QI GUARD®

to encourage skin healthier ageing

Marine prebiotic

Guardian of adaptive homeostasis
and
commensal microbiome activities

Microbiome-friendly multicertified

Microbiome® friendly

Gelyma

QI GUARD® A MARINE PREBIOTIC TO ENCOURAGE SKIN HEALTHIER AGEING

QI GUARD® is a blend of two red seaweeds known for their richness in special polysaccharides:

Kappaphycus alvarezzi

- Red seaweed selected from sustainable farming in Asia .

Cultivation from se-abased monoculture in open space management.

Gigartina stellata : Mastocarpus stellatus

- Red seaweed reasoned and manually harvested in Brittany in Natura 2000 area, in full agreement with the local laws and strict compliance of resource management with CITES regulations.

UNIQUE FEATURES OF QI GUARD®

Performance on the adaptive homeostasis

- Enhancement of antioxidant and antimicrobial defense, thus reviving the skin's defense system.
- Activation of DNA damage repair machinery, thus supporting the natural repairing capacity of cells when necessary.
- Ability to ameliorate the three main processes of proteostasis: HSP response, Ubiquitin proteasome system, Autophagic degradation, thus restoring the protein balance and increasing cell detoxification.

Performance on the commensal microbiome

- Increase of the growth of *Staphylococcus epidermidis,* thus acting as a prebiotic.
- Improvement of the activities of *Staphylococcus epidermidis* on the Immune protection and the skin barrier.

Microbiome friendly® multicertified

Performance on ageing signs

Clinical investigation

- Decrease of TEWL.
- Reinforcement of skin elasticity.
- Improvement of skin appearance
  - Decrease of the length, the depth, the amount, the surface area of wrinkles after 28 days application.

COSMETIC APPLICATIONS

- Anti-ageing care products for face and body care.
- Specific skin care with microbiome concepts.
- Skin resilience care.

PROVED BIOLOGICAL ACTIONS OF QI GUARD®

The efficacy of QI GUARD® has been evaluated by whole transcriptomic analysis, *in vitro* and *ex-vivo* studies, clinical investigation., consumer test.

Collaborations Strati CELL Laboratories – Belgium, My microbiome AG – certification developed by microbiologists in Germany Dermatech-Complife- Italy - J.S. Hamilton Poland Sp.

PERFORMANCE ON THE ADAPTIVE HOMEOSTASIS

Why the regulation of the adaptive homeostasis is important?

In response to fluctuating metabolic and environmental conditions, cells make transient and reversible adjustments to increase their stress resistance or resilience. Many adaptive alterations to the homeostatic range are mediated by signal transduction pathways to provide efficient protection in response to various toxic exposures (Davies K.J.A. 2016- Mol. Aspects Med. 49:1-7).

Oxidative stress induces adverse modifications to cell components, such as lipids, proteins, and DNA. The regulation of antioxidant defense mechanisms is critical for cell viability, activation, proliferation and organ function as well as for cutaneous ageing (extrinsic and intrinsic ageing).

Skin ageing is associated with changes in the physical, morphological and physiological properties of the skin structure perturbing its homeostasis. These changes are linked to an increase in free radicals, a functional decline in DNA repair networks and in the proteostasis machinery as well as an increasing deterioration of various biological systems, including the immune system and microbial dysbiosis.

In response to fluctuating metabolic and environmental conditions, it is important to optimize stress resistance, increase the protective capacity and improve overall skin ageing.

QI GUARD® energizes the expression of key genes linked to numerous transduction pathways
In order to manage an efficient restoration of skin homeostasis.

QI GUARD® VITALIZES THE ANTIOXIDANT DEFENSE

Skin damage caused by internal and external factors is accompanied in many cases by oxidative stress resulting of the toxic effects of reactive oxygen species (ROS). In particular, oxidative stress induces adverse modifications to cell components *e.g*. lipids, proteins and DNA.

The regulation of antioxidant defense mechanisms is critical for cell viability, activation, proliferation and organ function as well as for cutaneous ageing (extrinsic and intrinsic ageing).

Antioxidant responses evolves numerous transcription-related pathways to minimize the threat of excessive ROS and to regulate ROS as signalling entities.

Method

Full genome transcriptome analysis on normal human keratinocytes – 0.5% QI GUARD®.

Results

QI GUARD® highly significantly stimulates a plethora of actors linked to the anti-oxidant system compared to untreated control.

Upregulation of numerous genes encoding for numerous antioxidant response

Symbol	Gene names	Fold changes	p values
HMOX1	heme oxygenase 1	58.8	6.00E-08
GCLM	glutamate-cysteine ligase modifier subunit	6.4	1.60E-08
GCLC	glutamate-cysteine ligase catalytic subunit	4.4	6.50E-08
SLC7A11	Solute carrier family 7 member 11	3.7	1.10E-07
NOQ1	NAD(P)H quinone dehydrogenase 1	3.1	2.5E-07
GPX2	glutathione peroxidase 2	2.6	1.80E-05
SRXN1	sulfiredoxin 1	2.6	1.40E-05
TXNRD1	thioredoxin reductase 1	2.3	1.80E-06
G6PD	glucose-6-phosphate dehydrogenase	1.4	2.5E-02
SOD1	superoxide dismutase 1	1.4	3.70E-03
GSR	glutathione-disulfide reductase	1.4	1.40E-03
PRDX6	peroxiredoxin 6	1.3	8.80E-03
SOD2	superoxide dismutase 2	1.2	1.90E-02
TXN	thioredoxin	1.2	1.10E-02

Modulation of the Nrf2 pathway, the major regulator of cytoprotective responses to oxidative stress.

NFE2L2	nuclear factor, erythroid 2 like 2	2.5	2.20E-06

Upregulation of other important genes involved in cellular oxidative responses and cell homeostasis.

SESN2	sestrin 2	9.8	8.5E-09
SIRT1	sirtiun 1	2.9	1.1E-06

Conclusion

QI GUARD® promotes the antioxidant defense system by modulating numerous antioxidant pathways required for

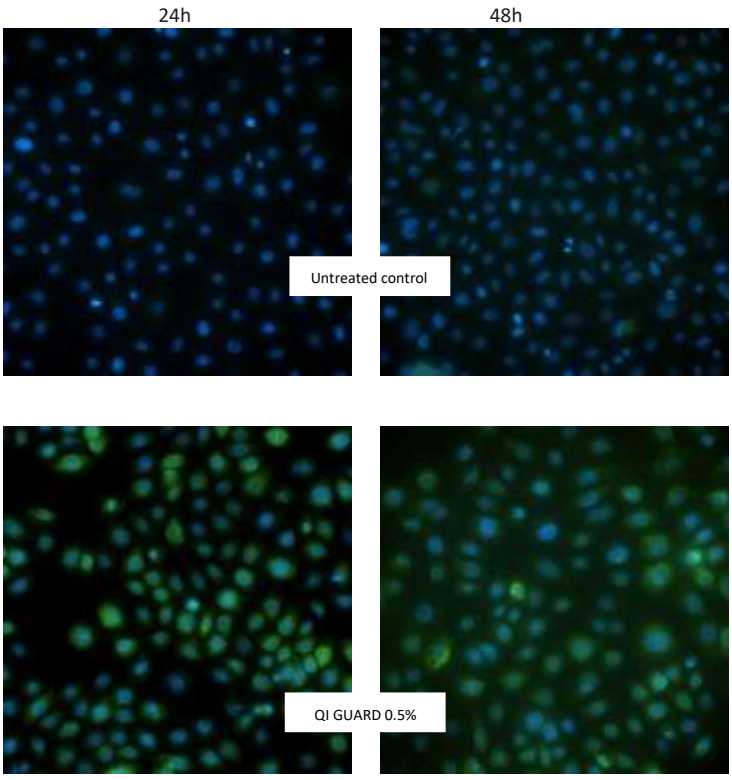
- the detoxification of oxidizing molecules,
- the repair and maintenance of cellular homeostasis against environmental and internal stresses.

QI GUARD® INDUCES HO-1 PROTEIN SYNTHESIS

Method

Immunolabelling on normal human keratinocytes – 0.5% QI GUARD®.

