

The Functional Skin Health Workshop



The skin is unique

It faces assaults from the outside

And it has to protect itself and thrive
based on what is available to it from
the inside

The nutrients it needs for the inside
have other places to go

And this makes it difficult to
understand the issues of the skin

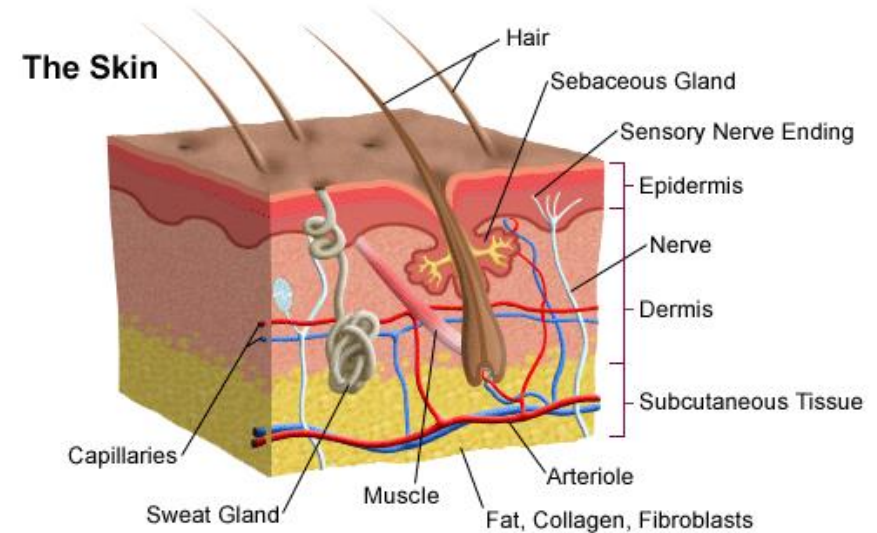


The elements that make up the skin are found in other parts of the body

If the person can't maintain these elements in the skin, they're unlikely to maintain them inside the body

We'll look at these and discuss the health issues they are linked to.

But it's important to understand that the body will also not prioritize the skin so it will show issues first

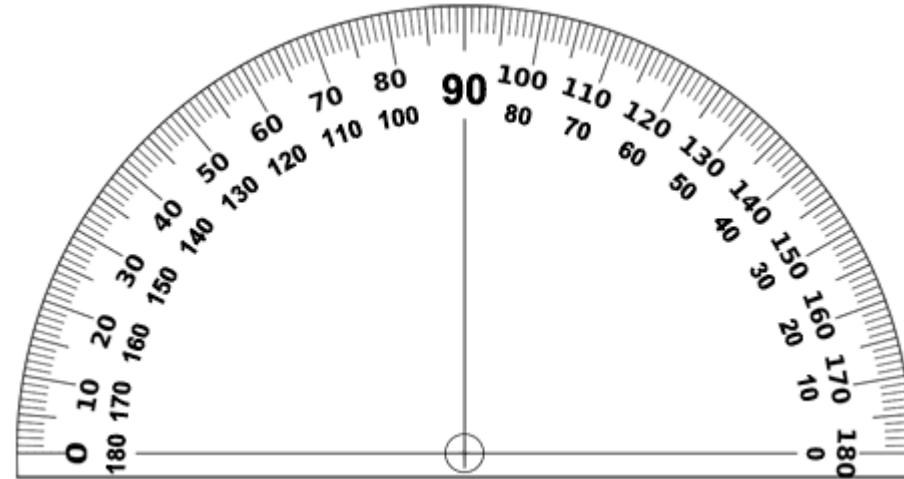


And there are degrees

One must also assess what could affect the skin from the outside

This will also be a factor in how the skin appears

But its resiliency also depends on what happens inside the body



Assessing The Skin

Look at it – and based on the person's age does it seem healthy

This is easier to do in a young person than an older person

We expect older people to have sagging and wrinkly skin

But should we?



The truth of this matter is that a healthy body should be able to support health skin

Therefore, it should not sag or wrinkle

We've seen very old fit people – but look at the skin

Shouldn't it be as fit?

If not, then why?



The body does prioritize the distribution of nutrients to vital organs and systems when there is a deficiency.

When nutrient intake is insufficient, the body allocates available nutrients to support critical functions and vital organs like the brain, heart, and liver.

This prioritization ensures survival and the maintenance of essential physiological processes.

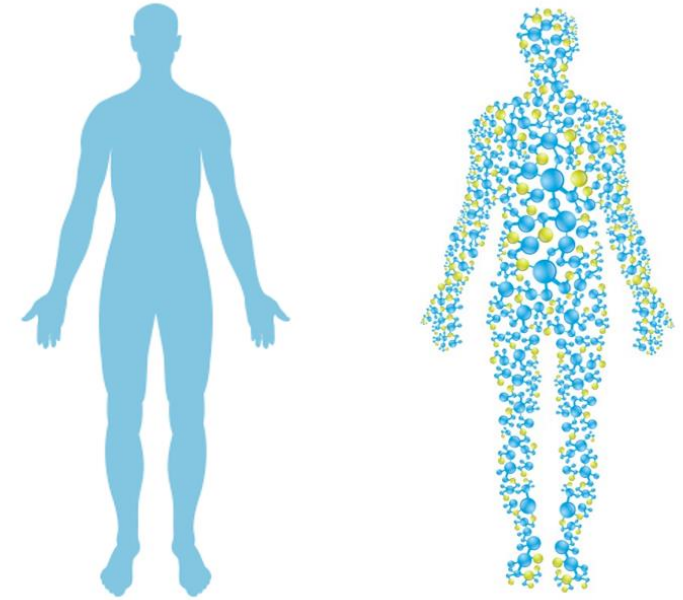


As a result, non-essential tissues like the skin, hair, and nails may not receive adequate nutrients, leading to visible signs of nutrient deficiency. For example:

Skin: May become dry, flaky, or develop conditions like dermatitis.

Hair: Can become dry, brittle, and may fall out more easily.

Nails: May become brittle and develop ridges or white spots.



Functional Connections

Liver: Crucial for detoxification, metabolizing nutrients, and regulating hormones.

Impact on Skin: Poor liver function can lead to toxin buildup, nutrient deficiencies, and hormonal imbalances, causing skin issues like acne, dullness, and premature aging.

Gut: Aids in digestion, nutrient absorption, and immune function.

Impact on Skin: An imbalanced gut microbiome (dysbiosis) can cause systemic inflammation and nutrient deficiencies, contributing to conditions like acne, eczema, and rosacea.

Hormonal System: Regulate various bodily functions, including skin health.

Impact on Skin: Hormonal imbalances during puberty, menstruation, pregnancy, menopause, and andropause can lead to acne, dryness, and changes in skin texture and elasticity.

Immune System: Protects against infections and regulates inflammation.

Impact on Skin: Autoimmune conditions and chronic inflammation can result in skin issues such as psoriasis, eczema, and other inflammatory skin disorders.

Circulatory System: Role: Delivers oxygen and nutrients to the skin and removes waste products.

Impact on Skin: Poor circulation can lead to inadequate nutrient delivery and toxin buildup, causing skin pallor, slower healing, and a lackluster complexion.

Adrenal Glands: Role: Produce stress hormones like cortisol.

Impact on Skin: Chronic stress and elevated cortisol levels can lead to collagen breakdown, increased oil production, and inflammatory skin conditions like acne and eczema.

