



# HMRlignan™

NORWAY SPRUCE LIGNANS



**HMRlignan™**  
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WATCH  
THE VIDEO



## MOTHER NATURE'S PERFECT CIRCLE

Nature has a lot to teach us about balance. Linnea learns from her, working in the laboratory day after day, developing high-quality botanical extracts through cutting-edge technologies.

HMRlignan™ is the result of such advanced research: patented by Linnea, this natural ingredient is extracted from the wood knots of *Picea Abies* L. (Norway Spruce) and designed to provide comprehensive anti-aging benefits to individuals of all ages.



# LIGNANS

## YOUR DAILY ALLIES TO MAINTAIN THE RIGHT BALANCE



Few values are as universally shared as the importance of taking care of oneself.

Yet, maintaining the right balance isn't easy, in part because of pressure from society to keep one foot constantly on the accelerator. We're always in a rush, hurrying to get things done. Days become frenetic, filled to the brim and stressful due to the massive quantity of responsibilities we have to juggle. This is in part because of the objectives we set for ourselves—when they aren't imposed by others. We spend countless hours at work or staring at a screen to stay connected, informed and up to date. Sports, self-care, family and all of its demands, personal relationships with coworkers and friends, events, volunteering, training courses, even political, cultural and financial documentaries...they all begin to take their toll.

But, at a certain point, we stopped: 2020 will be remembered as the year in which we slowed down. The measures adopted to contain the spread of the coronavirus have forced people around the globe to switch gears. We've slowed way down and for a bit, we were even happy about it, rediscovering

forgotten nooks of the house and the joy of spending time with family. However, during this extra-extended red light in which we thought we would do nothing but relax, it didn't take long before we realized our car was not only in need of a tune up, but also much too small. More specifically, while the lock down initially seemed like a period of well-deserved rest, it soon became clear that being forced to stay home unleashed even more stress than long days at the office or just dealing with everyday life: from managing conflict at home to work-related worries, from solitude to the loss of our daily social habits.

In particular, sedentary lifestyles, the desire for comfort and instant gratification that leads to eating junk food, and the sense of isolation felt by people of all ages are factors that increase the risk for premature aging and chronic illnesses, affecting all bodily structures.



GMP CERTIFIED  
by Swissmedic



DIETARY  
INGREDIENT

Manufactured  
in Switzerland

# PURIFIED INGREDIENT

## PRODUCT

7-hydroximatairesinol in aglycone form, co-crystallized with potassium acetate

## PLANT

Picea abies L. (Norway Spruce)

## PART OF THE PLANT USED

Wood knots

## APPEARANCE

Off-white crystalline powder

## REGULATORY CLASSIFICATION

New Dietary Ingredient - US / Novel Food (in process) - EU

## SUITABLE FOR

Tablets, capsules



HEART-  
WOOD

CAMBIUM

SAPWOOD

BARK

PICEA ABIES L.  
WOODKNOTS



## How can we regain control of our wellness? Does such a remedy exist?

The solution, as always, comes from mother nature with a bit of help from modern technology. Lignans, natural molecules found in plants, have been shown to possess miraculous antioxidative properties that help protect against cell and tissue degeneration. Some studies have even proven that they can benefit people of all ages, young and elderly, maintaining and promoting bone, joint and skin health. In addition, lignans combat oxidative stress and inflammation, helping prevent certain types of cancer and chronic illnesses, such as diabetes (Rodríguez-García, 2019).

Lignans are found in many types of food, such as legumes, whole grains, oilseeds, and fruit and vegetables. However, the quantity of lignans in food is quite low, making extraction inefficient, in addition to being quite costly to the environment. As a result, normal dietary intake is often insufficient, especially considering modern diets that tend to be lacking in fiber, whole grains and fresh fruit. One interesting source of extractable lignans is the wood knot of a type of spruce, *Picea Abies L.*, a tall tree that grows in forests in Europe and North America.

