

Niacinamide PC

*The multi-functional vitamin
for menopausal skin changes*



May 2025

Vitamins | Healthy foundations

dsm-firmenich 

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The next chapter in women`s life
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01

Embracing menopause: The next chapter in women's life

Menopause: Symptoms and effects on skin and hair

Hormonal changes during menopause affect skin and hair cell function leading to visible signs of aging

Thinning scalp hair

Hair grows slower and becomes thinner due to increased hair fall. Hair becomes to look drier, too. On the opposite, there may be an increase in facial hair due to menopause.

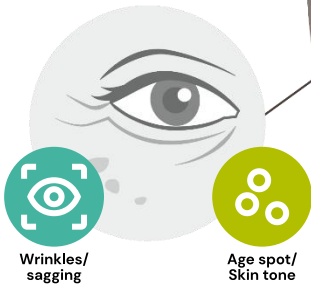


Wrinkles and age spots

Due to age & lower estrogen levels:

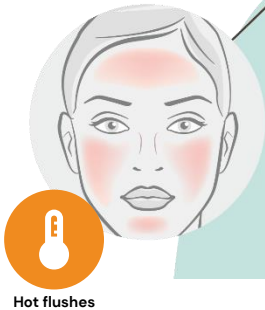
Collagen synthesis is reduced. Collagen and elastin levels decrease about 30% in the first five years of menopause. Skin also loses elasticity.

Overall melanin synthesis is reduced making its transfer to skin cells less efficient ultimately leading to uneven complexion and age spots.



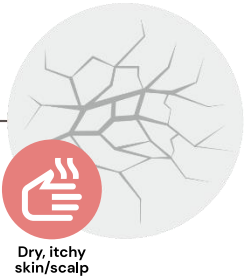
Hot flushes

Can go along with heavy sweating. They can lead to sleepless nights. Lack of sleep hampers the skin's ability to repair itself.



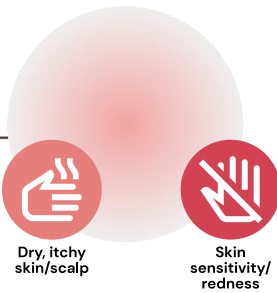
Dry skin and scalp

Thinning of the skin and impaired barrier. Hyaluronic acid levels also decrease. Skin becomes visibly drier. The main symptom of menopause skin. Consumers can also experience dry scalp.*



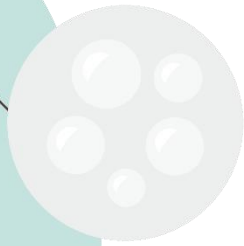
Itchy or red skin and scalp

Due to hormonal changes and becoming drier, skin gets itchy and slightly inflamed leading to skin redness. Consumers can also experience itchy scalp.*

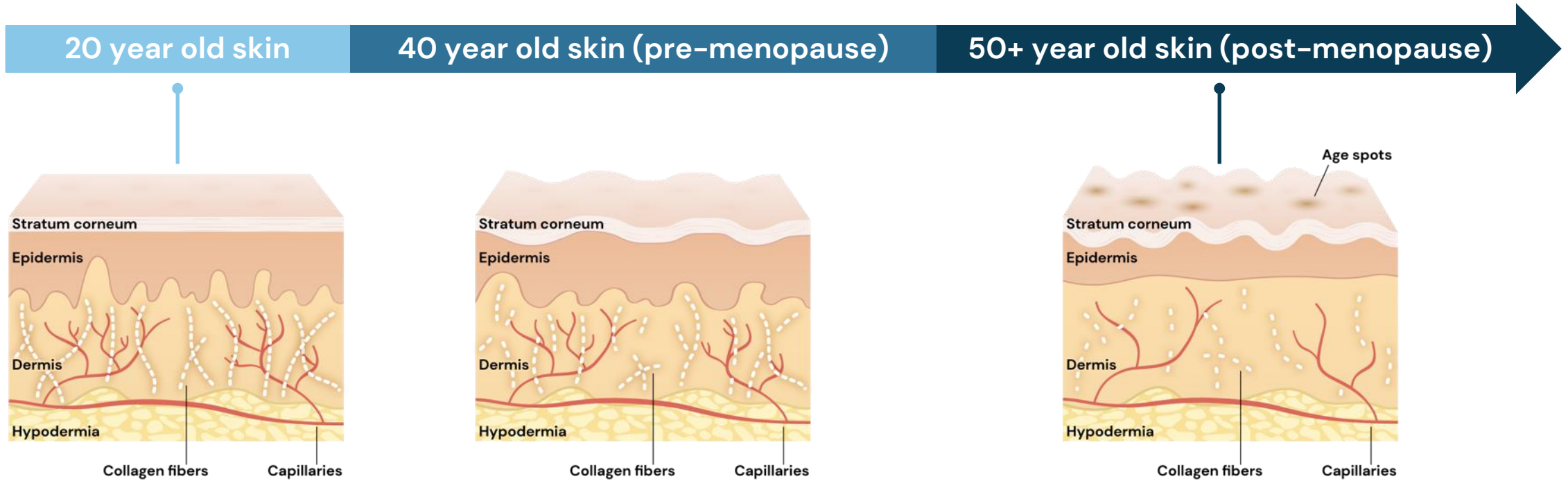


Oily skin

Some women experience oily skin and acne breakouts. This is due to decreased estrogen levels unmasking testosterone.



Menopause: focus on skin changes



Up to our 40s, signs of collagen and elastin degradation become visible. **Environmental stressors** take their toll, we see the first appearance of **fine lines** and skin starts showing an **uneven tone***.

In our 50s and beyond, **skin becomes even thinner**. Hormonal decline such as in **menopause** takes its toll drastically on the skin. Collagen is now significantly degraded; **deep wrinkles** and **age spots** form and **skin loses water and becomes dry**. Skin microbial composition does change, too. **

*Brincat et al. (1987) Decline in skin collagen content and metacarpal index after the menopause and its prevention with sex hormone replacement. Br J Obst Gyn94:126-129

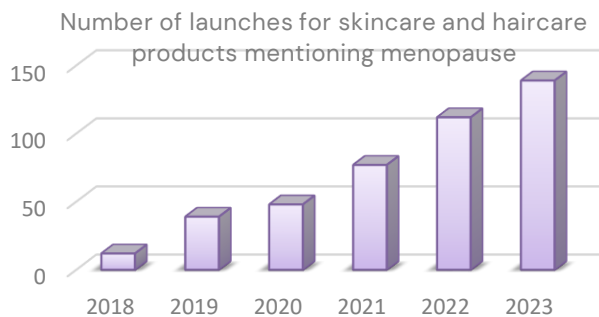
**Brincat et al. (1983) Sex hormones and skin collagen content in postmenopausal women. Br Med J 287:1337-1338

Image source: Affinito et al. (1999) Effects of postmenopausal hypoestrogenism on skin collagen. Maturitas 33:239-247

From taboo to trending topic: Personal care innovations to be more inclusive on menopause



According to 2021 data from Grandview Research, the global menopause cosmetics market size will reach \$22.7 billion by 2028.



Product launches incl. menopause claim increase from 2018 to 2023 by 35 folds, and +24% from 2022 to 2023.
Source: Mintel, gn timer.



RÉACTIVE LES MÉCANISMES DE LA PEAU À LA MÉNOPAUSE

MESURÉ SOUS CONTRÔLE DERMATOLOGIQUE

100% RÉGÈNÈRE LA PERTE DE LIPIDES EN SURFACE*

NEOVADIOL POST-MÉNOPAUSE

"À la ménopause, les variations hormonales provoquent des modifications profondes de la peau. Les signes visibles de l'âge s'accroissent."

MARION NIELSEN
DIRECTRICE SCIENTIFIQUE
DES LABORATOIRES VICHY

TESTED UNDER DERMATOLOGICAL CONTROL ON PERIMENOPAUSAL & MENOPAUSAL WOMEN

Neovadiol by Vichy is a line of cosmetics designed to reduce visible signs of post-menopausal skin aging. Backed by dermatological tests and endorsed by experts in the field, Neovadiol offers targeted solutions for menopausal skin care.



No. 7 Menopause Skincare line specially developed to target fine lines and wrinkles. Dermatologically tested and approved by dermatologists with expertise in menopausal skincare.



Pantene Pro V Hair Biology Menopause: a range to help manage the changes brought about by age and hormone imbalance.

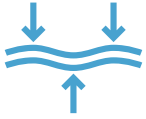
02

Niacinamide PC: multi-purpose vitamin for menopausal skin changes



Niacinamide PC: proven benefits

Resilient, flawless skin and radiant complexion



CORNEOCARE® – Skin Resilience

- Strengthens the skin barrier and stimulates and rebalances ceramides and lipids in stratum corneum¹
- Increases key skin barrier proteins: involucrin, filaggrin, keratin²



Environmental stress protection

- Boost cell energy production and repair (UV induced DNA damage)^{2,3}
- Protection against urban pollutants, UV and blue light related premature aging damage^{1,2,3}



Even skin tone

- Inhibition of melanosome transfer²
- Rebalances uneven skin tone^{1,3}



Blemish Care

- Reduces the appearance of acne¹
- Helps to reduce sebum level¹



Anti-aging activities

- Stimulates and protects collagen^{1,2}
- Improves the appearance of lines, wrinkles and skin elasticity¹

1. In vivo. 2. In vitro. 3. Ex vivo



Niacinamide PC

The multi-functional vitamin for menopausal skin changes

The multi-change stage of menopausal skin aligns well with the multi-benefit properties of **Niacinamide**, making it **an excellent ingredient for counteracting the skin effects of menopausal hormonal changes**.

The new *in vivo* study from dsm-firmenich shows that Niacinamide PC is an **effective solution for menopausal skin concerns**. It addresses issues such as dryness, sensitivity, fine lines, wrinkles by strengthening the skin barrier and protecting against collagen degradation. Its DNA repair properties and ability to fade hyperpigmentation make Niacinamide PC ideal for menopausal women skincare routines, enhancing overall skin health and resilience during this multi-change period.

Niacinamide PC strengthen the scalp barrier while keeping it hydrated, providing comprehensive care for scalp and healthy hair.



DESCRIPTION

INCI NAME: Niacinamide
KEY BENEFIT: Its main benefits include blemish care (blemish-free, shine-free, refined skin appearance), UV- and blue-light-stressed skin care (skin tone, damage caused by light), and enhanced functionality of the skin barrier
ORIGIN: Biotechnology, Synthetic

TECHNICAL INFORMATION

APPEARANCE: White crystalline powder
INCORPORATION: Can be processed either cold or at hot temperatures up to 70°C and has to be incorporated into the aqueous phase, or at the end of the manufacturing process for O/W formulation
COMPATIBILITIES: Very good compatibility with emulsifier systems, emollients and waxes, preservatives, hydrocolloids, sunscreens, detergents and other commonly used substances
INCOMPATIBILITIES: Strong acids and bases, oxidizing agents. Hydrolysis to nicotinic acid which may cause a flushing effect on skin
SOLUBILITY: Freely soluble in water (691 g/L) and in alcohol, soluble in glycerol, very slightly soluble in ether or chloroform
PRESERVATIVE: Free
RECOMMENDED USE LEVEL: Face care: 1 to 10%; Body care: 0.5 to 10%
pH RANGE: 4.0 – 8.0
SHELF LIFE: 36 months
STORAGE: Below 25°C
BIODEGRADABILITY: Readily biodegradable

CERTIFICATIONS & COMPLIANCES



03

New science behind Niacinamide PC for post- menopausal skin



Niacinamide PC – new clinical data

Study Design

Participants: healthy, Caucasian female volunteers*

Age: 48–65

Length of the study: 1 month

Application: Twice a day

Tested Skin Parameters:

- TWEL (tewameter)/hydration (corneometer)

Omics Technologies (on D-Squame tape strips):

- Metabolomics
- Lipidomics (Ceramides)



Research listed at Top 10 finalists for the Basic Research Award at IFSCC Conference.

**Pre-menopausal was defined by whether menstrual cycles were regular and Post-menopausal by the last menstrual period that occurred at least 12 months ago. Perimenopausal individuals were excluded from this study.*

New in vivo study

dsm-firmenich own study

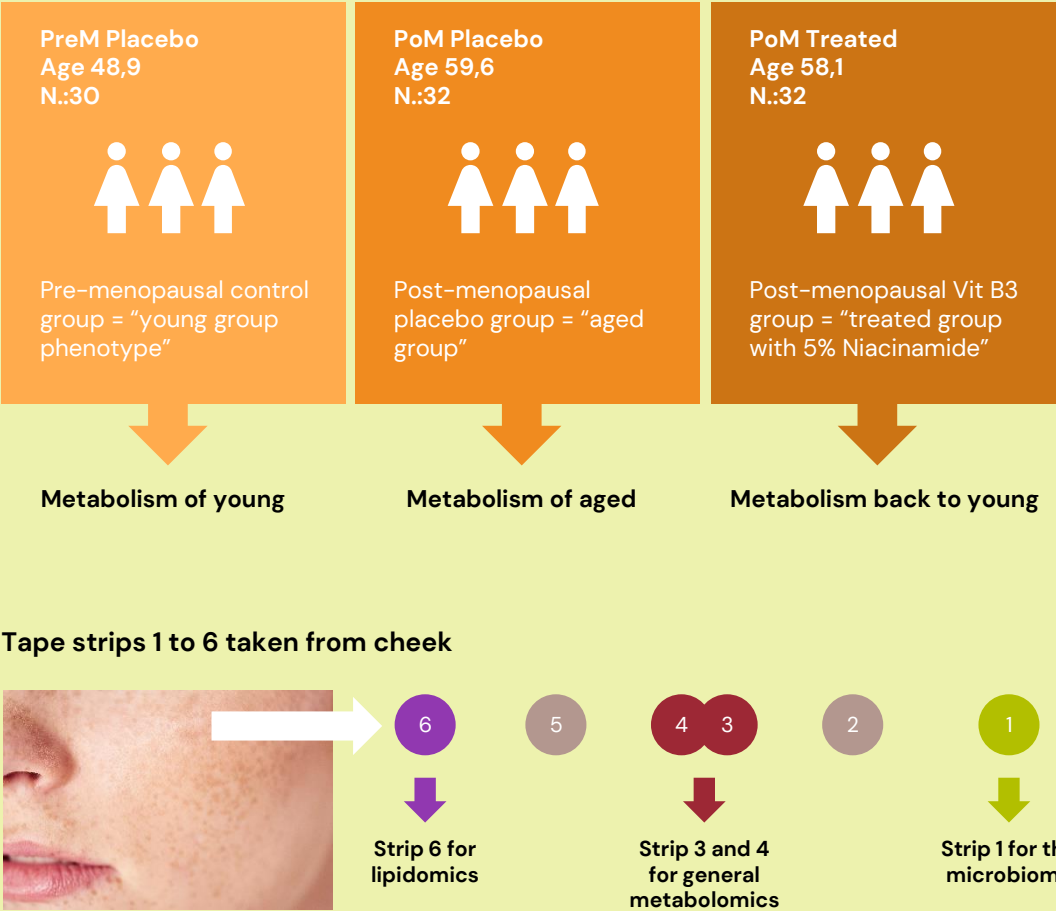


Figure 1. Six D-Squame tape strips were taken from the same spot on the cheek. N.1 used for microbe analysis (no clear conclusion due to variability of the group), n.3 and n.4 for metabolomics and n.6 for lipidomics.