Thyroid: Regulates metabolism and overall energy levels.

Impact on Skin: Thyroid imbalances can cause dry skin, hair loss, and changes in skin texture and thickness.

Kidneys: Filter waste and excess fluids from the blood.

Impact on Skin: Impaired kidney function can lead to toxin buildup, contributing to skin issues like itchiness, pallor, and edema.

Lungs: Role: Provide oxygen to the blood and remove carbon dioxide.

Impact on Skin: Poor lung function can reduce oxygen delivery to the skin, leading to a dull complexion and slower healing processes.

Musculoskeletal System: Supports movement and overall physical activity.

Impact on Skin: Regular exercise improves circulation, helps in the removal of toxins through sweat, and reduces stress, all of which benefit skin health.

What does this all mean – must identify what areas of the body are out of balance

Help the skin from the inside – help the body.

Look at what's being lost in the skin as a clue.



Tests

Functional medicine utilizes targeted lab tests to identify the underlying causes of skin aging, focusing on gut health abnormalities, increased inflammatory markers, nutrient deficiencies, and environmental toxins.

- 1. Micronutrient Test by SpectraCell Laboratories:** This test assesses essential nutrients crucial for skin health, identifying deficiencies in vitamins, minerals, and antioxidants. It enables the creation of personalized nutritional plans to support skin repair and slow aging.
- 2. GI-MAP by Diagnostic Solutions:** This test examines gut health, recognizing its influence on skin conditions. An imbalanced gut microbiome can cause systemic inflammation and skin issues.

3. High Sensitivity C-Reactive Protein (hs-CRP) Test by BostonHeart Diagnostics:

This test measures inflammation levels, a key factor in skin aging. Elevated hs-CRP levels indicate underlying inflammation affecting skin quality, guiding interventions to reduce inflammation through lifestyle changes or medication.

4. Hair Elements Test by Doctor's Data: This test evaluates exposure to toxic metals and the balance of essential minerals, both impacting skin health.

These functional medicine lab tests emphasize the importance of a holistic assessment in developing personalized interventions for preventing skin aging, offering a more tailored and effective approach to skincare.

Conditions Linked To High CRP

Heart Disease

Atherosclerosis

Rheumatoid Arthritis

Lupus

Inflammatory Bowel Disease (IBD)

Bacterial Infections

Viral Infections

Chronic Kidney Disease

Chronic Obstructive Pulmonary
Disease (COPD)

Obesity

Type 2 Diabetes

Cancer

Trauma and Surgery

Autoimmune Disorders (e.g., psoriasis,
multiple sclerosis)

Basic Aspects of Skin Aging

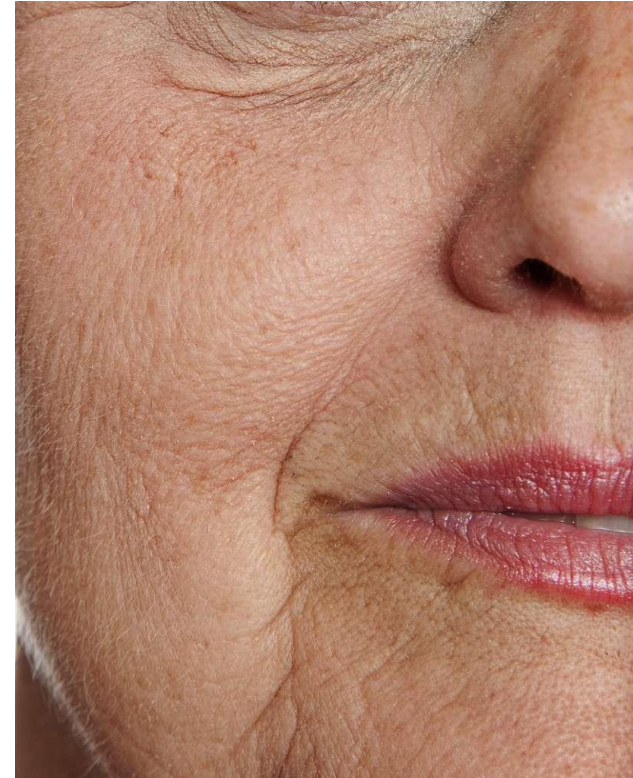
Aging skin involves more than just cosmetic concerns

It significantly impacts quality of life, particularly among older adults.

Mortality from skin diseases is mainly due to melanoma

But various dermatological disorders are prevalent in the elderly

This can range from mild but distressing issues like pruritus to serious conditions such as carcinomas and melanomas.



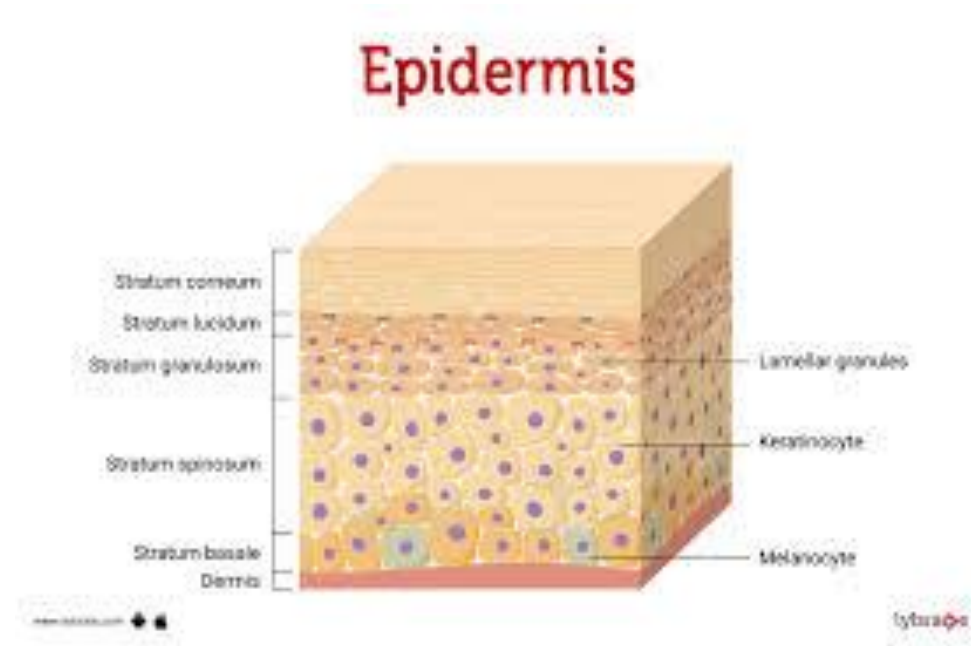
What happens to skin as it ages

The outer layer of the skin, the epidermis, becomes thinner, making the skin more fragile and transparent

This increases the risk of injuries and reduces the skin's ability to protect against environmental damage

Collagen and elastin fibers in the dermis (the middle layer of the skin) decrease

This leads to reduced skin elasticity and strength, resulting in sagging, wrinkles, and fine lines.

