to the Cyanophyceae family, still called the blue-green micro algae.

Cyanophyceae appeared approximately 3.8 billion years ago and belong to the species that contributed to the build up of molecular oxygen in the Earth's atmosphere allowing the development of life on Earth.

Synonyms: *Pseudanabaena persicina (Reinke ex Gomont) Anagnostidis*

CODIF R&N

## BOTANICAL

Botanical Family: Cyanophyceae

*Phormidium persicinum* is a thin, filamentous marine cyanophyceae. This micro-alga is organized in mucilage-producing colonies that have generated over many billions of years the geological formations called stromatoliths, (from the Greek stroma, carpet and lithos, stone): these are rock domes in the shape of “cushions” or “columns”, which have helped de-acidify the oceans.

*Source: http://fmp.conncoll.edu*

## BIOTOPE

*Phormidium Persicinum* lives in saltwater, and can grow in a large number of biotopes: it is tropical in origin, but is adapted to extreme climatic conditions, such as very low temperatures in the Antarctic and the Arctic (Canadian high Arctic) - temperatures below 5°C. It is capable of surviving several freezing / thawing cycles, growing in spite of persistent low temperatures, withstanding exposure to very strong sunlight and placing itself in a prolonged state of dormancy. In plants, dormancy is equivalent to hibernation in some animals.

*Stromatholites in Shark Bay-Australia*

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# HISTORICAL AND GEOGRAPHICAL DISTRIBUTION

## *The discovery: one of the great names in algal culture stumbles across a microscopic grain…*

Luigi Provasoli was 45 years old when he discovered, quite by chance, a new species of cyanobacteria: *Phormidium persicinum*. It was not his first attempt, but he had come a long way before he came across this marine speck.

Whilst the Provasoli family had been excelling itself for several generations in the Italian Textile industry, Luigi decided to follow his passion for biology. First he concentrated on the study of insects, which he found to be so rich and fascinating that he published 17 articles on the subject during his thesis. It was his time spent at the Pasteur Institute in Paris in the 1940's that lead him to concentrate on the culture conditions of algae and protozoa. After the war, he travelled to New York where he embarked upon 25 years of successful collaboration with Seymour Hutner and Caryl Haskins in one of the biggest private institutes in the United States: Woods Hole Oceanographic Institute.

*Pr. Luigi Provasoli*

While he was working on the culture of algae and protozoa, he discovered microscopic algae whose morphological characteristics were reminiscent of bacteria, a primitive alga. Thus was born *Phormidium persicinum*, an intermediate between bacteria and algae, belonging to the Cyanophycea family, which are still known as the blue algae.
The Cyanophycea, just like algae, produce oxygen through photosynthesis, and are responsible for enriching the earth's atmosphere with oxygen, which enabled the development of life on Earth. They are also responsible for the appearance of the protective ozone layer, and of the first big carbon reserve that decreased the greenhouse effect as the sun's temperature increased.

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## *The first building block of an empire…*

Provasoli did not just discover an ancestral microalga, what he discovered was the greatest witness account ever left on earth by a microorganism.
Over billions of years, *Phormidium persicinum* formed colonies that generated geological formations known as stromatoliths, rocky domes in the form of “cushions” or “columns”.
Only the keen eye of a scientist such as Luigi Provasoli could differentiate fossilized stromatoliths from the last living stromatoliths that can today be found strewn over Shark Bay in Western Australia.
He therefore needed to combine scientific curiosity with a passion for nature to winkle out this microscopic blue alga, which, well-sheltered in its casing, has been working since time immemorial to transform life on Earth into a miracle of nature.

The improbable discovery of *Phormidium persicinum* is on a part with the career of the scientist who subsequently gave his name to the Provasoli-Guillard National Centre for Culture of Marine Phytoplankton and to the Luigi Provasoli Award awarded each year by the Journal of Phytology of which he was editor from 1965 to 1974.

Nowadays, *Phormidium persicinum* can be found in several areas: Europe (Britain, Ireland), North America (Florida) or Pacific Islands (French Polynesia).

*Pr. Luigi Provasoli*

CODIF R&N

# OUR GROWING AREAS

To prevent using natural resources, and to extract *Phormidium persicinum* from its medium without harming its remarkable properties, our laboratory has been the first one to develop cutting-edge biotechnological tools to cultivate it in bioreactors.

This is a cultivation method developed to strengthen our management program of natural resources, which consists in the cultivation of plankton microorganisms, micro algae or macro algae in bioreactor under controlled conditions (temperature, culture medium, light…).

The resulting extracts are totally natural, enriched in interesting molecules and totally respectful of environment.

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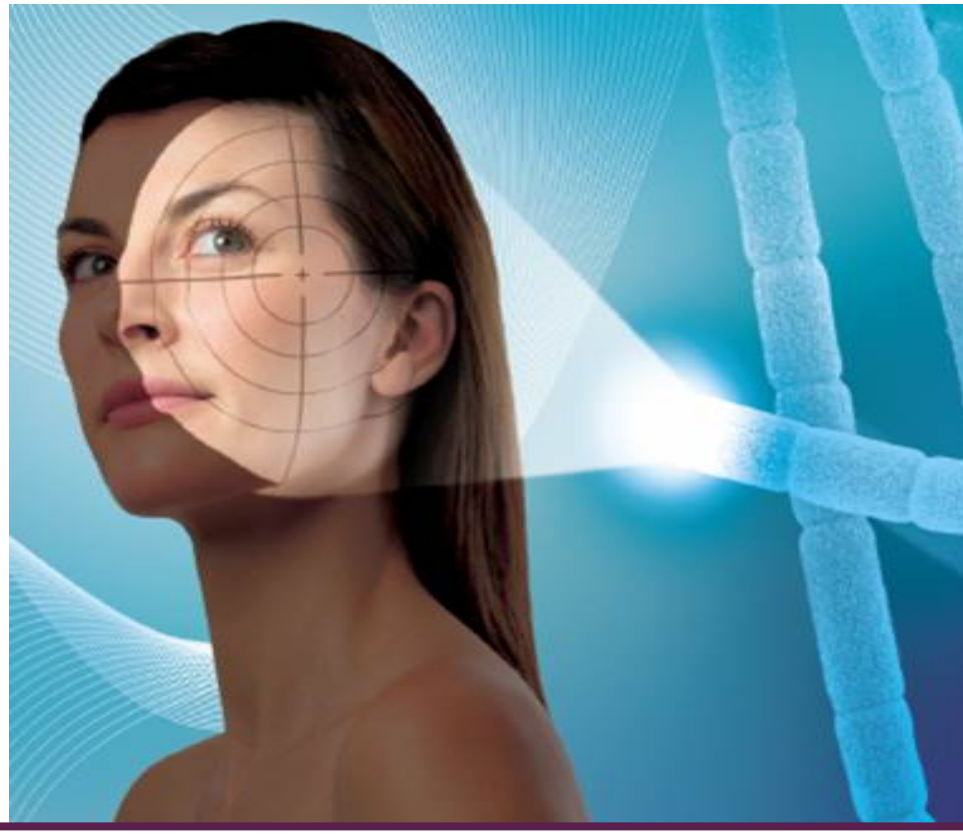
# PHOMISKIN
# BIOPROTECH G

www.codif-recherche-et-nature.com



**CHARACTERISTICS**
Water soluble
Marine origin

**INCI NAME**
Glycerin (and) Water
(and) Hydrolyzed alga extract

**% OF USE: 2%**

ECOCERT: approved
COSMOS: approved
**CHINA: OK**