Multipurpose vitamin for multiple skin changes during menopause

Niacinamide: the versatile vitamin

Menopause skin changes	What happens in the skin		Niacinamide Treatment
Epidermal barrier dysfunction	↓	Different distribution of Ceramides	Re-balance ceramides composition to pre-menopausal level Restores hydration Reinforces Epidermal barrier
Loss of hydration	↓	Hydration	
	↑	TEWL	
Sensitive skin	↑	Skin homeostasis and NMF disruption: release of imidazole compounds	Helps to relieve sensitive skin
Reduced energy availability	↓	NAD+ ¹	Supports cellular energy metabolism
Slower skin repair ability	↓	DNA protection and repair	Enhances skin repair
	↓	Cytosine level (marker of DNA protection)	
Reduced skin elasticity, promotes wrinkles	↓	Collagen protection	Boosts skin elasticity, reduced wrinkles
	↑	Free proline (marker of collagen degradation)	
	↓	Collagen production	
Increased UV induced skin damage and photoaging effects	↑	Upregulating histidine degradation (marker of skin homeostasis disruption):	Protects against UV-induced skin damage and photoaging
	↑	release of markers of UV skin damage	

1: NAD⁺ oxidized form of Nicotinamide Adenine Dinucleotide

Niacinamide PC re-balances ceramides composition

Menopause leads to changes in ceramide composition:

The stratum corneum has a high diversity of ceramides, with over 12 main classes and various subspecies of different chain lengths.

Post-menopause skin shows a depletion of ceramides, especially NS, AS, EOS, EOH, and EO leading to:

- Compromised skin barrier function
- Increased dryness and sensitivity
- Reduced elasticity
- Susceptibility to environmental damage

Niacinamide PC boosts Ceramides from within:

Treatment with Niacinamide PC boosts the endogenous ceramides production by 30%, restoring the native distribution of ceramide composition to pre-menopausal levels.

Unlike topical application of ceramides, which may not replicate the complex ceramide profile of the skin, Niacinamide supports a balanced and diverse ceramide composition profile for an healthy skin.

Skin Resilience

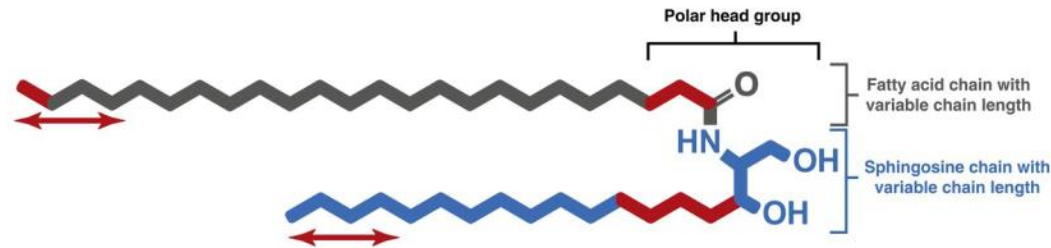
NEW: *in vivo* study

dsm-firmenich 
own study

dsm-firmenich 

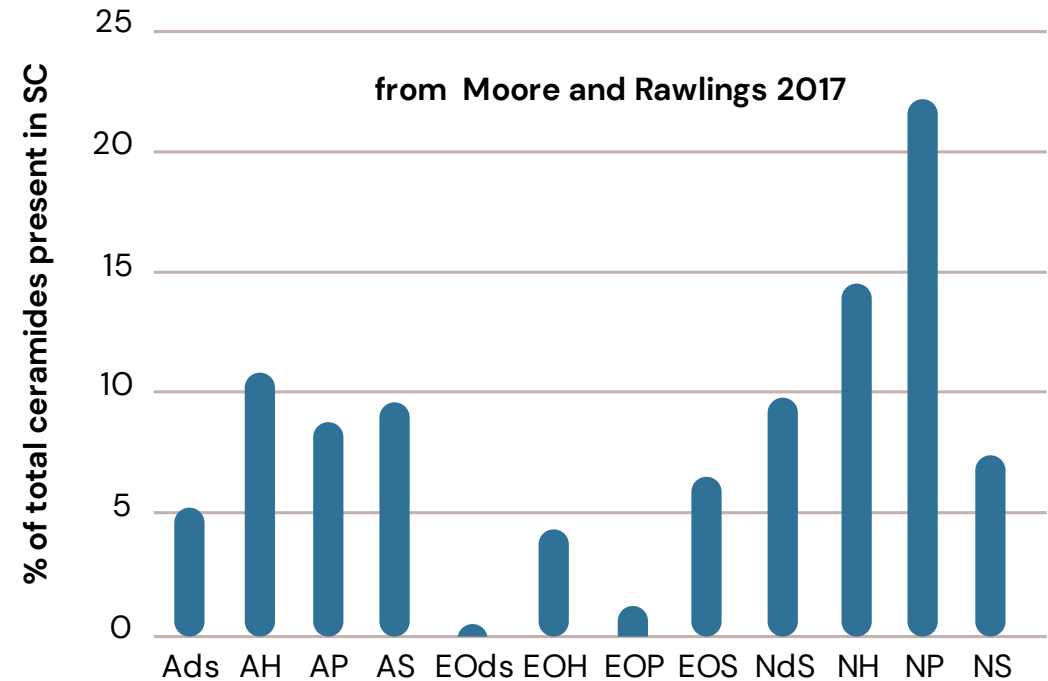
Ceramides in the skin (backup slides)

Diversity of ceramides



	Non-hydroxy fatty acid [N]	α-hydroxy fatty acid [A]	Esterified ω-hydroxy fatty acid [EO]
Dihydrosphingosine [dS]	[NdS]	[AdS]	[EOdS]
Sphingosine [S]	[NS]	[AS]	[EOS]
Phytosphingosine [P]	[NP]	[AP]	[EOP]
6-hydroxy sphingosine [H]	[NH]	[AH]	[EOH]

The stratum corneum has 12 main ceramide classes, but also many subspecies with different chain lengths, making its ceramide diversity very high.



This is a typical ceramide profile of the relative abundance in the stratum corneum of human skin (Moore and Rawlings, 2017).

Generally, ceramides NS, AH, and NH are the most abundant, while EOP and EOds were much less present (based on our in vivo study).

Niacinamide PC: re-balancing ceramides composition

NEW: *in vivo* study

dsm-firmenich
own study

Ceramide Composition Changes:

- Postmenopausal skin shows a tendency in reduction in ceramides NS (-10%), AS (-5%), EOS (-5%), and EOH (-6%).
- There is a significant ($p < 0,05$) increase in ceramides AP (+25%), NP (+17%), and AdS (+17%).

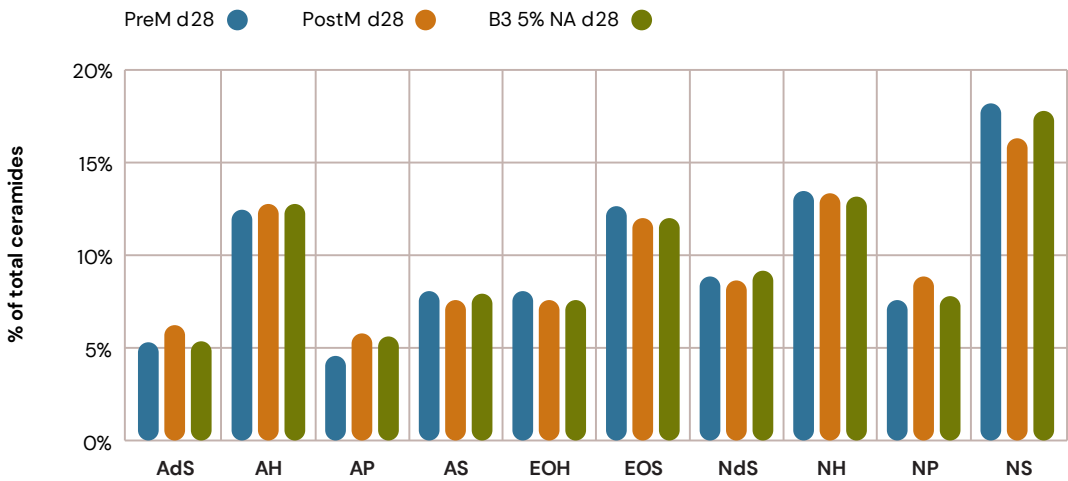
Niacinamide Treatment Effects:

- Niacinamide upregulates ceramides vs placebo with highest increases around 30% significant for NS, NdS, and AS.
- It also decreases NP, AdS, and AP levels, helping to rebalance ceramide distribution.
- Treatment with Niacinamide PC restores a ceramide composition similar to premenopausal skin.

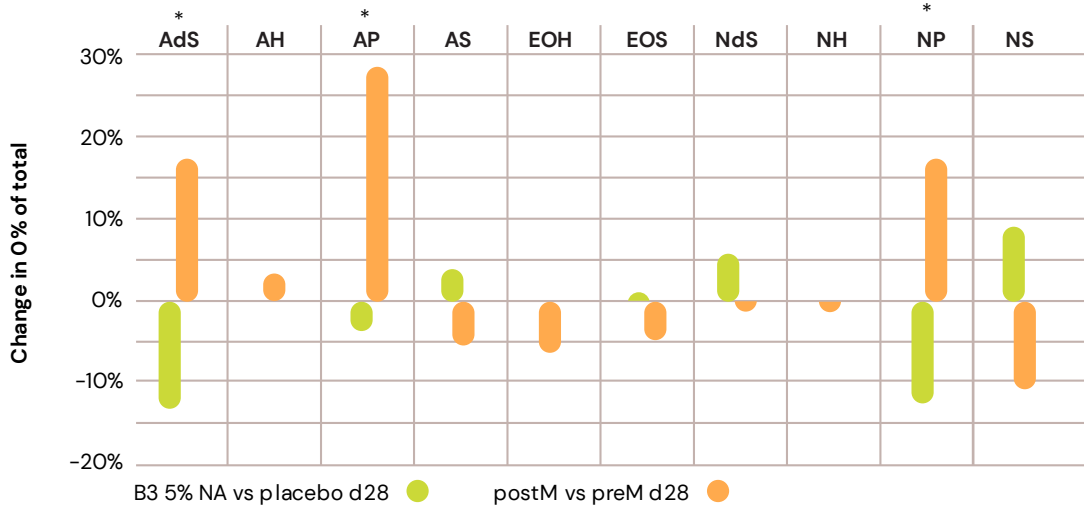
Advantages of Niacinamide:

- Niacinamide PC treatment restores the natural and highly diverse ceramide composition in the skin barrier.
- This approach appears to be more advantageous compared to using limited commercially available ceramides (mostly NP, AP, EOP, NS, and AS), which may increase the ceramide imbalance in post-menopausal skin.

Change in percentage share of total ceramides
Relative content of ceramides on total ceramides content



Relative distribution of ceramide on the total of ceramides * : p value <0.05



NS; AP, NP : ceramide commercially available

dsm-firmenich

Niacinamide PC promotes skin regeneration at cellular level

Postmenopausal skin is more prone to UV-induced DNA damage:

- Aged skin has lower NAD⁺ levels and reduced cytosine and methyl-cytosine, indicating increased DNA damages.

Niacinamide increases NAD⁺ levels, boosting cell energy and enabling DNA repair (skin enzymes that repair DNA require high NAD⁺ levels):

- **DNA repair:** +244% cytosine level vs placebo (*in vivo*).
- **Energy boosting:** Niacinamide protects cells from ATP depletion after UV stress.