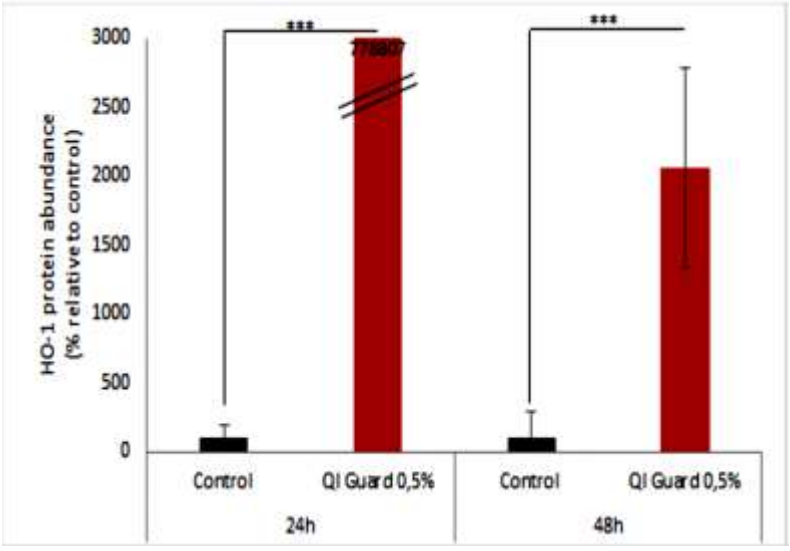
Results



As shown in figures in front, Heme oxygenase 1 (HO-1) protein appeared to be detected in keratinocytes cytoplasm as occasional puncta (granular pattern).

QI GUARD® can induce a remarkable increase in this staining pattern.

The visual difference of fluorescence (representing HO-1 abundance) is in accordance with the quantitative data.



The treatment with QI GUARD® at 0.5% increases very highly significantly the HO-1 abundance in keratinocytes, after 24h or 48h of treatment (strongest effect after 24h of treatment).

These results are in correlation with the data of the previous transcriptomic study.

Conclusion

QI GUARD® acts as a major inducer of the antioxidant response.

QI GUARD® STIMULATES THE ANTI-UVA DEFENSE

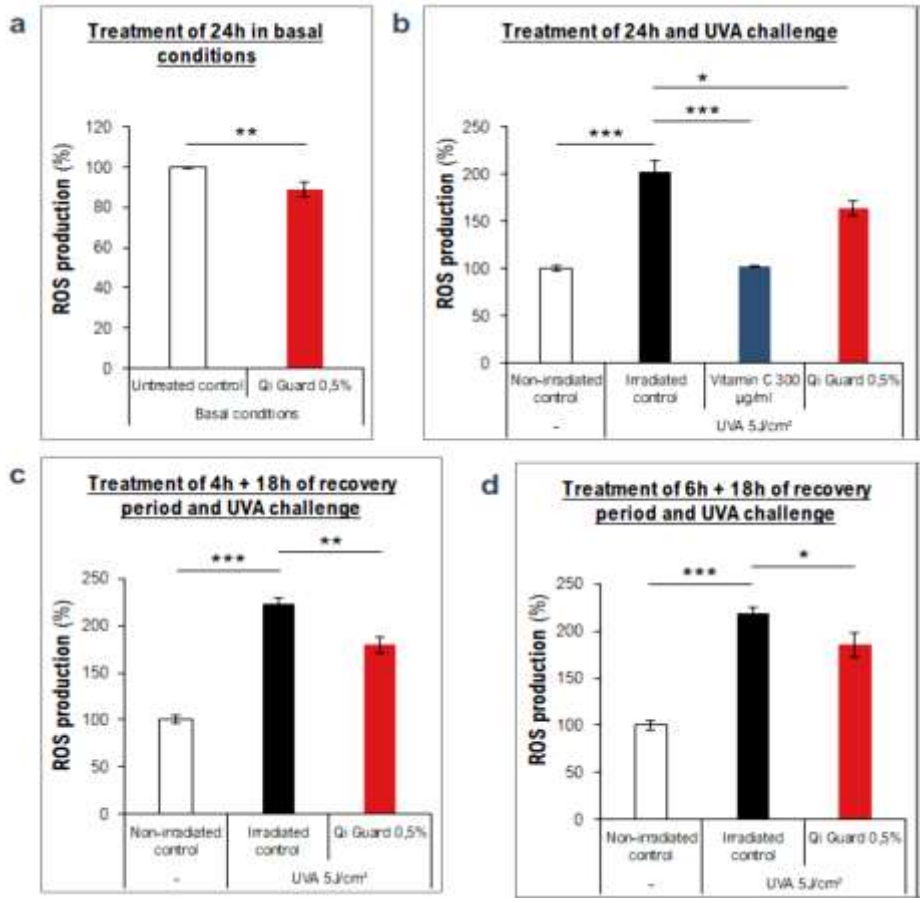
UVA is the major cause of premature skin ageing, inducing more severe damage than UVB.

Method

Quantification of intracellular ROS production form NHEK treated or not with QI GUARD® irradiated or not with UVA (5j/cm²).

Results

The effect of QI GUARD® on the production of intracellular ROS induced by UVA radiation is presented here after.



Graph a
The UVA challenge (5J/cm2) increases significantly the level of intracellular ROS production.

Graph b
The vitamin C (300 µg/ml), very highly significant decreases (***) this induction of ROS production.
The treatment with QI GUARD® at 0.5% during 24h and irradiated with UVA reduces significantly (*) the production ROS compared to untreated irradiated cells.

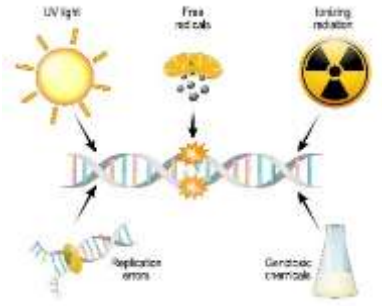
Graphs c and d
The pre-treatment with QI GUARD® for 4h or 6h followed by a recovery period of 18h protects the cells towards the UVA radiation (in a highly significant way* or very highly significant way**).

Conclusion

QI GUARD® protects cells towards an UVA challenge with an effective action 18h after the treatment.

QI GUARD® helps to fight oxidative stress, major cause of disturbance of skin homeostasis and skin premature ageing.

QI GUARD® INVIGORATES DNA DAMAGE REPAIR



DNA is a precious molecule encoding vital information about cellular content and function. It is a critical target for age-related deterioration.

DNA damage induces the formation of specific lesions caused by various exogenous hazards (*e.g.* UV radiation), endogenous toxic by products of cellular metabolism (*e.g.* ROS, RNS) or else spontaneous chemical reactions.

A rate of 10,000 to 1,000,000 DNA lesions would occur per cell per day with approximately 10 000 lesions relative from reactions to oxidative species alone.

Failure to respond to DNA damage has many consequences, and can result in mutations, gross chromosomal rearrangements which lead to disease, loss of fitness and death.

The DNA repair ability of a cell is vital to maintain genome integrity. With age, the rate of mutations increases and genomic rearrangements appear due to less efficacy of DNA repair pathways.

Method

Full genome transcriptome analysis on normal human keratinocytes – 0.5% QI GUARD®.

Results

QI GUARD® enlivens major pathways belonging to the both repair systems (DNA repair and mitochondrial DNA systems) to counteract different kinds of DNA lesions and promote their repair

Symbol	Gene names	Fold changes	p-value	Pathways
PPP1R15A	protein phosphatase 1 regulatory subunit 15A	13.1	6.80E-10	DNA damage ATM/ATR regulation of G1/S checkpoint
GADD45B	growth arrest and DNA damage inducible beta	6.2	6.60E-07	
CDKN1A	cyclin dependent kinase inhibitor 1A	6.1	8.70E-09	miRNA regulation
GADD45A	growth arrest and DNA damage inducible alpha	5.6	1.00E-08	miRNA regulation
SIRT1	sirtuin 1	2.9	1.1E-06	Single strand break repair Pyridine dimer repair Nucleotide excision repair (NER)
MSH4	mutS homolog 4	2.7	1.00E-05	Base excision repair (BER)
TDG	thymine DNA glycosylase	2	3.30E-05	Base excision repair (BER) Mismatch repair (MMR)
CHEK2	checkpoint kinase 2	1.7	1.30E-03	DNA double strand break response (DSB)
NEIL2	nei like DNA glycosylase 2	1.6	1.70E-03	Base excision repair (BER)
RAD23A	RAD23 homolog A, nucleotide excision repair protein	1.5	2.10E-03	Nucleotide excision repair (NER)

Conclusion

By acting on the multiple complex DNA repair pathways, QI GUARD® promotes positive effects on DNA surveillance mechanisms in order to perform efficient maintenance machinery to mend cellular genetic material and avoid increased frequency of DNA damage.

QI GUARD® could also contribute to modulate disturbing DNA transcription patterns occurring during ageing, especially BER, MMR, NER and DSB repair pathways.

QI GUARD® is able to assure DNA well-being.

QI GUARD® ORCHESTRATES FUNCTIONAL PROTEOSTASIS TO RESTORE THE PROTEIN BALANCE

Proteins are major players in the maintenance of cellular homeostasis. They have numerous functions in cells. These functions are tightly dependent on the ability of a protein to acquire and maintain a specific structure, which results from the folding of the polypeptide chain in a process mainly guided by its primary aminoacidic sequence (Anfinsen C.B. 1973 - Science 181, 223–230).