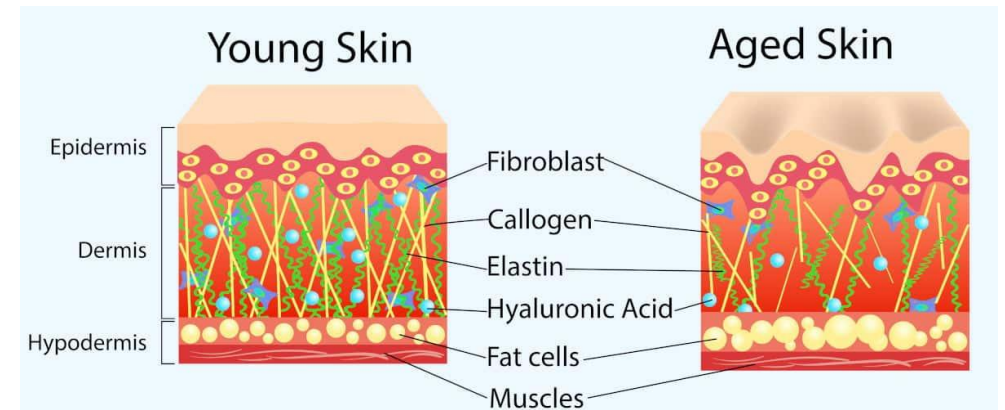


The rate at which new skin cells are produced and old ones are shed slows down.

This causes the skin to appear dull and less radiant. Plus wounds and other skin damage take longer to heal.

Oil glands produce less sebum, leading to drier skin.

Can exacerbate the appearance of fine lines and make the skin feel rough and itchy.

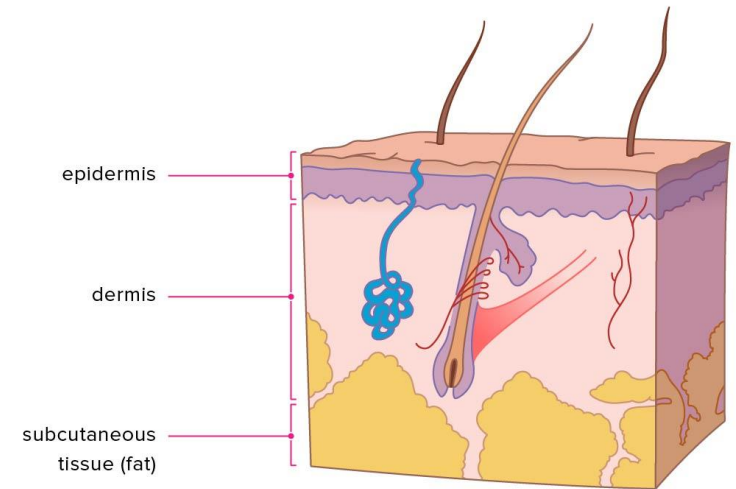


The subcutaneous layer (the deepest layer of the skin) loses fat, which provides cushioning and support to the skin.

This results in a loss of volume, making the skin appear thinner and more prone to sagging.

Aging can cause an uneven distribution of melanin, leading to age spots, liver spots, and other forms of hyperpigmentation.

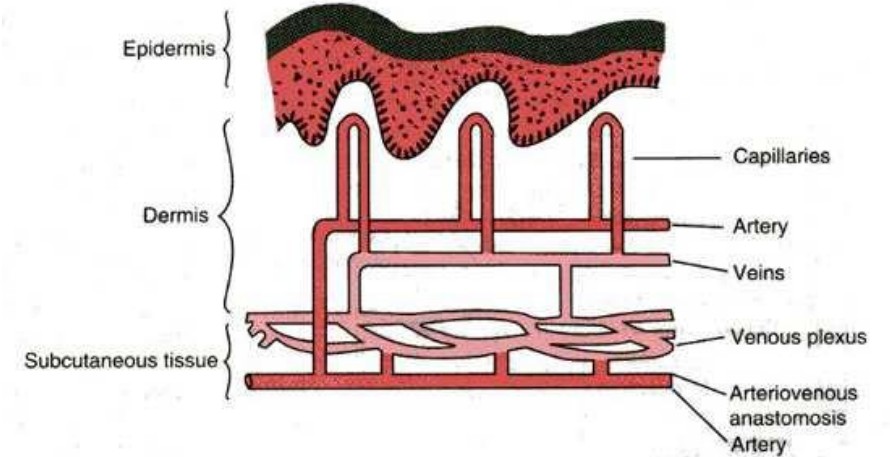
Conversely, some areas may lose pigmentation, resulting in lighter patches.



Reduced blood circulation means fewer nutrients and oxygen reach the skin, contributing to a less vibrant appearance and slower healing processes.

Sweat glands become less active, reducing the skin's ability to cool itself and increasing the risk of overheating.

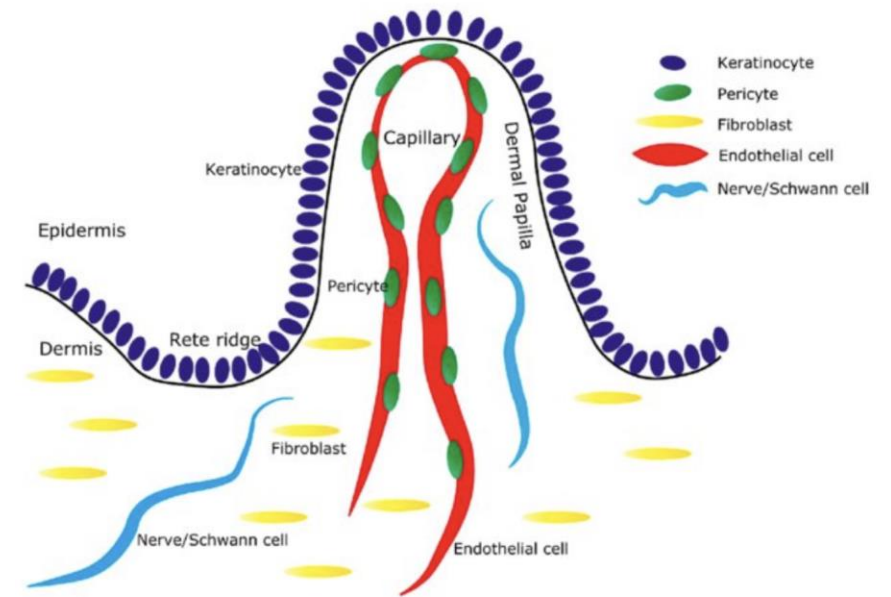
The skin's immune function diminishes, making it more susceptible to infections, inflammation, and diseases such as skin cancer.



The junction between the dermis and epidermis flattens out, reducing the skin's resistance to shearing forces and increasing the risk of tearing and blistering.

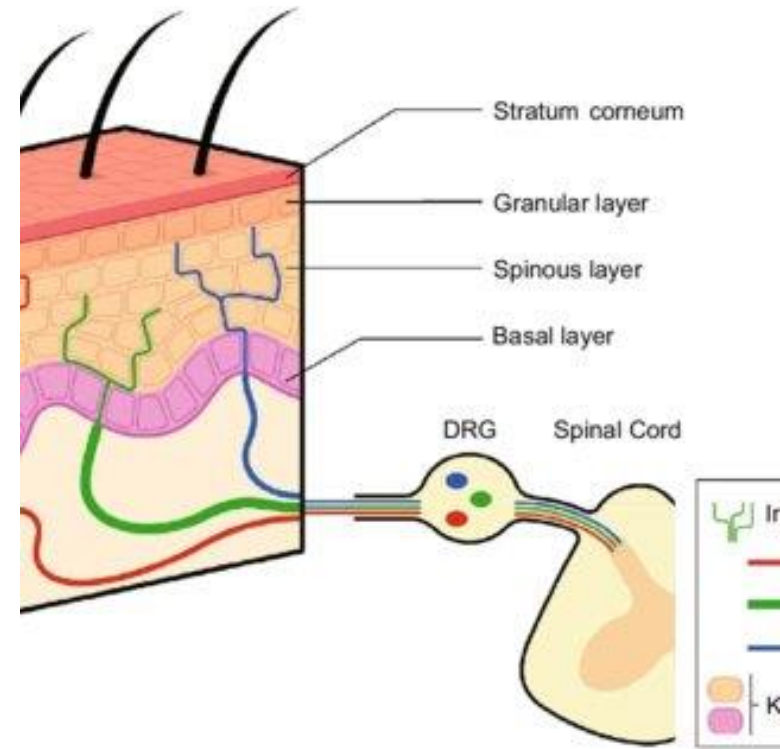
The number of nerve endings in the skin decreases, leading to a diminished sense of touch, pressure, and pain.