Environmental stress protection

NEW: *in vivo* study

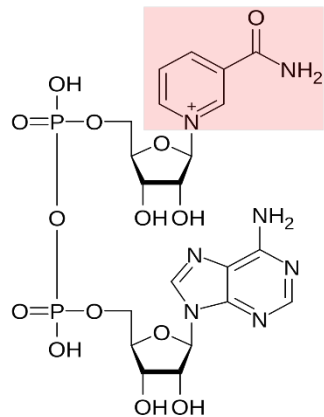
dsm-firmenich ●●●
own study



dsm-firmenich ●●●

NAD+ precursor in two key pathways: energy production and DNA repair

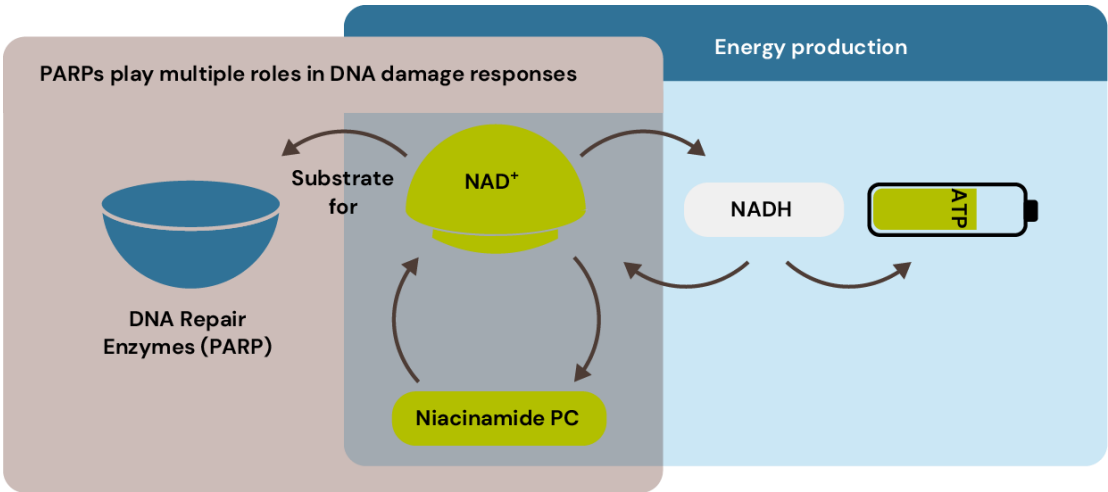
Cellular NAD+ pools are known to be lower in aged skin and treatment with nicotinamide helps restore these levels.



Niacinamide is part of NAD+

NAD+: oxidized form of Nicotinamide Adenine Dinucleotide
PARP: Poly (ADP-ribose) polymerase:

Simplified pathway of cellular energy production (ATP production) with niacinamide and NAD+



NAD+ is a substrate for poly (ADP-ribose) polymerases (PARP).
Enzyme PARP plays multiple roles in DNA damage responses including DNA repair and maintenance of genomic stability.

Significant recovery of cytosine levels after treatment with 5% Niacinamide PC

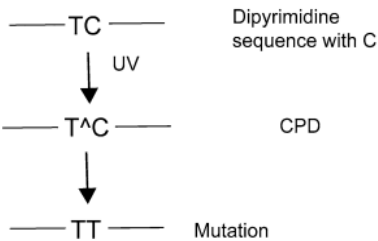
NEW: *in vivo* study

dsm-firmenich
own study

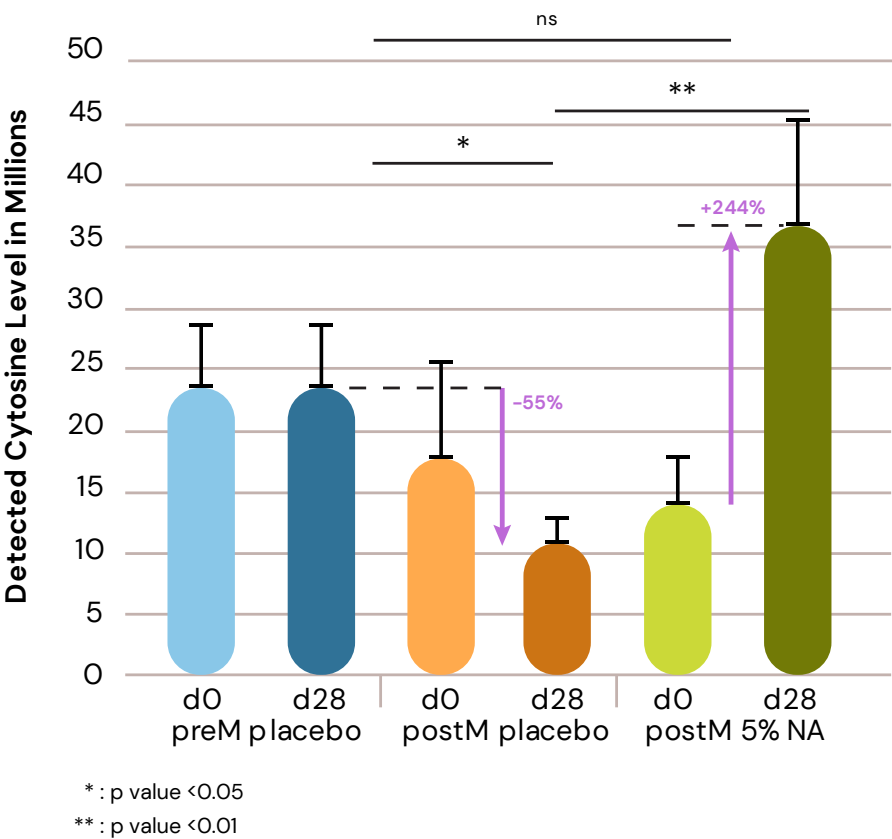
UV from sunlight can induce DNA damage in skin leading to a change in DNA sequence. This molecular lesion results in a depletion of Cytosine, a building base of DNA and RNA.
C-T mutations are highly prevalent in sequenced skin melanoma genomes¹.

- Significant reduction of cytosine (–55%) was observed in post-menopausal skin
- vs pre-menopausal skin as indirect indicator of increased DNA mutations.
- **Impressive significant recovery of cytosine levels (+244% vs placebo after 28 days, even above basal level) after treatment with 5% Niacinamide PC.** Confirming *in vivo* the high efficacy of **Niacinamide to enhance DNA repair**².

DNA mutation induced by UV, resulting to a depletion of Cytosine, converted to Thymine¹.



Cytosine level before and after treatment



Niacinamide PC reduces skin sensitivity and counteracts the effects of photo-aging in post-menopausal skin

Post-menopausal skin is more fragile and prone to UV-induced damage:

- Histidine is up-regulated with age and during menopause, which **unbalances skin homeostasis** and Natural Moisturizing Factor (NMF);
- High levels of imidazole acetaldehyde (catabolic intermediate of histidine) lead to **skin sensitivity, itchiness and redness**.
- High level of cis-urocanic acid (catabolic intermediate of histidine) in post-menopausal skin suggest **less UV protection**

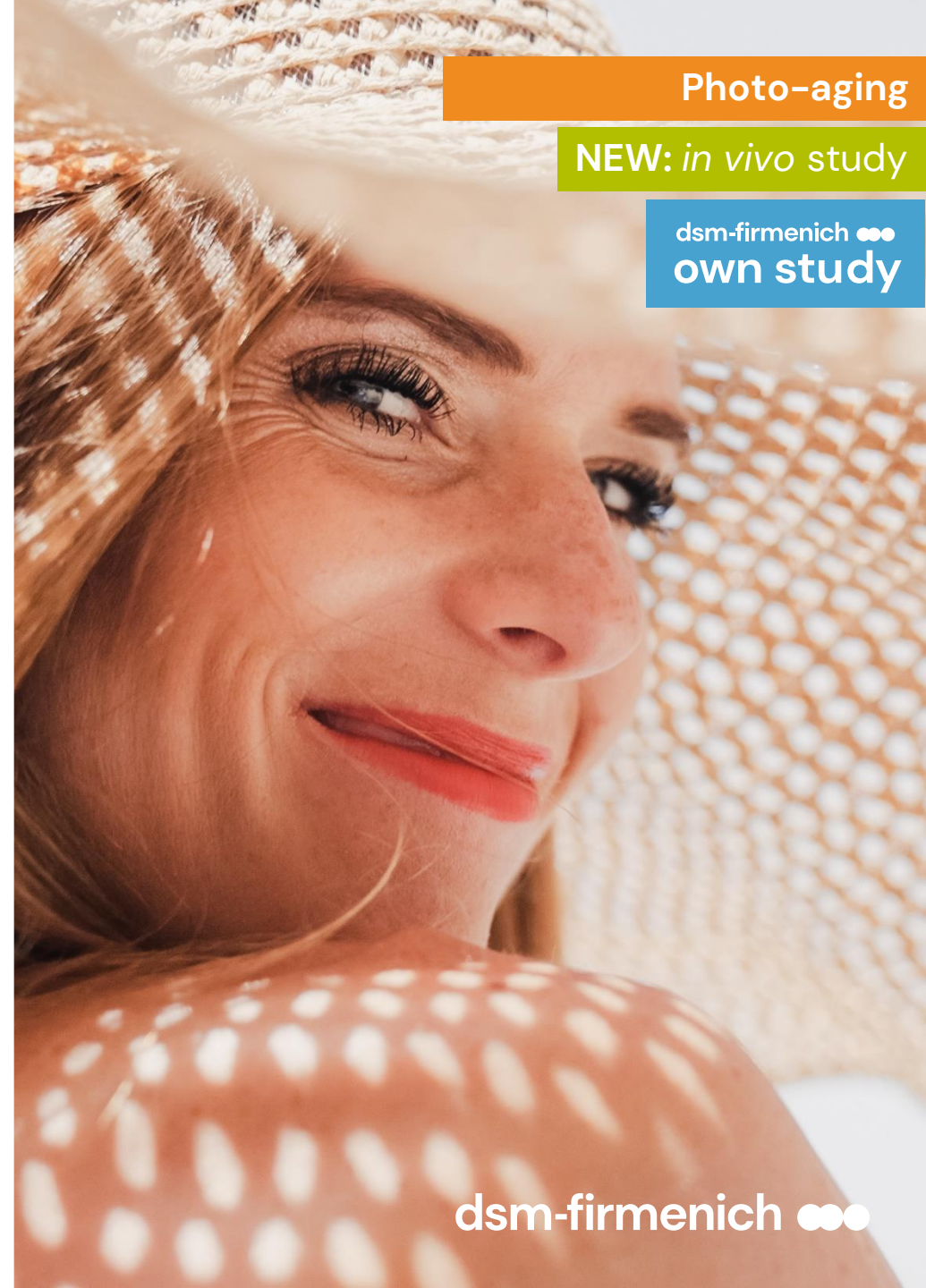
Niacinamide PC helps reducing the symptoms of sensitive skin (redness and itching) and counteracts photo-aging in post-menopausal skin:

- -36% significant reduction of Imidazole acetaldehyde
- -28% decrease of cis-urocanic acid form, maintaining the levels of trans form (a photo-protection marker).

Photo-aging

NEW: *in vivo* study

dsm-firmenich ●●●
own study



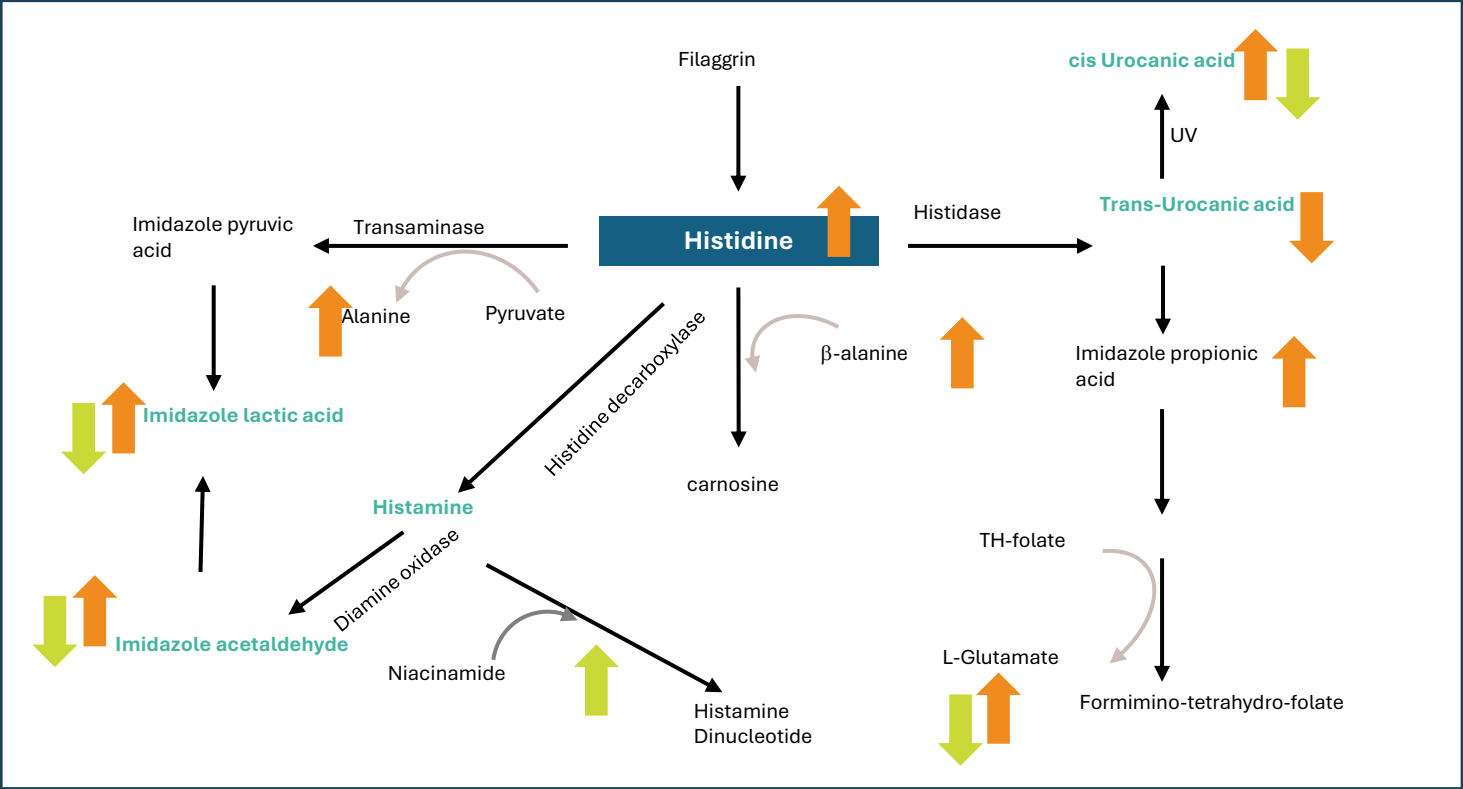
Histidine pathway

Stressed skin and its metabolites

NEW: *in vivo* study

dsm-firmenich
own study

Histidine catabolic pathway in post-menopausal skin at D28, with and without niacinamide treatment



Histidine is a key amino acid, a building block of Filaggrin, a skin protein which is crucial for the Natural Moisture Factor (NMF).