This continual maintenance is called "proteostasis" (Sontag E.M *et al.* 2017 - Annu. Rev. Biochem. 86: 97–122.). It is a dynamic regulation of a balanced, functional proteome, in order to maintain its functionality. This process involves precise coordination between different pathways involved in (1) protein synthesis, (2) protein folding, (3) refolding of partially unfolded proteins, and (4) sequestration and disposal of irreversibly unfolded/unneeded proteins. These pathways include many enzymes and specialized proteins.

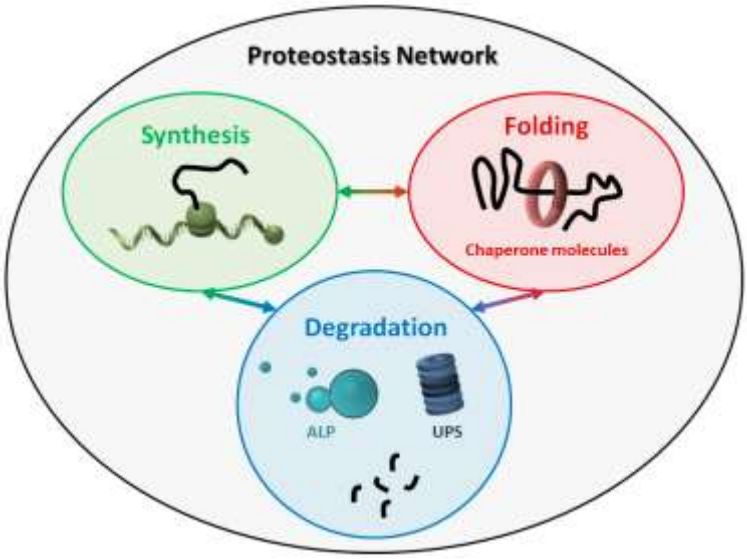
Proteostasis unbalance can cause overwhelming protein misfolding and aggregation eventually leading to cell death. Indeed, some degree of protein damage occur normally in every cell. However, the extent of protein damage increases by adverse intrinsic and environmental conditions, like unbalanced protein synthesis, oxidative stress, metabolic stress, some environmental toxins and pollutants, elevated temperature, high-energy radiation

The maintenance of protein homoeostasis (proteostasis) is essential to preserve cell functionality and the ability to respond and adapt to the changing environment.

All cells express a network of molecular components and cellular pathways working through three major processes:

> the action of chaperones molecules known as the HSP response,
> the Ubiquitin proteasome system (UPS),
> the Autophagic -lysosomal system (ALP).

The efficiency of the proteostasis network, that guarantees a firm healthy skin, declines when we age (Morimoto R.I. & A.M. Cuervo 2014 - J. Gerontol. A Biol. Sci. Mol. Sci. 69 (51): 533-548).



From Lualdi M *et al*. 2020 - Int. J. Mol. Sci. 21*(17), 6405*

QI GUARD® improves effectively the three main processes of proteostasis
to promote an efficient quality control process of skin proteins from folding to degradation.

PROTEOSTASIS - QI GUARD® HEIGTHENS THE HSP RESPONSE

The induction of HSPs represents the first line of defense toward an increase in protein unfolding.

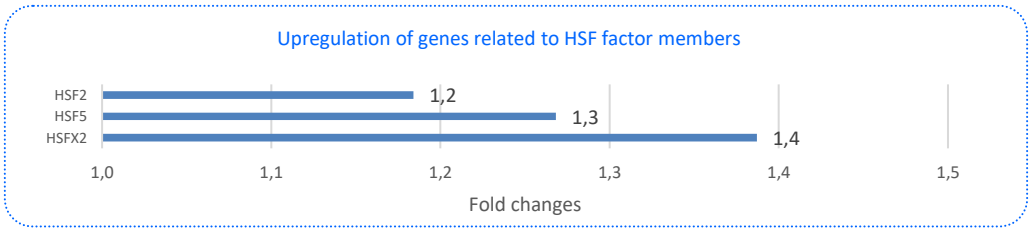
Firstly the response is mediated at the transcriptional level by specific regulators known as Heat Shock Factors (HSFs) that include various membrers essential to survive exposures to acute stress.

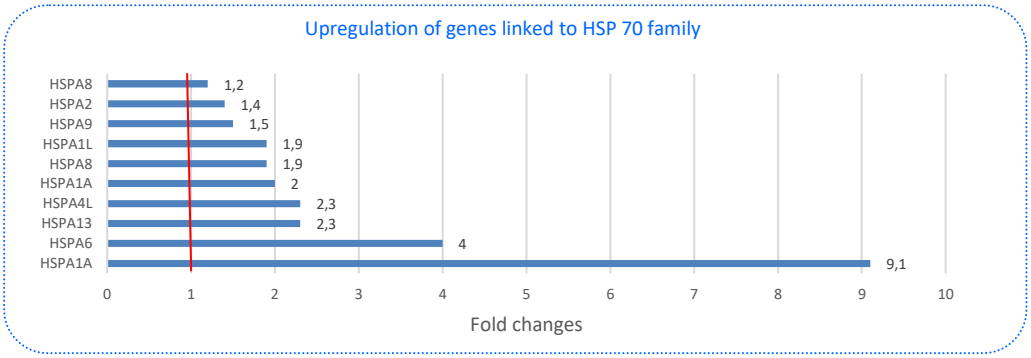
HSPs play critical role in the recovery of cells from stress and in cytoproection. In addition, they function to maintain protein homeostasis by regulating protein foldins quality control . They are grouped into different sub families *e.g.* HSP 70, HSP 40.

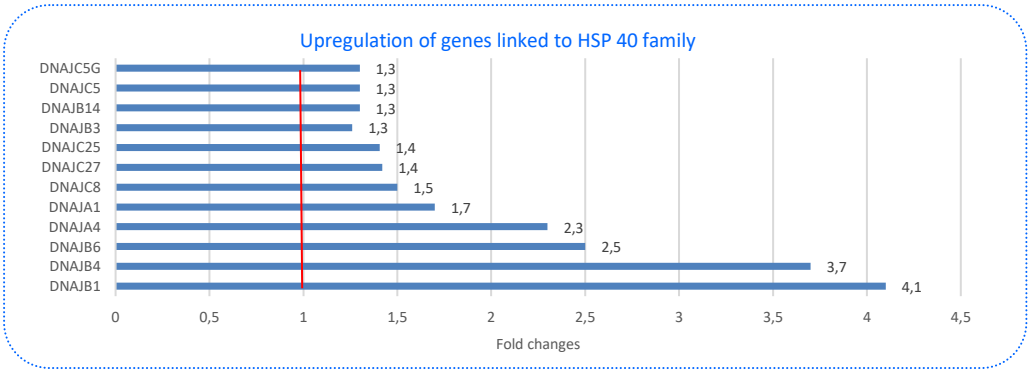
Method

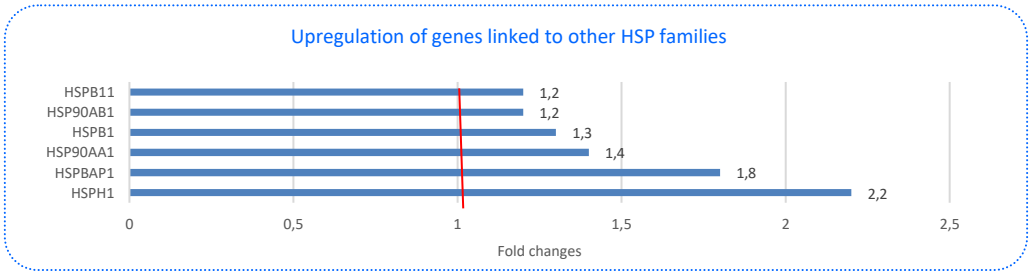
Full genome transcriptome analysis on normal human keratinocytes – 0.5% QI GUARD®.

Results









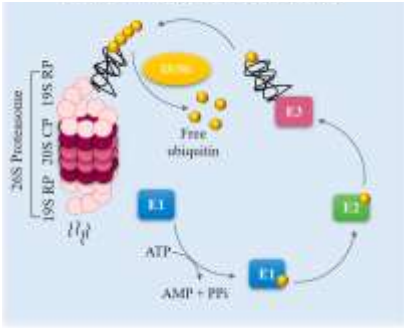
Conclusion

QI GUARD® reactivates the two important regulatory targets HSFs and HSPs to increase their ability to prevent inappropriate association or aggregation and direct the proteins into productive folding, transport or degradation pathways.

QI GUARD® is able to better control different HSP pathways to support protein folding.

PROTEOSTASIS - QI GUARD® REINFORCES THE UBIQUITIN PROTEASOME SYSTEM

The Ubiquitin proteasome system (UPS) is the main proteolytic mechanism responsible for directing the proteasomal destruction of misfolded and damaged proteins tagged with ubiquitin chains.



