ProVitalDNA

Beauty Sensor

Jane Doe
DEMO_DS

ProGenom
www.progenom.com

COVER LETTER

Dear Ms. Doe,

Your sample for the analysis arrived on in the laboratory and was evaluated according to the highest laboratory quality standards. The results were evaluated and released by two independent geneticists and molecular biologists. After obtaining the results, your personal report was compiled. We hereby convey the results to you in the format of your choice.

We would like to thank you for your trust and hope that you are satisfied with our service. We are always open to questions and suggestions. Please do not hesitate to contact us. We value your feedback. This is the only way we can continuously improve our services.

We hope the analysis meets your expectations.

Kind regards,

Dr. Daniel Wallerstorfer BSc.
Laboratory Director

Florian Schneebauer, MSc.
Laboratory Manager

Beauty Sensor

Personal analysis results for:
Jane Doe | Date of birth: 01/01/1990

Order number:
DEMO_DS

This report contains personal genetic information and is to be treated confidentially.

How genes influence aging

Aging and especially aging of the skin has a variety of causes. Certain environmental influences such as UV radiation and the lack of nutrients play an important role. Still, there are people who seem to age faster or slower, even while leading the same lifestyle. There are significant individual factors that vary from person to person and these differences are in the genes.

Every person has genes that should protect them from accelerated aging processes. Unfortunately, frequently occurring errors in these genes, so-called gene variants, interfere with their function which leads to an acceleration of one or more factors of aging.

The objective of this program is to analyze the status of these protective genes and identify personal genetic strengths and weaknesses. The results will then allow you to follow a beauty program based on your genetic makeup that best supports your personal genetic strengths and combats your weaknesses.

On the following pages you will find information on your genetic status of the main factors of aging:

- Collagen breakdown
- Collagen production
- UV protection of the skin
- Skin hydration
- Oxidative stress
- The effect of Q10
- Your selenium requirements
- Inflammatory reactions
- Your biological age

Your Result

You've decided on a genetic test package which examines the most relevant genetic factors pertaining to the aging of skin. The lab analysis revealed the following result:

Collagen breakdown

SYMBOL	rs NCBI	GENOTYPE
MMP1	rs1799750	G/G

Collagen production

SYMBOL	rs NCBI	GENOTYPE
CYP1A2	rs762551	A/A

UV protection of the skin

SYMBOL	rs NCBI	GENOTYPE
MC1R	rs885479	G/G
MC1R	rs11547464	G/G
MC1R	rs1805006	C/C
MC1R	rs1805007	C/C
STXBP5L	rs322458	A/A

Skin hydration

SYMBOL	rs NCBI	GENOTYPE
MC1R	rs885479	G/G
MC1R	rs11547464	G/G
MC1R	rs1805006	C/C
MC1R	rs1805007	C/C
STXBP5L	rs322458	A/A

Oxidative stress

SYMBOL	rs NCBI	GENOTYPE
GSTM1	Null allele	INS
GSTT1	Null allele	DEL
GSTP1	rs1695	G/A
SOD2	rs4880	T/T
GPX1	rs1050450	C/C

The effect of Q10

SYMBOL	rs NCBI	GENOTYPE
NQO1	rs1800566	C/C

Your selenium requirements

SYMBOL	rs NCBI	GENOTYPE
GPX1	rs1050450	C/C

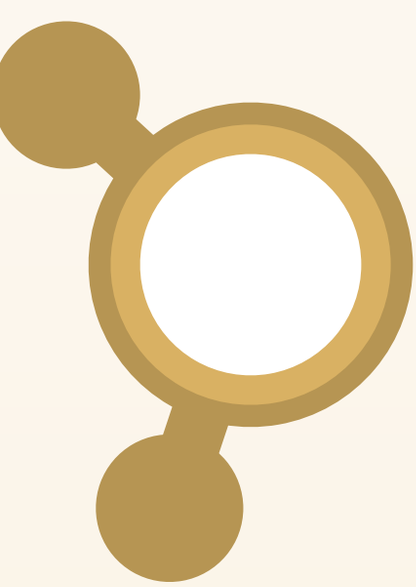
Inflammatory reactions

SYMBOL	rs NCBI	GENOTYPE
TNF-α	rs1800629	A/A
IL1A	rs1800587	C/C
IL1RN	rs419598	C/T
IL 1 Beta	rs1143634	C/T

Your biological age

SYMBOL	rs NCBI	GENOTYPE
TERT	rs2242652	C/C
TERT	rs2735940	C/C
BICD1	rs2630578	C/G
PPARG	rs1801282	C/C

LEGEND: SYMBOL = Name of investigated genetic variation, rsNCBI = description of investigated genetic variation, GENOTYPE = result.



The genetic factors of beauty

COLLAGEN BREAKDOWN

Collagen gives skin firmness. Old collagen must be broken down for long lasting youth and new collagen needs to be produced.

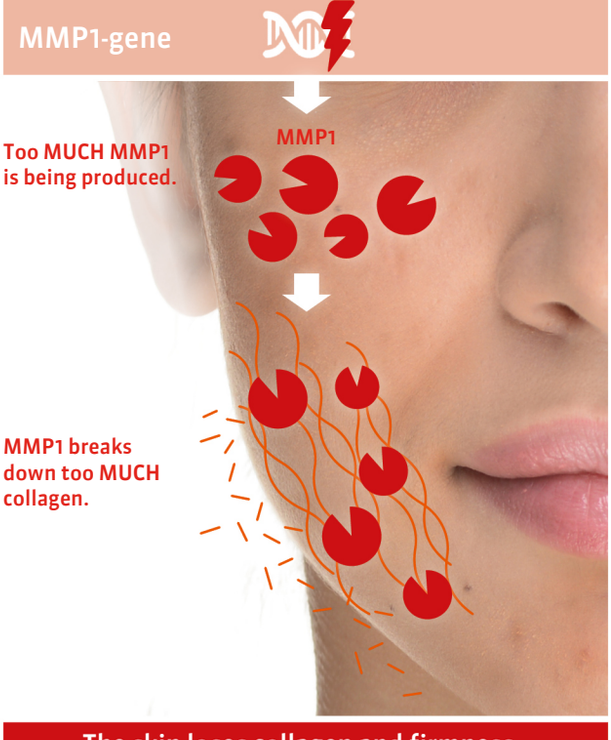
Collagen and skin firmness

Collagen consists of long, flexible fibres that accumulate in the skin and give it firmness. Since collagen is crucial for the proper function of the skin, there are mechanisms which break down and remove old collagen from the skin.

A special enzyme in the skin performs this task. It is named MMP1 and is a collagenase. The removal of old collagen keeps the collagen fresh and functional, and allows the skin to remain firm even with increasing age. The building instructions for the MMP1 enzyme is encoded in the MMP1 gene. This gene controls how the enzyme has to be made and how much of the enzyme should be produced.

A gene variation causes an excess of MMP1 to be produced and the breakdown of collagen in the skin is too fast. The skin gradually loses its firmness and begins to age faster.

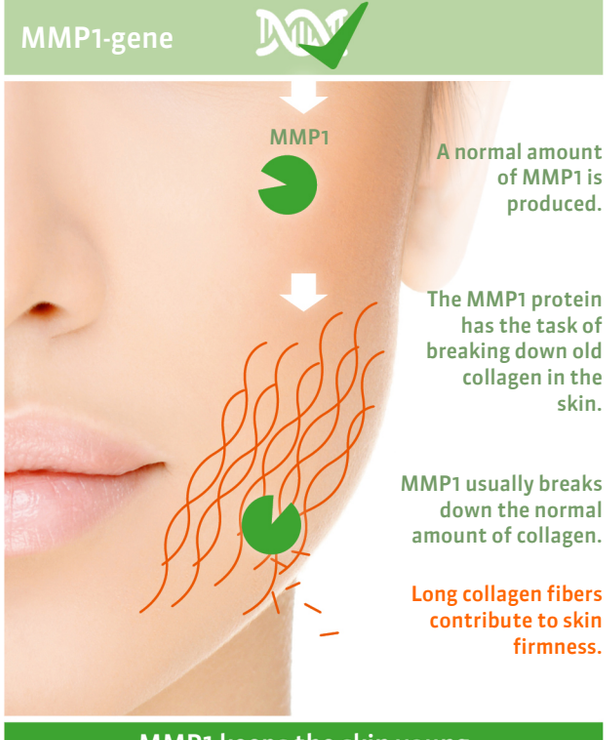
MMP1-gene



The skin loses collagen and firmness.

When the genes are functioning correctly, the normal amount of MMP1 is produced, which breaks down old collagen and thereby keeps the skin young.

MMP1-gene



MMP1 keeps the skin young

Your genetic score

Your DNA analysis has shown that due to a genetic variation your skin is producing too much MMP1 and therefore too much collagen breaks down. Your individual products are focused on disrupting the MMP1 function and increase your skin's collagen density.

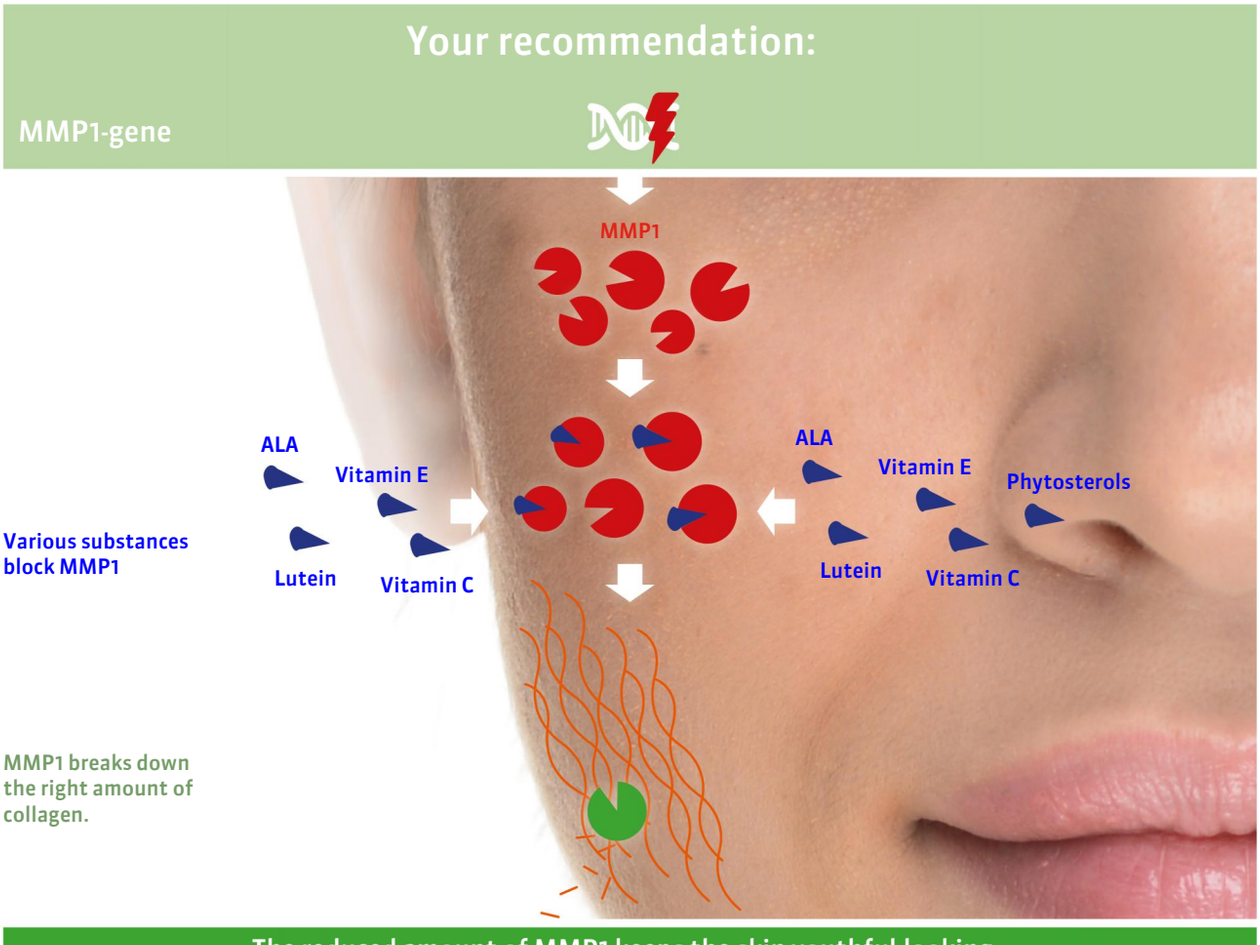
Genetic result

GENE	MUTATION	RESULT
MMP1	rs1799750	G/G

The collagen depletion in your skin

ELEVATED NORMAL

Your recommendation:



The reduced amount of MMP1 keeps the skin youthful-looking.

Which micronutrients does your skin need?

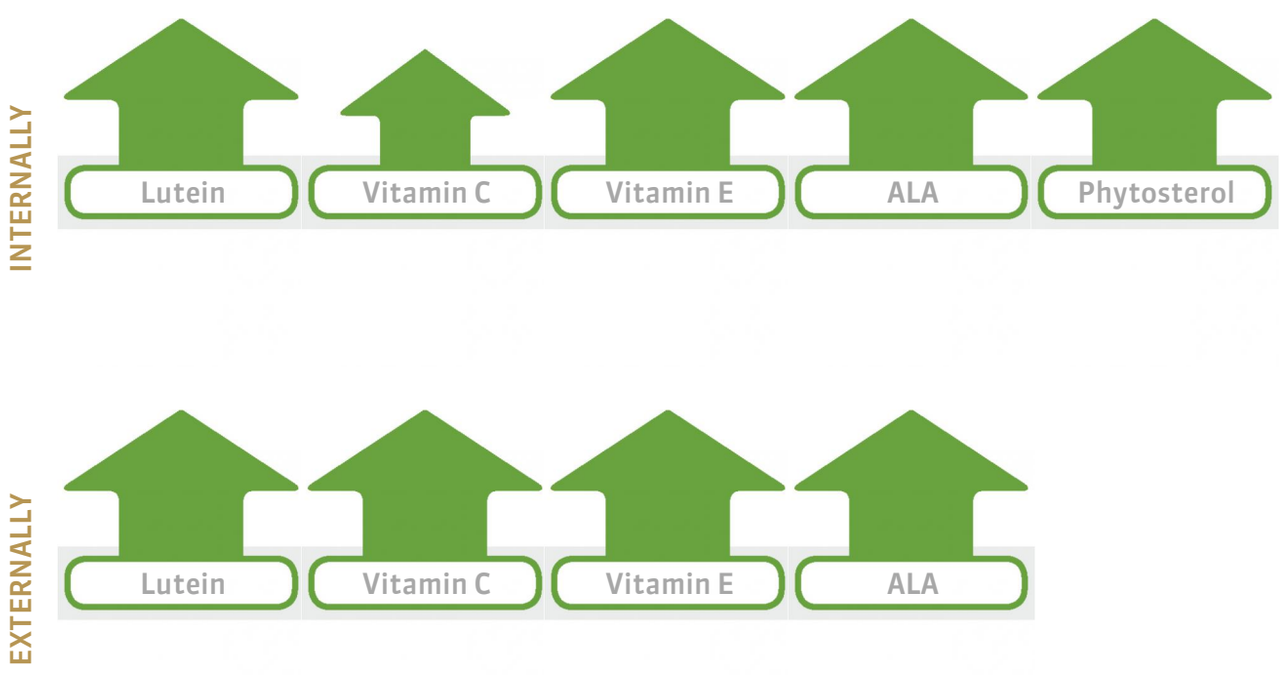
Since your genetic analysis has shown that your MMP1 gene produces too much MMP1, it's crucial to reduce this overproduction and restore the lost collagen. Scientific research has identified several substances that might block MMP1 and thus counteract your skin's genetically-accelerated aging process.

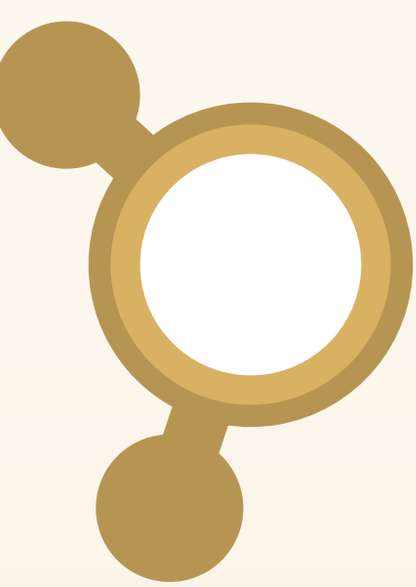
The secondary phytochemical lutein can be absorbed through diet and then it builds up in the skin, where it exerts its effect. Lutein inhibits the production of MMP1 and thus the collagen breakdown is slowed down. By knowing the status of your MMP1 gene, the optimum amount of lutein for your skin cream and your dietary supplements can now be defined [13,15-18,20,21].

Vitamin C can be applied to the skin in a cream that can reduce the MMP1 activity and therefore collagen breakdown. Vitamin E blocks a particular protein (protein kinase C), which increases the production of MMP1 with age. Through a correct dosage of vitamin E, the age-related gradual increase in MMP1 can thus be prevented. Alpha lipoic acid and phytosterols may also block the activity of MMP1 and thus slow down the breakdown of collagen. [22-29].

Now the optimum amount of these substances can be determined on the basis of your genetics and age. When applied regularly and in the correct amount, they will help the collagen to get into your skin and contribute to youthful skin.

Your personalized recommendations based on this section:





The genetic factors of beauty

- COLLAGEN BREAKDOWN
- **COLLAGEN PRODUCTION**
- UV PROTECTION ON SKIN
- SKIN MOISTURE
- OXIDATIVE STRESS
- THE EFFECT OF Q10
- YOUR SELENIUM REQUIREMENT
- INFLAMMATORY REACTIONS
- YOUR BIOLOGICAL AGE
- SUMMARY OF RESULTS
- THE SOLUTION
- ADDITIONAL INFORMATION

COLLAGEN PRODUCTION

Collagen is important for the tensile strength of the skin and must be constantly re-produced in order to keep the skin young.