The degradation of histidine leads to catabolic compounds, such as cis-urocanic acid, histamine, which are damaging the skin health:

- Trans-urocanic acid, a natural sunscreen, accumulates in the epidermis and converts to cis-urocanic acid under UV exposure.
- Histidine catabolism produces histamine and its metabolites (imidazole acetaldehyde and imidazole lactic acid), leading to skin sensitivity, itchiness, and redness.

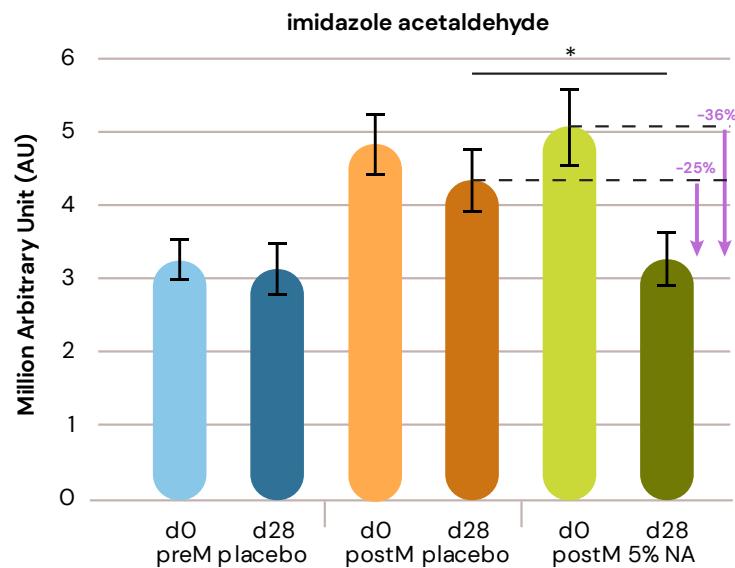
Niacinamide PC rebalances histidine pathway counteracting the effect of UV stress and menopause

NEW: *in vivo* study

dsm-firmenich own study

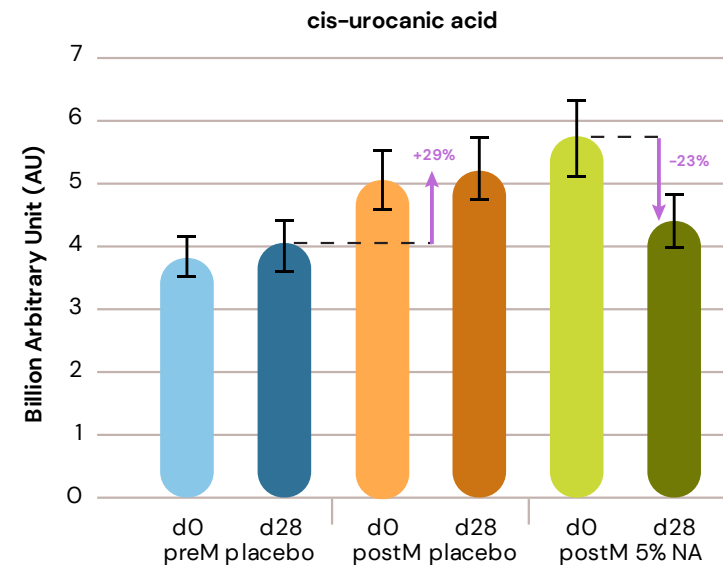
Menopause disrupts skin homeostasis and NMF, upregulating histidine and its catabolic intermediates.

- Elevated imidazole acetaldehyde levels explain increased skin sensitivity, itching, redness, and discomfort in postmenopausal skin.
- Niacinamide PC significantly downregulates imidazole-acetaldehyde by 36% vs baseline, and 25% vs placebo, indicating reduced histamine activity suggesting improvement on sensitive skin symptoms.



*: p value <0.05

- High cis-urocanic acid levels in postmenopausal skin suggest reduced UV protection.
- Treatment with Niacinamide PC show a decrease of 23% in cis-urocanic acid content vs T0.
- Niacinamide PC rebalances UV-stress markers such as cis-urocanic acid counteracting photo-aging.



Results show clear tendency (ns).

Niacinamide protects and stimulates collagen production

Anti-aging Activities

NEW: *in vivo* study

dsm-firmenich 
own study

Menopause causes loss in collagen levels in the skin:

- Menopause causes a significant decline in estrogen, which reduced collagen production and a **rapid drop of collagen levels** in the skin:
- ~30% decrease in the first 5 years after menopause.
- Ongoing depletion of ~2% per year for the next 15 years.
- Additionally, menopausal skin shows elevated levels of **free amino acids like proline and its derivatives**, which are **collagen degradation markers**, highlighting age-related processes.

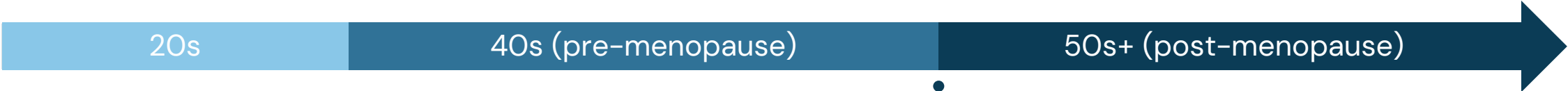
Niacinamide counteracts collagen degradation:

- Niacinamide treatment effectively addresses collagen degradation.
In vivo: **Reduces free proline and acetyl-proline levels.**
- *In vitro*: **Stimulates collagen production.**
- Niacinamide improves skin health during menopause by counteracting collagen degradation and stimulating its production.



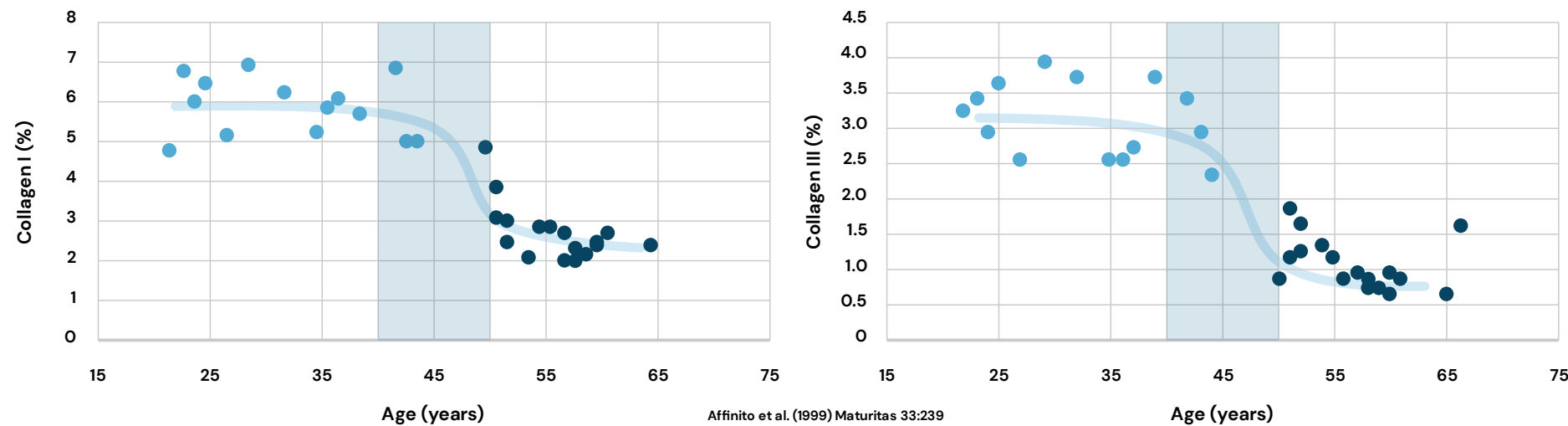
Menopause

Focus on skin changes



Skin collagen content in women pre- vs post-menopause

● Pre-menopause ● Post-menopause



Major drop in collagen I and III levels during menopause

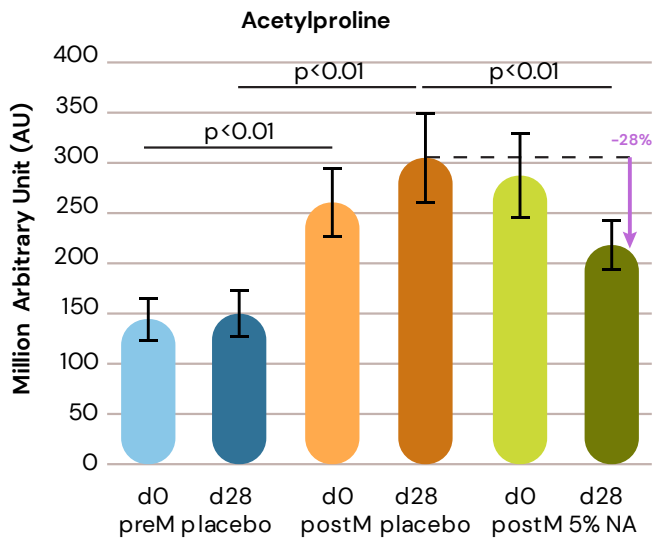
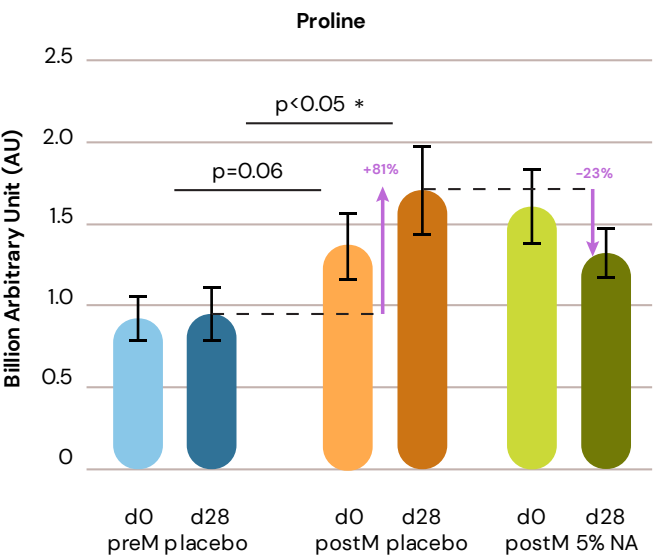
Niacinamide PC protects and stimulates collagen production

NEW: *in vivo* study

dsm-firmenich
own study

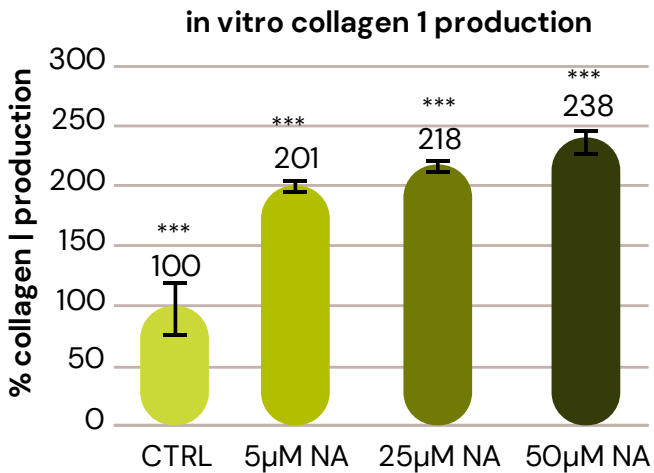
In vivo study:

- Significant increase in post-menopausal vs pre-menopausal skin of free proline (+80%) and acetyl-proline (+100%), indicators of collagen degradation.
- Significant reduction with Niacinamide PC after 28 days vs placebo of acetyl-proline (-28%) and proline (-23%)



In vitro study:

- Niacinamide PC positive effect on stimulation of collagen I synthesis (+138%) in human dermal fibroblasts.



*** p < 0.001

Note: as this is based on a dermal effect it might need more time than 4 weeks to become significant

Niacinamide PC improves skin hydration

Menopause can lead to reduced skin hydration:

Menopause can increase trans-epidermal water loss (TEWL) and consequently, reduce skin hydration, contributing to dryness and compromised skin health.

Niacinamide PC increases skin hydration:

In vivo study confirms that Niacinamide easily penetrates the skin barrier. After topical application, its derived metabolites can be observed in the skin, such as methyl nicotinamide and amino nicotinic acid derivatives, contributing to increase skin health.

High level of Niacinamide is correlated with reduced water loss (TEWL) and consequent increase of skin hydration.

Clinical results show that, compared to TO, treatment with 5% Niacinamide PC for 28 days led to:

- +23% increase in skin hydration
- – 19% reduction in TEWL

Niacinamide PC effectively improves skin hydration and skin barrier function.