The number of blood vessels in the skin decreases, leading to a paler appearance and slower healing.



Recent advances are providing insights into the molecular and cellular changes in aging skin

Skin aging involves intrinsic (genetics and internal body function) and extrinsic (environmental) factors.



With rising life expectancy, especially among women who will spend a significant portion of their lives in menopause, skincare must shift focus from aesthetics to overall skin health and functionality.



Hormones

Estrogen, progesterone, and the skin:

- Stimulates collagen production, which maintains skin elasticity and strength – decreases result in wrinkles and sagginess
- Helps maintain skin hydration by increasing the production of natural oils and hyaluronic acid.
- Promotes better wound healing and skin repair. Low estrogen makes skin more susceptible to damage and slower to recover.
- Maintains skin thickness by promoting cell turnover and growth. With declining hormones, the epidermis (outer skin layer) becomes thinner, contributing to a more fragile skin structure.



Benefits of testosterone in men:

- Thicker skin and higher collagen density due to testosterone, providing more resilience against aging.
- Higher sebum production helps maintain skin hydration and barrier function.

Declining progesterone and estrogen play a role in the aging of the skin in women



Gut Connection

A healthy gut microbiome produces anti-inflammatory metabolites, such as short-chain fatty acids (SCFAs), which can help reduce inflammation and support a healthy skin barrier.

The gut microbiome influences the body's hormonal balance, including hormones that affect the skin such as androgens and cortisol.

Imbalances in these hormones due to gut dysbiosis can lead to skin issues like acne and increased sensitivity.

Microbiome Cross-Talk:

There is evidence that the gut and skin microbiomes can communicate with each other through immune and metabolic pathways.

This cross-talk can help maintain the balance of beneficial microorganisms on the skin and support overall skin health.

What does loss of collagen do?

Joint Pain and Stiffness: Decreased collagen can cause joint pain, stiffness, and osteoarthritis

Weaker Bones: Lower collagen can lead to decreased bone density and higher risk of fractures and osteoporosis.

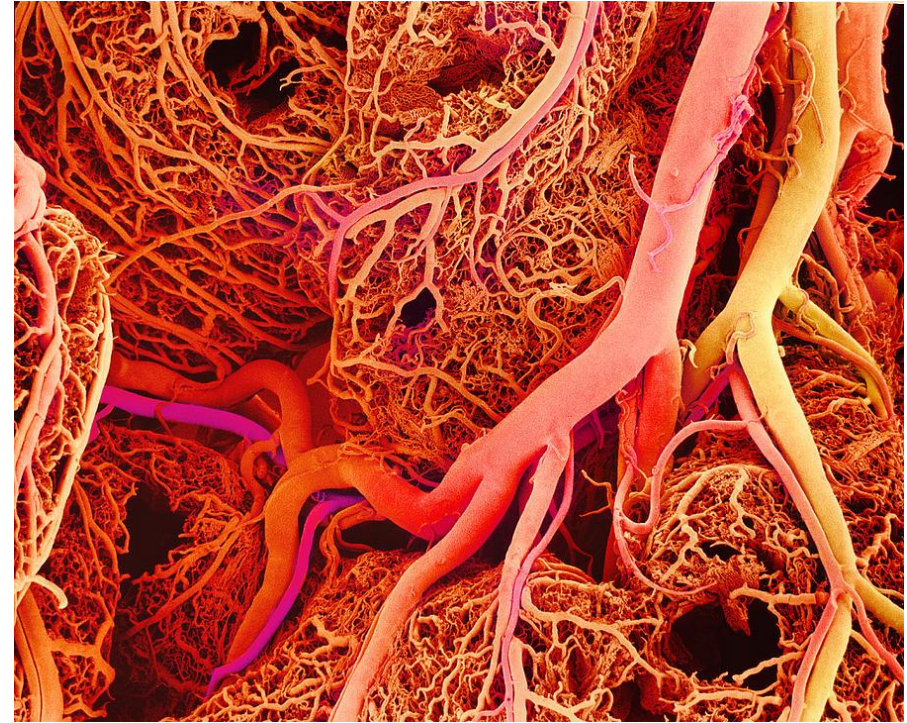
Reduced Muscle Mass: Reduced collagen contributes to sarcopenia, the age-related loss of muscle mass and strength.



Blood Vessel Weakness: Less collagen weakens blood vessels, leading to conditions like aneurysms and varicose veins.

Slower Wound Healing: Lower collagen slows down wound healing and can cause more scarring.

Digestive Issues: Reduced collagen can impair the gut's ability to repair itself, potentially leading to leaky gut syndrome.



Thinning Hair and Brittle Nails:
Decreased collagen leads to thinning hair, hair loss, and brittle nails.

Weaker Teeth and Gums: Lower collagen can cause gum disease and dental problems.

Loss of Flexibility in Tendons and Ligaments: Reduced collagen decreases flexibility and increases the risk of injuries and longer recovery times.



Blood Vessels: Collagen helps maintain the integrity and elasticity of blood vessel walls, ensuring proper blood circulation.

Heart: The heart valves and walls contain collagen, which helps maintain their structural integrity and function.

Lungs: Collagen is present in the lung tissue, providing support and elasticity, essential for breathing.

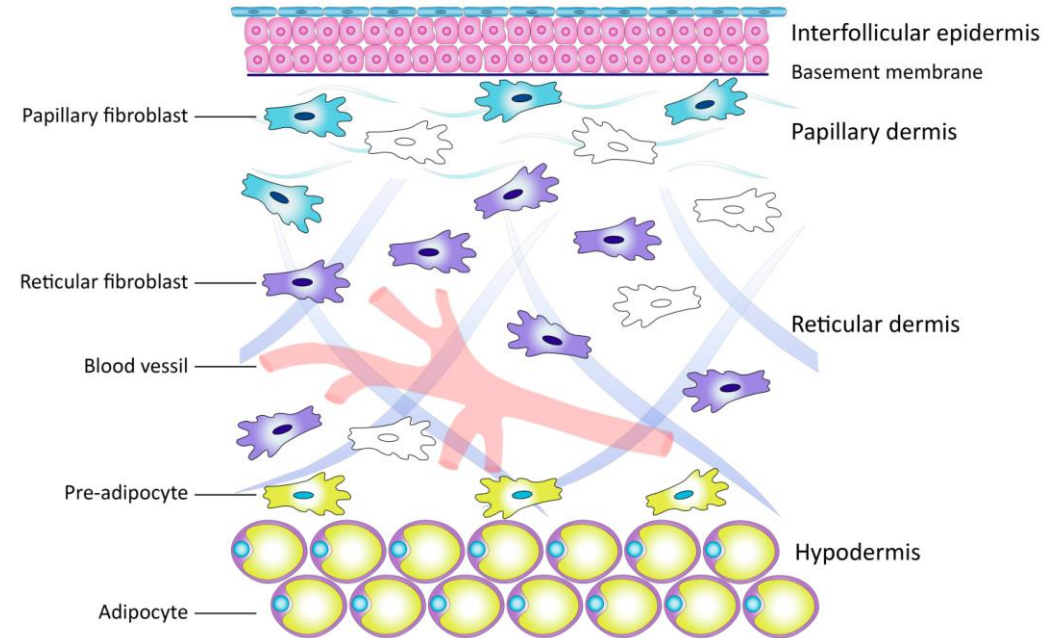
Kidneys: Collagen helps support the structure of the kidneys, ensuring proper filtration and function.