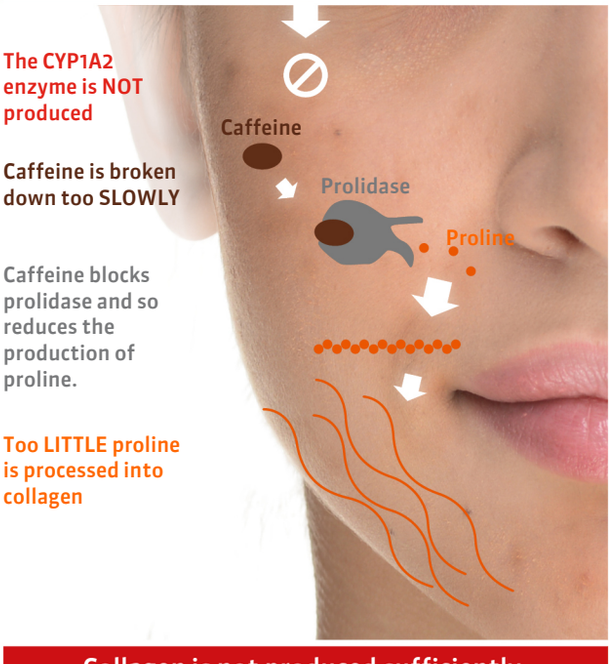
Collagen and skin aging

The enzyme prolidase produces the raw material (proline) for collagen production. If prolidase is disturbed for some reason, the skin begins to break down collagen. Caffeine is an example of a disruptive factor that prevents prolidase from producing the collagen raw material.

However, caffeine also has a circulation-promoting effect on the skin and is therefore often used in beauty products. Your body has a gene (called CYP1A2), which has the task of identifying and degrading caffeine. If this gene works normally, it breaks down enough caffeine to avoid the prolidase-interfering effect. Prolidase can then generate proline without interference, which is then processed to form large amounts of collagen in the skin.

If the CYP1A2 gene does not function correctly, caffeine will not be removed from the cells before it can interfere with the collagen production.

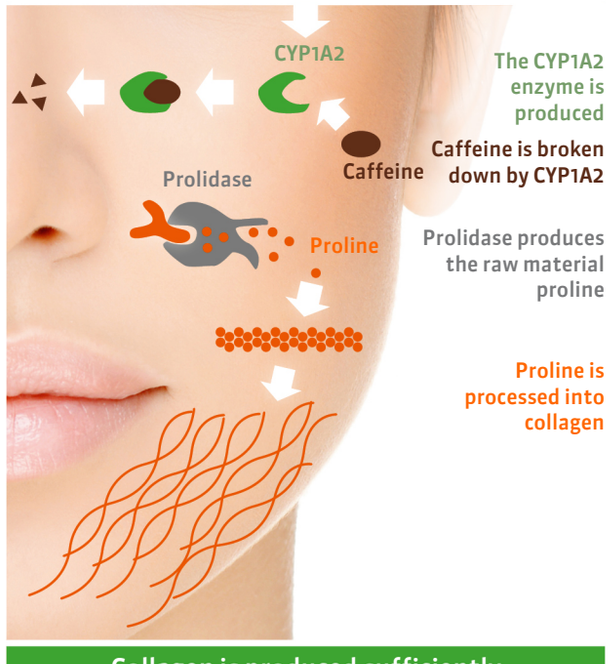
CYP1A2:



Collagen is not produced sufficiently

A working CYP1A2 removes ingested or skin-applied caffeine before it starts interfering with the proline/collagen production.

CYP1A2:



Collagen is produced sufficiently

Your genetic score

Your genetic analysis revealed that the CYP1A2 gene is functioning correctly, so caffeine is broken down at a sufficient rate. For this reason, there is no need to reduce caffeine for the sake of collagen production. In your case, the individual products will just counteract the slow age-related loss of collagen.

Genetic result

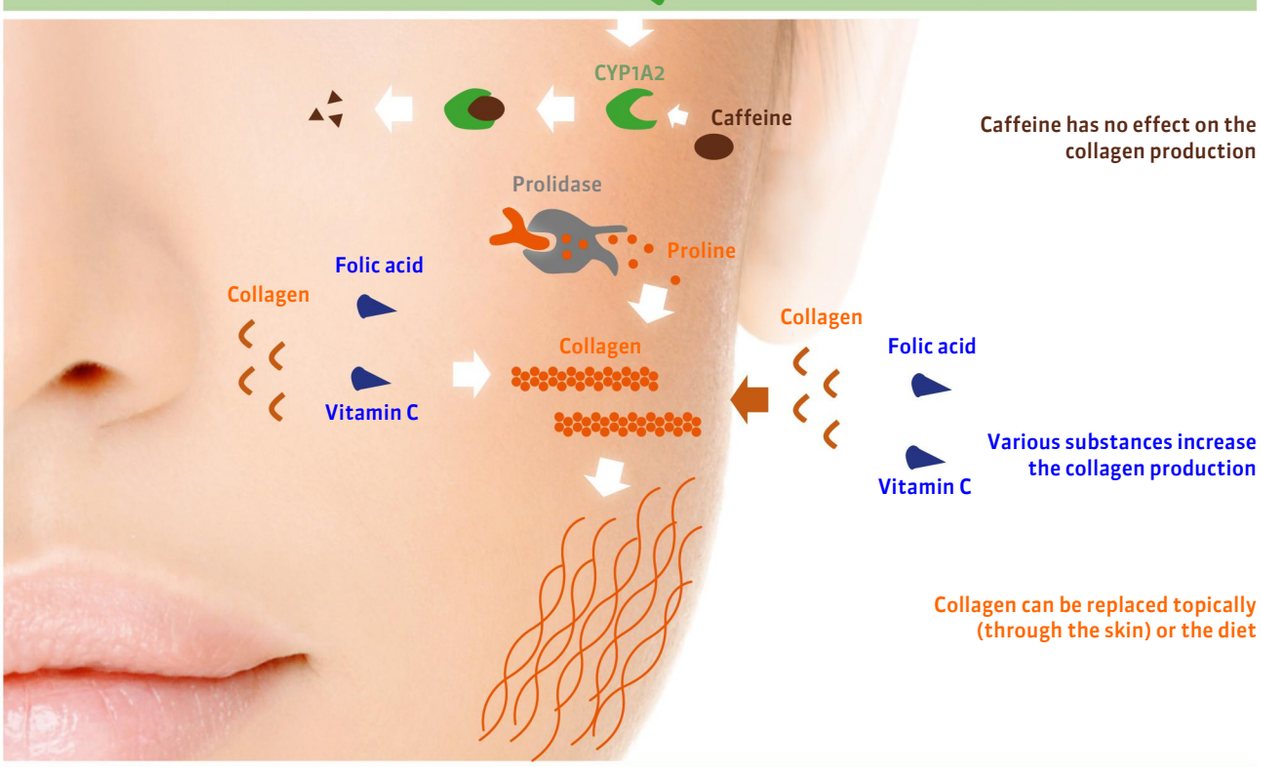
GENE	MUTATION	RESULT
CYP1A2	rs762551	A/A

Influence of caffeine on your collagen production

REDUCED NORMAL

Your recommendation:

CYP1A2:



CYP1A2 breaks down caffeine, collagen is produced

Which micronutrients does your skin need?

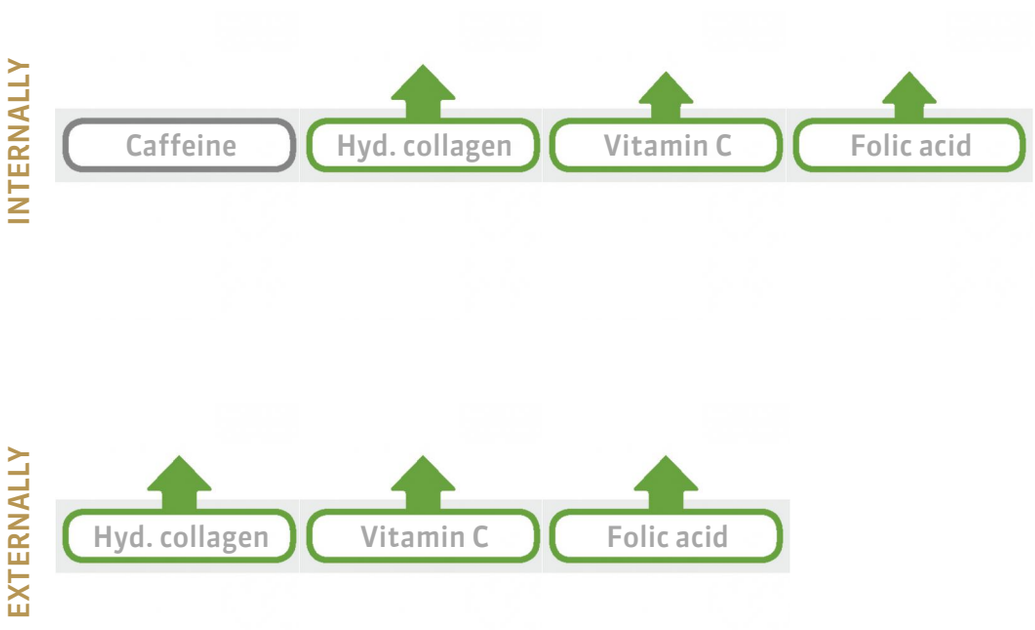
Since your genetic analysis has revealed that your CYP1A2 gene is in order, there's no need for you to specifically reduce caffeine. As a person ages, their production of collagen in the skin usually decreases. Therefore, it is important to stimulate collagen production by means of certain substances and increase collagen density in the skin.

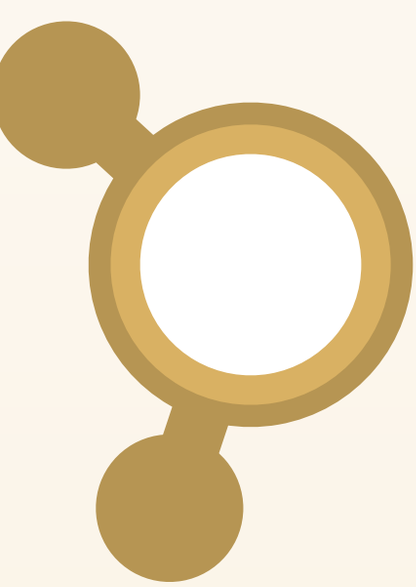
Vitamin C doesn't just reduce collagen breakdown but when applied in the form of skin cream, also promotes the production of new collagen.

Folic acid can also enter through the skin and activate collagen-producing genes, thereby increasing the collagen density in the skin.

Hydrolyzed collagen consists of small collagen fragments; if these increase in the body, the cells will register that too much collagen is being broken down. As a result, they begin producing more collagen to counteract the degradation.

Your personalized recommendations based on this section:





The genetic factors of beauty

UV PROTECTION

The sun's UV rays can harm the skin if they are not properly neutralized

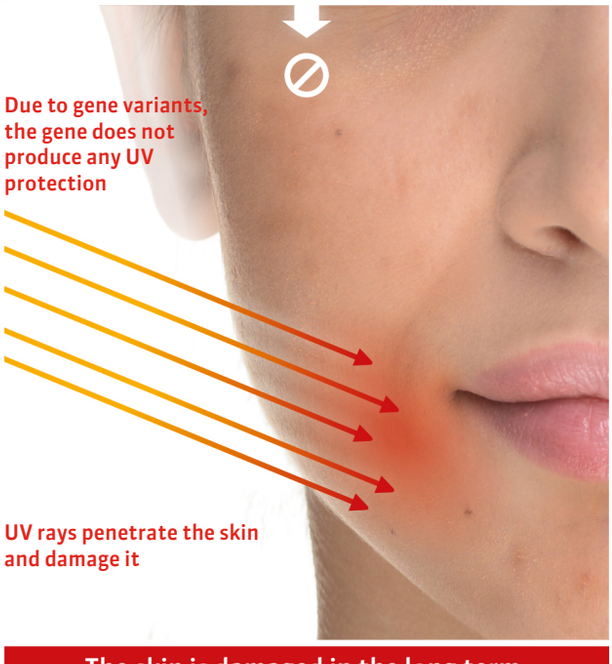
Protection against UV rays

The sun's ultraviolet radiation (UV) is the most harmful environmental factor for the long-term preservation of young skin. The harmful rays can penetrate into the cells and cause a variety of damage that, over a long period, will cause accelerated aging of the skin.

Since these rays are so harmful, the body has developed a mechanism that produces UV-protective pigments and protects the skin from UV radiation. The genes MC1R and STXBP5L are largely responsible for this protection, but frequently occurring genetic variations may interfere with the functioning of these genes and minimize the protection against UV radiation.

If the genes do not protect sufficiently against the sun's UV rays, they can penetrate deep into the tissue and damage it in the long term.

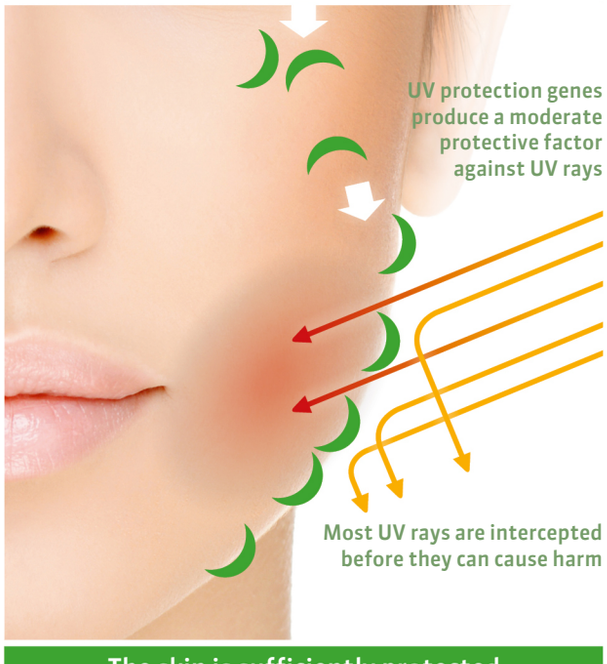
MC1R,STXBP5L:



The skin is damaged in the long term

If the genes protect sufficiently against UV rays, the skin is hardly damaged

MC1R,STXBP5L:



The skin is sufficiently protected

Your genetic score

Your genetic analysis has shown that your genes function sufficient and protect the skin relatively well against the sun's UV rays. In your case, the individual products will support the skin to an extent in its fight against the UV rays.

Genetic result

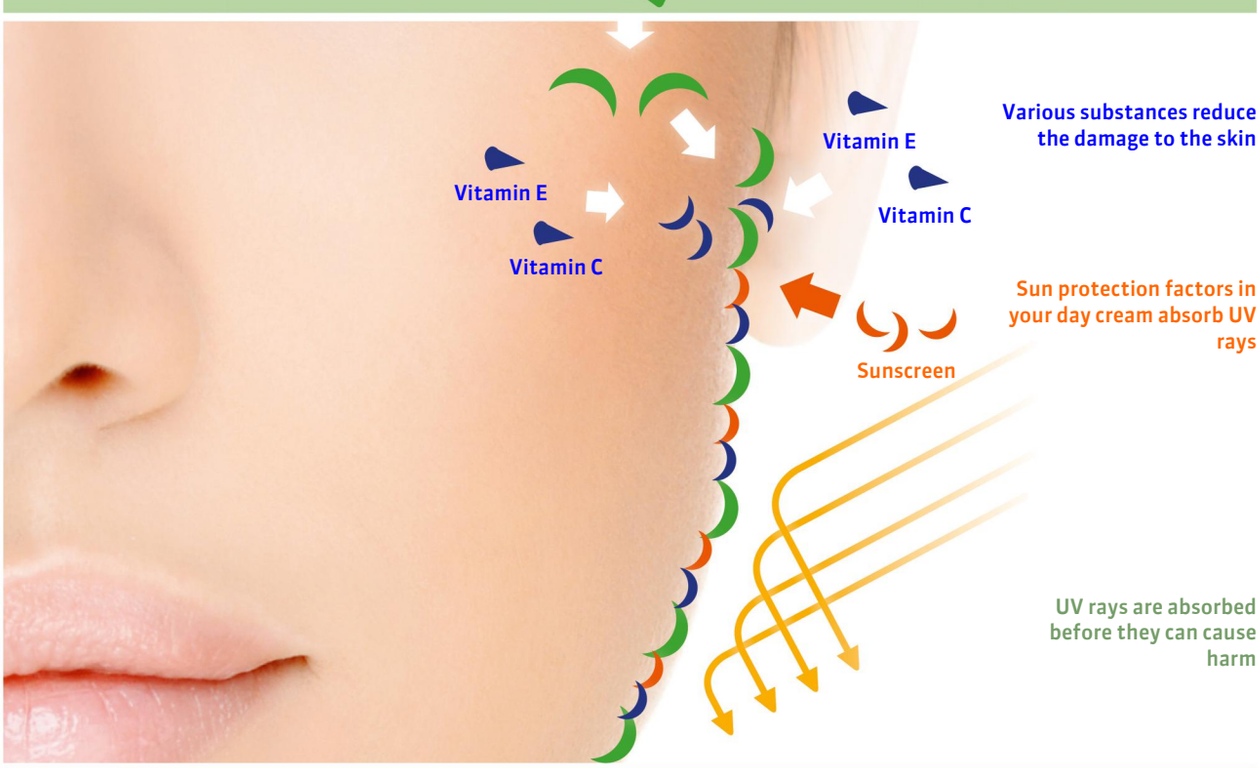
GENE	MUTATION	RESULT
MC1R	rs885479	G/G
MC1R	rs11547464	G/G
MC1R	rs1805006	C/C
MC1R	rs1805007	C/C
STXBP5L	rs322458	A/A

Your genetic UV protection

WEAK NORMAL

Your recommendation:

MC1R,STXBP5L:



The harmful UV rays are neutralized

Which micronutrients does your skin need?