Healthy skin barrier

NEW: *in vivo* study

dsm-firmenich 
own study



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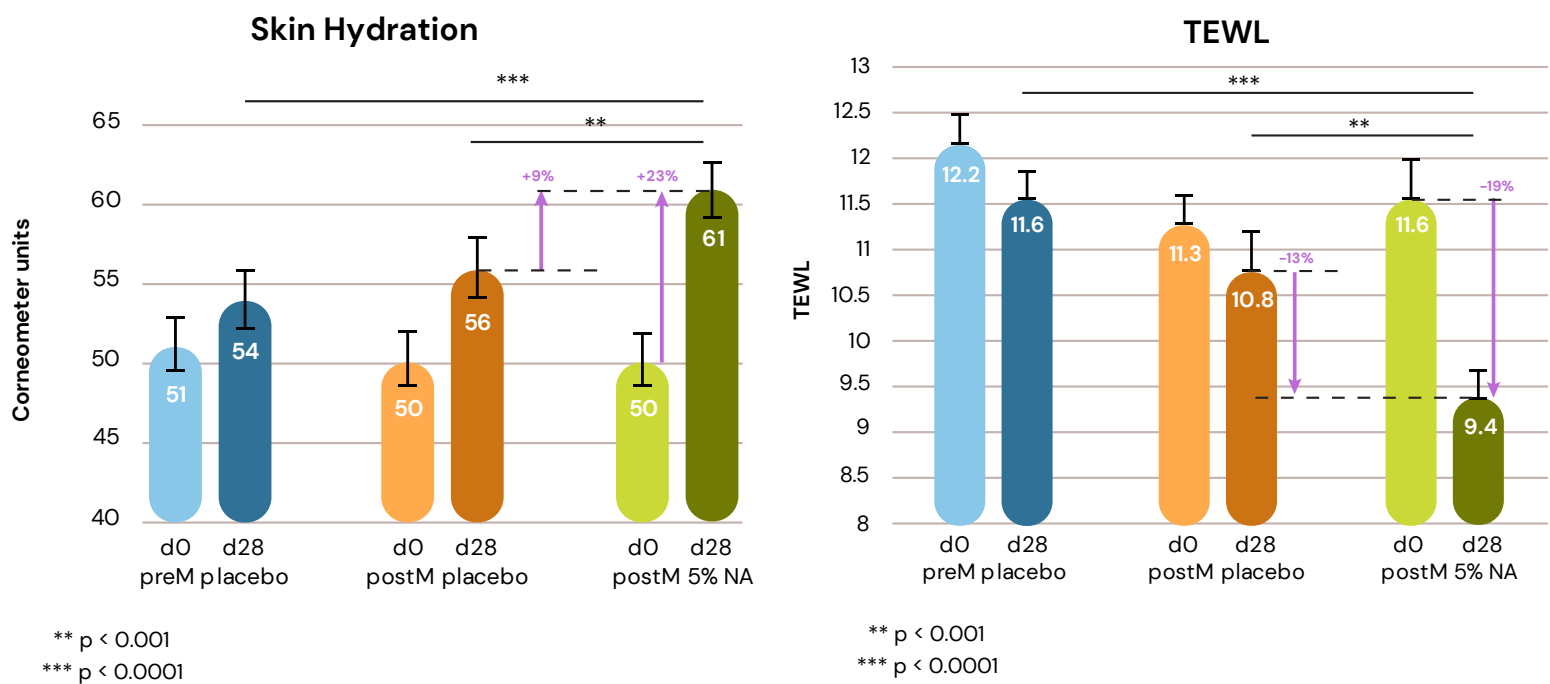
Niacinamide PC reinforces skin barrier

NEW: *in vivo* study

dsm-firmenich
own study

TEWL and Hydration graphs:

- Pre vs post menopause
- Pre vs pre/post menopause after treatment with Niacinamide



Hydration:

- At T0 no difference between pre- and post-menopausal group
- **+23%** significant increase with 5% Niacinamide after 4 weeks on post-menopausal group vs T0 and vs placebo

TEWL:

- At T0 slight difference between pre- and post-menopausal group (+5%)
- **-19%** significant drop with 5% Niacinamide after 4 weeks on post-menopausal group vs T0 and vs placebo

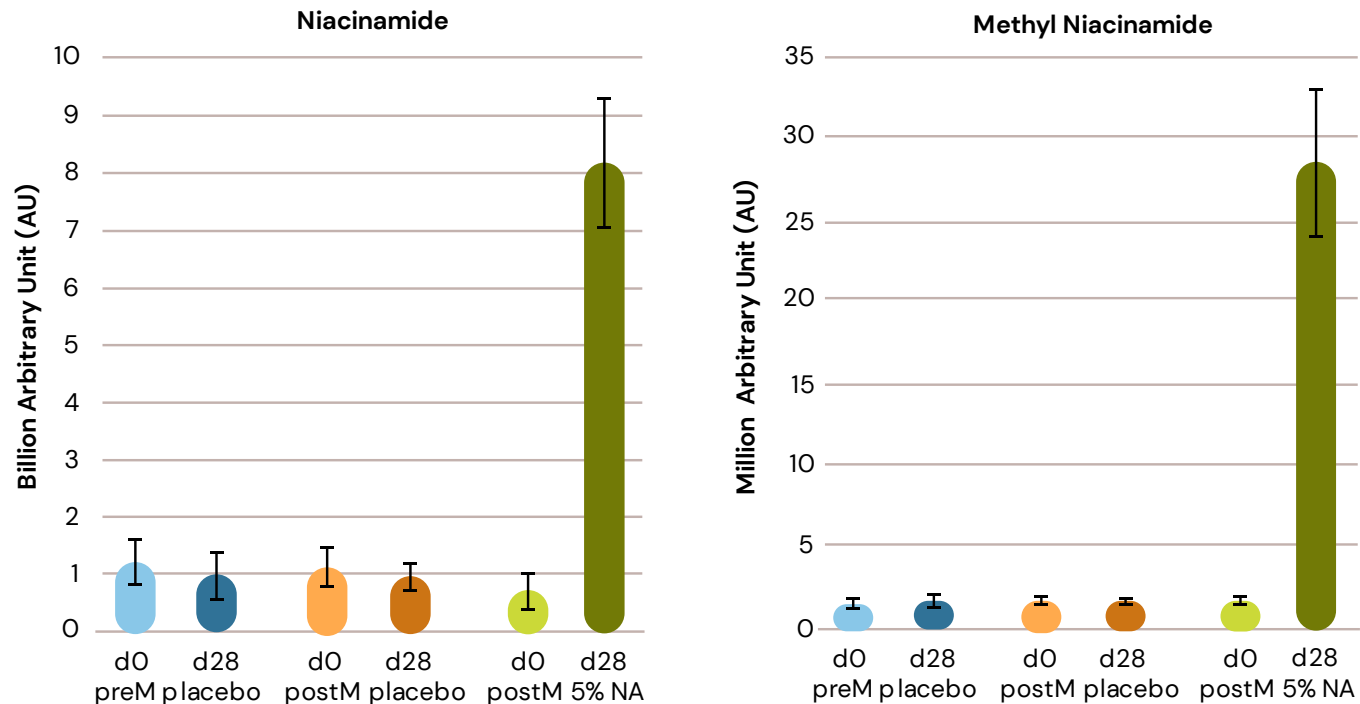
Skin measurements of the premenopausal group (preM) and postmenopausal groups (poM) before day0 (left column) and after treatment day28 (right column). NA =5% niacinamide formulation. Absolute measured values are shown for Corneometer and TEWL.

Topical application of Niacinamide PC drastically boosts Niacinamide and its metabolites in the skin

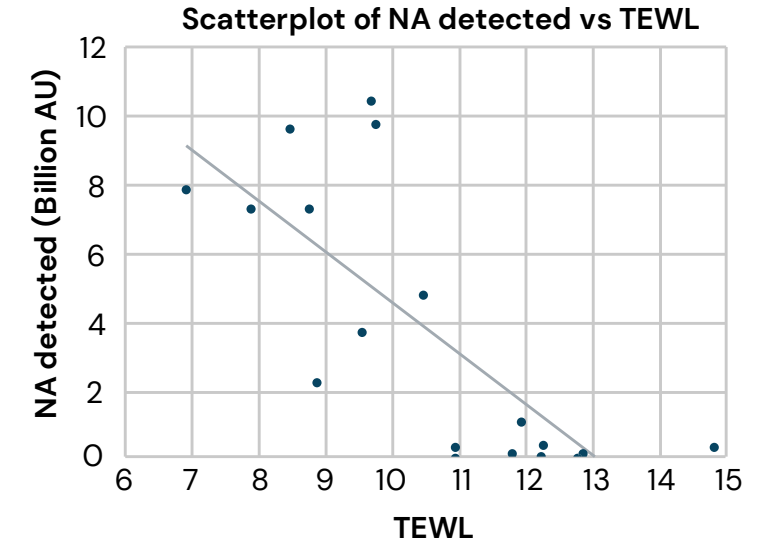
NEW: *in vivo* study

dsm-firmenich
own study

Niacinamide (X8) and Methyl niacinamide (x12) show **significant** increase after 4 weeks treatment with 5% niacinamide vs placebo.



High level of Niacinamide in skin is clearly correlated to lower TEWL.



The Pearson correlation coefficient is -0.76 and the p value 0.0002

04

Combination of
Niacinamide PC
and key bioactives for
hyperpigmentation
control

Hyperpigmentation Solutions

The approach

- Carefully selecting the best combination of active ingredients to design the best solution to target the pigmentation problematic
- It combines tried and true science-backed ingredients and heritage ingredients
- Targeting different key mode of actions contributing to increased efficacy



DOUBLE ACTIVE (1)

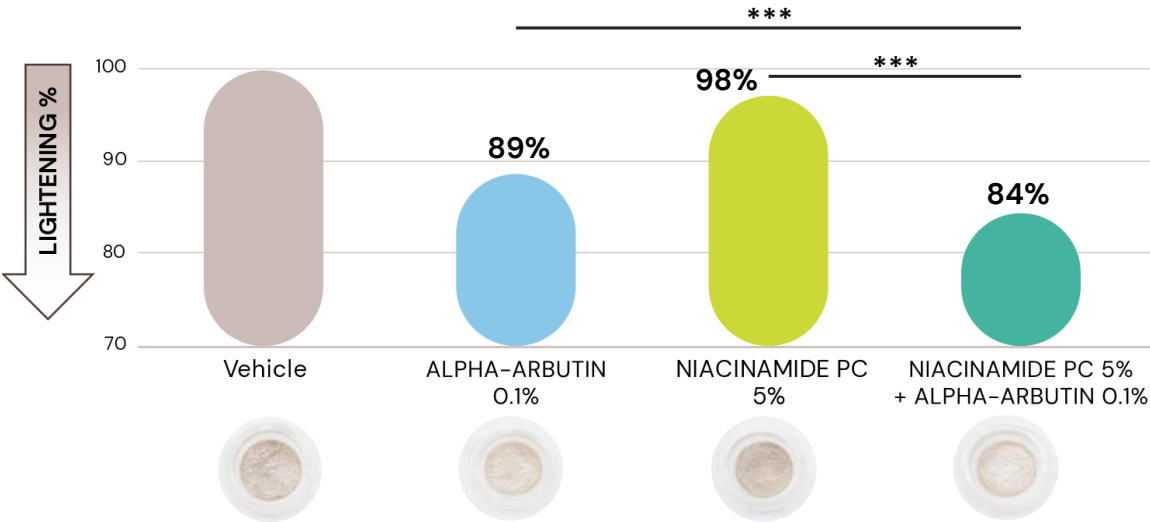
Niacinamide PC plus ALPHA-ARBUTIN

Mode of actions:

- Inhibits melanosome transfer from melanocytes to surrounding keratinocytes¹
- Directly inhibiting the tyrosinase enzyme²

Tested on reconstituted tanned human skin (Fitzpatrick skin type V)

- Skin lightening was measured with Chromameter



- Visible results
- Significant skin lightening improvement by ALPHA-ARBUTIN (0.1%) and NIACINAMIDE PC (5%)



DOUBLE ACTIVE (2)

Niacinamide PC plus OXY 229 CB

Mode of action:

- Helps to minimize redness^{1,2}
- Inhibits melanosome transfer from melanocytes to surrounding keratinocytes¹
- Favoring epidermal turnover and the removal of pigmented cells²

Dermatologically tested in China

- According NMPA (National Medical Products Administration) skin whitening standard test (I) in China

¹ NIACINAMIDE PC, ² OXY 229 CB



DOUBLE ACTIVE

NIACINAMIDE PC plus OXY 229 CB



Study design
according NMPA China skin
whitening standard test (I)



Comparative (benchmark),
randomized clinical study
performed in China



- 30 Chinese subjects
- 7 males and 23 females
aged from 26 – 60 years old
- Test area: thigh



- Formulation with 7% Ascorbic
acid
- Formulation with
3% NIACINAMIDE PC
2% OXY 229 CB

Measuring time points:
DO, Week 1, Week 2, Week 3, Week 4

	4 Days	DO	Week 1	Week 2	Week 3	Week 3
UV stress ¹	X	-	-	-	-	-
Product application ²	-	-	X	X	X	X
Skin ITA° measurement ³	-	X	X	X	X	X
Melanin index (MI) measurement ⁴	-	X	X	X	X	X

¹Each test area was irradiated with a xenon arc lamp daylight simulator (with UVA+UVB wavelengths) at 0.75 times the MED dose once a day for 4 consecutive days.

²Product application: twice a day

³Skin ITA° (lightening) characterizes human skin color by measuring skin L*a*b* data with a skin colorimeter

⁴Melanin index (MI) is an optical skin parameter related to the melanin content in the tissue. It can be measured by spectrophotometry (Melanin meter).

