MOLECHOLIN

BIOREVITALIZING AND TONING SOLUTION OF THE DERMAL MATRIX BASED ON HYALURONIC ACID FRAGMENTS, AMINO ACIDS AND CHOLINE

EU MDR CERTIFIED
Medical Device Regulation

celens international

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Molecholin® is an innovative biorivitalising and biostimulating intradermal solution based on **hyaluronic acid fragments (20 - 38 monomers)**, **amino acids** and **choline** suitable to treat wrinkles and skin ageing. Certified by the Italian National Institute of Health as a Class III Medical Device, it is able to stimulate CD44 receptors and activate fibroblasts with the formation of new hyaluronic acid, collagen and elastin, thereby regulating the cellular regrowth of the epidermis and providing a stimulating action on muscle tone.

INDICATIONS

Molecholin® is indicated in the prevention and treatment of sagging skin. It has a toning effect and a botox-like action on the epidermis.

COMPOSITION

Hyaluronic acid, Choline, Glycine, L-serine, L-alanine, L-proline, L-lysine, Cysteine, phosphate buffer system.

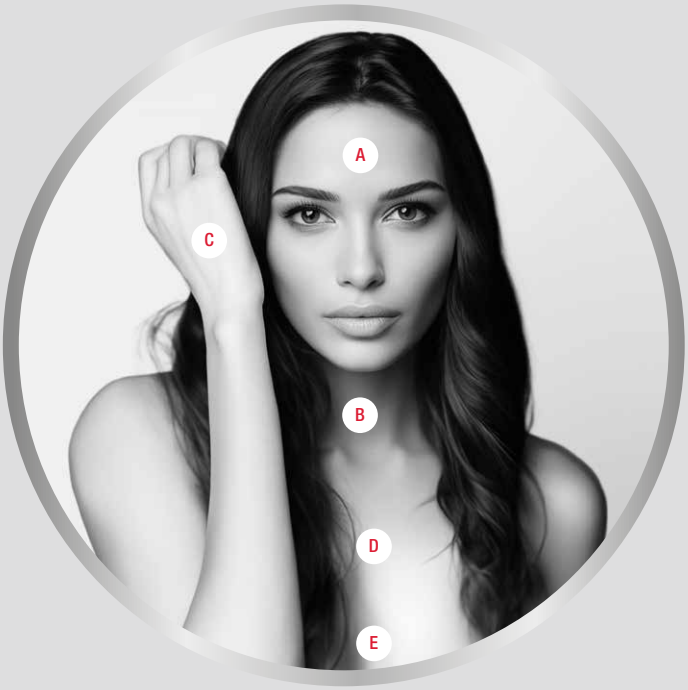
The medical device contains:

- **HYALURONIC ACID FRAGMENTS (20-38 monomers)** capable of activating fibroblast CD44s.
- Precursor **AMINO ACIDS** of collagen, elastin and glycosaminoglycans.
- **PHOSPHATE-BASED BUFFER SYSTEM.**
- **CHOLINE** as a precursor of skin acetylcholine. The product is introduced intradermally according to the classic dosing schedule of mesotherapy.