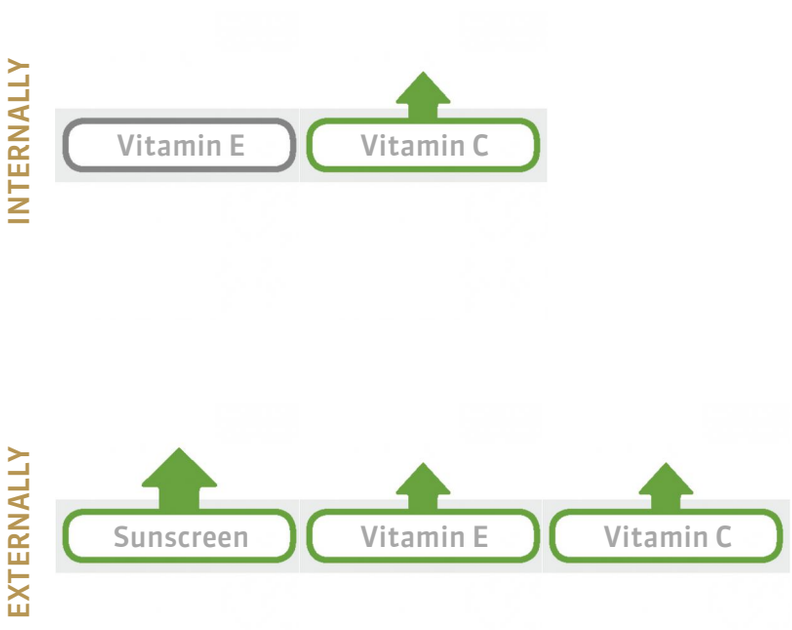
Sun protection factors are substances that are applied to the skin, which either reflect or absorb the harmful UV rays. Since your UV protection genes are working effectively, you only need a low sun protection factor in your daily cream. This can help you sufficiently protect your skin.

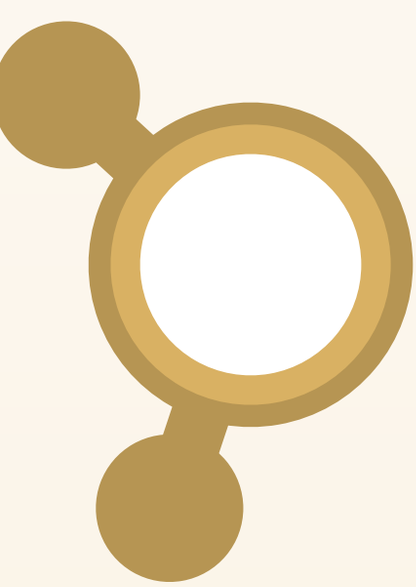
Caution! This cream merely serves as protection from the usual daily amount of UV rays and is NOT a substitute for the type of sunscreen that is used when sunbathing.

Vitamin E acts as a natural sun protection factor and reduces the skin damaging effect of UV rays (either applied to the skin or absorbed through the food), as well as accelerates regeneration of the skin.

A combination of vitamin C and vitamin E resulted in far better protection from UV rays.

Your personalized recommendations based on this section:





The genetic factors of beauty

SKIN MOISTURE

Hyaluronic acid stores moisture in the skin, but it can be destroyed by harmful UV rays

Moisture storage in the skin

Inside the collagen matrix of the skin, there is hyaluronic acid. This substance retains moisture and contributes to a youthful appearance of the skin.

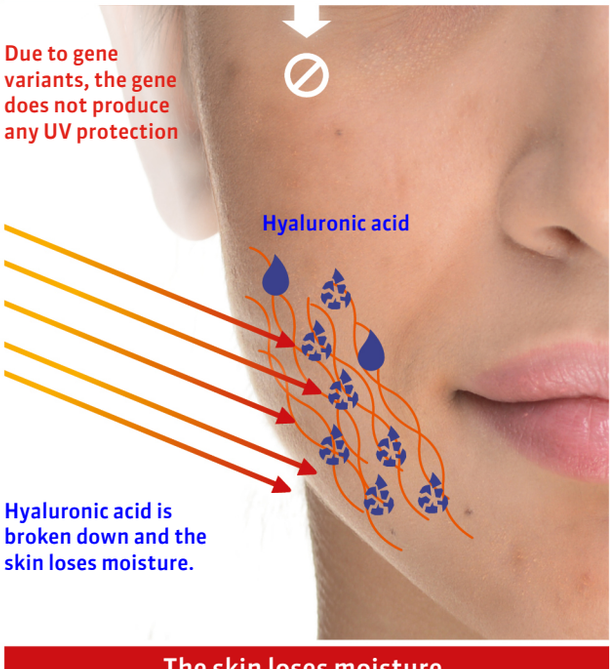
If the harmful UV rays of the sun (mainly UV-B rays) are not neutralized by the UV-protective genes, hyaluronic acid in the skin is degraded. The skin loses moisture and begins to age faster.

If the genes do not function properly, harmful UV-B radiation can penetrate the skin and destroy the hyaluronic acid. The skin loses its moisture and youthful appearance.

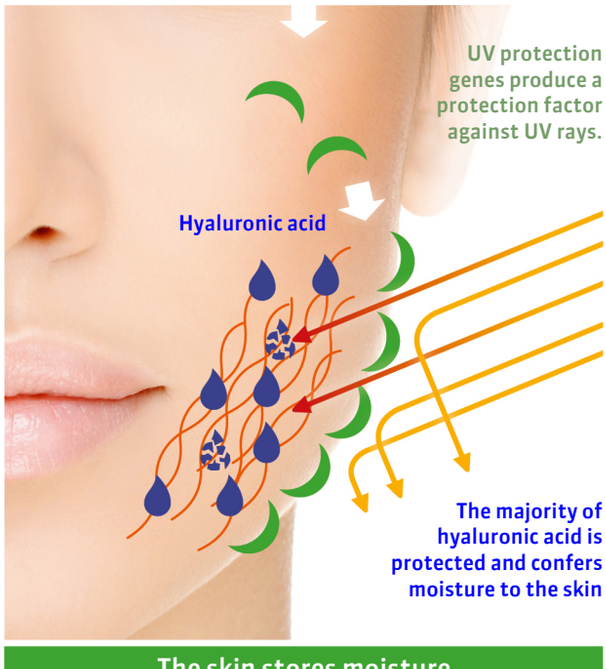
MC1R, STXBP5L:

When the UV-protective genes work properly, the harmful UV-B rays cannot penetrate the skin. Hyaluronic acid is retained and keeps the skin moist and young.

MC1R, STXBP5L:



The skin loses moisture



The skin stores moisture

Your genetic score

Your genetic analysis has shown that your UV-protective genes function sufficiently and prevent the penetration of harmful UV rays into the skin. Your hyaluronic acid is retained and keeps your skin moist and youthful. For this reason, only low concentrations of hyaluronic acid are needed to counteract the slow, natural aging process.

Genetic result

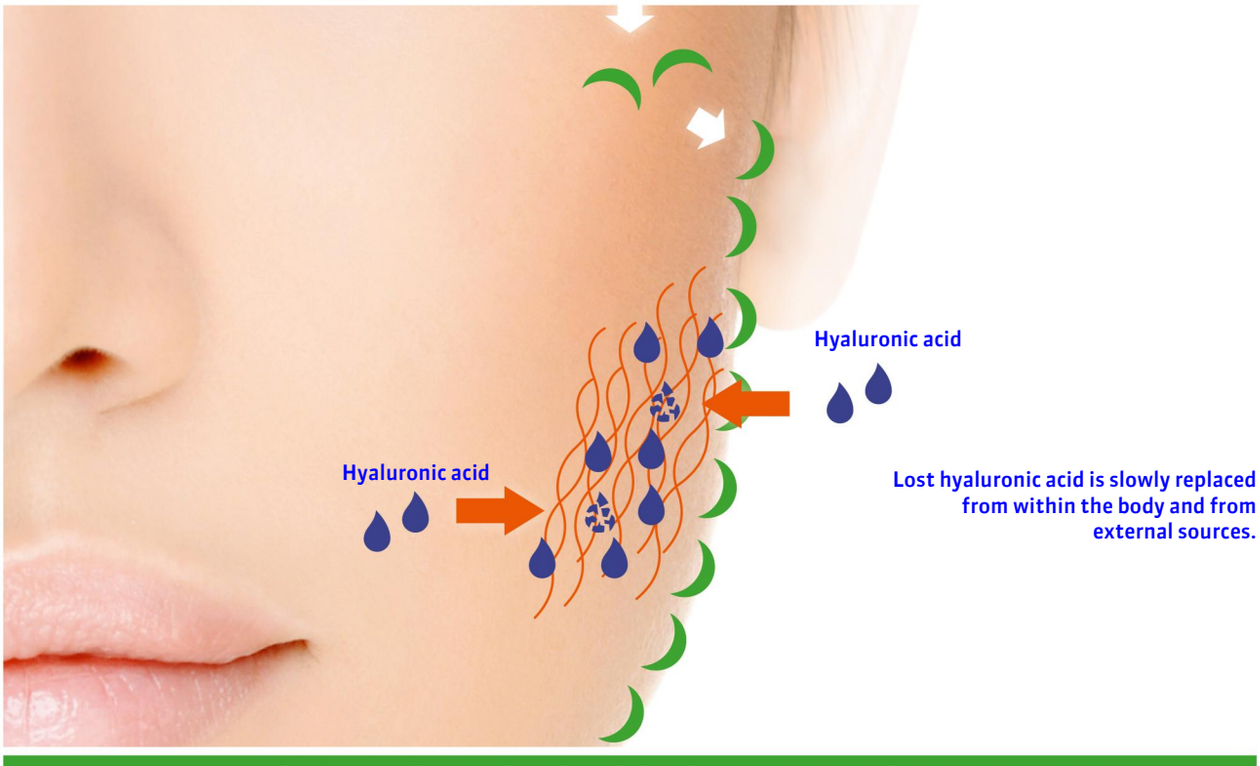
GENE	MUTATION	RESULT
MC1R	rs885479	G/G
MC1R	rs11547464	G/G
MC1R	rs1805006	C/C
MC1R	rs1805007	C/C
STXBP5L	rs322458	A/A

Your skin's capacity to store moisture

WEAK NORMAL

Your recommendation:

MC1R, STXBP5L:



Hyaluronic acid is regulated, and the skin stores enough moisture

Which micronutrients does your skin need?

Since your genetic analysis has shown that you are adequately protected from UV rays, your skin's hyaluronic acid content is also adequate. You only require small amounts of hyaluronic acid to counteract the gradual aging process.

Hyaluronic acid enters the body through various ways. When taken as a dietary supplement, it is absorbed by the intestine and transported to the skin.

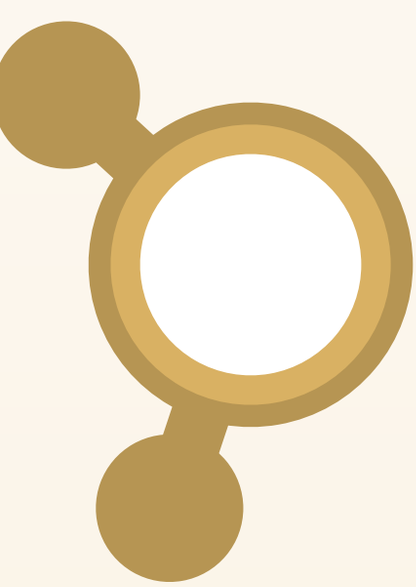
Low-molecular-weight hyaluronic acid applied to the skin can also penetrate and restore the skin's moisture.

In respect of your genetics, you only require smaller amounts of low-molecular-weight hyaluronic acid because your skin is already well-protected due to your genes.

Your personalized recommendations based on this section:

INTERNALLY

EXTERNALLY



The genetic factors of beauty

OXIDATIVE STRESS

There are free radicals that are created in our cells every second that can damage tissues and accelerate aging, if they are not neutralized.

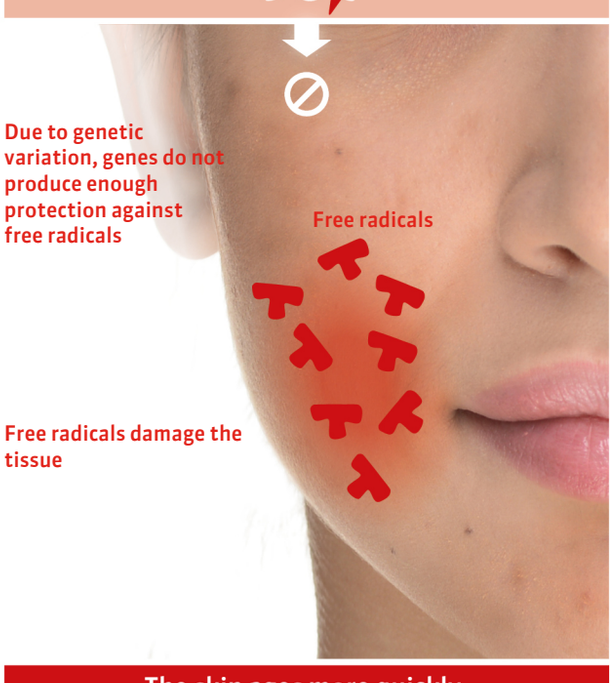
Oxidative stress and skin aging

Through normal metabolism and UV ray damage, toxic substances called free radicals are constantly created in the skin. These substances are considered a major cause of aging skin, and they cause tissue damage in the long run, if they are not neutralized. If there are too many free radicals in the body, we refer to it as increased oxidative stress.

Free radicals are harmful therefore body has certain genes that protect against them. Thus, these substances are usually neutralized soon after they are produced.

If some or all of the protective genes are dysfunctional, free radicals can cause permanent damage.

GSTs, SOD2:



The skin ages more quickly

When the genes are working properly, they can neutralize free radicals before they cause permanent damage.

GSTs, SOD2:

The skin remains young

Your genetic score

Your genetic analysis has shown that at least some of your antioxidant genes do not function properly, and therefore you are not adequately protected against free radicals. Due to this, your skin will age noticeably faster. It is therefore necessary for you to have the right dose of antioxidants in order to restore protection to the skin.

Genetic result

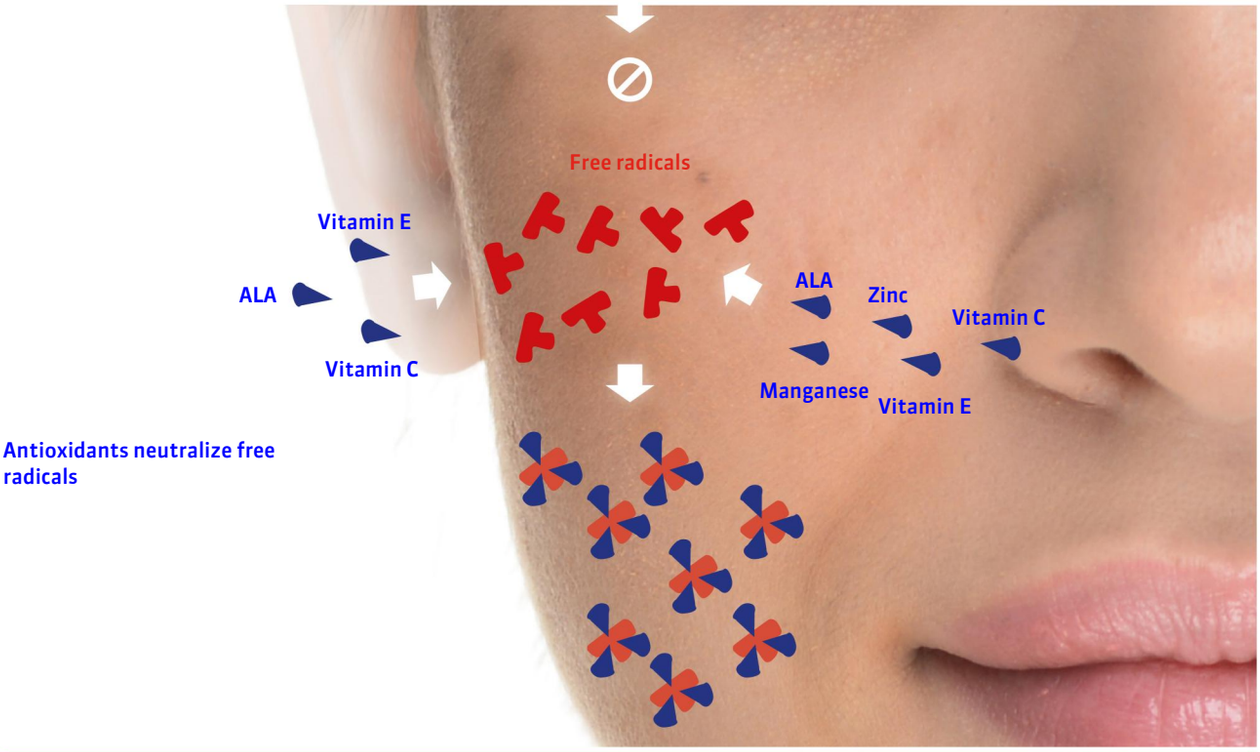
GENE	MUTATION	RESULT
GSTM1	Null allele	INS
GSTT1	Null allele	DEL
GSTP1	rs1695	G/A
SOD2	rs4880	T/T
GPX1	rs1050450	C/C

Oxidative stress in your skin

CRITICAL NORMAL

Your recommendation:

GSTs, SOD2:



Micronutrients compensate for the missing function of the genes and the skin stays young.

Which micronutrients does your skin need?

Since your genetic analysis revealed that your oxidative protection is impaired, you should ensure a particularly high intake of antioxidants. These can either be absorbed through food or to some extent also via the skin.