DOUBLE ACTIVE: Niacinamide PC plus OXY 229 CB

Significant and visible lighter skin tone

After 1 week

- +13% lighter skin
- -5% melanin

After 2 weeks

- +19% visibly (ITA° > 3) lighter skin
- -7% melanin

After 4 weeks

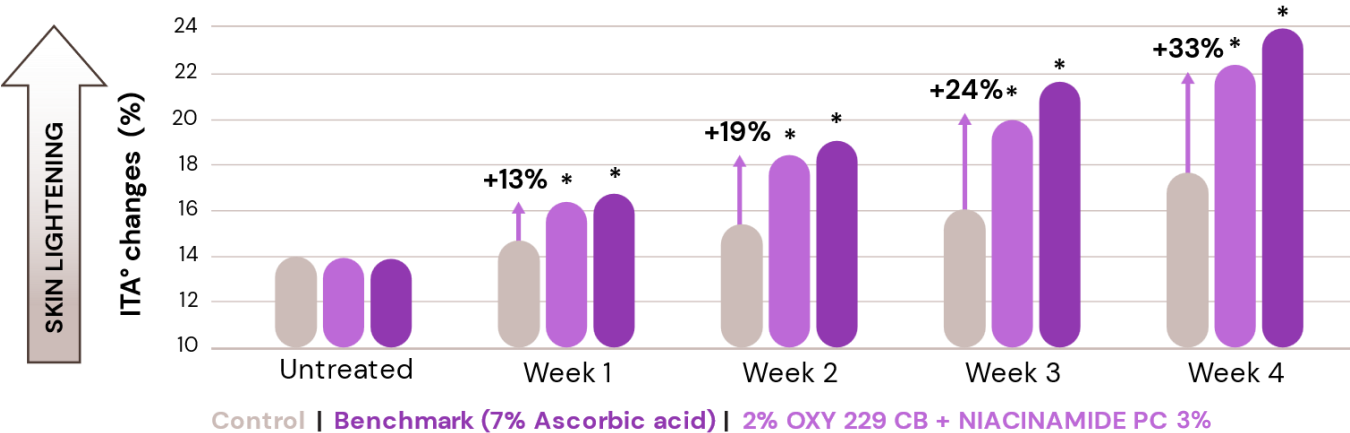
- +33% visibly (ITA° > 3) lighter skin
- 14% melanin

Significant results

Similar to the benchmark 7% Ascorbic acid

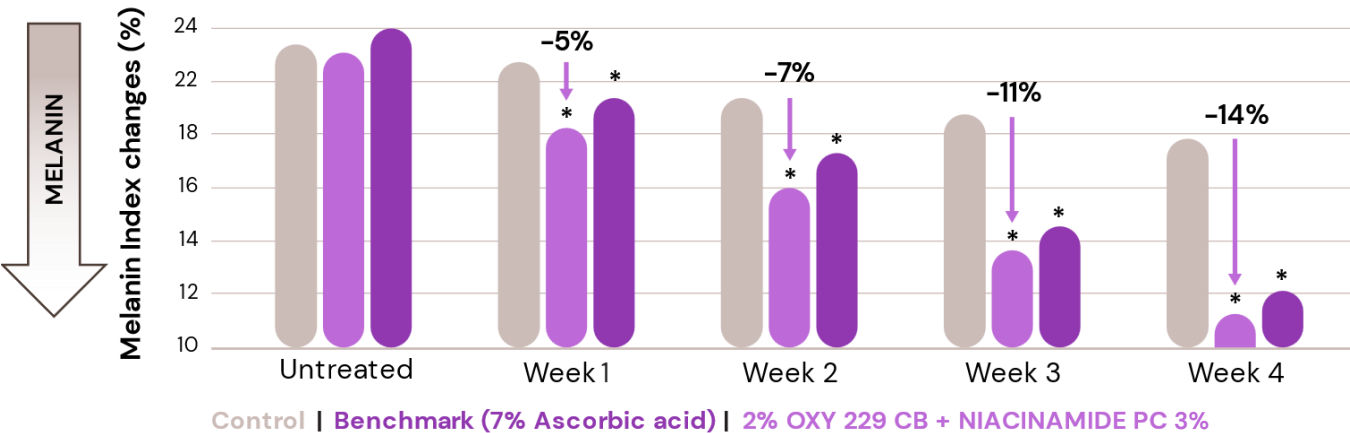
Evolution of ITA° changes (%)

* P < 0.05 compared to control Δ ITA° of >3 can be distinguished visually



Evolution of Melanin Index (MI) changes

* P < 0.05 compared to control



TRIPLE ACTIVE

Niacinamide PC plus ALPHA-ARBUTIN plus REGU®-FADE

Mode of action:

- Help to minimize redness^{1,3}
- Act as a strong antioxidant ³
- Intervening in the pre-melanin synthesis processes³
- Directly inhibiting the tyrosinase enzyme^{2,3}
- Inhibits melanosome transfer from melanocytes to surrounding keratinocytes^{1,3}
- **Dermatologically tested in China**
According NMPA (National Medical Products Administration)
skin whitening standard test (II) in China

¹ NIACINAMIDE PC, ² ALPHA-ARBUTIN, ³ REGU®-FADE



TRIPLE ACTIVE

NIACINAMIDE PC plus ALPHA-ARBUTIN plus REGU®-FADE

Study design
according NMPA China skin whitening standard test (II)

 Placebo controlled, randomized clinical study performed in China



- 30 Chinese subjects (test product group)
- 30 Chinese subjects (placebo group) aged from 23 – 58 years old
- Test area: facial age spot areas



- Formulation placebo
- Formulation with 3% NIACINAMIDE PC 0.3% ALPHA-ARBUTIN 0.05% REGU®-FADE

Measuring time points:
DO, Week 2, Week 4, Week 8

	DO	Week 2	Week 4	Week 8
Product application ¹	-	X	X	X
Skin ITA° measurement ²	X	X	X	X
Melanin index (MI) measurement ³	X	X	X	X

¹Product application: twice a day

²Skin ITA° (lightening) characterizes human skin color by measuring skin L*a*b* data with a skin colorimeter

³Melanin index (MI) is an optical skin parameter related to the melanin content in the tissue. It can be measured by spectrophotometry (Melanin meter)

TRIPLE ACTIVE: NIACINAMIDE PC + ALPHA-ARBUTIN + REGU®-FADE

Significant lighter age spots

Significant results

After 2 week

- +6% lighter age spots
- -3% melanin

After 4 weeks

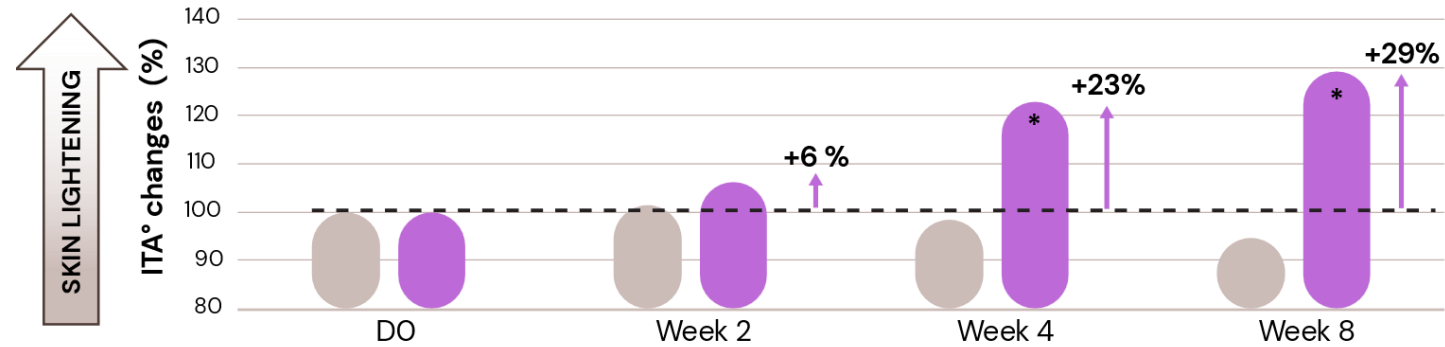
- +23% lighter age spots
- -5% melanin

After 8 weeks

- +29% lighter age spots
- 9% melanin

Evolution of ITA° changes (%)

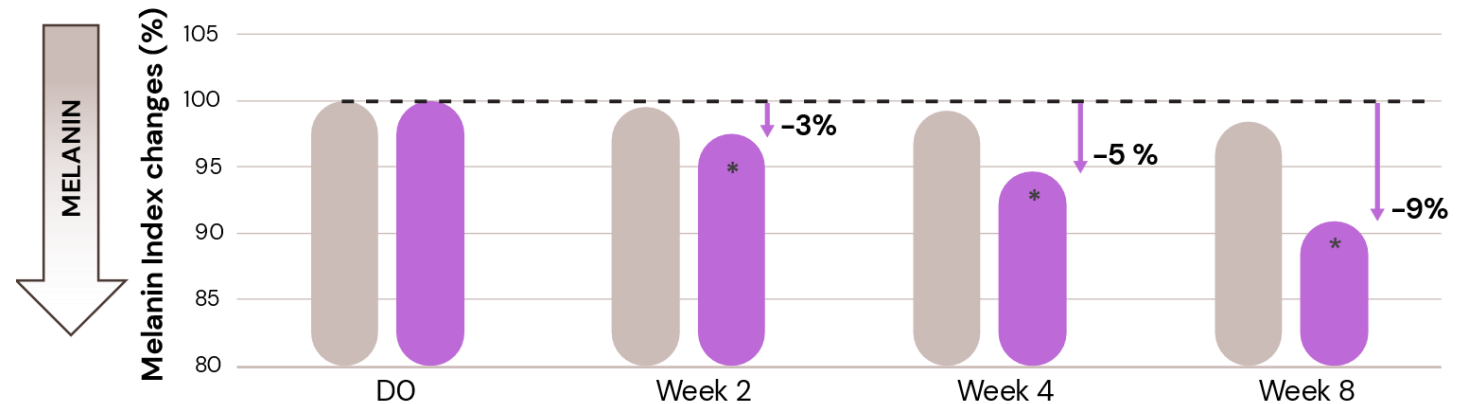
* P < 0.05 compared to control



Placebo | 3% NIACINAMIDE PC + 0.3% ALPHA-ARBUTIN + 0.05% REGU®-FADE

Melanin Index changes (%)

* P < 0.05 compared to control



Placebo | 3% NIACINAMIDE PC + 0.3% ALPHA-ARBUTIN + 0.05% REGU®-FADE

05

Niacinamide PC in haircare

Hair changes in menopause

During menopause, hair grows slower, and follicles continue to shrink leaving hair thinner and thinner. Women can experience as well dry and itchy scalp.

The hair concerns related to menopause are very emotional and can lead to a loss of self-confidence and to sadness.

The main hair symptoms related to menopause are hair loss for 29% of the consumers and hair thinning (25% of the consumers) followed by scalp and hair dryness sensation.

When consumers experience hair concerns related to menopause, they start to look for dedicated solutions to their own symptoms.

Shampoo is the main preferred product for 58% of the consumers followed by conditioner and leave-on for the scalp.

Menopause is a very personal experience and each women experiments and deserves her own hair care solution.



Quali-B

Vitamin B3 (Niacinamide PC)

ID Card



Key benefit:	Scalp Care (strengthens scalp barrier / moisturization) Hair Thickening (helps increase hair diameter)		
INCI name:	Niacinamide		
Description:	Niacinamide PC has a low guaranteed level of residual nicotinic acid to address any concerns about unpleasant scalp sensations		
Technical:	Form: Powder Use level: Up to 7% pH of use: 4 to 8	Preservative: Free Solubility: Water soluble	Target: Scalp and hair fiber Biodegradability: Readily biodegradable

Registration
certification



Quality for Life™ seal that guarantees the highest standards for Quality, Reliability, Traceability, and Sustainability.

Vitamin B3 (Niacinamide PC)

Penetrates the hair and contributes to thicken & strength the fiber

Significantly increases fiber diameter*

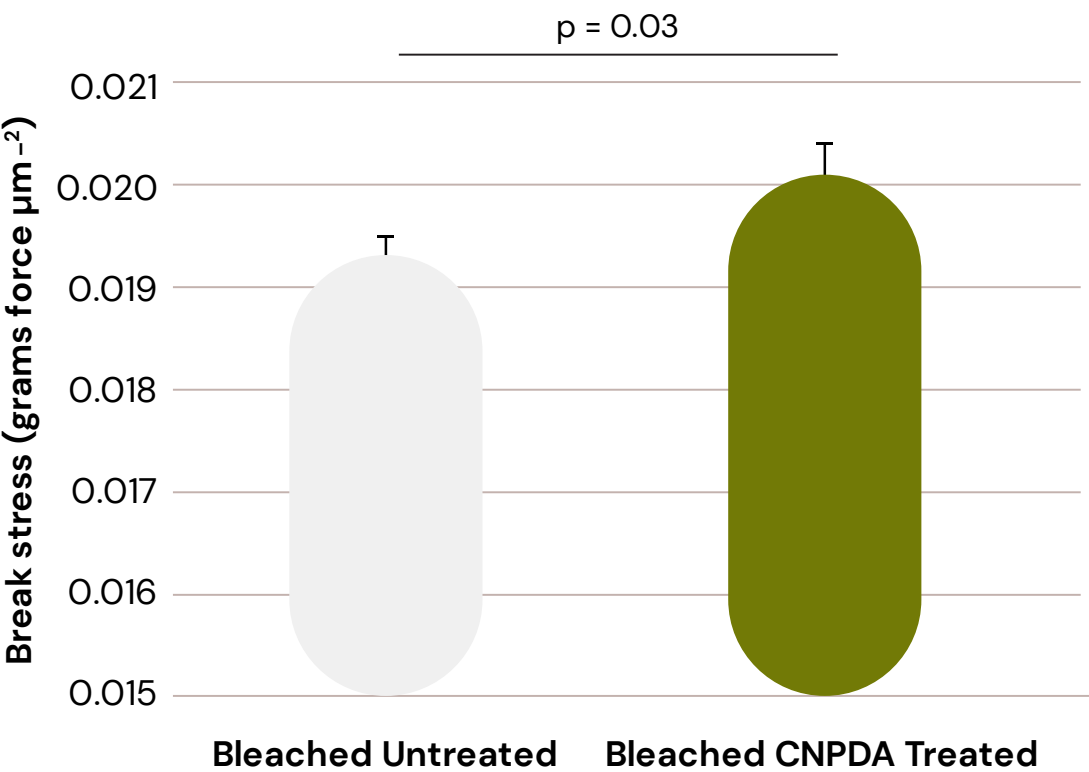


White represents Niacinamide penetrated and deposited on the surface of the hair fiber



Autoradiographic image with Caucasian, bleached hair.

Improves fiber resistance to breakage by ~4%*



Fiber break stress for CNPDA Treated hair fibers at 60% relative humidity.

Data reported as mean + SEM.