# 7-HMR DIRECT DIRECT ABSORPTION ALLOWED BY THE AGLYCONE FORM

Lignans found in natural sources are in glycoside form, that cannot be easily absorbed. Aglycone form allows both the direct and fast absorption of 7-HMR and the transformation in the active metabolite Enterolactone\*.

Products obtained using this method offer a concentrated lignan source that is not otherwise found in nature.

In addition to meeting consumer needs in terms of natural ingredients and an environmentally responsible production chain, this product also fully meets the needs of the human body. The lignans consumed via a standard diet are generally in glycoside form. In order to be absorbed, they must be split into aglycones or undergo

## NATURAL INGREDIENT

extracted from the wood knots of *Picea Abies L.*

## HMRlignan™

7-Hydroxymatairesinol aglycone form (7-HMR)

Thanks to patented technology and a careful selection process, the novel lignan 7-hydroxymatairesinol can be extracted and purified in an efficient, environmentally-friendly manner, creating a highly-effective, bioavailable product without harming the planet.

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by the gut microbiome into enterolignans, which are also active. As a result, the small quantities of lignans offered by food are mostly expelled via feces.

Ingesting purified 7-hydroxymatairesinol lignan in aglycone form, which is exactly why HMRlignan™ was developed, makes it possible to maximize the health benefits of enterolignans and also—and perhaps most importantly—to exploit the powerful direct action of 7-hydroxymatairesinol.

## CLASSIC PATHWAY

Standard lignans absorption pathway

## ABSORPTION

## NON-CLASSIC PATHWAY

7-HMR direct absorption allowed by Aglycone form

## BIOLOGICAL ACTIVITY

Demonstrated through clinical trials setting

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BRAIN HEALTH

SKIN AND TISSUE HEALTH

# BALANCE RESTORING

CARDIOVASCULAR HEALTH

SENIOR HEALTH & WELL-BEING

WELLNESS RESERVOIR

When tested in the lab, HMRlignan™ has shown excellent capabilities in combating and preventing a broad range of stress and aging disorders.

In fact, the use of HMRlignan™ at a dose of 72 mg per day (the FDA approved dosage) has been shown to fight the oxidative mechanisms underlying the development of chronic illnesses and those linked to stress and aging (Cosentino, 2010). It isn't a matter of just preventing precancerous cellular degeneration, but also of providing valuable support in combatting a broad range of disorders linked to wellness: skin problems, menopause-related symptoms and all issues caused by stress and inflammation.