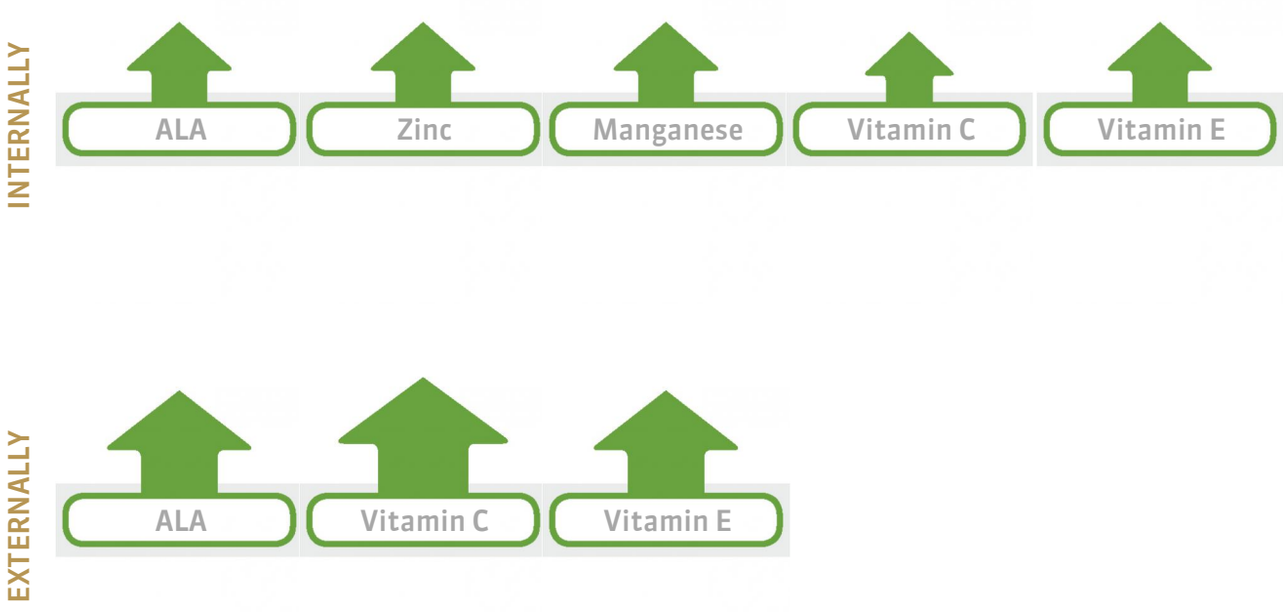
Vitamin C is absorbed through the skin or intestine and is considered a very powerful antioxidant that protects the body from free radicals.

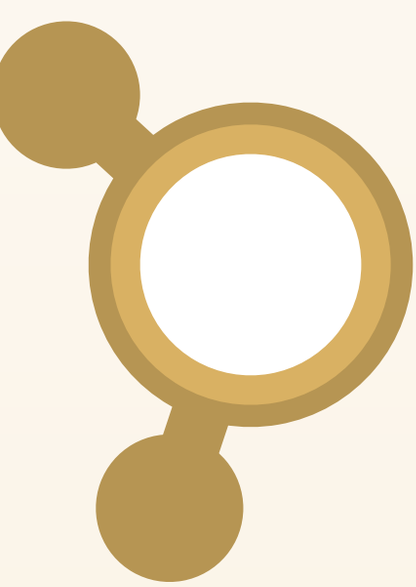
Vitamin E is a fat-soluble antioxidant, which is particularly well-suited for protecting cell walls (which consist of fat) from free radicals. In addition, it acts as a natural sun protection factor and protects the skin from UV rays.

Alpha lipoic acid (ALA) is a powerful antioxidant that can potentiate other antioxidants (such as vitamin C and E) in their effect. ALA can enter via the skin and protect the tissue from free radicals. When ingested, it also protects the inner tissues from oxidative stress.

Zinc and manganese are components of important antioxidant proteins (enzymes) and crucial to a number of important processes, as well as fighting off free radicals. However, they cannot be absorbed through the skin. Therefore, it is important to absorb these minerals via the digestive tract.

Your personalized recommendations based on this section:





The genetic factors of beauty

THE EFFECT OF COENZYME Q10

Coenzyme Q10 can be transformed into a powerful antioxidant by the body, as long as the NQO1 gene works correctly.

The effect of coenzyme Q10

Coenzyme Q10 is considered a potent antioxidant. It is initially inactive in the body, but it can be converted to its active form, ubiquinol, through a particular gene (NQO1).

The body can produce coenzyme Q10 itself, but it can also take it up through the diet or the skin.

If the NQO1 gene is disrupted by a genetic variation, no NQO1 protein is produced. As a consequence, the inactive coenzyme Q10 is not converted into its active form ubiquinol.

NQO1 gene:

Because of genetic variation, the NQO1 gene does not produce any NQO1 protein.

Q10

Q10 is not converted to its active form

Q10 thus has no antioxidant effect and free radicals damage the tissue unhindered.

Free radicals

Q10 does not have any effect

If the NQO1 gene works adequately, NQO1 protein is produced in sufficient levels. Inactive coenzyme Q10 is converted into the active form, ubiquinol.

NQO1 gene:

The NQO1 gene produces the NQO1 protein

Q10

Ubiquinol

The NQO1 protein converts Q10 into its active form ubiquinol

Q10 manifests its antioxidant effect, and free radicals are neutralized

Free radicals

Q10 is activated

Your genetic score

Your genetic analysis has revealed that the NQO1 gene is functioning properly and can effectively convert coenzyme Q10 to its active form. Coenzyme Q10 is exhibiting antioxidant activity in your body and can be utilized.

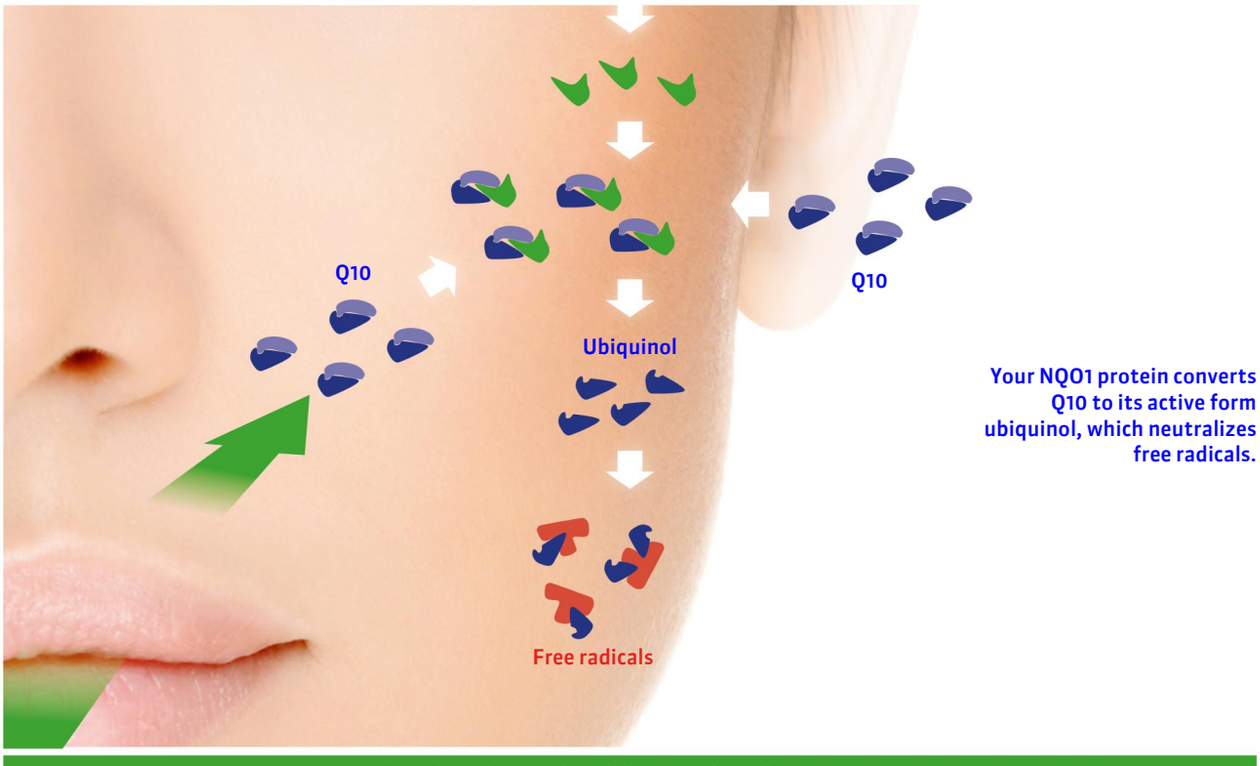
Genetic result		
GENE	**MUTATION**	**RESULT**
NQO1	rs1800566	C/C

Activation of Q10 in your body

IMPOSSIBLE SLOW NORMAL

Your recommendation:

NQO1 gene:



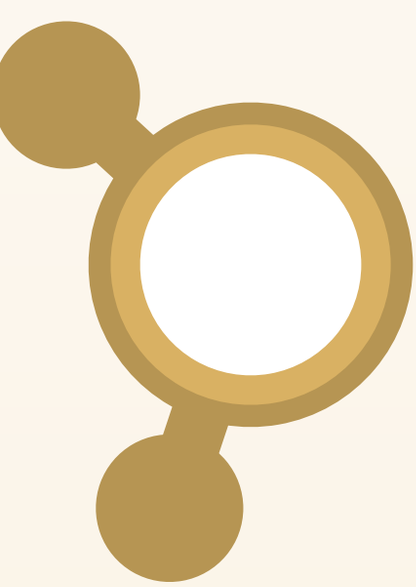
Your NQO1 protein converts Q10 to its active form ubiquinol, which neutralizes free radicals.

Q10 is activated and keeps the skin young

Which micronutrients does your skin need?

Since your NQO1 gene is functioning properly, you can use coenzyme Q10 as an effective antioxidant. Coenzyme Q10 can be absorbed from the diet but it can also be absorbed through the skin. For this reason, it is possible to use coenzyme Q10 as a dietary supplement and as a topical cream.

Your personalized recommendations based on this section:



The genetic factors of beauty

YOUR SELENIUM REQUIREMENT

Selenium is essential for important processes in the body and some people require significantly larger amounts of selenium due to their genes.

Selenium metabolism and oxidative stress

Selenium is an essential part of the GPX1 enzyme which targets and neutralizes specific free radicals.

If a person suffers from a selenium deficiency, the body cannot produce sufficient amounts of the GPX1 enzyme and oxidative stress increases as a consequence. This is one of the reasons why a selenium deficiency can have health effects.

If the GPX1 gene does not function adequately, not enough GPX1 enzyme will be produced despite sufficient selenium.

GPX1 gene:

Selenium is necessary for the production of the GPX1 enzyme.

Selenium

GPX1 enzyme

The GPX1 enzyme is produced in a slightly altered form.

Free radicals

The GPX1 enzyme binds more weakly and thus neutralizes fewer free radicals.

The body is not protected sufficiently

If the GPX1 gene works correctly, and there is enough selenium available, a sufficient amount of GPX1 enzyme will be produced.

GPX1 gene:

GPX1 enzyme

Selenium

Selenium is necessary for the production of the GPX1 enzyme.

Free radicals

The GPX1 enzyme is correctly produced

The GPX1 enzyme binds strongly to free radicals and neutralizes many of them.

Free radicals are neutralized

Your genetic score

Your genetic analysis has revealed that the GPX1 gene is functioning properly, and thus a normal selenium intake provides adequate protection against certain free radicals. A normal selenium intake is therefore perfectly adequate for you.

Genetic result

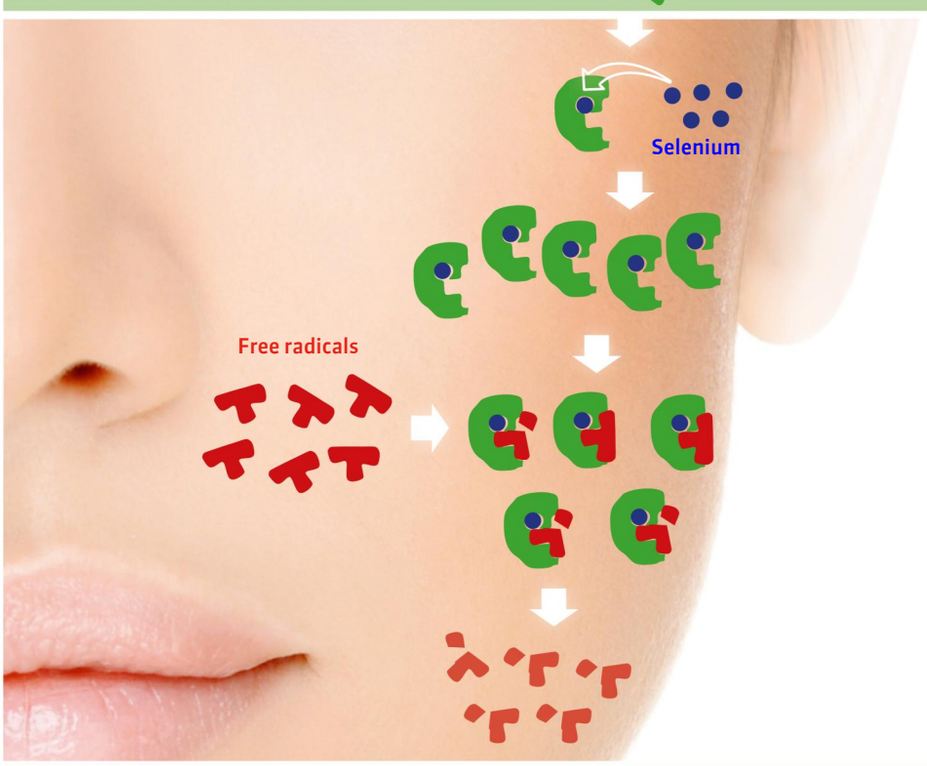
GENE	MUTATION	RESULT
GPX1	rs1050450	C/C

Your individual selenium requirement

VERY ELEVATED — ELEVATED — NORMAL

Your recommendation:

GPX1 gene:



A normal supply of selenium is fine.

The normal amount of selenium protects the skin.

Which micronutrients does your skin need?

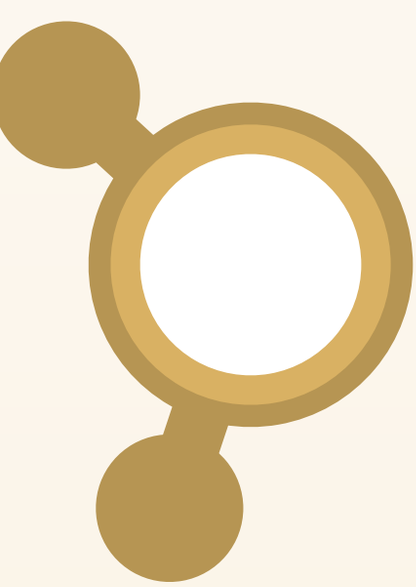
Since your GPX1 gene is functioning regularly, a normal supply of selenium is adequate to protect you against certain forms of free radicals.

Selenium is an essential component of many enzymes and must be obtained from the diet because the body can neither produce nor absorb it through the skin. For this reason, the body is dependent on either dietary intake or dietary supplements.

Your personalized recommendations based on this section:

INTERNALLY

EXTERNALLY



The genetic factors of beauty

INFLAMMATORY REACTIONS

A genetically triggered hyper-aggressive immune system can damage the skin from within.

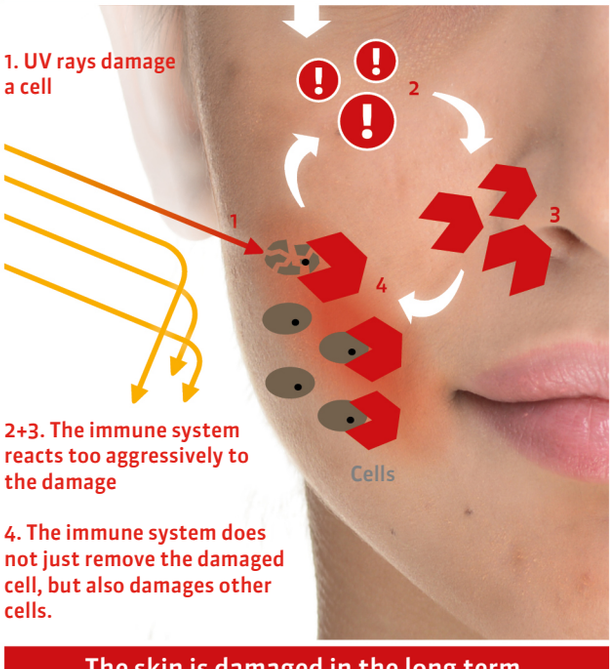
Inflammatory reactions

Inflammatory responses will be triggered by the body's immune system, and if they are too aggressive, they can damage tissue and accelerate aging.

The main cause of inflammatory processes in the skin is damage from the sun's UV rays. In most cases this is not a big problem, but some genetic variations can render the immune system too aggressive, meaning that it will damage the tissue even more.

Genetic variation in the genes that are responsible for the aggressiveness of the immune system can bring about a hyper-aggressive reaction and damage tissue.

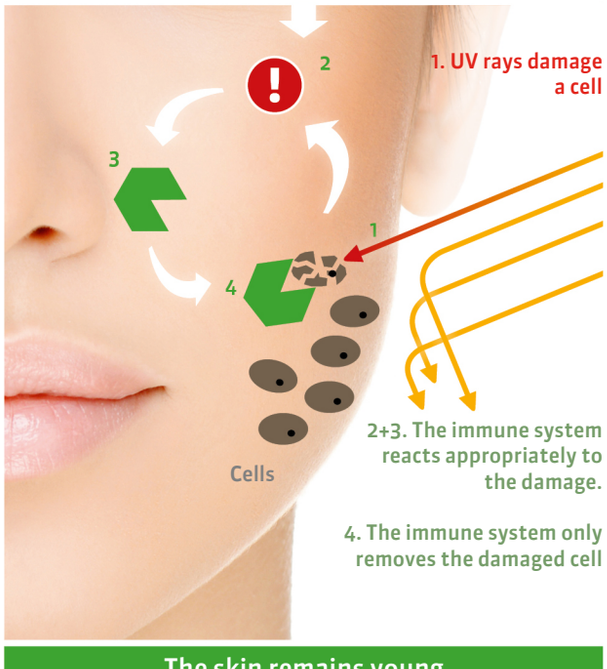
TNFa, ILs:



The skin is damaged in the long term

If the genes are working correctly, the immune system will react adequately to any damage caused by the sun's UV rays.