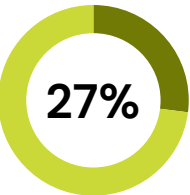
*Results based in the combination of Caffeine, Niacinamide, Panthenol, Dimethicone and Acrylate polymer (CNPDA)

J.H. Thomas et al., A novel cosmetic approach to treat thinning hair, British Association of Dermatologists, 2011 165 (Suppl. 3), pp24–30

Vitamin B3 (Niacinamide PC)

Improves resilience for a healthier scalp

in vivo studies

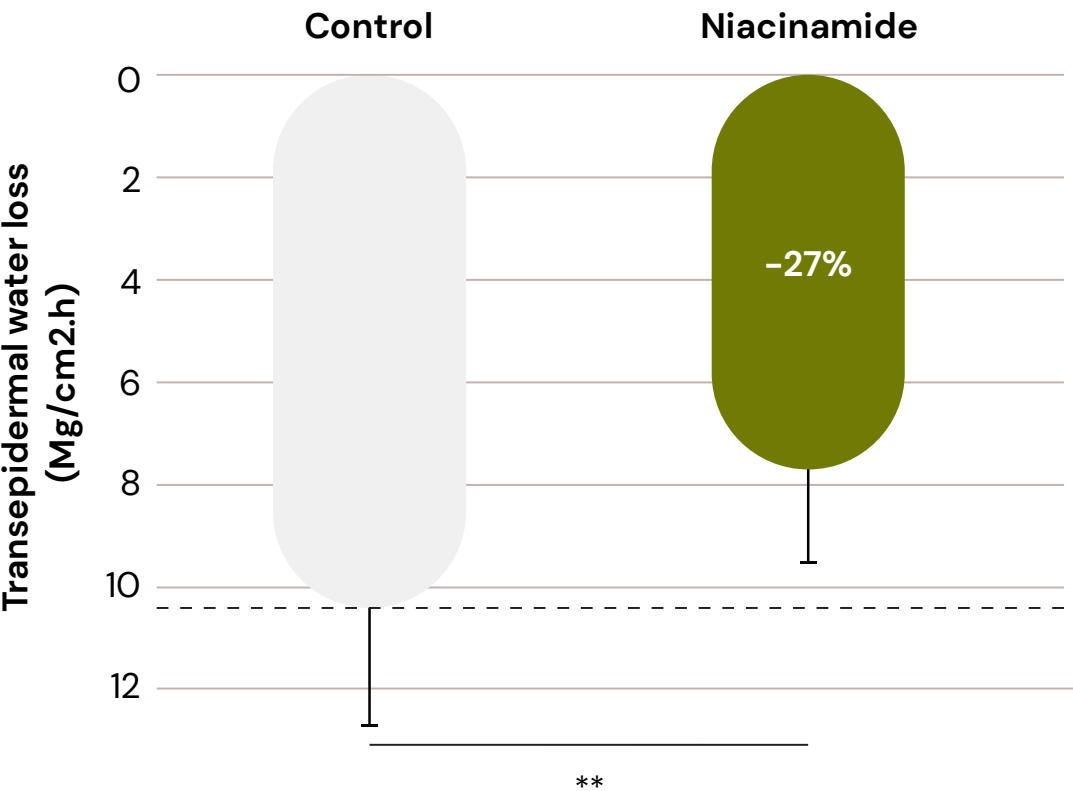


TEWL was **reduced by 27%** when skin was treated twice daily with **Niacinamide** for 4 weeks



2% **Niacinamide PC** helps to keep the scalp **hydrated**

Strengthens Scalp Barrier:
-27% water loss reduction improving scalp **hydration**



S. Inoue, Nicotinamide increases biosynthesis of ceramides as well as other stratum corneum lipids to improve the epidermal permeability barrier, British Journal of Dermatology, 2000; 143: 524-531

** p < 0.01

NIAWAVE

Niacinamide PC for a new wave of beauty



NIAWAVE

Niacinamide PC for
a new wave of beauty

Aging brings its own set of challenges, but it also has the power to unlock new opportunities for a more fulfilling life. Embrace the beauty of maturity with **NIAWAVE**.

NIAWAVE is a skincare line crafted to cater your skin's evolving needs and to honour your powerful beauty.

Recent scientific studies on pre and post-menopausal skin highlight the pivotal role of Niacinamide PC in addressing menopausal skin changes. This potent ingredient helps prevent photoaging, boosts collagen production, reduces inflammation, and minimizes sensitivity to daily stressors, promoting healthy aging.

For skin that is stronger, more resilient,
and radiant, just like you.

NIAWAVE

Niacinamide PC for
a new wave of beauty



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NIAWAVE

Niacinamide PC for
a new wave of beauty

BRIGHT ENERGY SERUM

With a powerful combination of Niacinamide PC and vitamins B5, C, and E, our facial serum is perfect for maintaining radiant, even-toned skin at every stage of life. It helps control hyperpigmentation, energizes the skin, and restores its glow and vitality during the challenges of menopause. Plus, it reduces signs of aging, helping you look youthful and face hormonal changes with greater confidence.



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NIAWAVE

BRIGHT ENERGY SERUM

93,41% Natural Origin content according to ISO 16128



PHASE	INGREDIENTS	INCI NAME	% W / W
A	Water Dem	AQUA	59,00
	STAY-C® 50	SODIUM ASCORBYL PHOSPHATE	3,00
	Niacinamide PC	NIACINAMIDE	3,00
	SODIUM METABISULFITE	SODIUM METABISULFITE	0,10
	D-PANTHENOL	PANTHENOL	1,00
	Edeta® BD	DISODIUM EDTA	0,10
B	Glycerin 99.5%	GLYCERIN	5,00
	Propanediol	PROPANEDIOL	25,00
	HYA-ACT™ M	SODIUM HYALURONATE	0,20
C	DL-alpha-Tocopheryl Acetate	TOCOPHERYL ACETATE	0,10
	Focusguard PE 9010	PHENOXYETHANOL, ETHYLHEXYLGLYCERIN	0,60
	PEG-40 HYDROGENATED CASTOR OIL	PEG-40 HYDROGENATED CASTOR OIL	1,20
	RB-211127 Facial 2	PARFUM	0,50
D	Citric Acid 25% solution	AQUA, CITRIC ACID	1,20

SK-E-103204-1

PROCEDURE:

- 1 Prepare Phase A and stir until it's homogenous.
- 2 Add Phase B under stirring, until it's homogenous.
- 3 Add Phase C as a premix and homogenize under stirring.
- 4 Adjust pH with Phase C

TECHNICAL DATA:

pH: 7,3 Viscosity: < 100 mPa.s

Technical Specificity: Opalescent

The formulation fulfils the 3 months stability at 4°C, room temperature, 40°C

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NIAWAVE

Niacinamide PC for
a new wave of beauty

BALANCING FACIAL CREAM

Our facial cream is your perfect partner for your skincare routine during menopause! With Niacinamide PC and vitamins B5, B6, and B12, it restores ceramide balance, strengthens the skin's barrier, and delivers deep hydration. It also stimulates collagen production, while smoothing out fine lines and wrinkles, combating dryness and sensitivity that often accompany this life stage. Best of all, it protects against environmental stress and hormonal changes, leaving you looking radiant and full of vitality.



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NIAWAVE

BALANCING FACIAL CREAM



PHASE	INGREDIENTS	INCI NAME	% W / W
A	Water Dem	AQUA	78,49
	Ecogel™	LYSOLECITHIN, SCLEROTIUM GUM, PULLULAN, XANTHAN GUM	2,50
	Propanediol	PROPANEDIOL	3,00
	Dermosoft® Octiol	CAPRYLYL GLYCOL	0,20
	Cosphaderm® Pentiol natural	PENTYLENE GLYCOL	3,00
B	Myritol® 318	CAPRYLIC/CAPRIC TRIGLYCERIDE	5,00
	Perfume Fleur de peau RS90514	PARFUM	0,15
C	VALVANCE® Touch 210	SILICA	1,00
D	Niacinamide PC	NIACINAMIDE	4,00
	D-Panthenol 75 L	PANTHENOL, AQUA	2,00
	PYRIDOXINE HYDROCHLORIDE (VITAMIN B6)	PYRIDOXINE HCL	0,20
	Vitamin B12 Cryst Food Grade	CYANOCOBALAMIN	0,01
E	Sodium Hydroxide 10% Solution	AQUA, SODIUM HYDROXIDE	0,45

SK-E-103205-1

PROCEDURE:

- 1 Prepare Phase A and heat up to 75°C–80°C under stirring for 30 min.
- 2 Prepare Phase B under stirring.
- 3 Add Phase B into Phase A under stirring.
- 4 Add Phase C into Phase A+B and homogenize at 18000 rpm for 2 min.
- 5 Cool down to 35°C under stirring.
- 6 Add ingredients of Phase D one by one into the emulsion under stirring.
- 7 Adjust pH to 7 with Phase E.

TECHNICAL DATA:

pH: 7,2 Viscosity (spindle RV-4 / 10 rpm): 8640 mPa.s
 Technical Specificity: Opaque

The formulation fulfils the 3 months stability at 4°C, room temperature, 40°C, 50°C and daylight

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NIAWAVE

Niacinamide PC for
a new wave of beauty

PROTECT & REPAIR STICK RADIANT SHIELD

Looking for an easier way to protect your skin from daily sun damage? Check out our powerful stick! Enriched with Niacinamide PC (2.5%), it offers superior UV protection with the super trio of PARSOL® UV filters while boosting your skin's natural repair against sun damage. It prevents photoaging and leaves your skin healthy and glowing like the sun itself!



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NIAWAVE

PROTECT & REPAIR
STICK RADIANT SHIELD

PHASE	INGREDIENTS	INCI NAME	% W / W
A	UVA-sorb HEB	DIETHYLHEXYL BUTAMIDO TRIAZONE	3,00
	Cetiol® B	DIBUTYL ADIPATE	10,00
B	PARSOL® DHHB	DIETHYLAMINO HYDROXYBENZOYL HEXYL BENZOATE	9,50
	PARSOL® EHT	ETHYLHEXYL TRIAZONE	2,50
	PARSOL® Shield	BIS-ETHYLHEXYLOXYPHENOL METHOXYPHENYL TRIAZINE	5,00
	Finsolv® TN	C12-15 ALKYL BENZOATE	15,00
	Cetiol® CC	DICAPRYLYL CARBONATE, TOCOPHEROL	10,00
	Eutanol® G 16	HEXYLDECANOL	9,70
	KahlWax 2811 Rice	ORYZA SATIVA BRAN CERA	9,50
	KahlWax 2225 Phyto	HELIANTHUS ANNUUS SEED CERA, OLEA EUROPAEA OIL UNSATURATED, RHUS VERNICIFLUA PEEL CERA, SHOREA ROBUSTA RESIN	5,00
	KahlWax 6642 Organic Carnauba	COPERNICIA CERIFERA CERA	3,50
	antaron™ soja glyceride	MALEATED SOYBEAN OIL GLYCERYL/OCTYLDODECANOL ESTERS	2,00
	Mixed Tocopherols 95	TOCOPHEROL	0,20
	DL-alpha-Tocopheryl Acetate	TOCOPHERYL ACETATE	0,50
	Eldew SL-205	ISOPROPYL LAUROYL SARCOSE	2,40
	Niacinamide PC	NIACINAMIDE	2,50
C	Water Dem	AQUA	4,99
	Vitamin B12 cryst Food Grade	CYANOCOBALAMIN	0,01
	SODIUM GLUCONATE GRANULAR	SODIUM GLUCONATE	0,40
D	ACTICIRE MB	JOJOBA ESTERS, ACACIA DECURRENS FLOWER CERA, HELIANTHUS ANNUUS SEED CERA, POLYGLYCERIN-3	4,00
	GLACIAL CASCADE CHBG-2587/15	PARFUM, CITRONELLOL, HEXYL CINNAMAL	0,30

SU-E-103209-1

PROCEDURE:

- 1 Prepare Phase A and heat up to 90°C under stirring until homogeneous.
- 2 Prepare Phase B and add it to Phase A.
- 3 Heat Phase A+B to 90°C under stirring until homogeneous.
- 4 Prepare Phase C and heat up to 60°C under stirring until homogeneous.
- 5 Prepare Phase D and add it into Phase C under stirring until homogeneous.
- 6 Cool down Phase A+B to 80°C.
- 7 Add Phase C+D into Phase A+B under stirring.
- 8 Cool down to 75°C.
- 9 Pour into the mold.

TECHNICAL DATA:

pH:	7,2
Viscosity :	Solid
Technical Specificities:	Stick, Opaque
SPF:	64,8
In vitro UVA-PF:	21,4
In vivo according to ISO 24444	According to ISO 24443
UVA-PF/SPF:	0,35
Critical Wavelength:	373 nm
(60 labelled; >= 0.33)	(Measurement done with Labsphere equipment)

The formulation fulfils the 2 weeks stability at 50°C and the 3 months stability at 4°C, room temperature, 40°C. Regulatory compliance in EU, MERCOSUR, ASEAN, CN, KR, AUS for UV filters in formulation.

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NIAWAVE

Niacinamide PC for
a new wave of beauty

HYDRASTRENGTH HAIR DROPS

A few drops, many benefits! This advanced formula hair serum combines the power of Niacinamide PC (0.5%) with other ingredients to provide complete and sophisticated care for menopausal women's hair and scalp. It boosts thickness, volume, and strength while keeping the scalp hydrated, leaving your hair healthier, stronger, and full of vitality.



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NIAWAVE

HYDRASTRENGTH HAIR DROPS

98.80% Natural Origin content according to ISO 16128

PHASE	INGREDIENTS	INCI NAME	% W / W
A	Water Dem	AQUA	77,16
	Natrosol 250 HR PC	HYDROXYETHYLCELLULOSE	1,00
B	D-Biotin	BIOTIN	0,02
	PENTAVITIN®	SACCHARIDE ISOMERATE, AQUA, CITRIC ACID, SODIUM CITRATE	0,80
	Niacinamide PC	NIACINAMIDE	0,50
	SODIUM GLUCONATE GRANULAR	SODIUM GLUCONATE	0,20
	ALPAFLOR® EDELWEISS CB	LEONTOPODIUM ALPINUM FLOWER/LEAF EXTRACT, GLYCERIN, AQUA, CITRIC ACID	1,00
	Vitamin B12 cryst Food Grade	CYANOCOBALAMIN	0,02
	ALPAFLOR® ALP-SEBUM CB	EPILOBIUM FLEISCHERI FLOWER / LEAF / STEM EXTRACT, GLYCERIN, AQUA, CITRIC ACID	1,50
	Propanediol	PROPANEDIOL	5,00
C	ALCOHOL DENAT.	ALCOHOL DENAT.	12,00
	U Locks P01B839	PARFUM, COUMARIN, HEXYL CINNAMAL, BENZYL SALICYLATE, D-LIMONENE, ALPHA-ISOMETHYL IONONE, HYDROXYCITRONELLAL	0,40
	ARGAN OIL	ARGANIA SPINOSA KERNEL OIL	0,10
	Dermosoft Hexiol	1,2-HEXANEDIOL	0,30

HC-E-102436-15

PROCEDURE:

- 1 Prepare Phase A by adding ingredients in water and stir until a homogeneous solution is obtained.
- 2 Prepare ingredients of Phase B and slowly pour into Phase A under stirring.
- 3 Prepare ingredients of Phase C one by one and add into Phase A+B under stirring.