TREATMENT AREAS

Face	Neck	Hands	Pumps	Abdomen*
A	B	C	D	E

*(*and other areas of the body with laxity)*



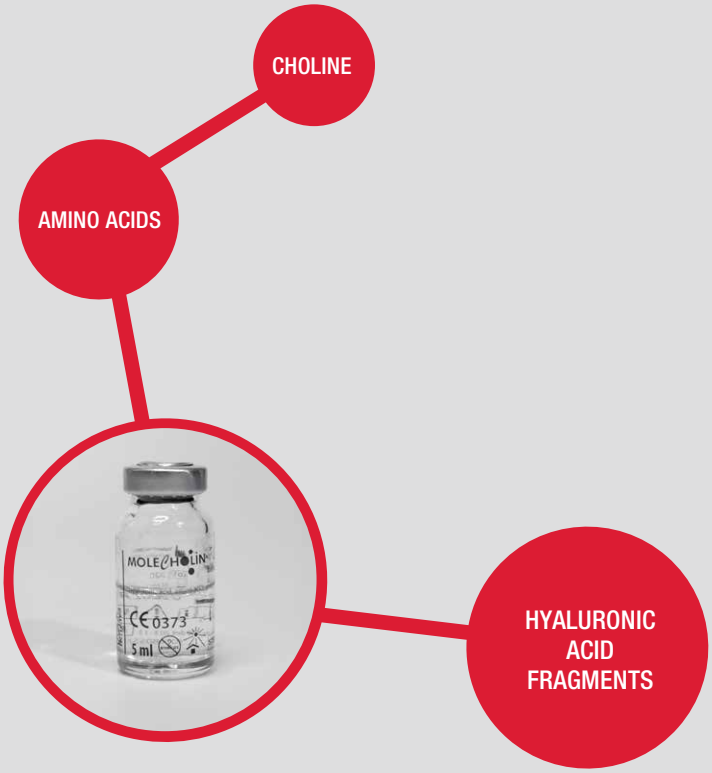
MOLECHOLIN® ACTION

It **activates the CD44s of fibroblasts** and provides cells with the necessary principles to build collagen, elastin and glycosaminoglycans in the surrounding environment.

It ensures skin's **biological optimisation**.

The matrix **acidity buffering** maintains the SOL condition of the colloid solution, thereby promoting metabolic exchanges.

Choline, as a precursor of acetylcholine, optimises the skin's cholinergic system and corneocyte differentiation with the prevention of UV damage.



BENEFITS

- Exclusive formula based on the careful selection of ingredients already naturally featured in the skin;
- Very high safety standards (**Medical Device Class III**, the highest);
- **Sterile vial** to guarantee extreme purity and no risk of bacterial contamination.
- **Diversified** and very simple **treatment protocols.**

HOW TO USE

Before injecting the product, thoroughly disinfect the area to be treated with iodopovidone or disinfectant containing chlorhexidine.

Remove the full tear-off cap, insert the syringe-mounted needle into the butyl stopper and withdraw the product from the vial. Inject an appropriate quantity of the product into the superficial layer of the dermis.

PROTOCOL

Face
1 session every 15-30 days
The maximum recommended dosage is 5 ml per treatment session.

Body Toning
5 ml per muscle (intramuscular injections), once a week for 4 times.

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BIOSTIMULATION

An increasing number of women and men interested in **skin rejuvenation** and in placing attention on their physical appearance represent a great demand for so-called anti-ageing remedies to **counteract photo and chrono-ageing**. Environmental factors influence skin damage associated with chronological age, increasing *dehydration*, *causing wrinkles*, *sagging skin* and *irregular skin pigmentation*.

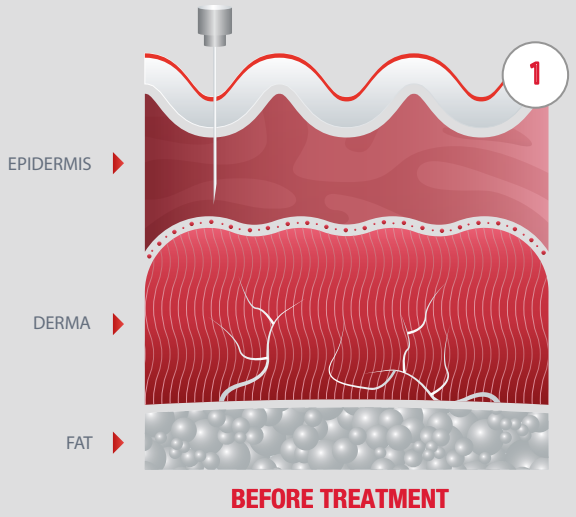
Over the years, along with ageing, there are several reasons that contribute to the formation of wrinkles. Indeed, with age, the dermis reduces its ability to produce collagen, elastin and hyaluronic acid due to the action of UV rays, smog, stress, pollution, a poor diet and all those metabolic factors capable of generating free radicals.

Hyaluronic acid (HA) is a natural linear polysaccharide widely used in the biomedical field as a biocompatible, biodegradable, non-toxic and non-immunogenic polymer with a *high affinity to water*. HA is an important component of the extracellular matrix and helps promote skin elasticity. It plays a fundamental role in wound healing and *tissue repair processes* due to its ability to maintain a moist environment conducive to the stimulation of growth factors, cellular constituents and the migration of various cells, which is essential to heal tissues.