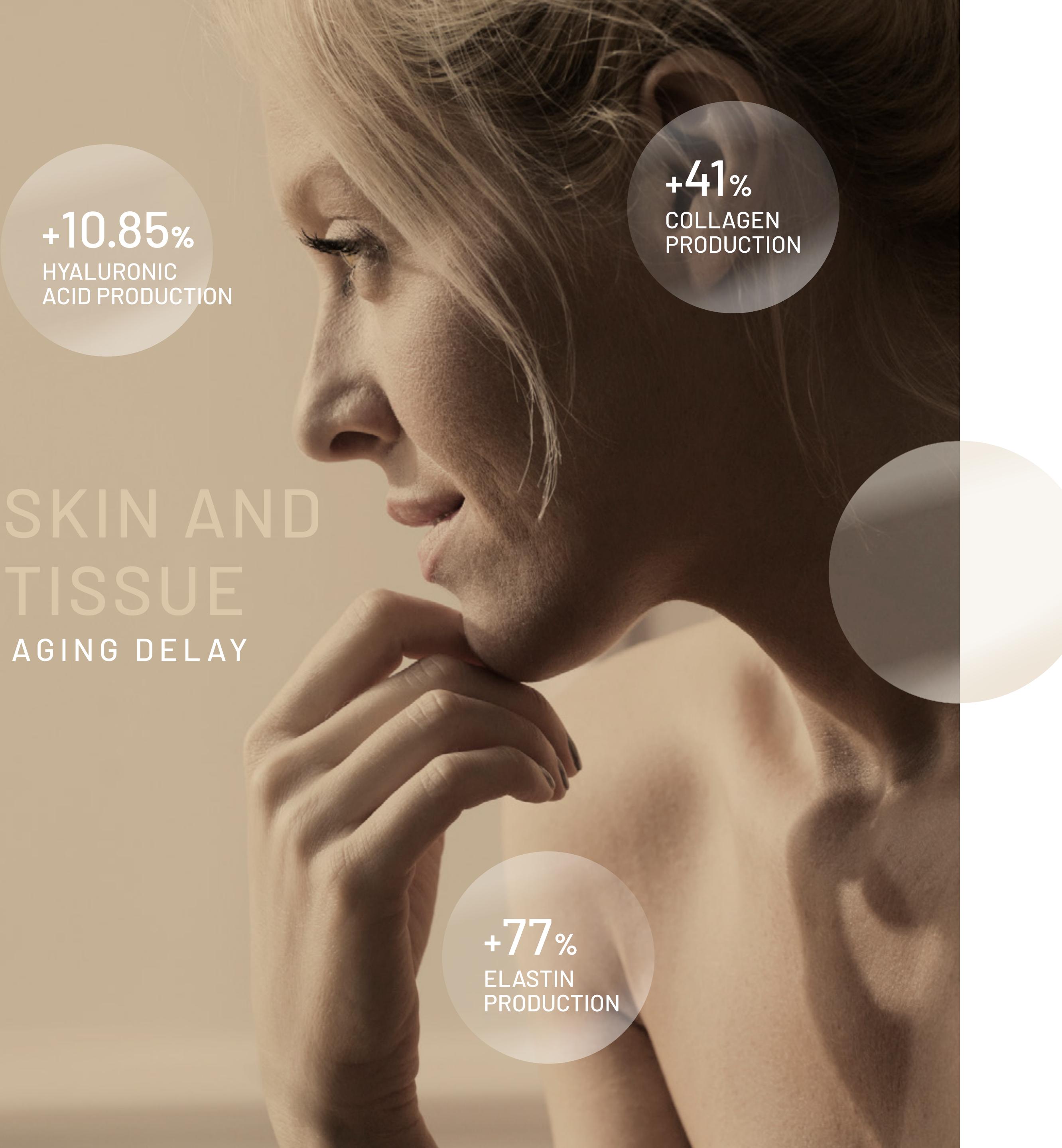
Stress, a hectic life and poor eating habits over the medium to long term can cause mood swings and psychological distress, and even generate inflammation with the related signs of dysfunction, such as slight memory loss and mental fatigue. In particular, sitting for extended periods of time and binge eating may facilitate cardiovascular, bone and joint ailments through the development of chronic inflammation, which can, in turn, lead to heart disease, bone disease and diabetes. Even in young and healthy individuals, the protraction of these bad habits (whether freely chosen or obligatory) can cause premature aging of the skin and joint deterioration, and even contribute to cardiovascular degeneration. HMRlignan™ has been shown to act on a wide range of these disorders, often related to a sedentary lifestyle and an unhealthy diet, compensating for and boosting the beneficial effects of dietary lignans and encouraging vascular health while combatting

the loss of collagen, elastin and hyaluronic acid in the skin, bones and joints, and correcting altered glycemic levels (Biasotto, 2018). The addition of HMRlignan™ to the diet thus brings with it a general increase in the physiological response against aging and the loss of functionality of bodily structures.

This phenomenon, which is most often observed during menopause or in old age, is comparable to what happens when we are overworked, stressed, or subject to exceptional pain and suffering. With time, it can even cause the degeneration of brain structures. 7-hydroxymatairesinol has been proven to be able to act on the brain, combatting neuroinflammation and restoring mental facilities effectively, naturally and safely (Giuliano, 2020).