TNFa, ILs:



The skin remains young

Your genetic score

Your genetic analysis showed that your immune system reacts too aggressively to the damage caused by UV rays due to genetic variations. Because of this, your tissue is permanently damaged and aging processes are accelerated.

Genetic result

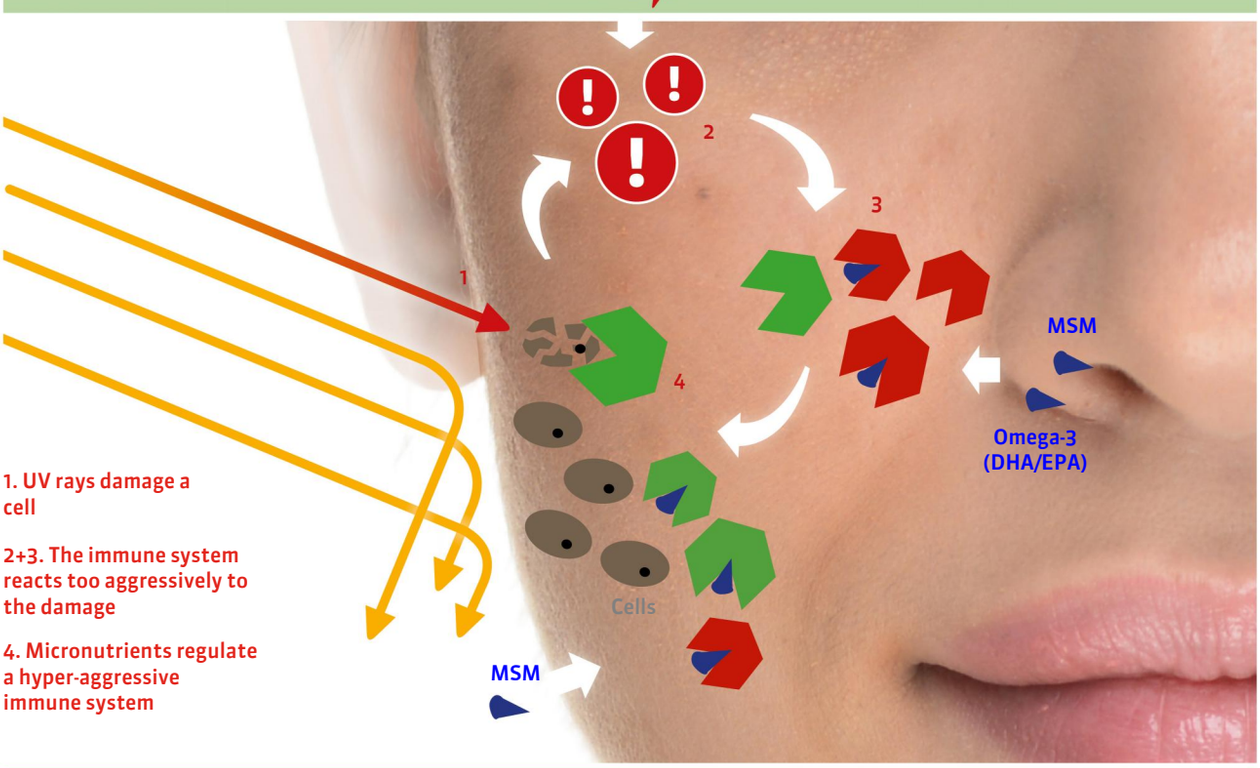
GENE	MUTATION	RESULT
TNF-α	rs1800629	A/A
IL1A	rs1800587	C/C
IL1RN	rs419598	C/T
IL 1 Beta	rs1143634	C/T

The aggressiveness of your immune system

ELEVATED NORMAL

Your recommendation:

TNFa, ILs:



Micronutrients regulate a hyper-aggressive immune system

Which micronutrients does your skin need?

Since your genetic analysis has shown that your immune system-regulating genes are disrupted by genetic variations, it is important to reduce the aggressiveness of your immune system in order to protect your skin.

Arachidonic acid, which is mainly found in animal foods, promotes inflammation in the body and, along with certain genetic variations, renders the immune system more aggressive. For this reason, it would be advisable to steer clear of foods that contain too much arachidonic acid. These include, in descending order: chicken, eggs, beef, sausages and fish, to a small extent.

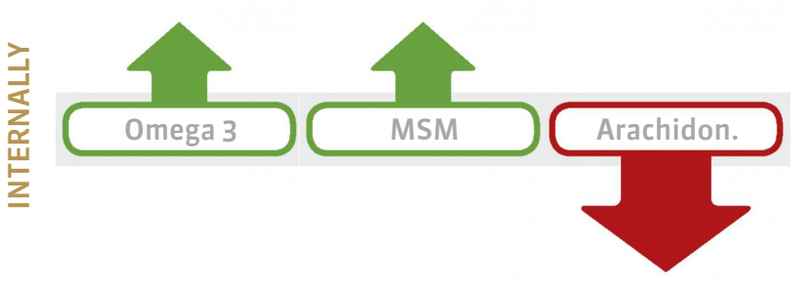
There are certain micronutrients that inhibit inflammation and therefore are able to counteract your aggressive immune system:

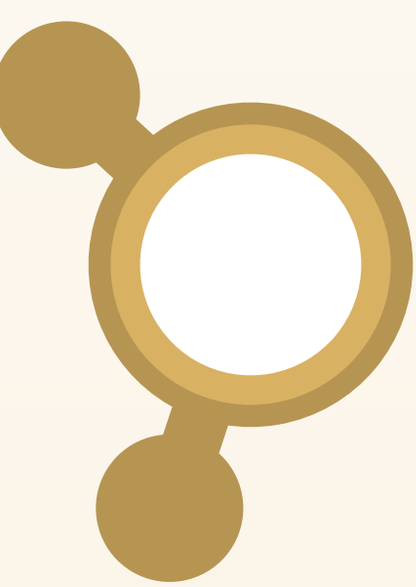
Omega 3 fatty acids (EPA)
EPA, one of the components of omega 3 fatty acids, competes with arachidonic acid, blocking its pro-inflammatory effect, thereby exerting an anti-inflammatory effect.

MSM - Organic sulfur - methylsulfonylmethane
MSM reduces inflammation and can be absorbed through the skin, and also taken up from the diet.

Based on your genetic analysis, the optimal quantities of these substances in the form of a skin cream and dietary supplements can now be established.

Your personalized recommendations based on this section:





The genetic factors of beauty

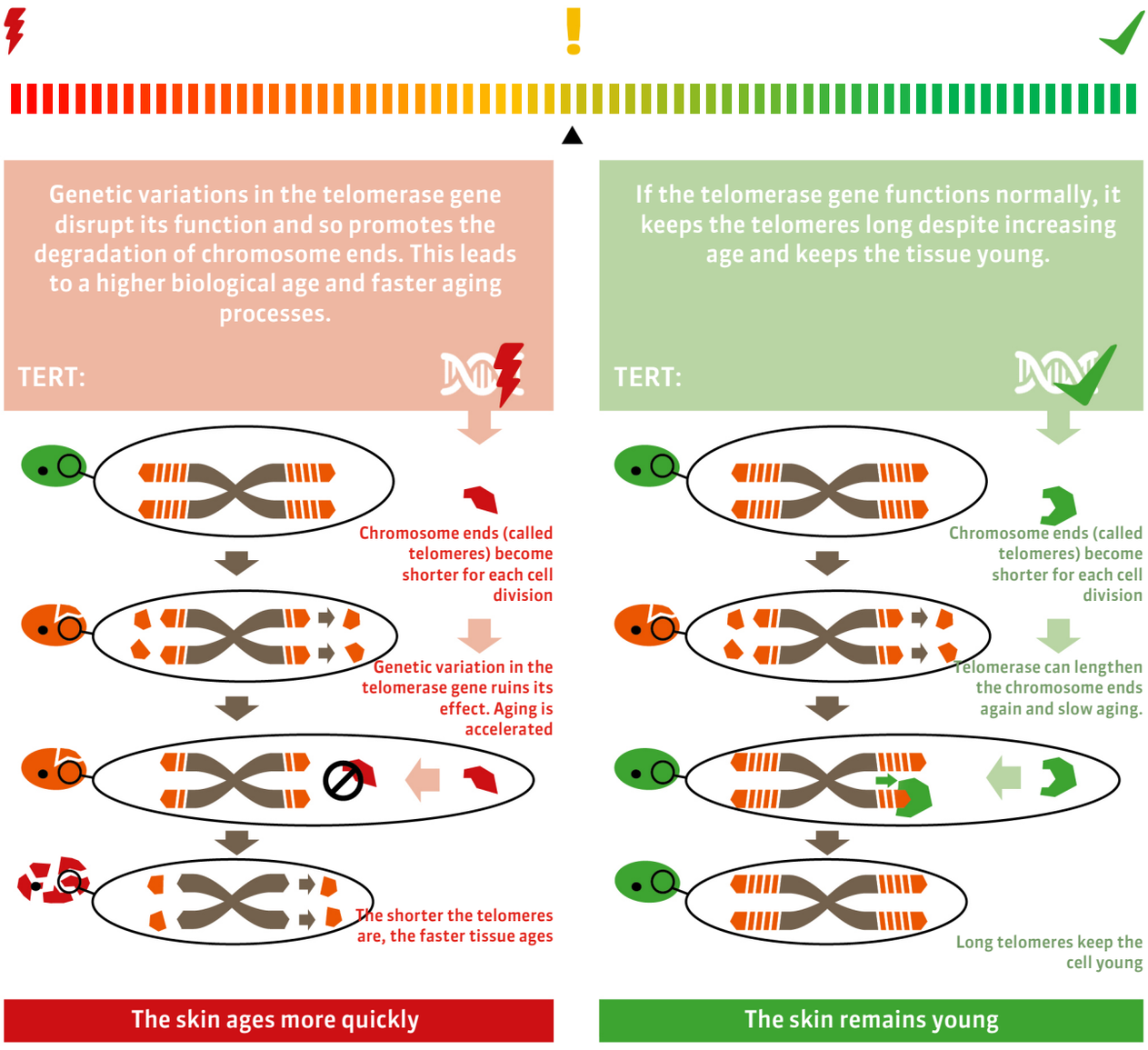
BIOLOGICAL AGE

Through frequent cell division, chromosome ends (telomeres) will get increasingly shorter and accelerate aging.

Telomeres and biological age

The entire human genetic code consists of 3.2 billion letters. They are split into 23 "packages" called chromosomes, and on average a chromosome contains about 1000 different genes.

A chromosome has a typical X-shape under the microscope, and it must be completely copied at each cell division. Each new copy of the end of a chromosome's arms (so-called telomeres) is slightly shorter. If the arms have become too short, the cell goes into a sleep mode where it no longer properly fulfills its tasks and start damaging the surrounding tissue. In this way, such "sleeper" cells accumulate with increasing age. We call this process aging.
Certain lifestyle factors such as smoking, disease and oxidative stress, but also genetic predispositions accelerate the degradation of the chromosome ends. However, there is also an telomerase-gene that can lenghten the telomeres again and thereby rejuvenate the tissue.



Your genetic score

Your genetic analysis has shown that your telomerase gene is not working properly due to a genetic variation, so your chromosome arms are getting shorter faster. This in turn, increases your biological age and skin aging accelerates.

Genetic result

GENE	MUTATION	RESULT
TERT	rs2242652	C/C
TERT	rs2735940	C/C
BICD1	rs2630578	C/G
PPARG	rs1801282	C/C

Your body's ability to lengthen telomeres

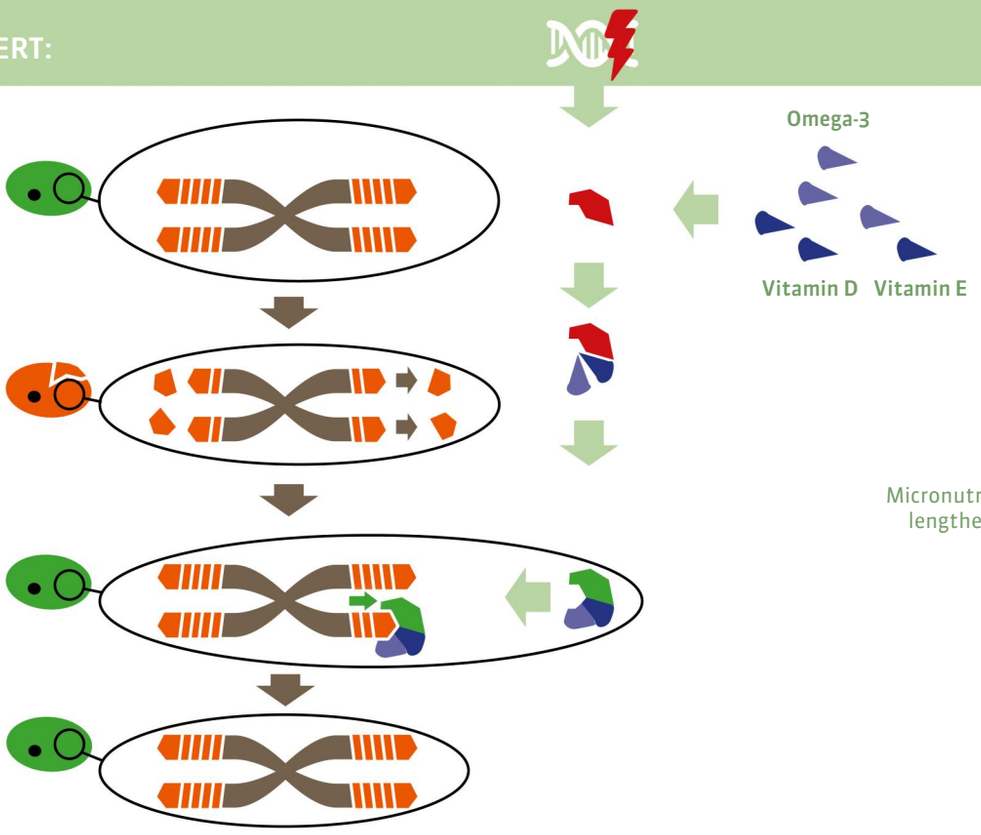
LIMITED NORMAL

Effect of a Mediterranean diet on your telomere length

NONE LENGTHENING

Your recommendation:

TERT:



Micronutrients help telomerase to lengthen the chromosome ends.

Telomerase is more active and telomeres are retained

Which micronutrients does your skin need?

Since genetic variations impair the functioning of your telomerase and the chromosome ends are degrading faster with increasing age, it is important to increase the telomerase activity through the consumption of certain micronutrients. There are a number of micronutrients, which have been shown to increase the activity of telomerase by up to 25%:

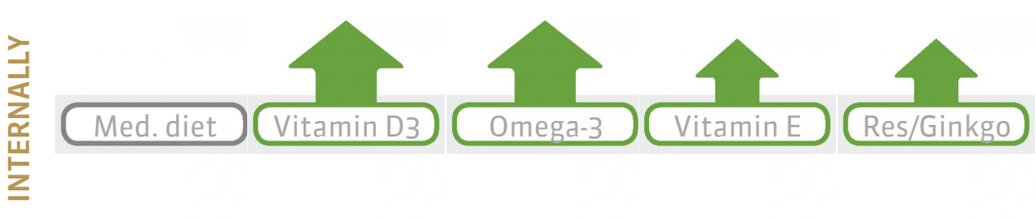
Vitamin D3
Regular intake of vitamin D3 increases telomerase activity by about 20%. As the vitamin, according to current studies, cannot be absorbed through the skin, it is recommended to take it as a dietary supplement and not in a skin cream.

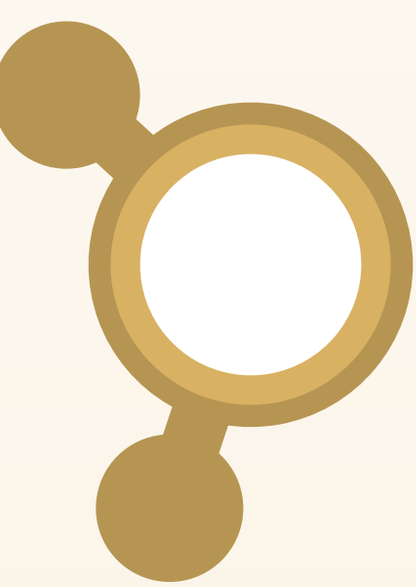
Micronutrient mix
According to one study, a micronutrient mix consisting of nine different components has been shown to cause a 25% increase in telomerase activity.

Resveratrol & Ginkgo Biloba
Resveratrol & Ginkgo Biloba can be added to the diet to extend the telomeres. The substances increase the activity of the telomerase and thus keep the tissue young and healthy.

Although the Mediterranean diet is generally healthy, it does not, have any positive influence on your telomeres due to your genes.