Liver: Collagen is involved in the structural framework of the liver, supporting its regenerative capabilities and function.

Where is collagen produced?

Fibroblasts, which are found throughout connective tissues, produce collagen in the skin (particularly in the dermis),

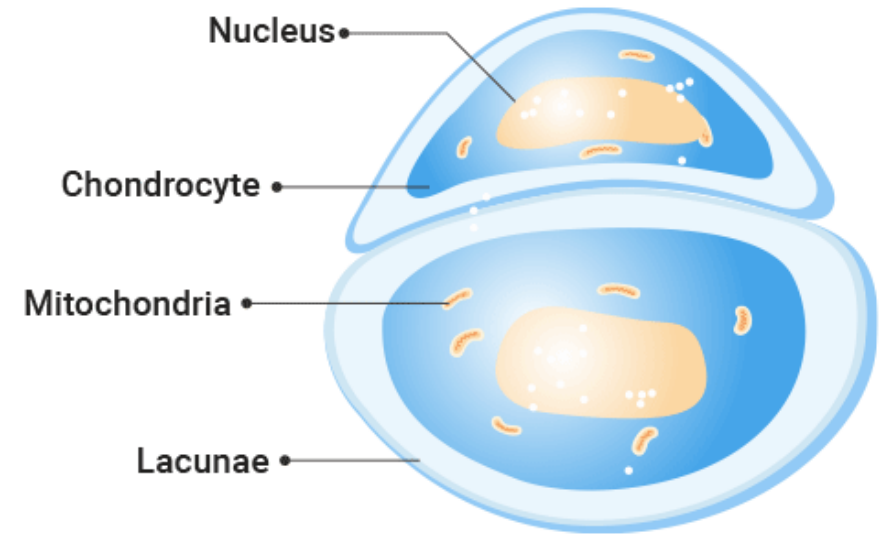
As well as tendons, ligaments, supportive tissues in organs, the stromal tissue of bone marrow, and the synovial membrane in joints.



Chondrocytes in cartilage produce collagen in joints, the rib cage, ears, nose, and intervertebral discs.

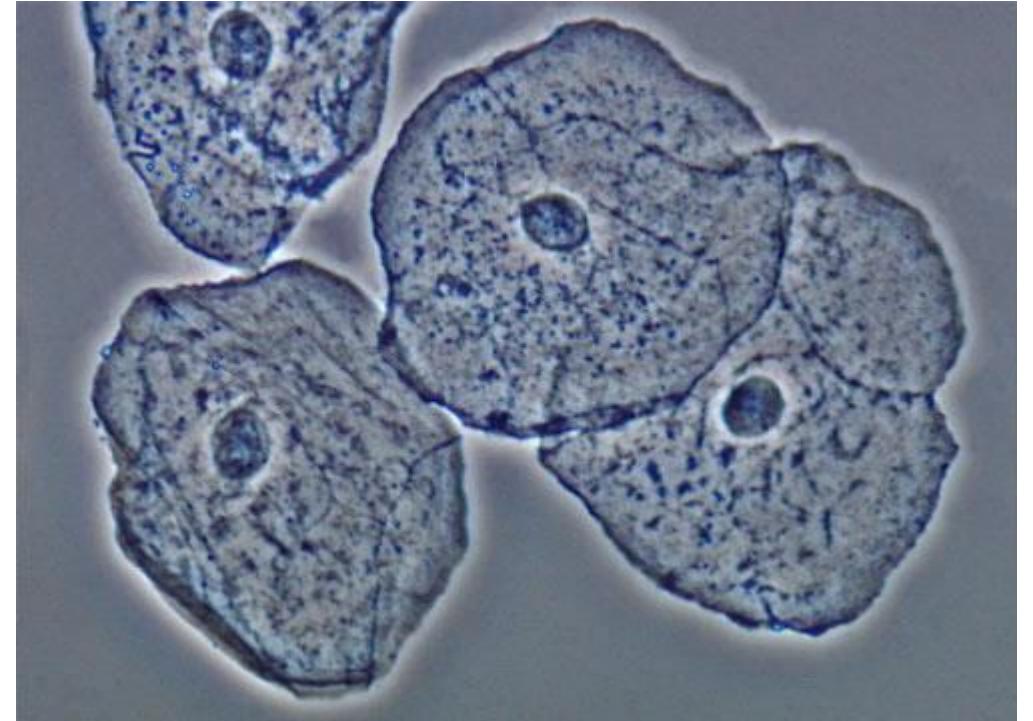
Osteoblasts in bone tissue produce collagen throughout the skeletal system, including long bones, vertebrae, and the skull.

These cells are essential for maintaining the structure and function of cartilage and bones.



Epithelial cells play a crucial role in maintaining the structural integrity, strength, and repair of tissues across the body, they producing collagen in various tissues

Collagen production is essential for the proper function and resilience of these tissues.

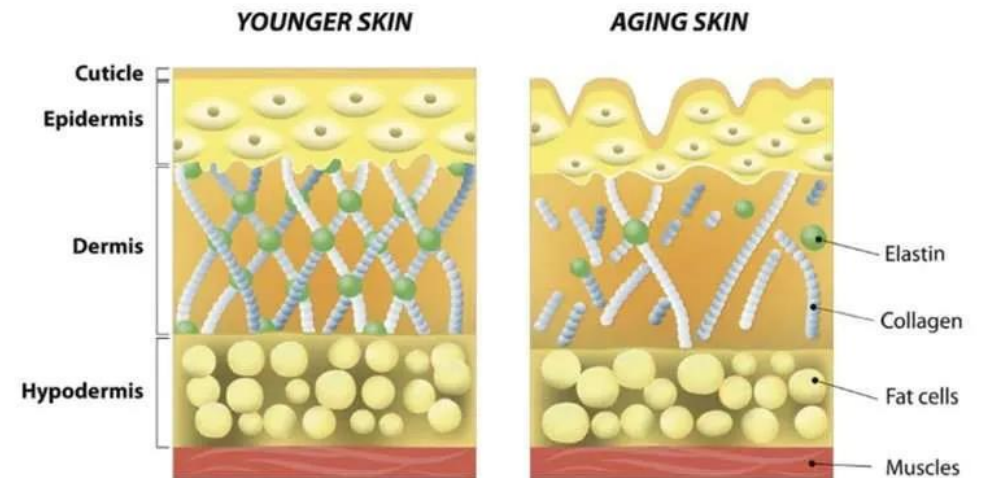


Elastin

Provides elasticity and allows tissues to return to their original shape after stretching or contracting.