Ubiquitin is a crucial molecule for the UPS-mediated degradation of proteins. It plays through a process called ubiquitination thanks to different ubiquitin-activating enzymes (E2, E2, E3) forming a poly-ubiquitin chain to facilitates substrate recognition by the proteasome. The ubiquitinated protein is recognized, unfolded and degraded by the 26S proteasome.

The maintenance of proteasome is essential for many cellular processes. Its maintenance is reported to be correlated with visible skin benefits (Imbert L. *et al*. 2010-Int.J. Cosmet. Sci. 32:446-457).

Figure from Vasilopoulou (M.A. *et al.* – 2021).

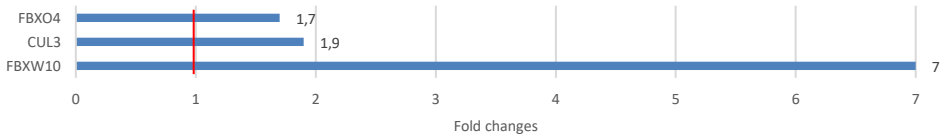
Method

Full genome transcriptome analysis on normal human keratinocytes – 0.5% QI GUARD®.

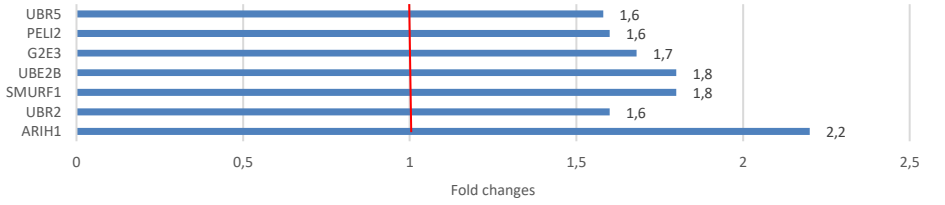
Results

The cascade of catalytic reactions involves major groups of enzymes that perform the protein ubiquitination, tagging and driving to degradation.

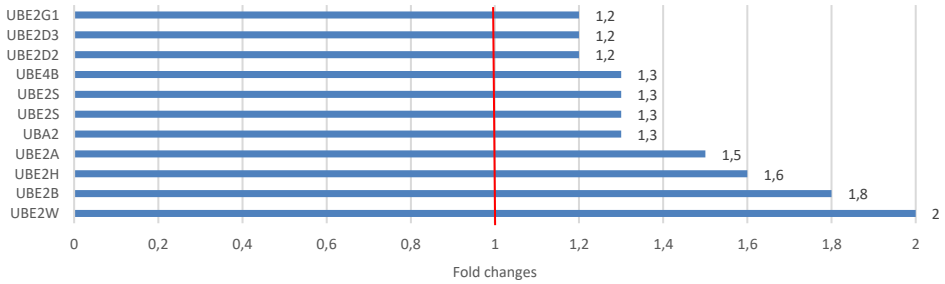
Upregulation of genes coding for components of SCF (SKP-Cullin-F-box protein) ubiquitination complexes thought to bind and recruit substrate for ubiquitination and degradation.



Upregulation of genes coding for ubiquitin-conjugating enzymes



Upregulation of genes coding for ubiquitin-protein ligases.

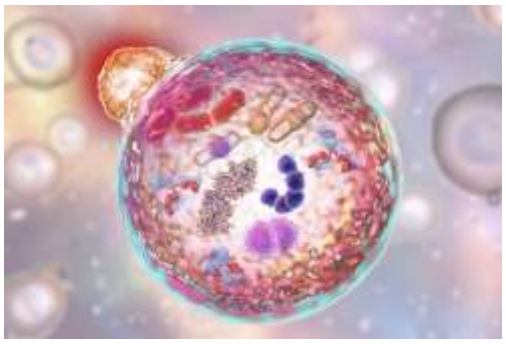


Upregulation of genes coding for 26S proteasome: PSMC6 (x 1.5) – PSMA1 (x 1.5) – SEM1 (x 1.5).

Conclusion

QI GUARD® can maintain adequate proteasome activity for efficient protein homeostasis against protein degradation at the transcriptional level, by over-expressing significantly numerous genes.

PROTEOSTASIS - QI GUARD® ACTIVATES THE AUTOPHAGIC DEGRADATION



Autophagy plays an essential role in the adaptive response to cell stress and in the maintenance of cellular homeostasis and quality control. The homeostatic role of autophagy involves both non selective degradation that supports basal turnover of cytoplasmic components and selective degradation that specifically targets damaged or aggregated organelles and proteins

In the skin, autophagy is considered as a benefit process allowing to degrade macromolecules accumulated in the cells, especially those exposed to solar radiation.

Autophagy is involved in a series of physiological events regulated through multiple pathways. It is an intracellular lysosomal (vacuolar) degradation process characterized by the formation of double-membrane vesicles, autophagosomes which sequester cytoplasm.

Method

Full genome transcriptome analysis on normal human keratinocytes – 0.5% QI GUARD®.

Results

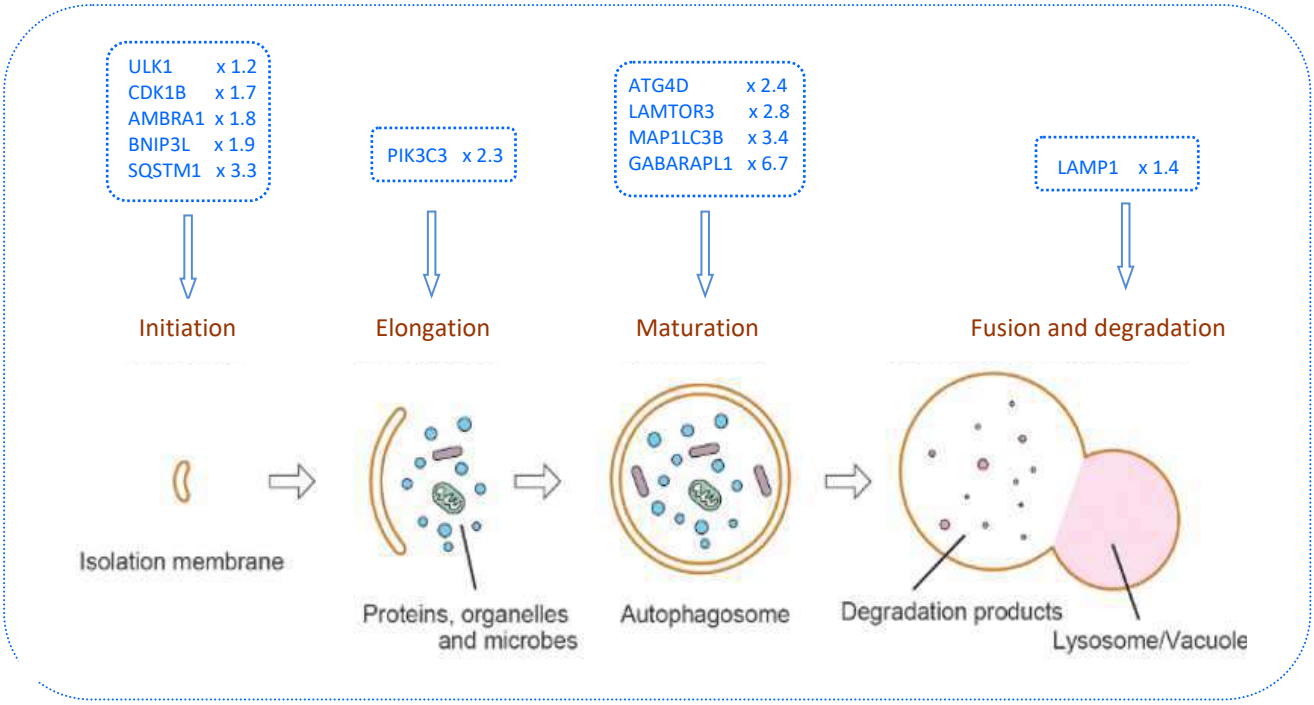


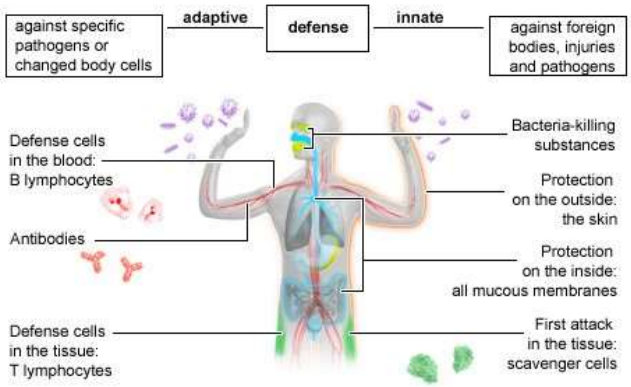
Figure adapted from Maruyama T. & N Noda, 2018.

Conclusion

QI GUARD® significantly modulates numerous genes implicated in different pathways of the autophagy machinery.

QI GUARD® promotes cellular detoxification by significant positive regulation of some key factor.

