



## Collagen and the Skin

The word collagen alludes to healing and bonding. It is derived from the Greek words kolla (glue) and gennao (I produce). A “producer of glue” is a suitable portrayal of collagen as this intercellular structural protein plays a fundamental role in holding the body together.

Collagen is the main protein in the skin and most powerful protein in our system. It represents 60% of the total skin content and 30% of all whole body protein content.. Its highest quantities occur in the skin, skeletal system, organ of sight, kidneys, liver and alimentary tract. The extracellular matrix, known as ECM, in which the body is submerged contains collagen which flows around the organs, supplementing existing structural defects.

The main function of collagen is to give the skin flexibility, tone and elasticity, as well as to moisturize and to stimulate. It is found in the dermis layer storing and releasing water to maintain the optimum texture level and constant renewal of cells, thus preventing wrinkles and stretch marks from forming. Collagen is produced by fibroblasts, the cells of connective tissues. The turnover of collagen occurs throughout the life of a human organism. Its renewal cycle is every 140-160 days - worn out collagen degrades and shortages are replaced

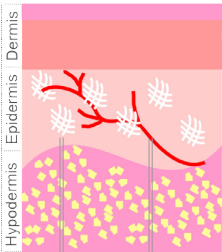
Over 20 types of collagen occur naturally in the human organism. Collagen type I, is the most abundant collagen in human body and is known to maintain the integrity of the dermis and ECM. Aging skin is admittedly related to the reduction of collagen type I. The synthesis of this type of collagen in skin takes place not only in fibroblasts, but also in the keratinocyte layer of the epidermis.

From age 25 onwards, the natural supplies of collagen weaken and become less productive. The body begins to lose its ability to create new collagen, losing collagen at a rate of 1.5% per annum. Free radicals and toxins destroy collagen fibers, and reducing levels of copper, vitamin A, C or E in the body adversely affect the natural production of collagen.

The lack of new collagen leads to a host of symptoms associated with aging: sagging, fine lines, wrinkles, dryness, discoloration and uneven skin tone.

## 20s

Free Radicals Attack Surface  
Environmental Damage is High

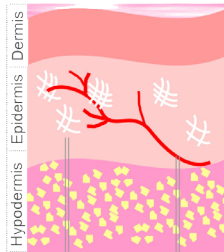


Collagen Fibres Healthy    Vascular Tissue

Constant exposure to the sun & fast life style leads to skins premature aging.

## 30s

First Signs of Aging Appear  
Dull, Lackless, Lifeless Skin

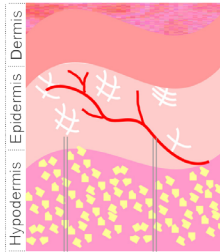


Collagen Fibres Lessening    Vascular Tissue

Skin regeneration is reducing leading to dull complexion & uneven skin tone. Use of harsh skin care can become apparent. Elastin degradation can show first signs of aging.

## 40s

Significant dullness, aging & dark spots. Skin sensitivity.

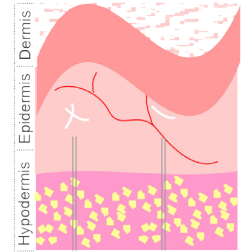


Collagen Fibres Reducing    Vascular Tissue

Skin thinning can cause sensitivity, redness, dry, oily, sudden redness. Photo aging appears - dark spots - more prominent signs of aging appear.

## 50+

Significant tension decrease.  
Moisture retention slowing.



Collagen Fibres Reduced    Vascular Tissue Thin

Decrease in surface tension impairs skin structure and ability to defend itself. Barrier lessens leading to less efficiency in retaining moisture. Combined with excessive dryness sometimes accompanied by adult acne





# Collagen Extraction & Processing

COLWAY has developed a technologically advanced extraction process involving an extraordinary delicate mechanism process of hydrolyzing Marine Collagen to breakdown the molecular bonds between individual collagen strands by use of slowly finessed chemical reaction and multiphase filtration. Key to this process is maintaining stable temperatures under 95°F to ensure a small molecular structure of the extracted collagen, enabling its absorption by the skin and flow deep down the skin layers.