Needed for the flexibility and resilience of the skin, blood vessels, lungs, and other tissues.

Elastin is more challenging to maintain and regenerate than collagen.



Naturally decreases with age, leading to reduced skin elasticity and the formation of wrinkles.

Maintaining elastin involves protecting the skin from UV damage, not smoking, and ensuring adequate hydration.

Ingredients in skincare products, like retinoids and peptides, may help stimulate elastin production to some extent

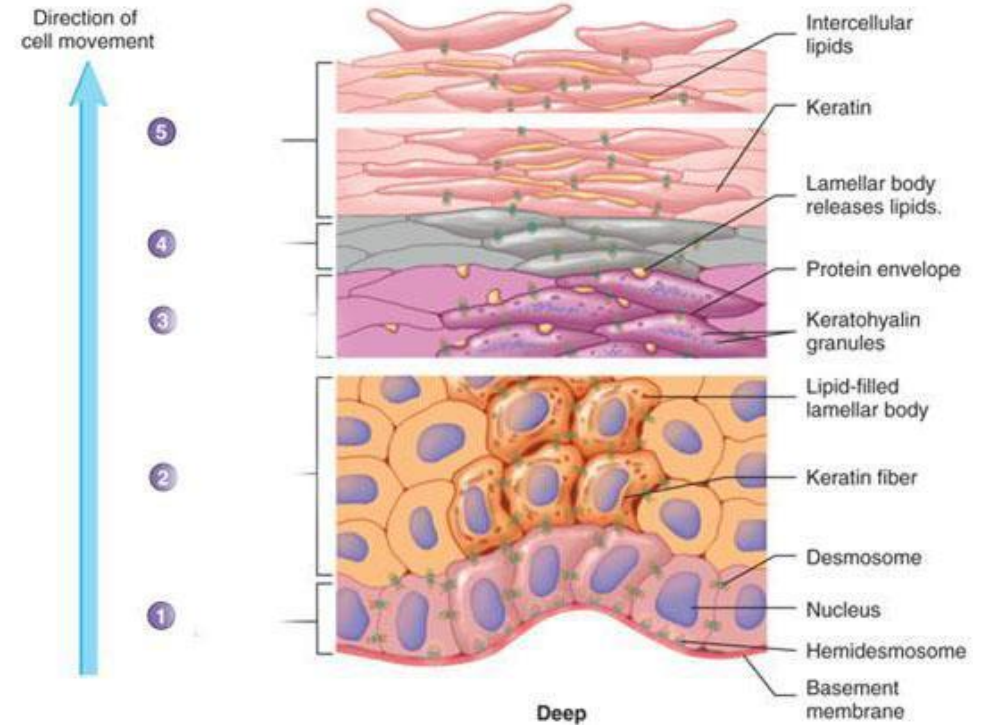


The basement membrane is a thin, specialized layer of extracellular matrix that lies beneath epithelial cells and surrounds muscle cells, fat cells, and Schwann cells (involved in nerve function).

It provides structural support and acts as a barrier and filter for cells, maintaining the structure and function of tissues,

Plays a pivotal role in the health of the skin and conditions like cancer, diabetes, and kidney diseases

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Superficial



Face Exercises

Boosts Collagen Production:

Increases blood flow, delivering more oxygen and nutrients to the skin, which helps produce collagen for firmer skin.

Enhances Elastin Production:

Exercises the facial muscles, improving skin elasticity and making it more resilient.



Better Blood Flow: Delivers essential nutrients and oxygen, promoting collagen and elastin production.

Muscle Stimulation: Keeps facial muscles toned, supporting skin structure.

Reduced Tension: Relieves muscle tension, preventing collagen and elastin breakdown.

Overall Impact:

Reduces Fine Lines and Wrinkles: Firmer skin appears smoother.

Improves Skin Elasticity: More elastin reduces sagging.

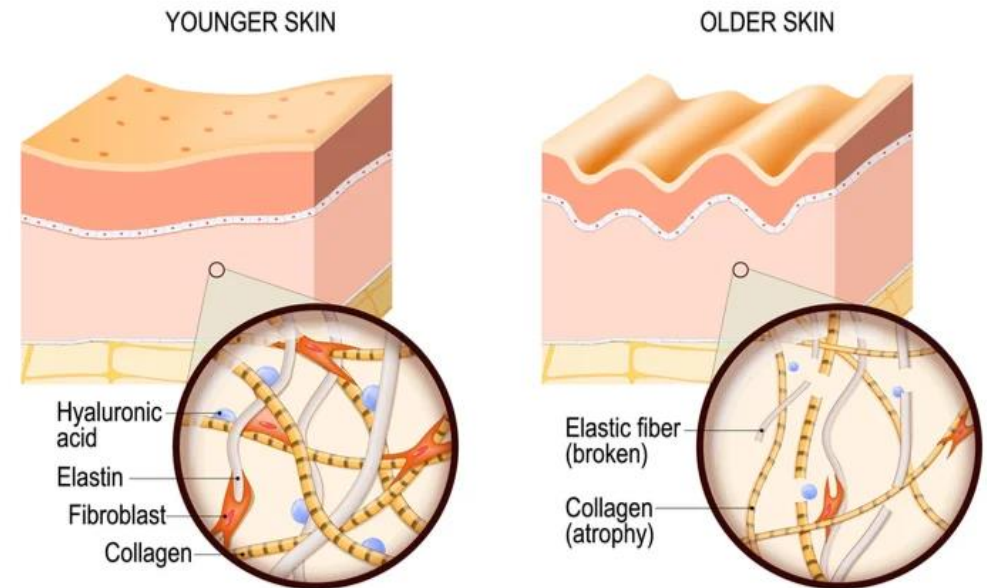
Maintains Skin Firmness: Regular practice helps keep skin looking youthful.

Types of Collagen

Type I Collagen: Provides tensile strength and structural support to skin, bones, tendons, and ligaments.

Type II Collagen: Maintains the structure and elasticity of cartilage, crucial for joint function.

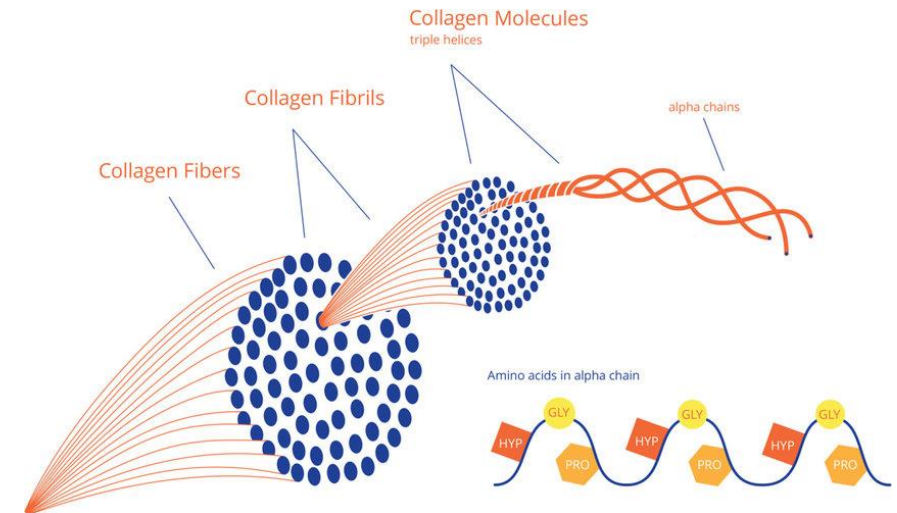
Type III Collagen: Supports the structure of organs and blood vessels, often found alongside Type I collagen.