HMRlignan™ is thus able to reduce inflammation caused by psychological stress, a common symptom of social isolation as well as of overwork or bad habits, including an unhealthy diet or a sedentary lifestyle, promoting bone and joint health.

Natural, eco-friendly and the result of extensive technological expertise, HMRlignan™ is an essential ally in readjusting the body and restoring balance and wellbeing. It helps keep us healthy, both physically and mentally, by preventing inflammation of the human organism and bringing anti-aging benefits to the skin, helping restore its tone and beauty, ensuring people feel better than ever.



# SKIN AND TISSUE AGING DELAY

+10.85%  
HYALURONIC  
ACID PRODUCTION

+41%  
COLLAGEN  
PRODUCTION

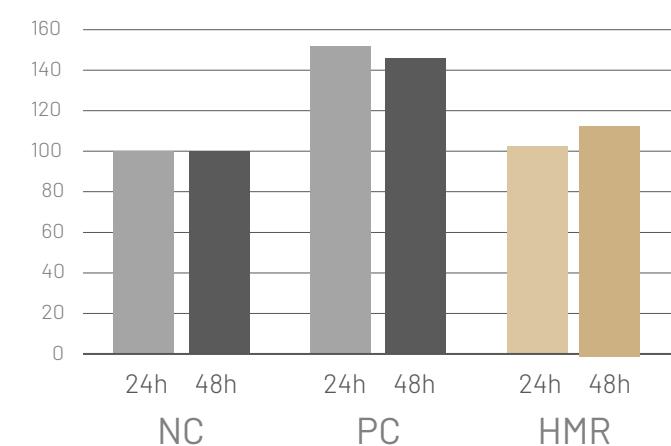
+77%  
ELASTIN  
PRODUCTION

## Effects on Structural Fibers - Cells

HMRlignan™ improves the production of the three main structural components of connective tissues.

### HYDRATION, REGENERATION

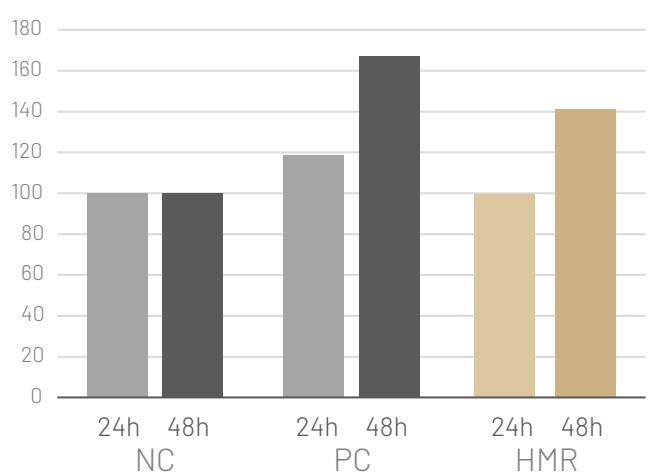
Hyaluronic acid production: +10.85%



Tissues are correctly nourished despite the flow of time.