COLWAY Marine Collagen bears characteristics that are essential to naturally complement and stimulate the human collagen synthesis, supplementing any deficiencies and initiating the process of skin regeneration.

- **High Quality** - Biologically active, native soluble collagen type I
- **Intact Molecular Structure** - During extraction process, its triple helix structure suffers no cell structure degradation until it is absorbed in skin
- **Low Molecular Weight** - Its molecular structure is small enough to effectively penetrate the deeper skin layers and implement itself into the ECM
- **High Solubility** - Soluble collagen has high water-holding capacity, dissolves in water and is more efficient and more readily absorbed into the skin

COLWAY Marine Collagen is a 'living' biologically active protein able to effectively (1) retain a triple helix structure outside its natural environment, (2) achieve a metabolic process, (3) penetrate deep into skin, (4) deposit soluble native collagen and (5) reinforce ECM by boosting the synthesis of collagen and nourish the underlying structures of the skin.





## Transdermal Collagen Delivery

Upon transdermal application and skin absorption, COLWAY Marine Collagen spirals break down and EMC is immediately enriched by the supply in abundance of key amino acids, glycine, proline and hydroxyproline, and other active ingredients that activate the function in the skin of fibroblasts and keratinocytes. Consequently, pro-collagen formed in the fibroblasts is synthesized into helices.

COLWAY Marine Collagen's triple helix structure has a triple boosting effect on skin's own collagen synthesis:

- Awakens fibroblasts and stimulates protein production
- Protects collagen from degradation and destruction
- Helps maintain collagen quantity and quality

When the COLWAY Marine Collagen is applied to the skin immediately after the face is cleansed while the pores are open for maximum assimilation of the collagen into the lower layers of the skin, it enriches the ECM of all the layers of the skin with amino acids, which facilitates fibroblast activity. At the same time, it increases the organism's production of its own collagen.

Once applied on the skin, the enzyme collagenase breaks down collagen's molecular structure. As a result the denaturation temperature (temperature above or below the range in which cells tend to live that will cause proteins to unfold or "denature") for the triple helix structure decreases, allowing it to unravel at body temperature, and then enzymes such as elastase and gelatinase break down the unraveled helix into lower molecular weight compounds (extracellular route). At the same time, another route is used, in which collagen is taken into cells like macrophages (defense cells) and broken down in those cells.

Because collagen from other sources and other processes melts at a much higher temperature, it often sits on the skin without melting or being absorbed. The processing of COLWAY Marine Collagen allows for

a lower molecular weight and lower denaturation rate which enables its molecular structure to easily melt on the skin and be gradually absorbed.

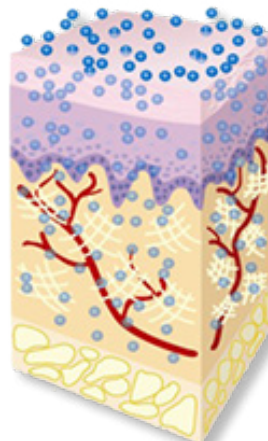
For the extracellular space (everything outside a cells, excluding ECM), the ECM is a collagen 'factory' of fibroblasts, chondrocytes and keratinocytes freeing the polypeptide amino acid chains. It is here, with the help of ascorbic acid (Vitamin C) as an activator, the amino acid sequence twists into helices. The ECM is reinforced when it is infused with peptides which are absorbed and dissolved on their way through the high capacity layers of the marine collagen spirals - ultimately increasing the amount of collagen in the ECM.

**A SKIN PORE IS 18 ANGSTROM WIDE**



**AN INJECTED COLLAGEN MOLECULE IS 2,800 ANGSTROM WIDE**

**A COSMETIC CREAM MOLECULE IS 1,000 -- 3,000 ANGSTROM WIDE**



**NATURAL COLLAGEN MOLECULES ARE 12 ANGSTROM WIDE!**