Your personalized recommendations based on this section:





The genetic factors of beauty

SUMMARY

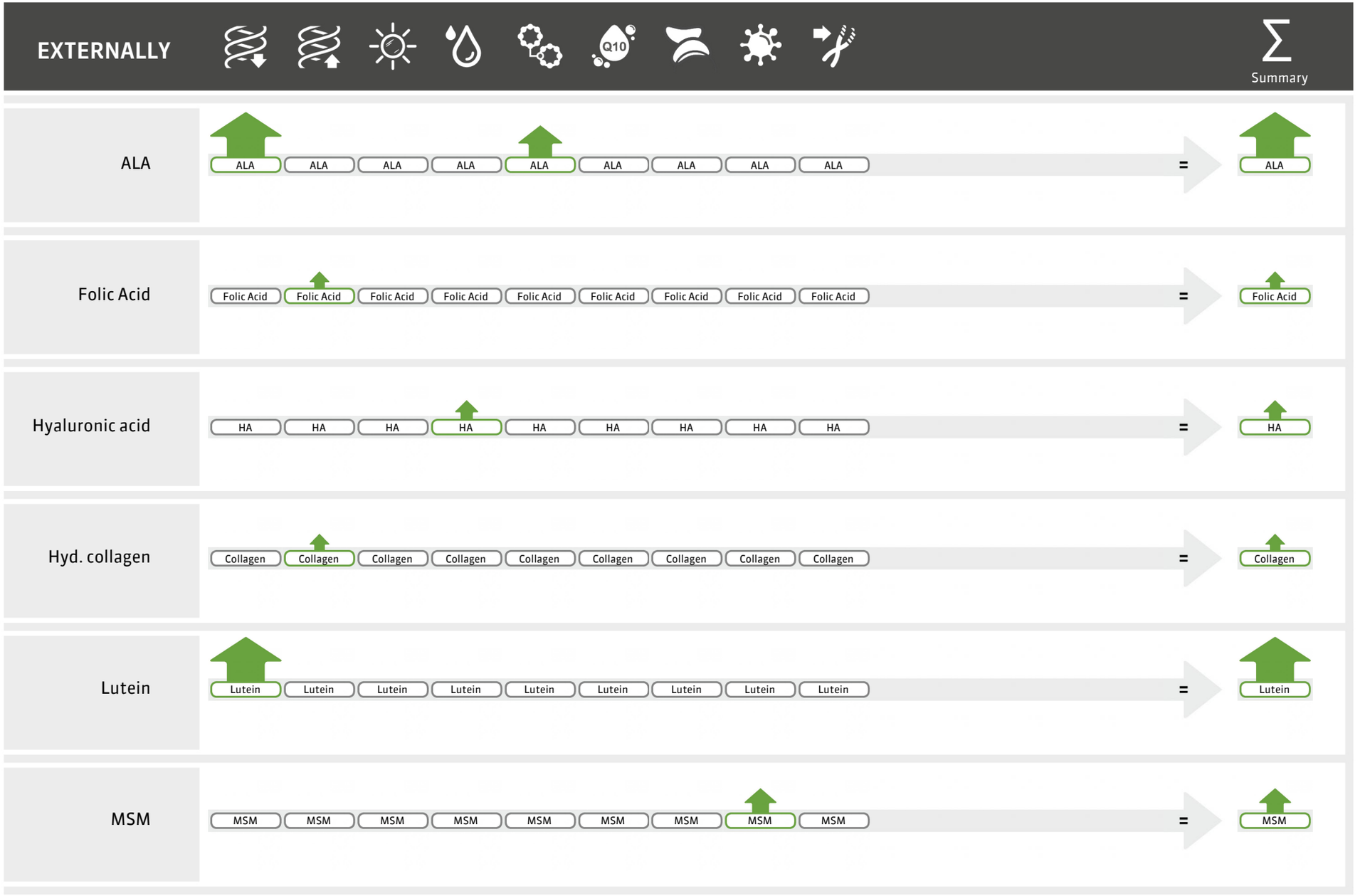
Here you will find a clear summary of your personalized recommendations

Your individual micronutrient recommendation

The last pages featured evaluations of the effect of certain nutrients (supplied externally or internally) based on each genetic aging process. In this section, the effects of the individual nutrients from the different areas are now combined to create a final recommendation for your cosmetic products and nutritional supplements.

This section, once again, lists the arrows of individual ingredients from the different categories. Taking into account the arrows for each substance, in each of the genetically analyzed categories, a summary that should be applied to your cosmetic products and dietary supplements, is provided.

These arrows form the foundation of your individually designed formula and ensure that your skin is supplied with the correct levels of important nutrients from both the inside and outside.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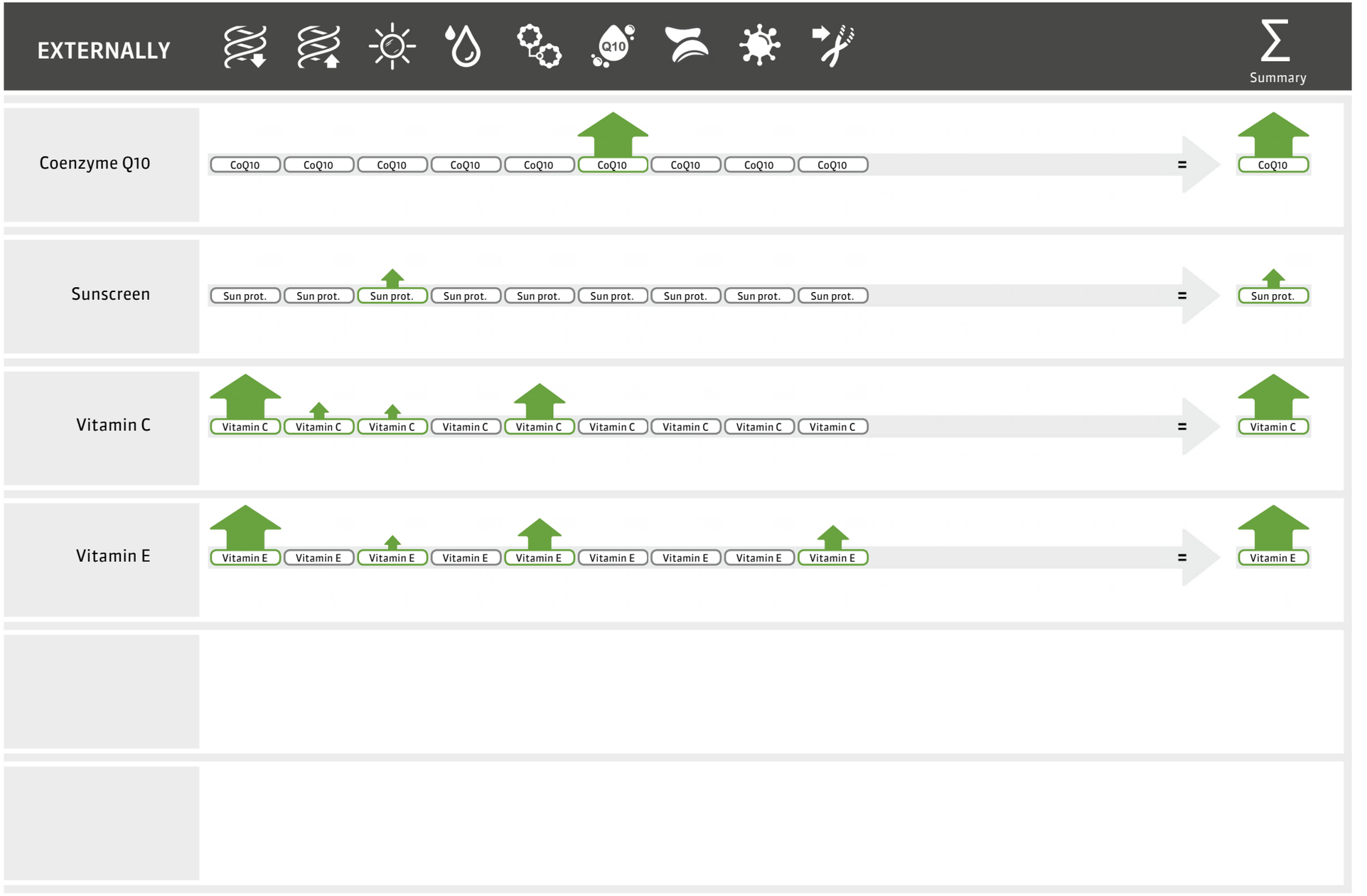
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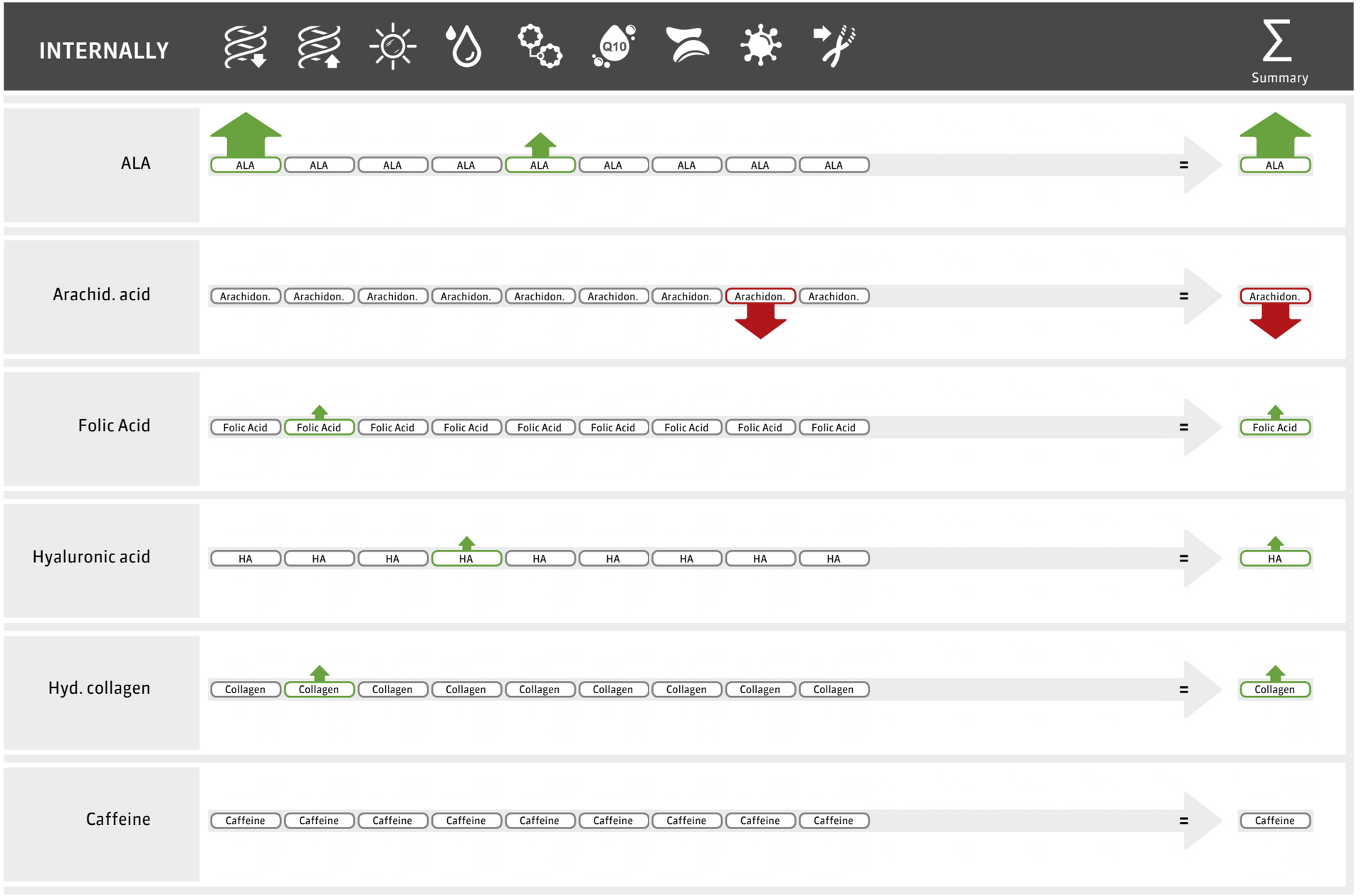
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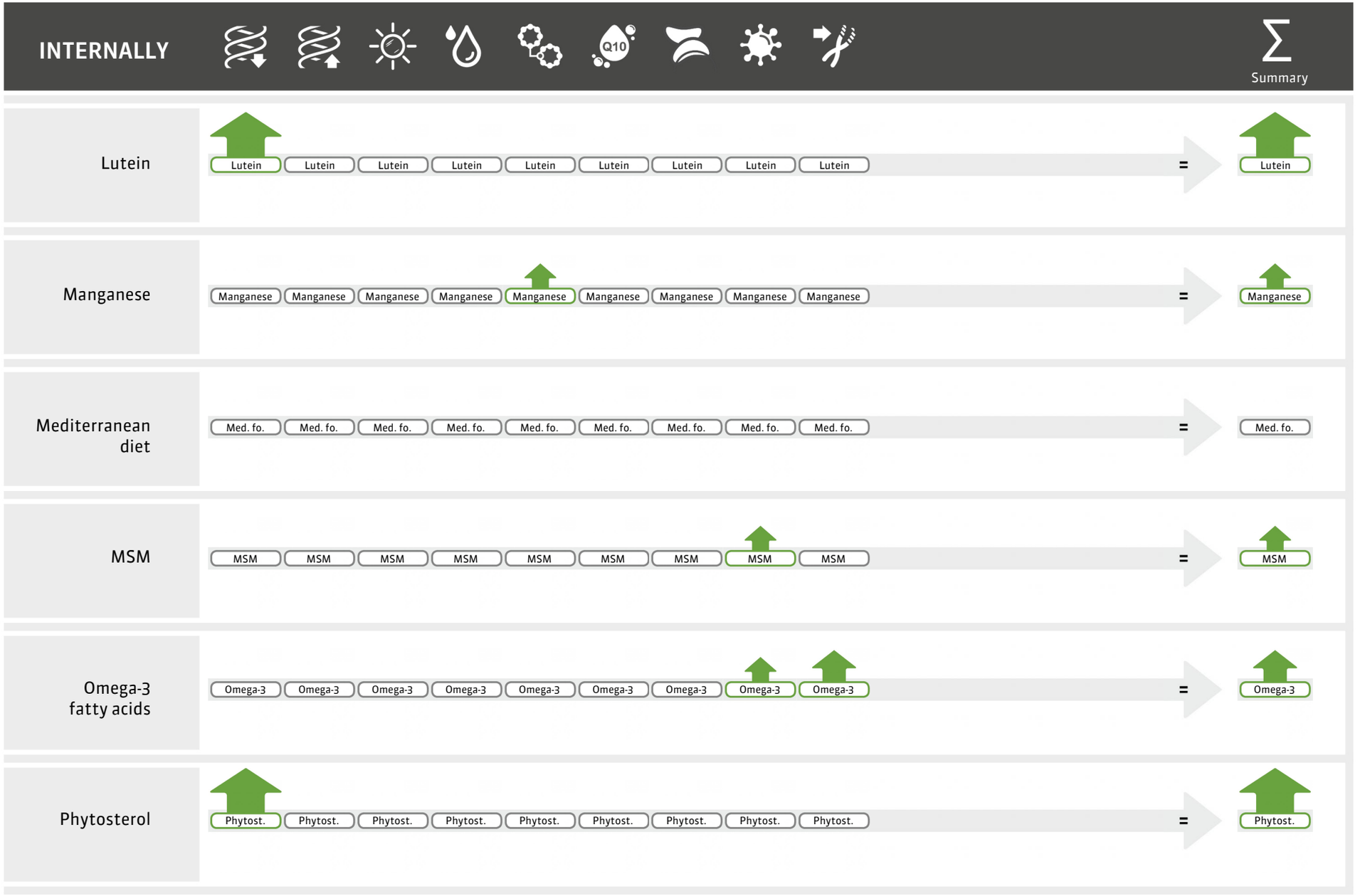
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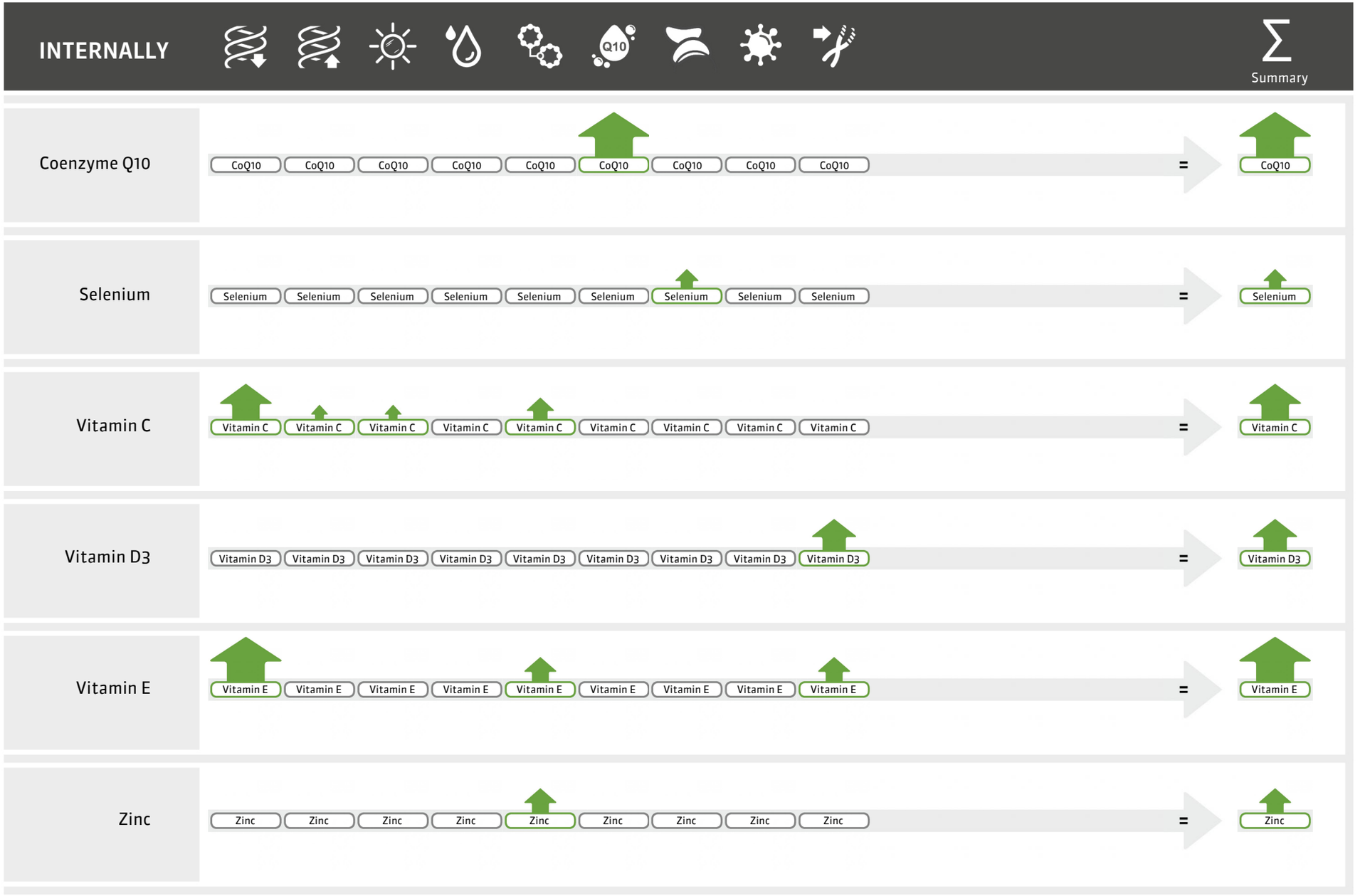
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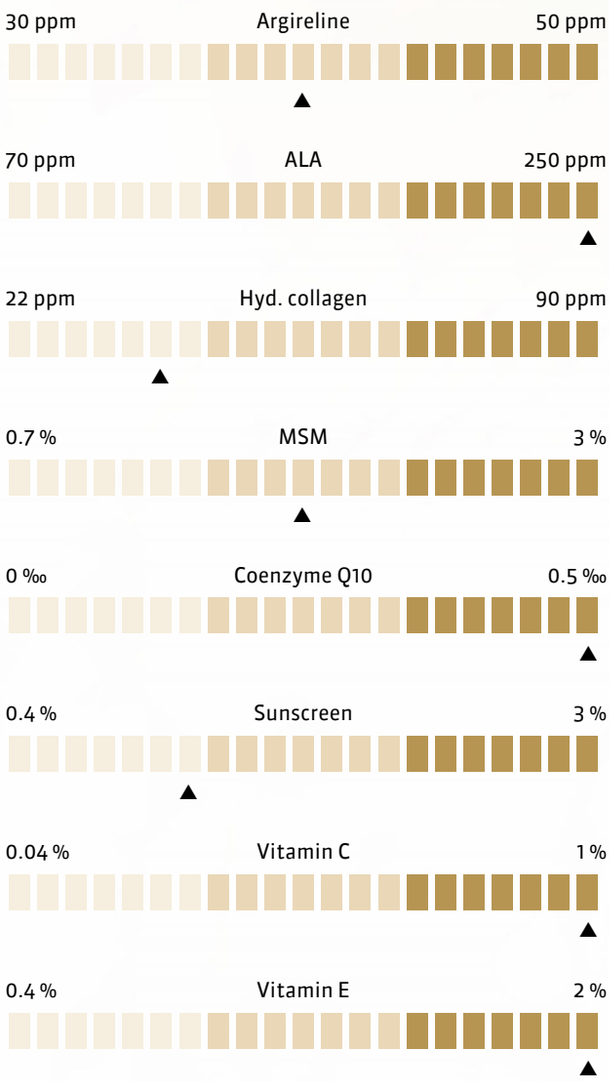
The genetic factors of beauty