Type IV Collagen: Forms the basement membrane, providing support and filtration in epithelial and endothelial tissues.

Type V Collagen: Regulates the size of collagen fibrils, found in skin, cornea, placenta, and hair, contributing to tissue integrity.

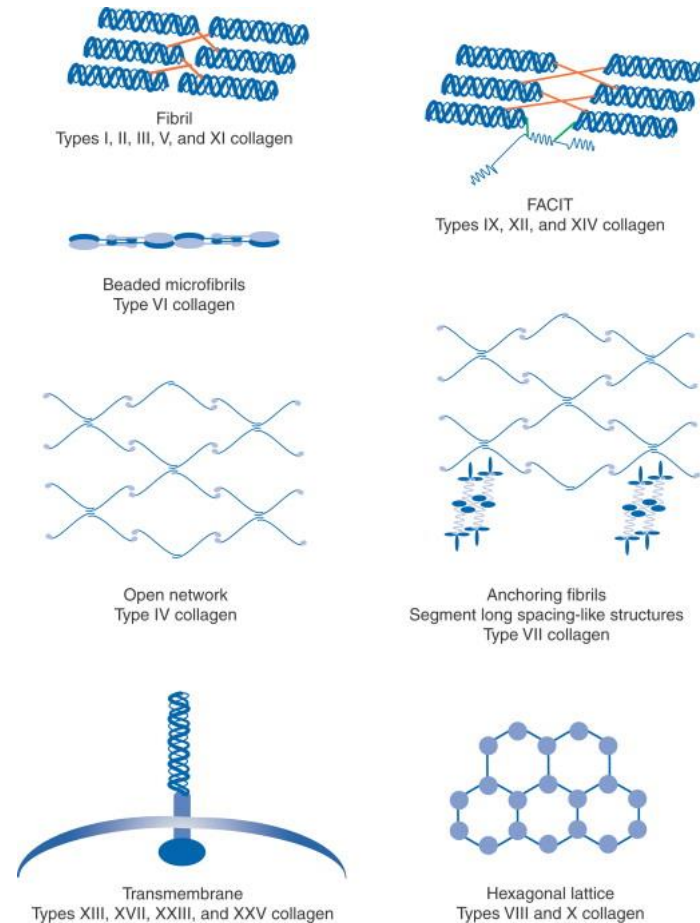
Type VI Collagen: Provides structural support in the extracellular matrix of muscles and connective tissues.



Type VII Collagen: Anchors the epidermis to the dermis, playing a key role in skin integrity.

Type VIII Collagen: Involved in the formation of endothelial cells in blood vessels.

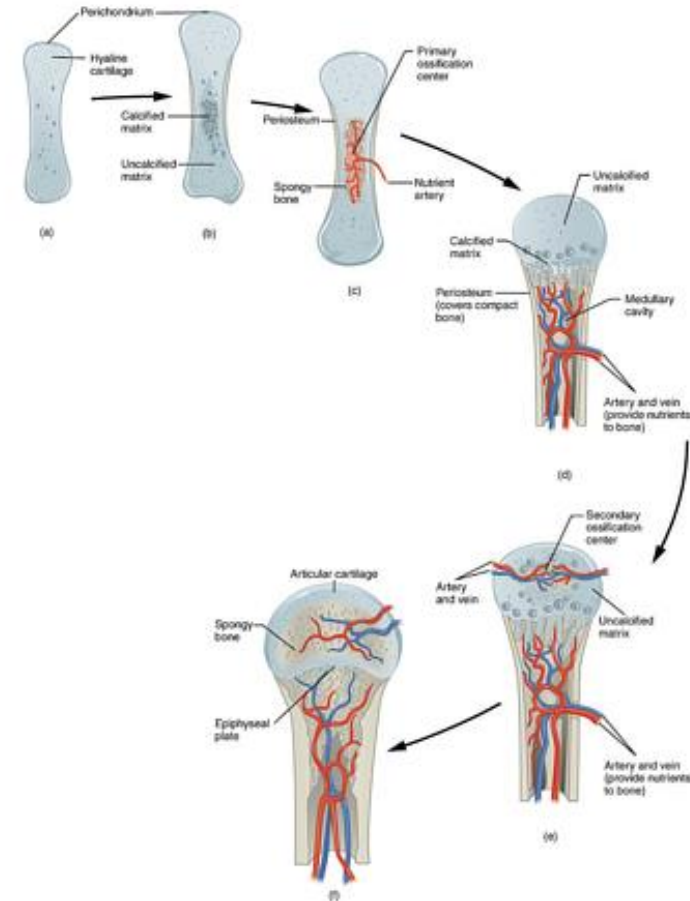
Type IX Collagen: Found in cartilage, interacting with Type II collagen to support joint function.



Type X Collagen: Facilitates the process of endochondral ossification, essential for bone growth and development.

Type XI Collagen: Works with Type II collagen in cartilage, helping to maintain its structure.

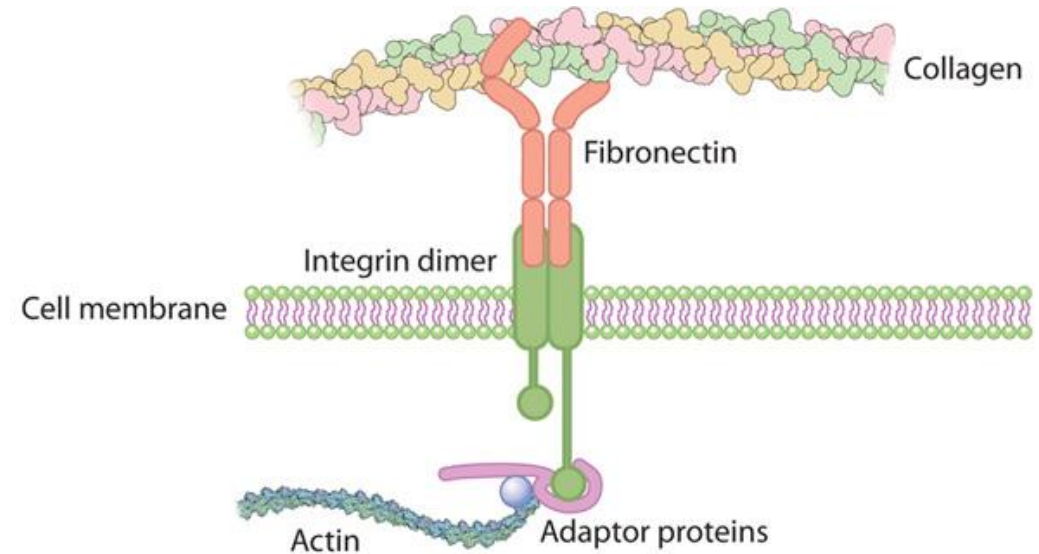
Type XII Collagen: Associates with Type I collagen, contributing to the mechanical strength of tendons and ligaments.



Type XIII Collagen: Involved in cell adhesion and maintenance of the structure of various tissues.

Type XIV Collagen: Supports the structure of connective tissues and interacts with other types of collagen.