QI GUARD® BOOSTS THE ANTIMICROBIAL DEFENSE



From Institute for Quality and Efficiency in Health Care (IQWiG, Germany, 2020).

The antimicrobial defense is a major part of the skin immunity that is the first line of defense after the physical skin barrier.

Immune responses are executed by cells and molecules of either the innate or the adaptive immune system.

Innate reactions are typically rapid and poorly discriminating. Adaptive responses, in contrast, show a high degree of specificity. Innate and adaptive responses are consecutive events influencing each other

The innate immune system triggers a sequence of factors that results in the production of cytokines, chemokines, endogenous antimicrobial substances, the activation of immune cells and transcription factors, and in the end initiates the killing of the pathogenic microbe and activation of adaptive immunity.

Antimicrobial peptides secreted by skin cells contribute to this homoeostatic maintenance of microorganisms by forming a shield against infectious agents. Several immune cell types are also resident in the skin and are ready to respond to a variety of stimuli. Balancing the multiple skin defensive mechanisms is important for achieving homoeostasis as disruption of any of these components contribute to the manifestation of skin diseases.

Method

Full genome transcriptome analysis on normal human keratinocytes – 0.5% QI GUARD.

Results

QI GUARD® significantly upregulates important genes with antimicrobial function :

ADM (x 11.5) very effective action against *Propionibacterium acnes*
Anti-inflammatory properties.

SLPI (x 1.3) implicated in controlling microbial growth
Promotes the repair of injured skin.

Toll-like receptor family
major role in sensing a wide range of invading pathogens including bacteria, fungi and viruses
TLR6 (x 2.4) –– CD180 (x 1.4).

RNASE family major AMP with a broad antimicrobial spectrum
RNASE 6 (x 1.5) – RNASE7 (x1.4) – RNASE 8 (x 1.3).

Defensin family major antimicrobial protein with great importance in the skin barrier
DEFB108B79 (x 1.2) – DEFB125 (x 1.4).

Conclusion

QI GUARD® modulates the ability of AMPs of the immune response in order to protect immune cells and prevent the eventual development of immune diseases.

PERFORMANCE ON THE COMMENSAL MICROBIOME

The microbiome barrier is regarded as a complex ecosystem colonized by numerous microorganisms including bacteria, fungi, mites and viruses.

Up to one billion organisms inhabit a square centimeter of skin classified into two groups:

- residents that permanently inhabit the skin and
- transients that can be found intermittently,

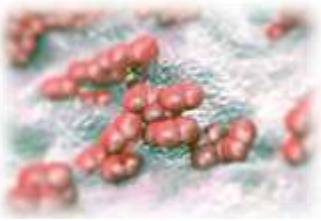
even if defining a clear edge is difficult.

Resident skin bacteria are a relatively fixed group of microorganisms (the core microbiota) that are routinely found in the skin and that re-establish themselves after perturbation. This core skin microbiota is considered to be commensal, meaning that these microorganisms are usually harmless and able to provide some benefit to the host.

Transient bacteria (the 'tourists' according to Dreno B. *et al.* 2016 - J. Eur. Acad. Dermatol Venereol. 30: 2038-2047) do not establish permanent residency, but rather derive from the environment or other body sites through direct skin contact. They persist for hours to days before disappearing.

Why the commensal microbiome is important ?

Commensal microorganisms play a crucial role in maintaining human health across a number of organ systems, particularly in the skin.



Among the commensal bacteria, *Staphylococcus epidermidis* is more than "one microbe." living in tight association with keratinocytes, the cells that constitute the skin top layer. *Staphylococcus epidermidis* brings numerous benefits e.g. it enhances innate immunity, develops tolerance to commensals, inhibits toxin production and skin neoplasia, blocks inflammation, promotes wound healing.

It is dubbed the "microbial gradian of skin health".

In the clinical setting, *Staphylococcus epidermidis* has demonstrated activity as a potential therapeutic and for cosmetic applications.

It is important to favor an integrate management of beneficial microbiome to bolster up skin health overall.

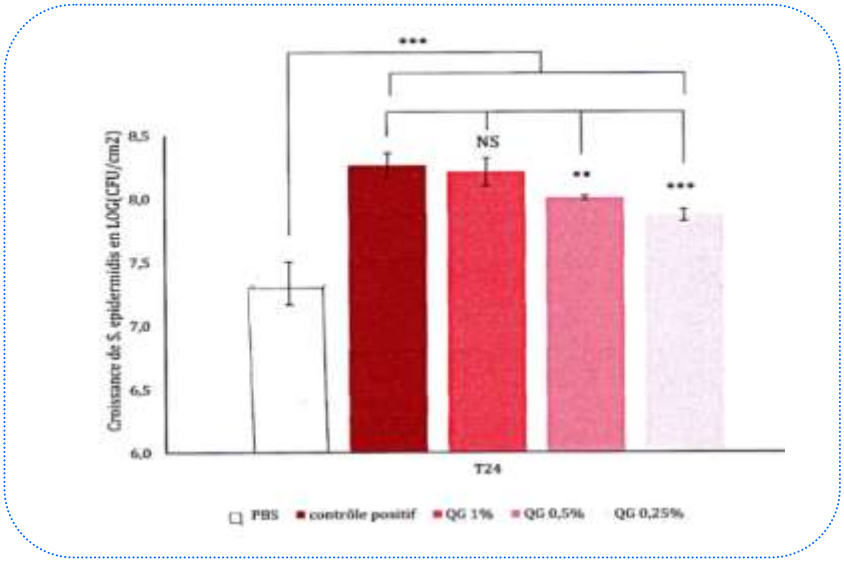
QI GUARD® PROMOTES THE GROWTH OF *Staphylococcus epidermidis*

Method

Study performed on human reconstituted epidermis (n=4) inoculated by the bacteria and treated with different concentrations of active, after 24h treatment.

Results

Results are expressed in LOG (UFC/cm²) and validated by Student t test.
NS p>0.005 - * 0.01 <p<0.05 - ** 0.001 < p<0.001 - *** p <0.001



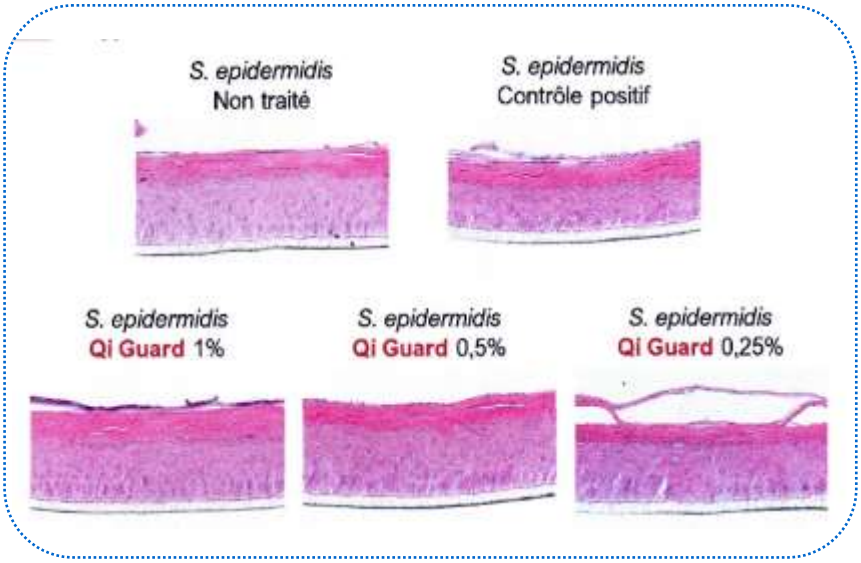
A significant increase of the growth of *Staphylococcus epidermidis* after 24H has been observed for all tested concentrations of QI GUARD® compared to untreated control.

PBS (positive standard):
0.92 log

QI GUARD® 1%
0.87 log

QI GUARD® 0.5%
0.67 log

QI GUARD® 0.25%
0.53 log



The morphological study of RHEs shows none alteration after the addition of QI GUARD® in presence of *Staphylococcus epidermidis*.

Conclusion

By increasing the bacteria growth in a dependant way, without any morphological perturbation, QI GUARD® behaves as a prebiotic agent.

QI GUARD® STRENGTENS THE IMMUNE ACTIVITIES OF *Staphylococcus epidermidis*

Staphylococcus epidermidis is known to enhance innate skin immunity and limit pathogen infection.

Method

Transcriptomic analysis by TaqMan Array on two experimental conditions vs untreated control

- *Staphylococcus epidermidis* alone (SE)
- *Staphylococcus epidermidis* in presence of 1% active (SE-QG).