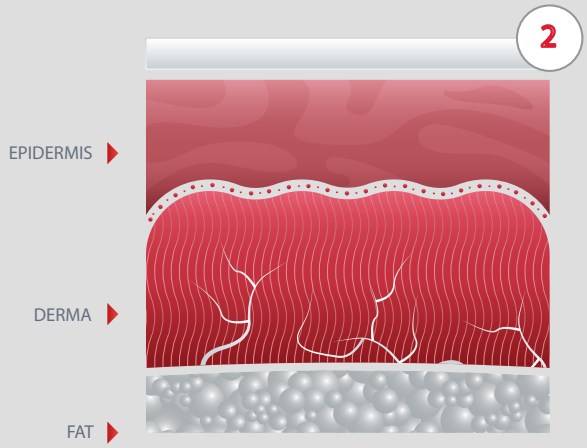
Cells that produce *collagen*, *elastin* and *hyaluronic acid* in the dermis are called **fibroblasts** and have many receptors on their surface, three of which, when stimulated, cause fibroblasts to produce various types of collagen.

The **receptors** identified as CD39 and CD40 induce the formation of type I° collagen (fibrotic collagen), characteristic of aging tissues and scar tissue that hardens the dermis, while **CD44** induce the formation of **type III° collagen**. This is called *reticular* collagen and is suitable for maintaining the turgor of the dermis, as well as being *typical of young tissues*.

Several studies have shown that a good **biostimulation**, **with CD44 activation** that induces a **dermal regeneration** with reticular collagen neoformation, is only possible with platelet growth factors or with products based on "**hyaluronic acid fragments**" in a range **between 20 and 38 monomers**, while macromolecular hyaluronic acid does not induce any type of fibroblast activation, although it may be useful for the purposes of providing deep hydration.



BEFORE TREATMENT



AFTER TREATMENT

EFFECTIVENESS AND SAFETY OF HA WITH AMINO ACIDS AND CHOLINE IN MOLECHOLIN®

Hyaluronic acid has been long used as a bio-revitaliser to treat ageing skin both on its own and in combination with other compounds such as amino acids or vitamins.

Several studies have evaluated the **efficacy** and **safety** of Molecholin® to **treat wrinkles on the face, neck, neckline, hands and body**. People suffering from skin damage such as wrinkles, dehydration and reduced sebum production can benefit from incredible, favourable and positive results to prevent and treatment of blemishes. This medical device, integrated with **choline**, offers cosmetic surgeons greater options in terms of personalisation and pharmacological diversification based on the deficit of the patient to be treated.

Therefore, Molecholin® **biostimulation** is a treatment that helps optimise skin functions by slowing down biological damage and producing **reticular collagen**. It helps maintain youthful skin, improves turgor, elasticity and tone by countering the action of free radicals. Molecholin® produces an undeniable aesthetic improvement in patients suffering from skin defects, when administered with **mesotherapy**.
Clinically a clear reduction in wrinkles has been observed with an *improvement of skin texture*, *shine* and *tone* with no adverse events reported. This confirms the safety and effectiveness of medical devices based on hyaluronic acid supplemented with amino acids and choline.

THE IMPORTANCE OF CHOLINE

Choline, or **vitamin J**, is a molecule similar to group B vitamins that intervenes as a coenzyme in numerous metabolic reactions. It has *antioxidant*, *hepatoprotective*, *neuroprotective* and *cardioprotective activities*.

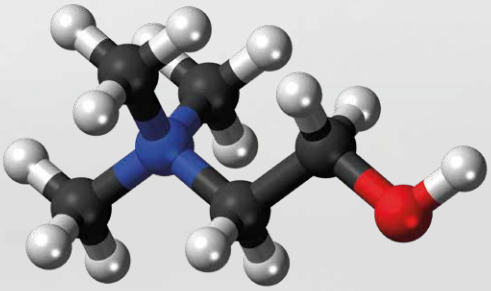
It is classified today as an *essential nutrient*. In many mammals, long term (weeks to months) ingestion of a diet deficient in choline leads to hepatic, renal, pancreatic, memory, and growth disorders. Muscle damage also occurs from choline deficiency.

In the body, choline serves several biological functions. It is the *precursor of phosphatidylcholine* and *sphingomyelin*, two phospholipids that serve as components of biological membranes and as precursors for intracellular messengers such as diacylglycerol or ceramide.