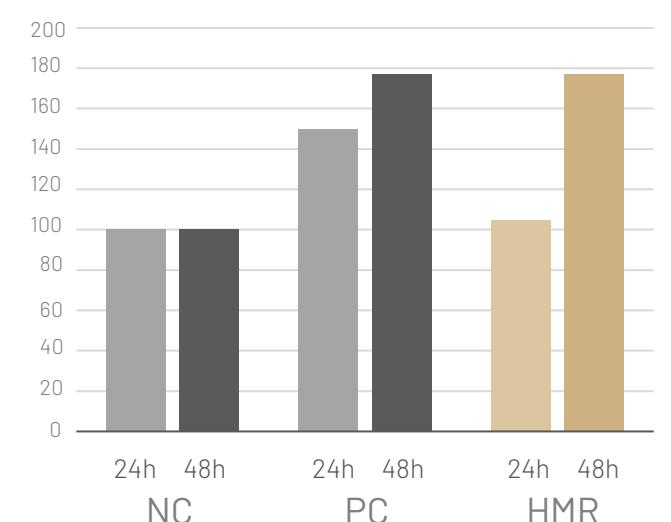
### SUPPORT, SHAPE

Collagen production: +41%



### ELASTICITY, STRENGTH

Elastin production: +77%



In vitro investigation performed on human skin fibroblast, incubated for 24 hours and then treated with:  
NOTHING (NC), HUMAN INSULIN 100 µg/mL (PC), HMRlignan™ 0.08 mg/mL (HMR).

Measurements are referred to the assembled macromolecules, values are measured with ELISA+UV after 24 and 48 hours of incubation. Cut-off 10%.  
Linnea internal report.



# CARDIOVASCULAR SKIN AND TISSUE HEALTH

## OXIDATIVE STRESS & DEGENERATION

Anti-oxidant direct activity on tissue, to protect from acute and chronic inflammation

Aging, inactivity, excessive sport practice can wore and inflame connective tissues that compose joints.

The same happens in skin: internal and external factors or diseases can trigger inflammatory processes. Inflammation and also physiologic aging can reduce production of structural elements.

HMRLignan™ significantly increases the production of elastin, collagen I and hyaluronic acid in fibroblasts and reduces the oxidative stress, supporting the function of connective tissues.

## JOINT & SKIN AGING

Increased elastin, collagen, hyaluronic acid production to nourish tissues

## HORMONE LACK

Menopause entails a reduction in fibroblasts activity, therefore skin and joint can reduce their functionality and appearance



# SENIOR HEALTH AND WELL-BEING

## MENOPAUSE SYMPTOMS

Normal and severe hot flushes  
reduction - hormone replacement  
natural treatment