THE SOLUTION

Based on your genetic testing, we can now tailor a product to your genes

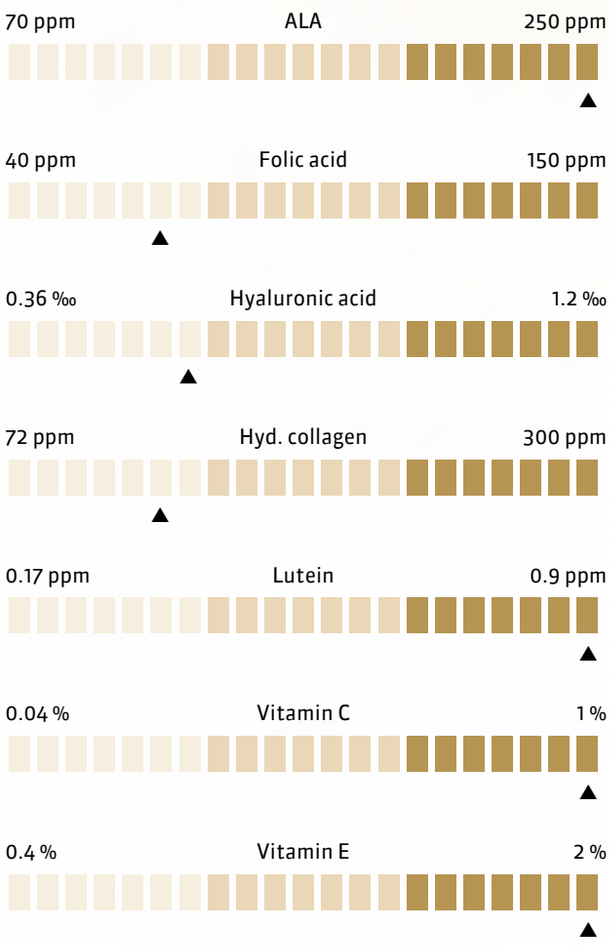
Gen-Serum Day

The serum contains high levels of genetically adjusted concentrations of protective active ingredients specifically for the face and décolleté. Apply as a base in the morning and continue to use your favorite cream, if you wish. Alternatively, you may use just the serum.



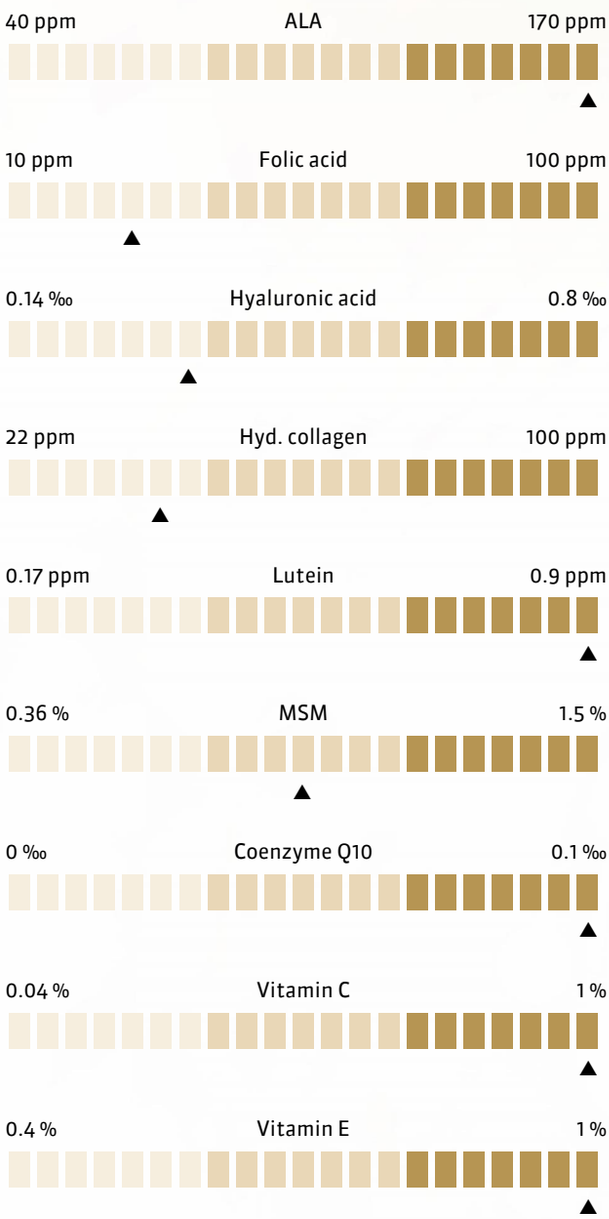
Gen-Serum Night

The potent serum contains high levels of genetically adjusted concentrations of regenerative active ingredients specifically for the face and décolleté. Apply it in the evening as a night cream to protect and regenerate your skin from the stresses of the day.



Gen-Lotion

The lotion has a higher fat content and includes certain nutrients adapted to your genes, which protect and regenerate the skin on your whole body. Apply the lotion in the evening before going to sleep or during the day to help with dry skin.






Micronutrient	Day	Night	Lotion	Supplements
Alpha lipoic acid	250 ppm	250 ppm	170 ppm	61 mg
Argireline	40 ppm	-	-	-
Coenzyme Q10	0.5 ‰	-	0.1 ‰	19.5 mg
Iron	-	-	-	12.5 mg
Folic Acid	-	70 ppm	30 ppm	208 µg
Hyaluronic acid	-	0.61 ‰	0.34 ‰	0 mg
Hyd. collagen	40 ppm	131 ppm	42 ppm	0 mg
Calcium	-	-	-	485 mg
Copper	-	-	-	0.39 mg
Lutein	-	0.9 ppm	0.9 ppm	3.4 mg
Magnesium	-	-	-	316 mg
Manganese	-	-	-	3.1 mg
MSM	1.9 %		0.93 %	269 mg
Omega-3	-	-	-	700 mg
Phytosterol	-	-	-	231 mg
Selenium	-	-	-	99 µg
SPF	1.2 %	-	-	-
Vitamin A	-	-	-	1376 µg
Vitamin B12	-	-	-	6.3 µg
Vitamin B2	-	-	-	0.8 mg
Vitamin B6	-	-	-	2.2 mg
Vitamin C	1 %	1 %	1 %	143 mg
Vitamin D3	-	-	-	16 µg
Vitamin E	2 %	2 %	1 %	22 mg
Zinc	-	-	-	8.8 mg

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DEMO_DS

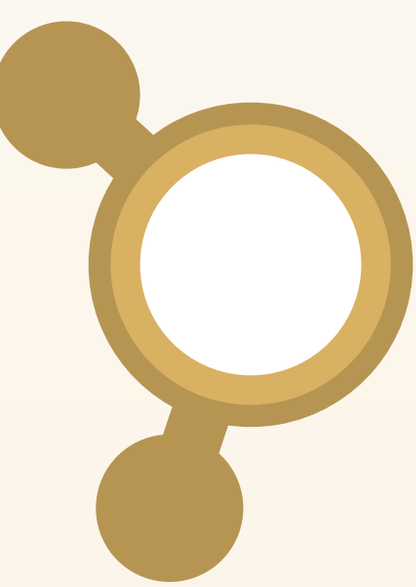
Customer Service

Influences on the micronutrient mixture

Your individual micronutrient mixture will be prepared based on various analyses and data. Here are aspects that affect your personal mix:

MICRONUTRIENTS

LIFESTYLE QUESTIONS



The genetic factors of beauty

ADDITIONAL INFORMATION

In this chapter you will receive useful information

Genetics of the MMP1 gene

The matrix metalloproteinase 1 (MMP1) enzyme is encoded by the same gene on chromosome 11. A frequently-occurring polymorphism in the promoter region (position -1607) increases the expression of the gene by more than double [1,3,4]. Heterozygous and homozygous carriers of the polymorphism thereby show increased MMP1 activity and increased collagen degradation (collagen types 1, 2, 3, 7, 8 and 10) [6-12]. Collagen type 1, 2 and 3 provide around 90% of the collagen of the body, and type 1 and 3 are also expressed in the skin [2]. The other collagenases MMP8 and MMP13 are also expressed in the skin and break down collagen, but no activity-enhancing polymorphisms are known in these genes, which is why the MMP1 polymorphism represents the only currently relevant polymorphism of the collagen content of the skin [4,14]. The detection of the polymorphism allows an assessment of the collagenase activity in the skin.

MMP1 (rs1799750)

RES	Genotype	POP	Possible results
	DEL/DEL	20%	Normal collagen breakdown
	G/DEL	47%	Somewhat faster collagen breakdown
X	G/G	33%	Much too fast collagen breakdown

References

Tower GB et al. The 2G single nucleotide polymorphism (SNP) in the MMP-1 promoter contributes to high levels of MMP-1 transcription in MCF-7/ADR breast cancer cells. Breast Cancer Res Treat. 2003 Nov,82(2):75-82.

Rutter JL et al. A single nucleotide polymorphism in the matrix metalloproteinase-1 promoter creates an Ets binding site and augments transcription. Cancer Res. 1998 Dec 1,58(23):5321-5.

Fujimoto T et al. A single nucleotide polymorphism in the matrix metalloproteinase-1 (MMP-1) promoter influences amnion cell MMP-1 expression and risk for preterm premature rupture of the fetal membranes.

Vincenti MP et al. Transcriptional regulation of collagenase (MMP-1, MMP-13) genes in arthritis: integration of complex signaling pathways for the recruitment of gene-specific transcription factors. Arthritis Res. 2002,4(3):157-64. Epub 2001 Nov 23.

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Tower GB et al. Erk 1/2 differentially regulates the expression from the 1G/2G single nucleotide polymorphism in the MMP-1 promoter in melanoma cells. Biochim Biophys Acta. 2002 Apr 24,1586(3):265-74.

Legend: RES = your personal result, POP = frequency within the population

Excipients' effect

LUTEIN

The secondary phytochemical lutein inhibits the MMP1 gene's expression and thereby reduces the collagenase activity in the skin [13.15 to 18]. Lutein, which is absorbed by food, accumulates in the skin, where it exerts its MMP1 inhibitory activity [21]. Even though lutein permeability through the skin has not been adequately examined, providing lutein in the form of a topical cream showed more than 20% better elasticity and more than 40% better moisture after 12 weeks of use, suggesting skin permeability [20].

VITAMIN C

Vitamin C is skin-permeable and when applied topically, increases the expression of "tissue inhibitor of metalloproteinase-1" and thus reduces the MMP1 activity [22,24].

VITAMIN E

Vitamin E (alpha-tocopherol) inhibited protein kinase C (PKC) which is expressed up to eight-fold more with age [23]. A reduced PKC level, in turn, reduces the expression of MMP1 [23,25].

ALA, PHYTOSTEROL

Alpha lipoic acid and phytosterols can block the activity of matrix metalloproteinases and thus slow the breakdown of collagen[26-31].

References

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The genetics of collagen synthesis

The prolidase enzyme synthesizes free proline, which is used as a raw material for collagen synthesis. The proline production (as well as prolidase enzyme) is the limiting factor in the synthesis of collagen is [1-3]. Caffeine is a potent inhibitor of the prolidase enzyme and thus has a negative influence on the synthesis of collagen [4]. The cytochrome P450-1A2 gene codes for the same protein that the main breakdown pathway (approximately 95%) of caffeine in the body represents [5-7]. One common genetic variation reduces the function of this enzyme, and also results in a significantly slower degradation of caffeine.

CYP1A2 (rs762551)

RES	Genotype	POP	Possible results
X	A/A	41%	Normal caffeine breakdown
	A/C	43%	Somewhat slower removal of caffeine
	C/C	16%	Very slow removal of caffeine

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Legend: RES = your personal result, POP = frequency within the population

Excipients' effect

HYDROLIZED COLLAGEN

Hydrolized collagen consists of small collagen fragments that are absorbed via the skin or food. When the body registers the increased concentration of collagen fragments, it is tricked into thinking that too much collagen is being broken down. As a result, it begins increasing collagen production. Intake of hydrolyzed collagen led to a significant increase in the collagen density in the skin after 12 weeks of application [8-11]. Collagen that is applied to the skin can strengthen the tissue and improve the skin complexion [10-13]. Therefore, hydrolyzed collagen in the form of dietary supplements and skin cream can be used to improve the skin's collagen density.

VITAMIN C

Vitamin C is highly skin-permeable and exhibits collagen synthesis-stimulating effects when applied externally in the form of a skin cream [14-18]. Here, vitamin C is an essential cofactor for two enzymes, which play an important role in collagen synthesis. On one hand, lysyl hydrolase serves to connect collagen molecules with one another, and on the other hand, the propyl hydrolase helps stabilize collagen strands [21]. The collagen production-enhancing effect of vitamin C has been demonstrated through in vitro studies [20,22-26], ex vivo studies [27], controlled clinical studies [28], double blind studies [29,30] and randomized double blind studies [31]. Here, the collagen stimulating effect acts on the DNA level [32,33].

FOLIC ACID

Folic acid is skin-permeable and shows an increased expression of procollagen and collagen genes, as well as an increased collagen density in the skin [19].

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The genetics of skin UV protection

The MC1R gene is expressed in the melanocytes, thus controlling the production of the melanocortin-1 receptor, which controls the skin and hair pigmentation. Various frequently occurring genetic variations affect the skin type, as well as the biological UV-protection of an individual [13-18].

The STXBP5L gene has specific gene variations which also affect the UV sensitivity of the skin [20].

MC1R (rs885479)

RES	Genotype	POP	Possible results
X	G/G	71%	Stronger UV protection
	A/G	19%	Moderate UV protection
	A/A	10%	Weak UV protection

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Legend: RES = your personal result, POP = frequency within the population

MC1R (rs11547464)

RES	Genotype	POP	Possible results
X	G/G	98%	Stronger UV protection
	A/G	1%	Moderate UV protection
	A/A	1%	Weak UV protection

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MC1R (rs1805006)

RES	Genotype	POP	Possible results
X	C/C	98%	Stronger UV protection
	A/C	1%	Moderate UV protection
	A/A	1%	Weak UV protection

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Legend: RES = your personal result, POP = frequency within the population

MC1R (rs1805007)

RES	Genotype	POP	Possible results
X	C/C	96%	Stronger UV protection
	C/T	3%	Moderate UV protection
	T/T	1%	Weak UV protection

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STXBP5L (rs322458)

RES	Genotype	POP	Possible results
X	A/A	11%	Stronger UV protection
	A/G	42%	Moderate UV protection
	G/G	47%	Moderate UV protection

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Legend: RES = your personal result, POP = frequency within the population

Excipients' effect

SUN PROTECTION FACTOR

The sun protection factor contains substances which act as a physical barrier to UV rays. As a result, the sun's rays are either absorbed or reflected. Since they do not penetrate the skin, skin irritations are very rare [1,2].

VITAMIN E

Since the body can not produce vitamin E, it must be absorbed through food [2,9]. As a strong antioxidant, it protects the tissue from free radicals and damage from UV rays [2,6,9-11]. Studies have shown that application of vitamin E onto the skin in the event of excessive UV radiation significantly reduces fluid accumulation under the skin, redness, inflammation and sunburn [10].

VITAMIN C

A combination of vitamin C and vitamin E demonstrated far better protection from UV rays [12]. A single application of skin creams with a concentration of 10% tocopherols and 0.3% tocotrienols led to significantly reduced photosensitivity (sensitivity to UV radiation) [6].