In human skin both resident and transiently residing cells are part of the extra- or non-neuronal cholinergic system, creating a highly complex and interconnected cosmos in which **acetylcholine (ACh)** and **choline** are the natural ligands of nicotinic and muscarinic receptors with regulatory function in both physiology and pathophysiology. ACh is produced in keratinocytes, endothelial cells and most notably in immune competent cells invading the skin at sites of inflammation. The cholinergic system is involved in basic functions of the skin through autocrine, paracrine, and endocrine mechanisms, like keratinocyte proliferation, differentiation, adhesion and migration, epidermal barrier formation, pigment-, sweat- and sebum production, blood circulation, angiogenesis, and a variety of immune reactions. The pathophysiological consequences of this complex cholinergic "concert" are only beginning to be understood.

Numerous studies performed in recent years have firmly established the human skin as not only a target but also an active source of various neurotransmitters and hormones. The extra- or non-neuronal adrenergic and cholinergic systems have begun to attract increasing attention as regulators of skin physiology and pathophysiology. In 1921 Otto Loewi and Henry Dale identified acetylcholine (ACh) as a principal neurotransmitter, a discovery that was rewarded with the Nobel prize for physiology and medicine in 1936. In the following years, most advances were made by the description of ACh action in the central nervous system and by the characterization of its nicotinic (nAChR) and muscarinic (mAChR) receptors. ACh is synthesized from choline and coenzyme A by choline acetyltransferase (ChAT), which is the rate-limiting step in ACh de novo synthesis and it is degraded by acetylcholinesterase (AChE). In humans, different tegumental cells covering the inner and outer surfaces of the human body and most notably various immune cells are part of the non-neuronal cholinergic system.

The **non-neuronal cholinergic system** has been implicated in *numerous functions* in the skin such as growth and differentiation, adhesion and motility, barrier formation, sweat and sebum secretion as well as modulation of the microcirculation. An important role in human disease, especially in inflammatory disorders such as acne vulgaris or atopic eczema is emerging together with a wealth of new data on its physiological role in maintaining skin homeostasis [4] [9]. In human skin both resident and transiently residing cells are part of this system, creating a highly complex and interconnected cosmos in which ACh is the main player with regulatory roles in both physiology and pathophysiology.



The box contains:
5 x 5 ml vials for intradermal use

MOLECHOLIN® TREATMENT

In past years, **Aesthetic Medicine** made use of techniques that alone promised *to improve the appearance of our skin, the tone of the tissues, the skin texture, the pigmentation of the epidermis*, but in recent years the tendency to look for a single solution the problem is something that has not found scientific rationality.

This is because we have always talked about the pathophysiological changes of **aging** as a complex range of changes in our body, therefore we can no longer talk about skin laxity, we must talk about **tissue remodeling** with **bone resorption of the facial mass**, **muscular hypotonicity of the mimic and non-mimic muscles** only, of **skin laxity** due to a change in the ratios between types I and III collagen and elastin, and of many other complex mechanisms.

We can do the same thing with other regions of our body such as the **inner thighs, buttocks, abdomen**. Tissues have their own history, pregnancies, breastfeeding, rapid losses or increases: the physiopathological process of aging is very vast. For this reason it was decided to find not only a way to slow down this process but to exploit it to our advantage, developing methods that can provide aesthetic help given by these pathophysiological trends, in order to obtain a satisfactory result for the Patient.

We have thus created a class III Medical Device containing **a concentration of choline three times higher** than that of the current ones on the market, to counteract two important phenomena due to aging, namely muscle hypotonicity and tissue laxity and trying to resolve or at least mitigate the various problems of normal chronoaging.

As time progresses, our **Acetylcholine** levels drop, resulting in hypotonia and therefore a downward descent of the mimic muscles. Acetylcholine derives in its formation from choline (in turn derived from DMAE); administering this precursor to the muscles in a three times higher dose allows you to improve the concentration of Acetylcholine in the tissues and therefore improve their tone, ensuring better subcutaneous support.

Molecholin® also contains **hyaluronic acid with fragments** ranging **from 20 to 38 monomers** in solution with **Glycine**, **Proline** and **Lysine** at a pH of 5.8 and 900 mOsm/1 in order to create dermal fibrosis with consequent distension and tissue support for our **muscle biostimulation**.

MUSCLE BIOSTIMULATION PROTOCOL

This is a **technique based on strengthening muscle tone** to give a skin relaxing effect by increasing acetylcholine concentrations at the neuromuscular plaque level.

HYPOTONIA OF THE ORBICULARIS MUSCLE

Objective: to counteract tired-looking eyes, strengthen tone, enhance the action of target muscles.