Results

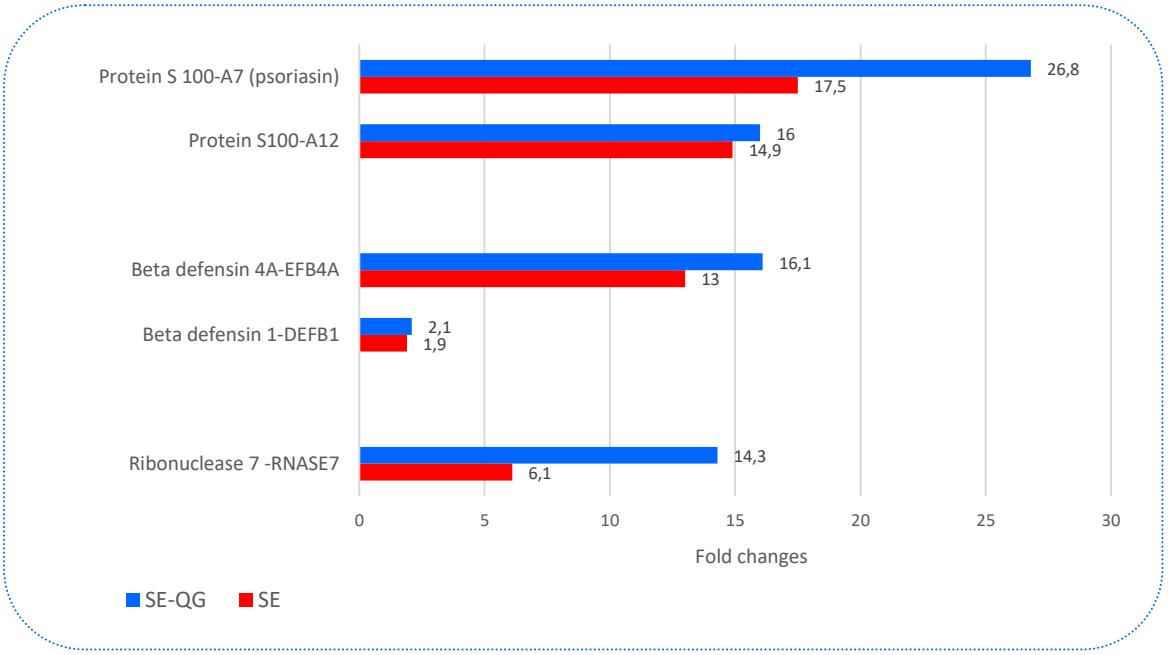
QI GUARD® significantly up-regulates the expression of S100 proteins, defensins and RNASE 7 by comparison to the condition of bacteria alone.

S100 proteins are involved in numerous cellular processes. S100 A7 and S100 A12 play key roles in the innate immune response to pathogens. Within cells, S100 proteins are involved in numerous aspects *e.g.* regulation of proliferation, differentiation, apoptosis, Ca^{2+} homeostasis, energy metabolism, inflammation. Defensins and RNASE 7 are major elements of innate immunity against microbial infections.

Defensins provide an efficient initial defense against a wide variety of microorganisms due to their broad-spectrum antimicrobial activity, killing bacteria in numerous ways.

RNase 7 exhibits a broad spectrum of antimicrobial activity against various microorganisms. It participates in innate cutaneous defense.

Symbol	Gene name	*Staphylococcus* alone SE			*Staphylococcus* + QI GUARD 1% SE-QG		
		Fold changes	p-value		Fold changes	p-value	
S100A7	Protein S100-A7 (psoriasin)	17.5234	0.0002	***	26.8362	0	***
S100A12	Protein S100-A12	14.8826	0.0057	**	16.0197	0.0009	***
DEFB1	Beta-defensin 1	1.9787	0.0017	**	2.1353	0.0096	**
DEF B4A	Beta-defensin 4A	13.0101	0.0015	**	16.0753	0.0005	***
RNASE7	Robonucleasde 7	6.1698	0.1132	NS	14.2819	0.0038	**



Conclusion

QI GUARD® completes effectively the beneficial potential of Staphylococcus epidermidis in the anti-microbial defense.

QI GUARD® REINFORCES THE EPIDERMAL ACTIVITIES OF *Staphylococcus epidermidis*

The skin barrier is essential for the protection against the environment.

Method

Transcriptomic analysis by TaqMan Array on two experimental conditions vs untreated control

- *Staphylococcus epidermidis* alone (SE)
- *Staphylococcus epidermidis* in presence of 1% active (SE-QG).

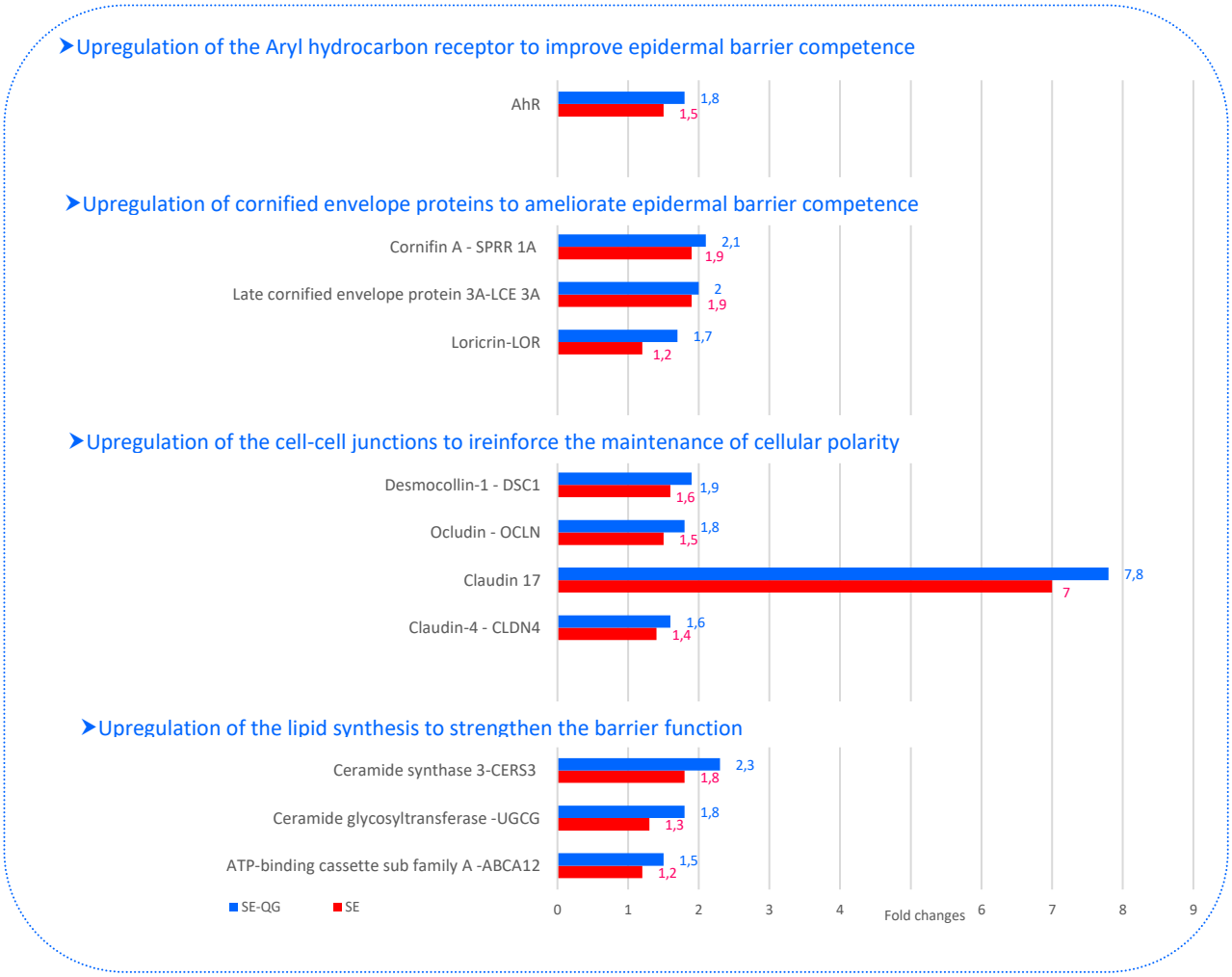
Results

QI GUARD® significantly increases the activities of *Staphylococcus epidermidis* relevant to epidermal differentiation by comparison with the condition of the bacteria alone.

QI GUARD® increases significantly the expression of:

- the Aryl hydrocarbon receptor,
- the cornified envelope proteins,
- the cell-cell junctions
- the lipid synthesis and transport

to better regulate barrier homeostasis.



Conclusion

QI GUARD® increases the benefits of Staphylococcus epidermidis related to the epidermal differentiation.

QI GUARD® GOT 'MICROBIOME-FRIENDLY' CERTIFICATIONS

Collaboration : MyMicrobiome - Certifications developed by microbiologists in Germany.

The human microbiome is very individual from person to person. Each area, however, harbours a characteristic composition of bacteria, viruses and fungi. An intact skin microbiome has a fundamental influence on skin health.