TECHNICAL DATA:

pH: 4.9 Viscosity (HR-10/ plate 40mm/ shear rate 1/s): 1200 mPa.s

Technical Specificity: Opalescent

The formulation fulfils the 3 months stability at 4°C, room temperature, 40°C

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NIAWAVE

Niacinamide PC for a new wave of beauty

Niacinamide PC

The innovations by dsm-firmenich have resulted in the following patent series on combinations with additional ingredients:

Some dsm-firmenich patent publications

WO 2018/177969 A1 Method of protecting human skin against damage upon exposure with blue light, comprising a cosmetic composition containing an effective amount of Vitamin B3 and an effective amount of Vitamin B6 to the skin

WO 2017/102589 A1 A topical composition, characterized in that the amount of alpha-arbutin is selected in the range of 0.1 to 0.3 wt.-% and the weight ratio of niacinamide to alpha-arbutin is selected in the range of 15 to 6. Use of niacinamide for enhancing the skin lightening activity of alpha-arbutin.

WO 2008/110268 A1 Use of ascorbyl phosphate and niacinamide for suppressing the crystallization of biotin in cosmetic or dermatological compositions

WO 2018/114742 A1 Use of an ascorbyl phosphate and niacinamide to solubilize allantoin in water. Use of an ascorbyl phosphate and niacinamide for suppressing the crystallization of allantoin in cosmetic compositions.



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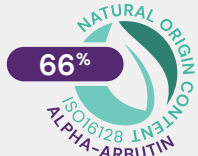
ALPHA-ARBUTIN

ID Card

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INCI NAME:	Alpha-Arbutin		
TECHNOLOGY:	The pioneer & leader of ALPHA-ARBUTIN High performing enzyme related biotechnology guarantees high purity, addressing consumer awareness about safety and efficacy 66% of natural origin (according to ISO 16128)		
TECHNICAL:	Form: powder pH of use: 3.5–6.5	Use level: face care: up to 2%; body care: up to 0.5% Preservative: free	Solubility: water soluble Biodegradability: readily biodegradable
BENEFITS:	• More than 20 times stronger inhibition of tyrosinase than with Beta Arbutin* • More efficient than Ascorbylglucoside* • Has anti-oxidant properties ¹ • Ensures a lighter skin tone after only one month** • Helps to minimize the appearance of dark spots** • Outperforms Hydroquinone and Beta-Arbutin after only one month** • Combination with NIACINAMIDE PC for even stronger efficacy, patented*		

REGISTRATION CERTIFICATION



* in vitro ** in vivo, ¹Frontiers in Physiology, November 2020 | Volume 11 | Article 586843

OXY 229 CB

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INCI NAME: Aqua, Glycerin, Caprylyl Glycol, 1,2-Hexanediol, Saccharomyces Lysate, Valine, Threonine, Glutamic acid, Glycine, Disodium Succinate

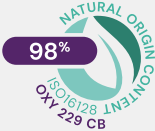
TECHNOLOGY: Contains postbiotics from a specific yeast strain obtained by fermentation and a sophisticated mixture of skin respiration facilitators
98% of natural origin (according to ISO 16128)

TECHNICAL:	Form: liquid Use level: 1–5%	pH of use: 3.0–7.5 Preservative: free	Solubility: water soluble Biodegradability: readily biodegradable
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BENEFITS:

- Helps to increase oxygen uptake to maintain healthy-looking skin glow*
- Stimulates cell viability in the epidermis to revitalize skin*.
- Up to 25% increased cell turnover to revive dull-looking skin**
- Helps to modulate oily skin and rebalances bacteria potentially involved in facial redness**
- Ensures a lighter skin tone, combined with NIACINAMIDE PC**

**REGISTRATION
CERTIFICATION**



REGU®-FADE

ID Card

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INCI NAME:	Resveratrol		
TECHNOLOGY:	Nature-identical, pure trans-resveratrol known as the 'longevity molecule' Organic synthesis guarantees high purity of trans-resveratrol, free from pesticides and cis form		
TECHNICAL:	Form: powder pH of use: 3.0-6.5	Use level: up to 1% Preservative: free	Solubility: ethanol, propylene glycol, butylene glycol soluble
BENEFITS:	• Attracted attention in recent years as an ingredient that visibly reduces skin pigmentation via a multiple target mechanism* • Fights against oxidation* • Reduces irritation after urban dust stress* • Reduces redness and unpleasant skin sensations** • Visibly smoother and firmer skin** • Lighter age spots in just 2 weeks **		
REGISTRATION CERTIFICATION			

Histidine catabolic pathway changes during menopause

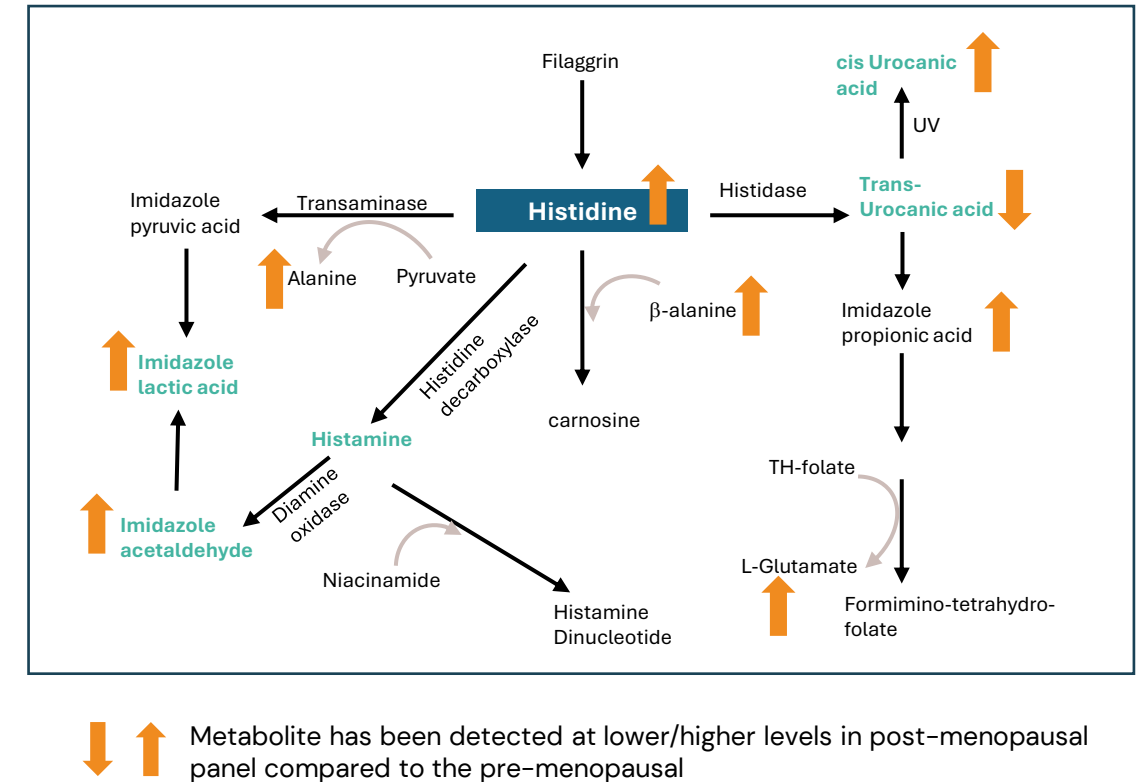
Histidine and NMF:

- Histidine is a key amino acid, a building block of skin protein filaggrin which is crucial for the Natural Moisture Factor (NMF).
- The degradation of histidine leads to catabolic compounds, such as cis-urocanic acid, histamine, which are damaging the skin health
- Trans-urocanic acid, a natural sunscreen, accumulates in the epidermis and converts to cis-urocanic acid under UV exposure.
- Histidine catabolism produces histamine and its metabolites (imidazole acetaldehyde and imidazole lactic acid), leading to skin sensitivity, itchiness, and redness.

Menopausal Imbalances:

- Menopause disrupts skin homeostasis and NMF, upregulating histidine and its catabolic intermediates as a compensatory mechanism.
- High cis-urocanic acid levels in postmenopausal skin suggest reduced UV protection.
- Elevated imidazole acetaldehyde levels explain increased skin sensitivity, itching, redness, and discomfort in postmenopausal skin.

Histidine catabolic pathway comparing niacinamide treatment at Day 28 in post-menopausal skin



Niacinamide PC:

Rebalances the histidine catabolic pathway for better skin health

NEW: *in vivo* study

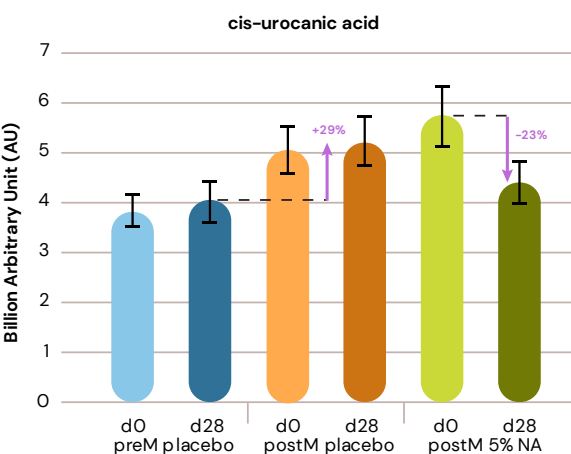
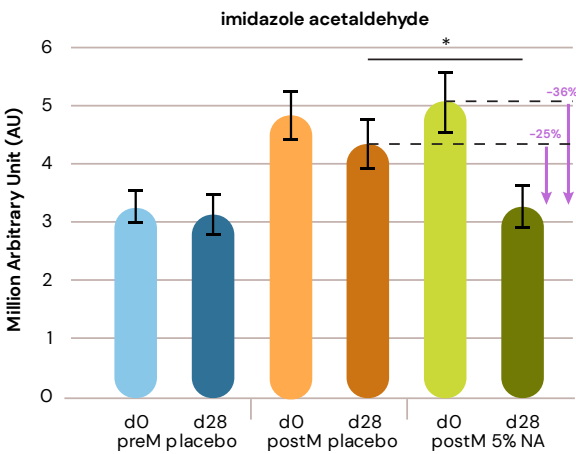
dsm-firmenich
own study

Niacinamide PC helps reducing sensitive skin (redness and itching):

- Significantly downregulates imidazole-acetaldehyde by 36% vs baseline, and 25% vs placebo indicating reduced histamine activity.

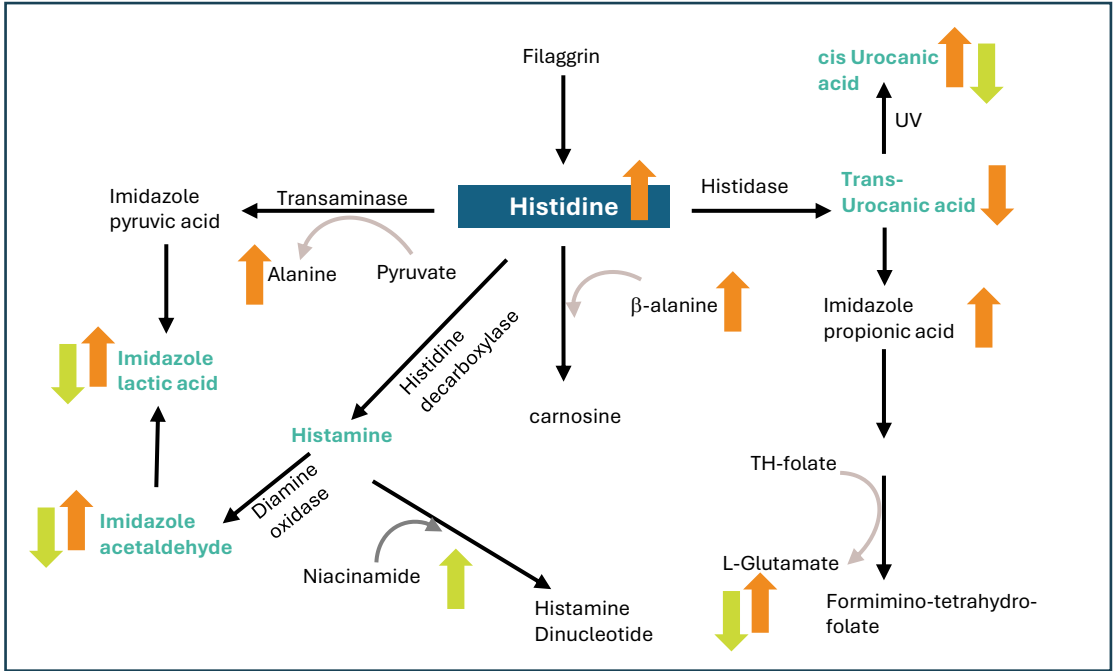
Niacinamide PC provides protection from UV damage in postmenopausal skin:

- Niacinamide PC rebalances key metabolites: UV-stress markers such as cis-urocanic acid can be found at increased level in post-menopausal skin. Treatment with Niacinamide PC show a decrease of 23% in cis-urocanic acid content vs TO.



*: p value <0.05

Histidine catabolic pathway comparing niacinamide treatment at Day 28 in post-menopausal skin



↓ ↑ Metabolite has been detected at lower/higher levels in post-menopausal panel compared to the pre-menopausal

↑ ↓ Metabolite has been detected at lower/higher levels after four weeks of B3 treatment compared to placebo post menopausal