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Skin hydration

Apart from the long collagen strands, the extracellular matrix of the skin contains hyaluronic acid, which stores moisture [1,6,9,10] and is therefore frequently injected in the skin as a solution at beauty clinics [2-4]. Hyaluronic acid can be absorbed through the digestive tract and then accumulates in high concentrations in the skin. [5].

MC1R (rs885479)

RES	Genotype	POP	Possible results
X	G/G	71%	Good moisture storage
	A/G	19%	Moderate moisture storage
	A/A	10%	Poor moisture storage

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Legend: RES = your personal result, POP = frequency within the population

MC1R (rs11547464)

RES	Genotype	POP	Possible results
X	G/G	98%	Good moisture storage
	A/G	1%	Moderate moisture storage
	A/A	1%	Poor moisture storage

References

Wong TH et al. The relation between melanocortin 1 receptor (MC1R) variation and the generation of phenotypic diversity in the cutaneous response to ultraviolet radiation. Peptides. 2005 Oct,26(10):1965-71.

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MC1R (rs1805006)

RES	Genotype	POP	Possible results
X	C/C	98%	Good moisture storage
	A/C	1%	Moderate moisture storage
	A/A	1%	Poor moisture storage

References

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Legend: RES = your personal result, POP = frequency within the population

MC1R (rs1805007)

RES	Genotype	POP	Possible results
X	C/C	96%	Good moisture storage
	C/T	3%	Moderate moisture storage
	T/T	1%	Poor moisture storage

References

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STXBP5L (rs322458)

RES	Genotype	POP	Possible results
X	A/A	11%	Good moisture storage
	A/G	42%	Moderate moisture storage
	G/G	47%	Poor moisture storage

References

Le Clerc S et al. A genome-wide association study in Caucasian women points out a putative role of the STXBP5L gene in facial photoaging. J Invest Dermatol. 2013 Apr,133(4):929-35.

Legend: RES = your personal result, POP = frequency within the population

Excipients' effect

NON-MOLECULAR HYALORONIC ACID

If low-molecular-weight hyaluronic acid is applied to the skin, it can enter the skin and restore the skin's moisture [7]. As a person ages, the concentration of hyaluronic acid in the skin decreases, causing the moisture, one of the decisive factors of skin aging, to also progressively decrease [7]. The sun's UV radiation (in particular UV-B rays) lead to a reduced expression of hyaluronic acid-producing genes (HYAL2 & HYAL3) and simultaneously increase the activity of hyaluronic acid-degrading enzymes (hyaluronidase) [8, 9].

Harmful UV-B rays are neutralized by the MC1R and STXBP5L genes, which is why these genes also influence the hyaluronic acid balance. In cases in which the skin-aging UV-B rays are not sufficiently neutralized due to genetic variations in these genes, any lost hyaluronic acid can be replaced by means of food supplementation and skin cream [7,5].

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The genetics of oxidative stress

Approximately 5% of the inhaled oxygen is metabolically converted to free radicals, such as superoxides in the body. To protect against these harmful molecules, the body has a number of enzymes that target and neutralize superoxides. The superoxide dismutase enzymes 1, 2 and 3 perform this role in the cytoplasm, mitochondria and extracellular matrix [29,30]. A common genetic variation in the SOD2 gene disrupts its function and leads to increased oxidative stress in the mitochondria [29,30]. Frequently occurring genetic variations in the GSTM1, GSTT1 and GSTP1 genes also increase oxidative stress [30-36]. A missing genetic protection function can be, at least partially, compensated by an increased intake of antioxidants.

GSTT1 - glutathione s-transferase theta 1 (null allele)

The glutathione s-transferases are found in the liver and in lymphocytes. They are involved in the detoxification of endogenous and exogenous substances. A defective GSTM1 gene reduces the enzymatic activity of the protein, which leads to a limited cellular detoxification.

RES	Genotype	POP	Possible results
	INS	74%	Good protection agains free radicals
X	DEL	26%	Poor protection against free radicals

References

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GSTM1 - glutathione s-transferase mu1 (null allele)

The glutathione s-transferases are found in the liver and in lymphocytes. They are involved in the detoxification of endogenous and exogenous substances. A defective GSTM1 gene reduces the enzymatic activity of the protein, which leads to a limited cellular detoxification.

RES	Genotype	POP	Possible results
X	INS	56%	Good protection agains free radicals
	DEL	44%	Poor protection against free radicals

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Legend: RES = your personal result, POP = frequency within the population

GSTP1 - glutathione s-transferase pi 1 (rs1695)

The glutathione s-transferases are found in the liver and in lymphocytes. They are involved in the detoxification of endogenous and exogenous substances. The GSTP1 enzymes are involved in the metabolism of endogenous metabolites, and protect the cells against oxidative stress- similar to GSTM1 and GSTT1.

RES	Genotype	POP	Possible results
	A/A	48%	Good protection agains free radicals
X	A/G	42%	Moderate protection against free radicals
	G/G	10%	Poor protection against free radicals

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SOD2 - superoxide dismutase 2, mitochondrial (rs4880)

SOD2 encodes the superoxide dismutase enzyme 2 and it is involved in the degradation of reactive oxygen molecules (ROS), thus protecting the body against oxidative stress. Defects may affect the enzymatic activity of the SOD2 enzyme, resulting in a limited protection against the free radicals.

RES	Genotype	POP	Possible results
	C/C	20%	Good protection agains free radicals
	C/T	53%	Moderate protection against free radicals
X	T/T	27%	Poor protection against free radicals

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Legend: RES = your personal result, POP = frequency within the population

GPX1 - glutathione peroxidase (rs1050450)

The GPX gene encodes the enzyme glutathione peroxidase, which catalyzes the reduction of peroxides and hydrogen peroxide. Thus, GPX plays a role in protecting the body against oxidative stress.

RES	Genotype	POP	Possible results
X	C/C	67%	Good protection agains free radicals
	C/T	26%	Moderate protection against free radicals
	T/T	7%	Poor protection against free radicals

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Hong Z et al. GPX1 gene Pro200Leu polymorphism, erythrocyte GPX activity, and cancer risk. Mol Biol Rep. 2013 Feb,40(2):1801-12.

Jablonska E et al. Association between GPx1 Pro198Leu polymorphism, GPx1 activity and plasma selenium concentration in humans. Eur J Nutr. 2009 Sep,48(6):383-6.

Legend: RES = your personal result, POP = frequency within the population

Excipients' effect

ALPHA-LIPOIC ACID

Alpha-lipoic acid is skin-permeable and acts locally as a powerful antioxidant. [2]
If it is obtained from the diet or as a dietary supplement, in addition to its antioxidant activity, it also has the ability to regenerate other antioxidants such as vitamin C and E [3,5-7]. In addition, ALA increases the production of new collagen in the skin, contributing to skin tension [4.9]. In trials, a 5% concentration applied to the facial skin led to a marked improvement in the texture of the skin [10-11].

VITAMIN C

Vitamin C is skin-permeable and, when applied externally in the form of a skin cream, exhibits a powerful antioxidant activity [12-16]. In addition, vitamin C is capable of regenerating vitamin E and thereby increasing the antioxidant capacity [17-20].

VITAMIN E

Vitamin E is not only a powerful fat-soluble antioxidant, but it is even more effective [25] in its antioxidant capacities in conjunction with Vitamin C because of the continuous regeneration. Whether applied on the skin or ingested through the diet, it exhibits a significant antioxidant effect, and offers significantly better protection against the effects of UV radiation on the skin [23,24].

ZINC AND MANGANESE

The minerals zinc and manganese are important parts of antioxidant enzymes and therefore have indirect antioxidant effects. The best example is the antioxidant SOD2 protein which requires manganese for its proper functioning [1.26]. The minerals can, however, not be absorbed through application to the skin, and so they must be supplied through the diet or in the form of dietary supplements [27,28].

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The genetics of Q10 metabolism

Coenzyme Q10 (also known as ubiquinone) can be produced by the body, or absorbed through the skin and from the diet [1,5-7,18,19]. It is converted by the enzyme NQO1 to its active form ubiquinol, and it is in this form that it exhibits its antioxidant effect [16,17,18]. One common genetic variation of the NQO1 gene disrupts the function of the protein and thus prevents the conversion into active ubiquinol [16,17]. This means that coenzyme Q10 is only converted to ubiquinol, protecting against oxidative stress, if an active allele of the NQO1 gene is present [16,17,18]. Due to this, supplements or dermal administration of coenzyme Q10 should only be recommended for carriers of at least one active allele of the NQO1 gene.

NQO1 - NAD(P)H dehydrogenase, quinone 1 (rs1800566)

The enzyme NAD(P)H dehydrogenase, encoded by the NQO1, is a so-called oxidoreductase, and catalyzes the oxidation of nicotinamide adenine dinucleotide (NAD). The polymorphism rs1800566 inhibits the enzymatic activity, and coenzyme Q10 cannot be converted into ubiquinol, or the conversion is slower than normal.

RES	Genotype	POP	Possible results
X	C/C	66%	The enzyme NQO1 effectively converts the coenzyme Q10 into the antioxidant ubiquinol.
	C/T	30%	The enzyme NQO1 converts the coenzyme Q10 into the antioxidant ubiquinol at a slower rate.
	T/T	4%	The enzyme NQO1 cannot convert the coenzyme Q10 into the antioxidant ubiquinol.

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Legend: RES = your personal result, POP = frequency within the population

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Selenium and the GPX1 gene

The GPX1 gene codes for the glutathione peroxidase 1 enzyme, which neutralizes hydrogen peroxide [1,4,5]. A frequently occurring polymorphism of this gene reduces the enzyme's activity and thus reduces the antioxidant capacity [5-8]. Studies have shown that in the presence of this gene variant, increased plasma levels of selenium can increase the reduced enzyme activity again [9].

GPX1 - glutathione peroxidase (rs1050450)

The GPX gene encodes the enzyme glutathione peroxidase, which catalyzes the reduction of peroxides and hydrogen peroxide. Thus, GPX plays a role in protecting the body against oxidative stress.

RES	Genotype	POP	Possible results
X	C/C	67%	Good protection agains free radicals
	C/T	26%	Moderate protection against free radicals
	T/T	7%	Poor protection against free radicals

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Tang TS et al. Association between the rs1050450 glutathione peroxidase-1 (C > T) gene variant and peripheral neuropathy in two independent samples of subjects with diabetes mellitus. Nutr Metab Cardiovasc Dis. 2012 May,22(5):417-25.

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Legend: RES = your personal result, POP = frequency within the population

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The genetics of immune system regulation

The immunomodulators TNF-alpha and various interleukins affect the aggressiveness of the immune system [2-6]. For example, a frequently occurring genetic variation in the promoter of the TNF-alpha gene leads to increased transcription and therefore to increased activation of inflammatory reactions [2-6].

IL1RN - interleukin 1 receptor antagonist (rs419598)

The interleukin 1 receptor antagonist (IL1RN) is involved in the regulation of immune and inflammatory responses. The rs419598 polymorphism can enhance the inflammatory activity, which leads to an increased risk of periodontitis. In addition, it was shown that carriers of the C-allele have an increased risk of titanium implant loss.

RES	Genotype	POP	Possible results
	T/T	47%	An aggressive immune system
X	T/C	47%	An aggressive immune system
	C/C	6%	A normal immune system

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IL1A - interleukin 1 alpha (rs1800587)

The interleukin-1 gene cluster on chromosome 2 contains the genes for IL1A and IL1B. In the presence of these polymorphisms (rs1800587 and rs1143634) the T-allele increases the IL-1 synthesis, leading to an increase of the inflammatory capacity.

RES	Genotype	POP	Possible results
	T/T	10%	An aggressive immune system
	T/C	50%	An aggressive immune system
X	C/C	40%	A normal immune system

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Legend: RES = your personal result, POP = frequency within the population

IL1B - interleukin 1 beta (rs1143634)

The interleukin-1 gene cluster on chromosome 2 contains the genes for IL1A and IL1B. In the presence of these polymorphisms (rs1800587 and rs1143634) the T-allele increases the IL-1 synthesis, leading to an increase of the inflammatory capacity.

RES	Genotype	POP	Possible results
	T/T	5%	An aggressive immune system
X	T/C	31%	An aggressive immune system
	C/C	64%	A normal immune system

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TNF-α - tumor necrosis factor a (TNF superfamily, member 2) (rs1800629)

The tumour necrosis factor (TNF or TNF-α) is a cytokine in the human immune system that regulates the activity of immune cells. TNF regulates apoptosis, cell proliferation, cell differentiation and the secretion of various cytokines. The polymorphism rs1800629 leads to a highly increased TNFa expression, and thus to an increased inflammatory capacity.

RES	Genotype	POP	Possible results
	G/G	67%	A normal immune system
	G/A	31%	An aggressive immune system
X	A/A	2%	An aggressive immune system

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Legend: RES = your personal result, POP = frequency within the population

Effect of various substances

ARACHIDONIC ACID AND OMEGA-3

Arachidonic acid is a part of many animal-sourced foods and is considered a pro-inflammatory substance. This is due to the fact that arachidonic acid is converted by the COX-1 and COX-2 enzyme systems to the inflammation mediator PEG2. The omega-3 fatty acid eicosapentaenoic acid (EPA) competes with arachidonic acid for the COX enzyme systems and is only converted to the weak inflammatory mediator PEG2 [1]. The activation of the inflammatory processes is thus reduced. For these reasons, a diet rich in omega-3 fatty acids EPA and poor in arachidonic acid should be given to patients with autoimmune diseases.

MSM

In studies, methylsulphonylmethane (MSM) with ethylenediaminetetraacetic acid (EDTA) had exhibited an anti-inflammatory effect [6], and it is therefore often used for patients with inflammation-related joint disorders such as rheumatoid arthritis [9]. MSM can be obtained from the diet but is also absorbed through the skin with dermal application [7,8].

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Telomere length and biological age

The ends of the chromosome arms, called telomeres, consist of a constantly repeated DNA sequence (TTAGGG) which, as part of one of the essential factors of the aging process, is shortened with each cell division [4-6]. If the telomeres become too short, chromosome ends start to fuse with each other and break at various points within the cell division cycle [8]; they will ultimately go to senescence, where they no longer fulfill their function and damage the surrounding tissue [9,10].

Telomerase is an enzyme with ability to either lengthen telomeres or slow down their gradual gradual decay [11,12] and thus rejuvenate the tissue. However, the telomerase activity in tissues is usually very low [11].

Certain genetic variations affect the function of telomerase and lead to a more rapid decay of the chromosome ends, or they interact with certain lifestyle factors, thereby affecting telomerase activity [13.16-23]. For example, carriers of the Ala allele of the PPARG gene, who are subjected to a Mediterranean diet, experience a telomerase-activating effect [13]. For those without this allele, telomerase is not influenced by this type of diet [13].

Carriers of a particular allele of the BICD1 gene have shorter telomeres that are comparable to the telomeres of people who are 15-20 year older [14]. The use of aspirin in connection with the rs2242652 polymorphism brought about a telomere-lengthening effect [19].

Although too-short telomeres define a higher biological age, too-long telomeres also produce a health disadvantage. In tumor formation, the cells start to grow rapidly and uncontrollably, and the aging body's telomeres become shorter and shorter until the senescent cells decay and cease to divide. A potential melanoma is prevented by this system. The disease will proceed as a cancer only when the tumor can activate telomerase through genetic mutation. If the telomeres are longer, the cells retain a greater chance of mutating and forming a tumor, which is why long telomeres can cause a significant rise in the probability of cancer [20-22]. For this reason, a good balance between too-long and too-short telomeres should be achieved.

TERT (rs2242652)

RES	Genotype	POP	Possible results
X	C/C	70%	Normal telomere length
	C/T	28%	Shorter telomeres
	T/T	2%	Shorter telomeres

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TERT (rs2735940)

RES	Genotype	POP	Possible results
	T/T	29%	Normal telomere length
	C/T	47%	Shorter telomeres
X	C/C	24%	Shorter telomeres

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BICD1 (rs2630578)

RES	Genotype	POP	Possible results
	G/G	74%	Normal telomere length
X	C/G	24%	Shorter telomeres
	C/C	2%	Shorter telomeres

References

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PPARG (rs1801282)

RES	Genotype	POP	Possible results
X	C/C	86%	A Mediterranean diet has no influence on telomere length
	C/G	12%	A Mediterranean diet lengthens telomeres
	G/G	2%	A Mediterranean diet lengthens telomeres

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Legend: RES = your personal result, POP = frequency within the population

Effect of various substances

VITAMIN D

A study revealed that regular intake of vitamin D over a period of 16 weeks increased telomerase activity by 19.2% [1]. Although its use in the form of skin cream is often recommended for treatment of psoriasis, the extent of skin permeability for vitamin D3 is still unclear. At least one study did not find any altered laboratory parameters for dermal use of vitamin D3 [2].

Although this is not clear proof that dermal vitamin D3 does not increase the telomerase activity in the skin, there is not enough scientific evidence that the vitamin D3 used in this case demonstrates the same telomerase activating effect as when taken orally.

VITAMIN E AND OMEGA-3

A 2014 study also showed that a micronutrient mixture consisting of 9 different components (including vitamin D3, vitamin E and omega-3) increased telomerase activity by over 25% [3]. It is uncertain whether the vitamin D3 contained therein alone led to this increase or whether other components also played a role.

GINKGO BILOBA & RESVERATROL

It has been shown that Ginkgo biloba is capable of significantly increasing telomerase activity (by inhibiting the PI3K/Akt signaling pathway) [25-26]. The active substance resveratrol, large quantities of which can be found in the skin of red grapes (hence in red wine and red grape juice), also shows this effect [27-28].

EGCG

In contrast to telomerase activating substances, there are also active ingredients that can block the function of telomerase. EGCG (epigallocatechin gallate), for example, accounts for about one-third of the dry mass of green tea and is able to block the function of telomerase, thus preventing an extension of chromosome ends. There is evidence that EGCG may be helpful in combating cancer cells [29-35].

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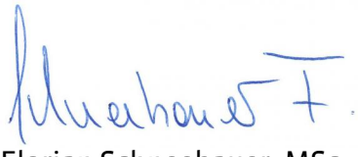

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