The MyMicrobiome Standard evaluates cosmetic and personal care products influence on the key organisms typical for a specific body site by covering all aspects of the microbiome, including the microbial balance between skin-friendly and skin-harmful bacteria, the microbial diversity of a specific body region and the growth behaviour of the microbes of the specific body region.

The standard uses a simple and transparent rating that makes products comparable for consumers:
1 0 – 2.0 = 'Microbiome friendly' 2 .1 – 3.0 = 'Microbiome damaging'

Why the "Microbiome -friendly" certification is important ?

A such certification is a useful way for manufacturers to assure consumers looking for products that respect the balance, diversity, and vitality of their skin microbiome.

Method

In vitro studies on various microbes' strains – 3% QI GUARD® in PBS

Results

QI GUARD® got acknowledged with the quality seal microbiome-friendly" according various MyMicrobiome standards:

18.10 Face and body - dry, oily (grade1.4) moist skin (grade 1.6)
19.10 Scalp (grade 1.5)
21.10 Vaginal tract (grade 1.2)
22.10 Feet grade (grade 1.7).

QI GUARD® respects the natural, healthy microbiome of the skin, both on the surface and in the deeper layers of the skin.

QI GUARD® has received excellent MY MICROBIOME rating for various body regions.

Dry skin

Propionibacterium acnes : Cutibacterium acnes
Corynebacterium tuberculostearicum
Staphylococcus mitis
Staphylococcus oralis
Malassezia luteus
Malassezia globosa

Sebaceous skin

Propionibacterium acnes : Cutibacterium acnes
Staphylococcus epidermidis
Staphylococcus capitis
Staphylococcus hominis
Staphylococcus mitis
Corynrbacterium simulans
Malassezia globosa

Moist skin

Propionibacterium acnes : Cutibacterium acnes
Staphylococcus epidermidis
Staphylococcus capitis
Staphylococcus hominis
Corynebacterium tubercustearicum
Corynebacterium simulans
Malassezia globosa

Vaginal tract

Lactobacillus crispatus
Lactobacillus jensenii
Lactobacillus gasseri

The vaginal tract is a finicky part of the body: the vaginal microbiome is extremely specialized and allows only a few bacterial species to live there. Even though the microbial diversity in this region is very low compared to other parts of the body, it is nevertheless a wholly unique ecosystem.

Feet

Staphylococcus hominis
Staphylococcus warneri
Staphylococcus epidermidis.
Micrococcus. luteus
Malassezia globosa

Scalp

Propionibacterium acnes : Cutibacterium acnes
Staphylococcus epidermidis
Malassezia globosa
Malassezia furfur

Conclusion

QI GUARD® shows adequate ranking to obtain microbiome-friendly labels suitable for different cosmetic applications.

QI GUARD® does not disturb the balance between skin-friendly (*Staphylococcus epidermidis*) and skin-harmful bacteria (*Staphylococcus aureus*). It respects the microbial diversity and the growth microbial behavior of each studied body region.

QI GUARD® leaves the skin microbiome intact.

QI GUARD® DECREASES TEWL

TEWL is directly proportional to skin hydration. It can be affected by environmental and intrinsic factors. Its measurement is a good indicator of the integrity of the skin barrier function.

Altered skin barrier and TEWL are correlated with skin ageing.

Method

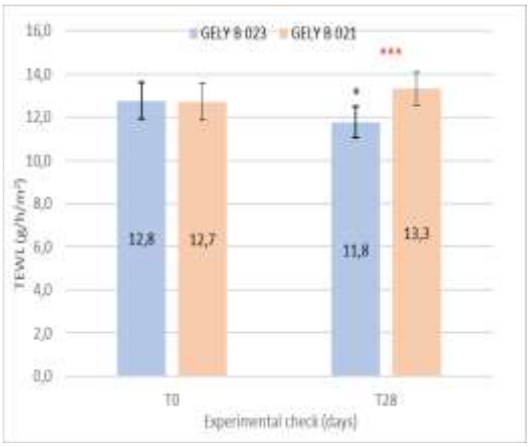
The aim of the test was to confirm that products does not perturb the skin hydro-lipid barrier (prevent water loss by epidermis). The test has been conducted using special measuring device manufactured by Courage + Khazaka Company – Tewameter® TM 300. Instrumental study has been carried out on maxima zone of 21 subjects on each side of the face. The measurements have been performed at the site of application – before products application (D0) and after 28 days (D28) of regular use. The study has been carried out in an air conditioned room in the temp. of 20±2ºC and relative humidity 50±10%. The products efficacy is confirmed in case of the positive results obtained in more than 50% of subjects

List of ingredients

Cream
AQUA (WATER), 1,3-PROPANEDIOL, HYDROGENATED VEGETABLE OIL, HYDROGENATED POLYDECENE, STEARETH-21, STEARYL ALCOHOL, STEARETH-2 SODIUM ACRYLATE/SODIUM ACRYLOYLDIMETHYL TAURATE COPOLYMER, C15-19 ALKANE, 1,2-HEXANEDIOL, KAPPAPHYCUS ALVAREZII EXTRACT, TOCOPHERYL ACETATE, GIGARTINA STELLATA EXTRACT, C10-16 ALKYL GLUCOSIDE, CAPRYLHYDROXAMIC ACID.

Placebo
AQUA (WATER), 1,3-PROPANEDIOL, HYDROGENATED VEGETABLE OIL, HYDROGENATED POLYDECENE, STEARETH-21, STEARYL ALCOHOL STEARETH-2, SODIUM ACRYLATE/SODIUM ACRYLOYLDIMETHYL TAURATE, COPOLYMER, 1,2-HEXANEDIOL, C15-19 ALKANE, TOCOPHERYL ACETATE CAPRYLHYDROXAMIC ACID, C10-16 ALKYL GLUCOSIDE

Results



Legend

* p < 0.05 - Intragroup statistical analysis (vs T0).

***p < 0.01 - Inter-group statistical analysis (active

After 28 days of use, the tested product determines a decrease of TEWL value by -6.6% obtained result is statistically significant both compared to baseline and to placebo.

An increase of the transepidermal water loss is recorded in the placebo treated hemi-face, however the recorded variation is not statistically significant.

Conclusion

QI GUARD® regulates transepidermal water loss for a reinforcement of the skin barrier condition.

QI GUARD® IMPROVES THE SKIN STRUCTURE

As we age, our skin begins to lose its internal plumpness. Over time skin firmness reduces and wrinkles deepen.

Method

The aim of the test was to define the direct influence of the tested products on biomechanical skin parameter by using Cutometer® MPA 580.

List of ingredients

Serum
AQUA (WATER), GLYCERIN, XANTHAN GUM, CHONDRUS CRISPUS POWDER,CETEARYL CLUCOSIDE,SORBITAN OLIVATE,CETEARYL ALCOHOL, DICAPRYLLYL CARNONATE,TOCOPHEROL, KAPPAPHYCUS ALVAREZII EXTRACT, GIGARTINA STELLATA EXTRACT SODIUM BONZOATE,POTASSIUM SORBATE,CITRIC ACID,SODIUM DRYDROXIDE.

Placebo
AQUA (WATER), GLYCERIN, XANTHAN GUM,CHONDRUS CRISPUS POWDER,CETEARYL CLUCOSIDE,SORBITAN OLIVATE,CETEARYL ALCOHOL, DICAPRYLLYL CARNONATE,TOCOPHEROL, SODIUM BONZOATE,POTASSIUM SORBATE,CITRIC ACID,SODIUM DRYDROXIDE.

Formulations including 3% QI GUARD® were applied on the half-face and half-neck chosen randomly, twice daily, during 28 consecutive days on a panel of 23 female Caucasian volunteers from 38 to 65 years old with sensitive skin and phototype (Fitzpatrick): from I to III.

Sensitive skin: 23 subjects (100%) distributed as follows =Normal skin: 5 subjects (20.8%) - Dry skin: 8 subjects (37.5%)- Dry combination skin: 4 subjects (16.7%) - Oily combination skin: 4 subjects (16.7%) - Oily skin: 2 subjects (8.3%).

Results

R2 : skin gross-elasticity

If R2 increases, skin elasticity increases

	D DO / D 28
Serum 3% active	+ 15 %
% subjects with positive effect	94

RO : stretchability/firmness

If R0 decreases the skin is less extensible, so more stretched

	D DO / D 28
Serum 3% active	- 16 %
% subjects with positive effect	83

Conclusion

QI GUARD® improves elasticity and strengthens the skin.