- Inject the product with a 30G 6 mm needle.

- Then carry out other infiltrations in the upper third of the face, exactly in the lateral margin of the frontalis muscle and in the zygomaticus major muscle with a 30G 12 mm needle, strengthening the tone of these and raising the lateral third of the eyebrow and the corner of the mouth respectively in a superlateral direction.

Treatment: one session a week 4 times and subsequent maintenance once a month.

DECREASE IN BODY FAT

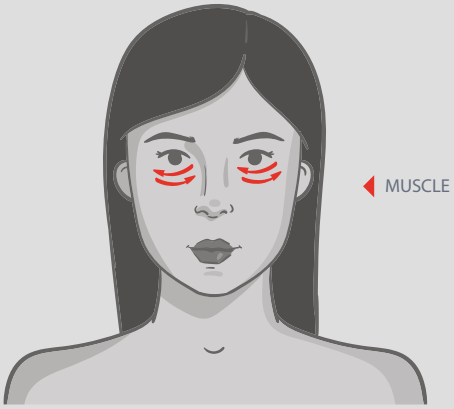
Objective: localized treatments for the reduction of adiposity, increase in tone following diets. Improvement of trophism, harmonization of the body figure.

Target muscles: gluteus maximus and pectoralis major.

Treatment: one session 2 times a week for 4 times with 5 ml of product per muscle, advising the patient to come to the office after physical activity, in order to rebuild the muscle fibre.

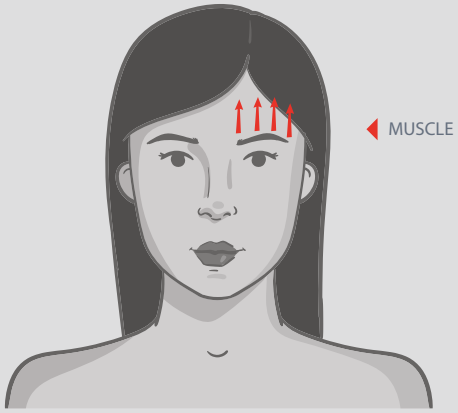
ORBICULARIS OCULI TONING

Wrinkles of the lower eyelid can be reduced by toning up the lower port of the **orbicularis oculi muscle** and through activating the cholinergic system of the epidermis with infiltrations of Choline.



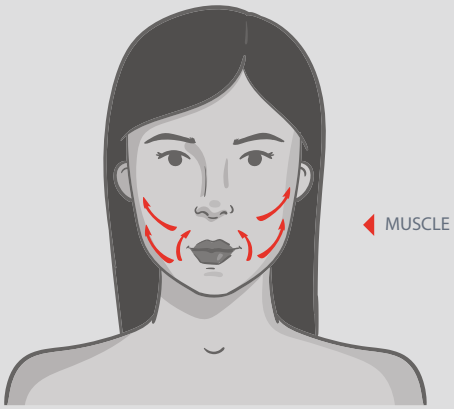
FRONTAL TONING

Drooping eyebrows con be corrected by toning up the frontalis muscle with infiltrations of Choline.



ZYGOMATIC TONING

Down-turned corners of the mouth, typical in ageing face, can be reduced by toning up the mayor and minor **zygomatic muscles** with infiltrations of Choline.

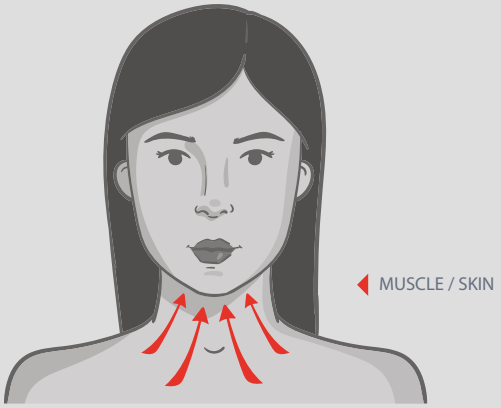


BODY TONING

Body Toning (infiltrations of Choline) is performed on the inferior heads of the pectoral muscle in order to support the breast upwards, and on the upper portion of the gluteus muscle to hold it up.

PLATYSMA TONING - SKIN LIFT

Ageing of the **neck** can be improved both by toning up the platysma (infiltrations of Choline) and through o process of dermal fibrosis (infiltrations of acid and hypertonic solutions).



MOLECHOLIN

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