## MENTAL HEALTH

Reduces neuroinflammation improving  
mental performance in young and elder

## JOINT & SKIN AGING

Increased elastin, collagen, hyaluronic acid  
production to nourish decaying

## OXIDATIVE STRESS & DEGENERATION

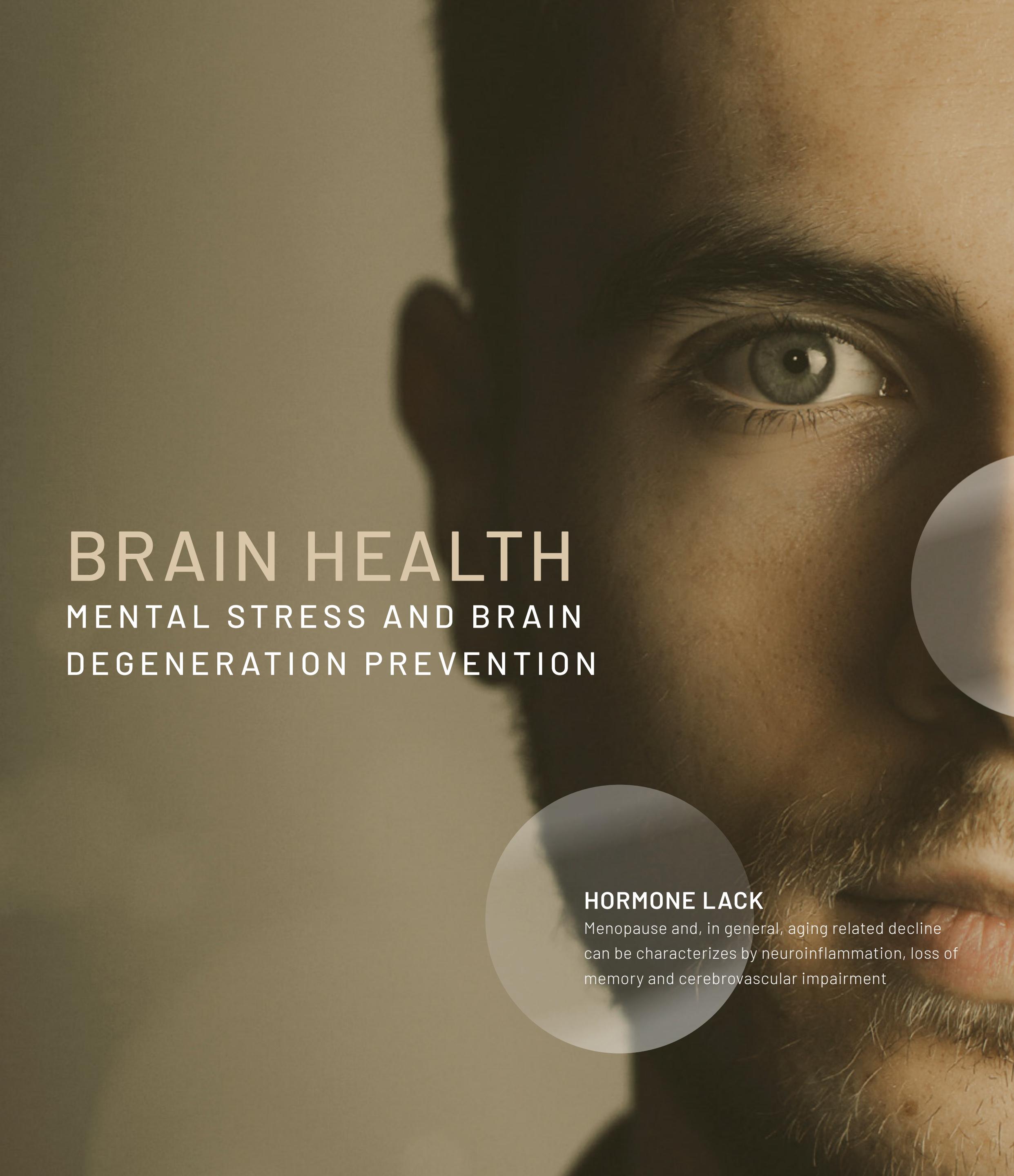
Anti-oxidant direct activity,  
DNA damage prevention

## CARDIOVASCULAR HEALTH

Protects vessels and helps control blood  
sugar levels, impaired by stress and aging

Aging process causes impairment of  
body physiology and a hormonal lack in women.

HMRLignan™ represents a valuable ally to bridge the hormonal gap and contribute to general health in this delicate cycle of women's life, with total safety.



# BRAIN HEALTH

## MENTAL STRESS AND BRAIN DEGENERATION PREVENTION

### HORMONE LACK

Menopause and, in general, aging related decline can be characterized by neuroinflammation, loss of memory and cerebrovascular impairment

### MENTAL STRESS

Enterolignans have been proven to reduce cortisol levels and peripheral resistance\*

**Neuroinflammation is a recognized cause of cognitive decline.**

Stress, both of social and oxidative origin, can promote inflammatory processes at brain level, promoting the appearance of signs of cognitive decline and reduced mental performance.

HMRLignan™ represents a safe and effective treatment to prevent mental stress and brain degeneration.

### NEUROINFLAMMATION

HMRLignan™ reduces neuroinflammation and oxidative stress \*\*

\* Spence, 2003

\*\* Giuliano, 2020 \*\* Cosentino, 2007



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# HMRlignan™

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FURTHER INFORMATION  
AND CLINICAL STUDIES:

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GMO FREE



HALAL



KOSHER



VEGAN



FREE

Manufactured  
in Switzerland

Linnea SA has proudly produced fine quality botanical extracts and pharmaceutical ingredients of natural origin since 1982. Based in Switzerland, Linnea SA consistently pushes the boundaries of innovation and technology while implementing strict policies for water reuse, clean energy, and solvent recycling, thereby safeguarding the natural world.

**Linnea**  
Natural Pharma Solutions

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