QI GUARD® AMELIORATES THE SKIN APPEARANCE

Method

Wrinkles' analysis by using Primos 3D Lite

The aim of the test was to define the direct influence of the tested products on reduction of wrinkle length and depth, evaluation of wrinkle count, volume and wrinkle area on the measurement zone by using Primos 3D Lite. The test has been conducted using special measuring device manufactured by LMI Technologies GmbH. Instrumental study has been carried out on 21 subjects on each side of the face. The measurements have been performed at the site of application – before products application (D0) and after 28 days (D28) of regular use. The study has been carried out in an air-conditioned room in the temp. of 20±2ºC and relative humidity 50±10%. The products efficacy is confirmed in case of the positive results obtained in more than 50% of subjects

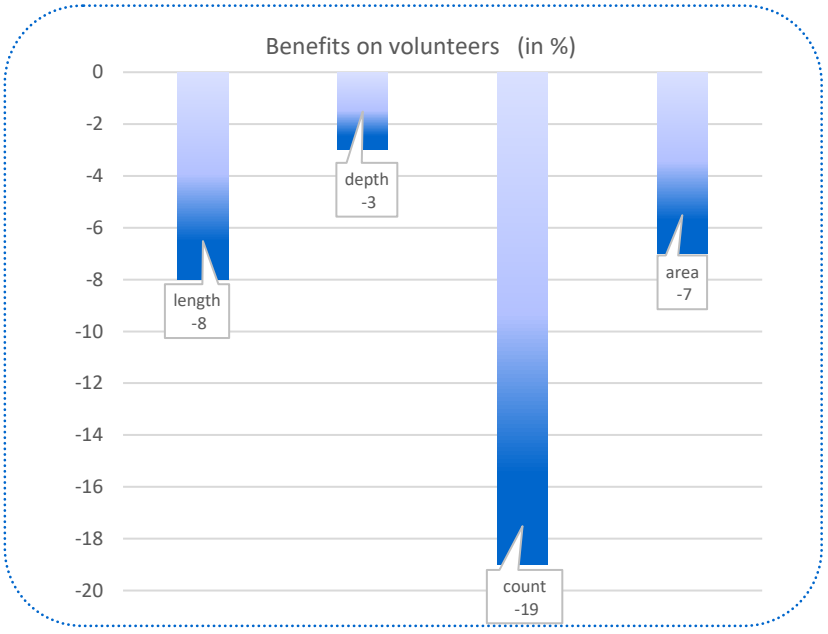
The tested products are the same than previously.

Results

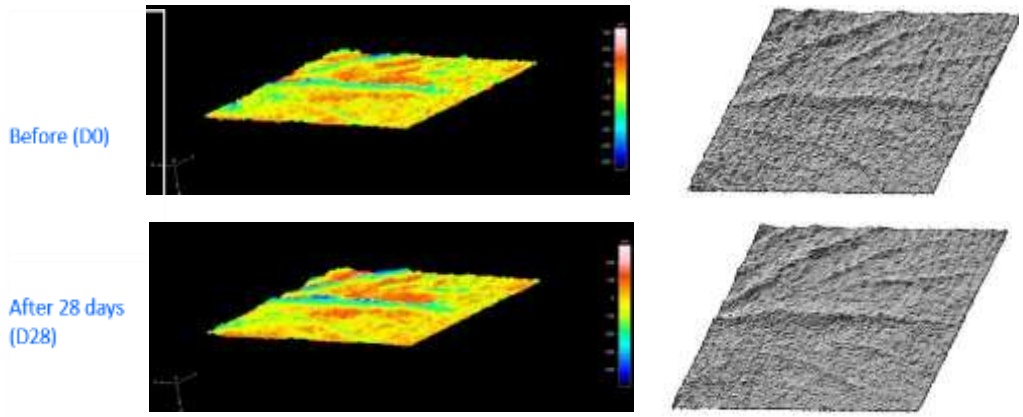
QI GUARD® decreases

- the length - 8% 95 % subjects with positive effect
- the depth - 3% 58% subjects with positive effect
- the amount - 19% 95% subjects with positive effect
- the surface area of wrinkles -74% subjects with positive effect

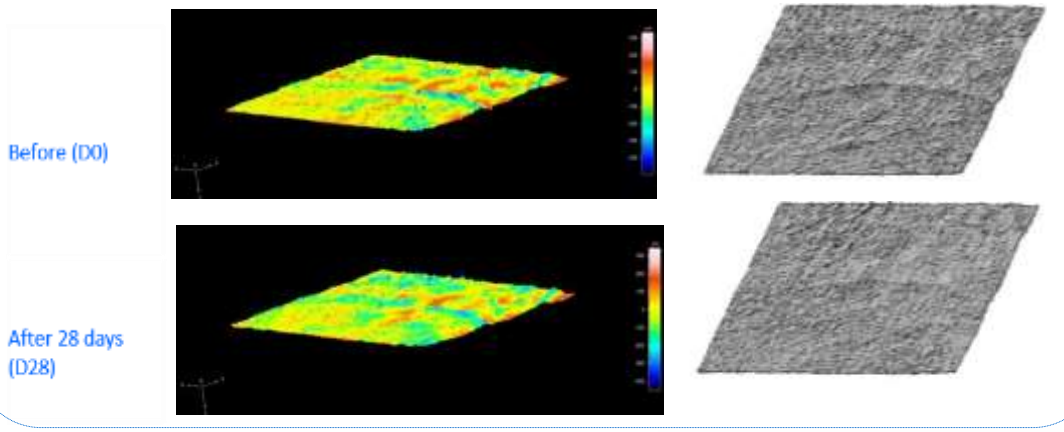
after 28 days application



Placebo



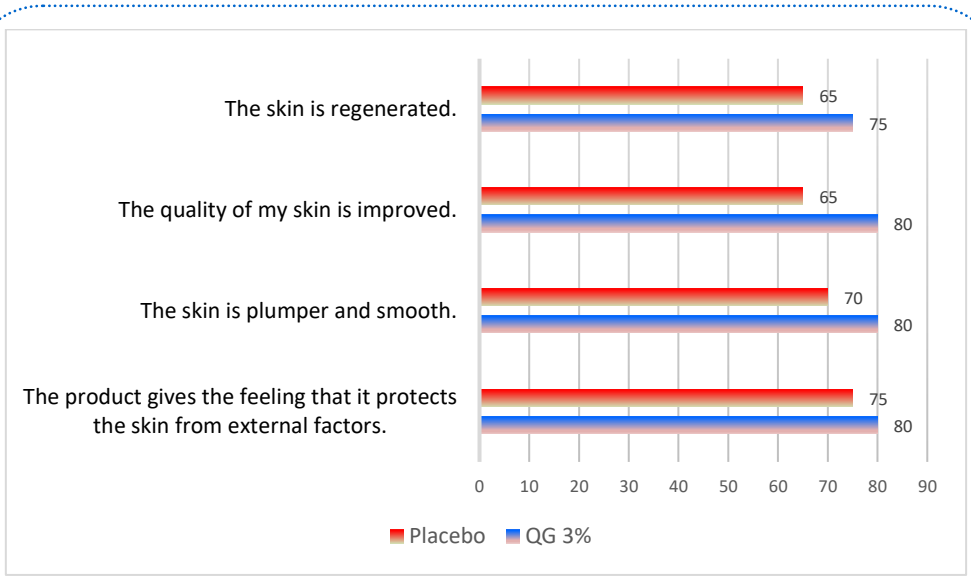
Serum 3% QI GUARD®



Conclusion

QI GUARD® provides an improvement concerning the visible signs of ageing

Self-assessment after 28 days treatment with 3% QI GUARD®



Improved perception of skin appearance in a healthy ageing approach.

GENERAL INFORMATION

Thanks to its unique combination of two red seaweeds,
QI GUARD® offers skin benefits through multiple ways of performance
to fortify cellular defense and repair capacities while to encourage skin healthier ageing

TECHNICAL DATA

➢ Characteristics

-Appearance	limpid liquid
-Colour	amber
-Odour	characteristic

➢ Safety (tested pure)

• Cutaneous irritation	non irritant
• Eye irritation	Slightly irritant
• Mutagenicity test	Non mutagenic- Non pre-mutagenic

➢ Storage

-in its original packaging at 15-25°C

FORMULATION DATA

➢ Suggested use level 1% - 3%

➢ Solubility

-Soluble in water
-Insoluble in oils and fats

➢ Mode of incorporation

-to be incorporated at a temperature around or below 40°C during the final cooling process under normal stirring conditions

➢ Optimal pH 4.0 – 7.0

➢ Heavy metals (mg/Kg)

Arsenic	:	0.4	Antimony	:	< 0.1
Lead	:	< 0.1	Nickel	:	0.1
Cadmium	:	0.01	Chromium	:	< 0.1
Mercury	:	< 0.01			

➢ Fragrance allergens (mg/Kg) all < 1

REGULATORY DATA

INCI names	CAS n°	EINECS n°	CHINA compliant (list 2021)
water	7732-18-5	231-791-2	水
Gigartina stellata extract	223751-69-7	-	星芒杉藻（GIGARTINA STELLATA）提取物
Kappaphycus alvarezii extract			长心卡帕藻（KAPPAPHYCUS ALVAREZII）提取物
Preservative / Additives	by selection: microcare SB, phenoxyethanol, emollient PTG		

Compliance

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