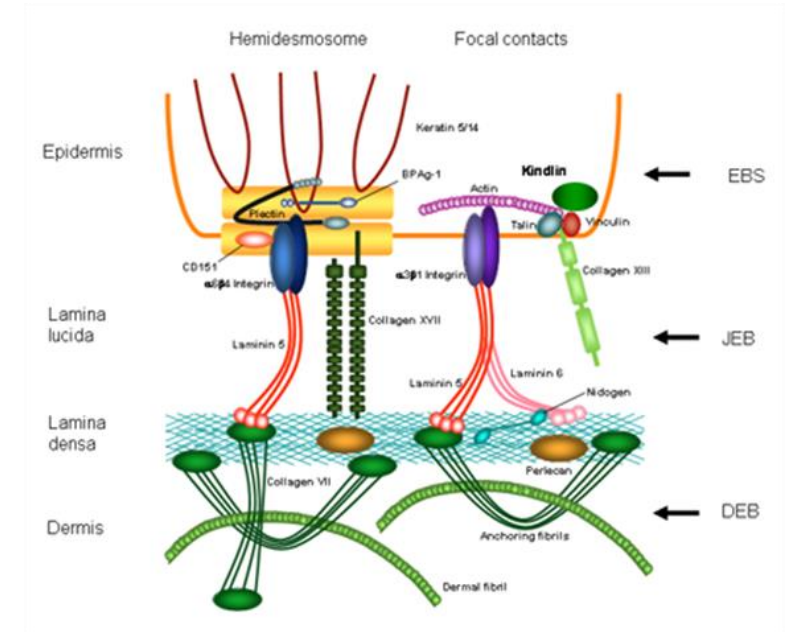
Type XV Collagen: Found in basement membranes, providing structural stability to muscles and blood vessels.



Type XVI Collagen: Present in various tissues, playing a role in the organization of the extracellular matrix.

Type XVII Collagen: Essential for the integrity of hemidesmosomes, which attach epithelial cells to the basement membrane.

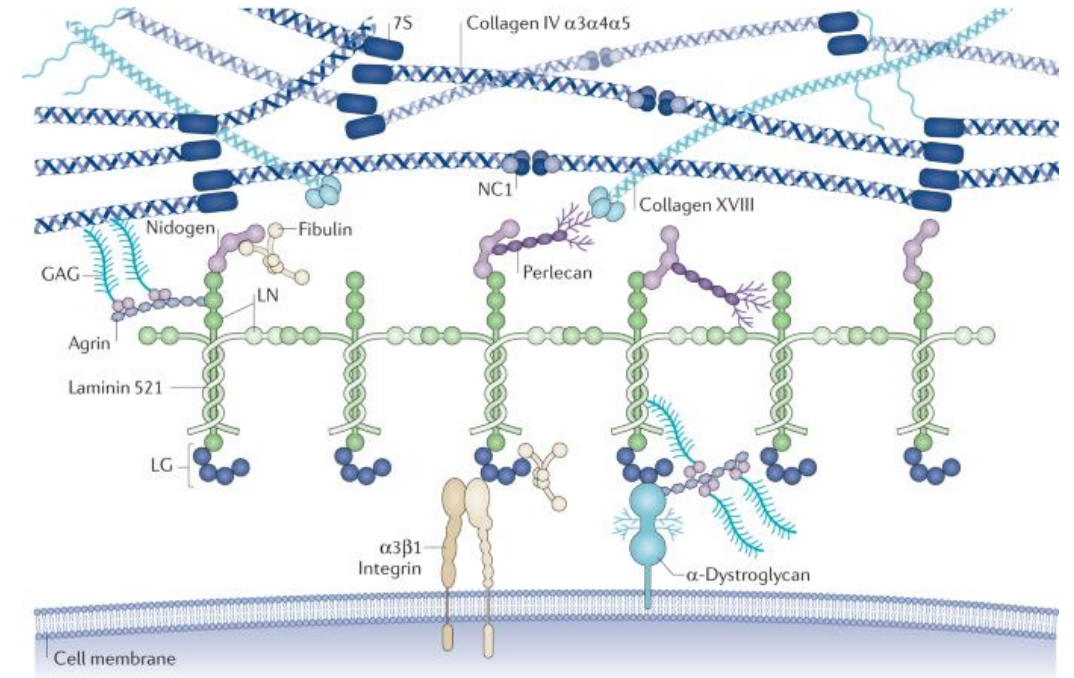
Type XVIII Collagen: Involved in the structure of basement membranes in various tissues, including blood vessels.



Type XIX Collagen: Found in basement membranes, contributing to tissue integrity and function.

Type XX Collagen: Present in various tissues, its exact function is still being researched but is believed to be involved in tissue organization.

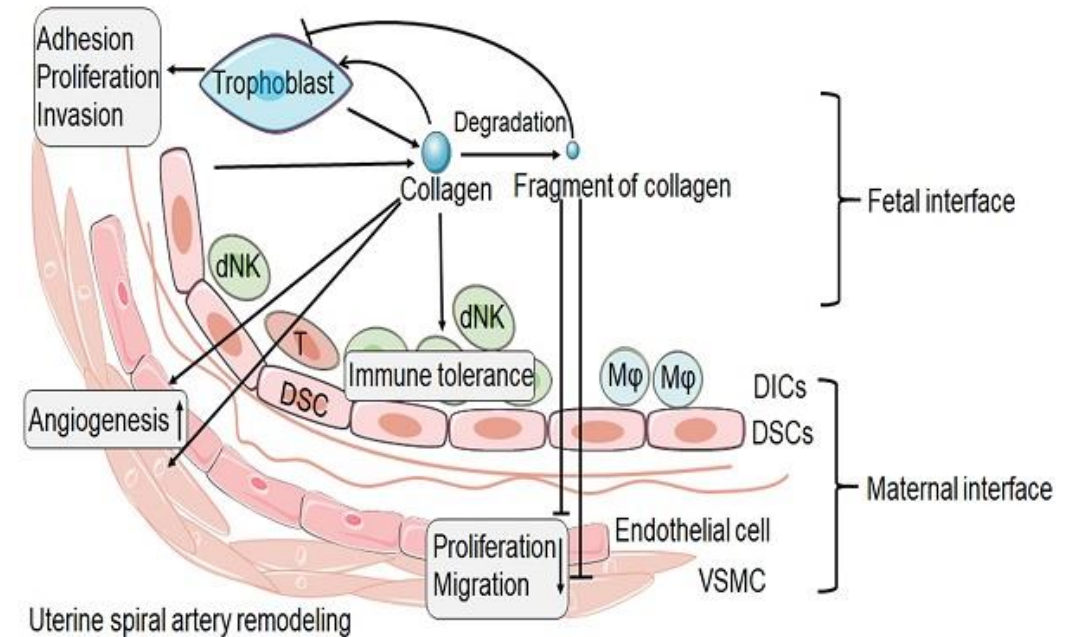
Type XXI Collagen: Associated with other collagen types, playing a role in the extracellular matrix of various tissues.



Type XXII Collagen: Found at tissue junctions, particularly in muscle and tendon insertions.

Type XXIII Collagen: Involved in cellular adhesion and is expressed in metastatic cancer cells.

Type XXIV Collagen: Plays a role in the development of the eye and other tissues during embryogenesis.



Type XXV Collagen: Associated with neural tissues, particularly in the brain, involved in neural development.

Type XXVI: Development and maintenance of tissues in the brain, eye, and potentially other tissues.

Type XXVII: Formation and maintenance of cartilage, crucial during skeletal development in cartilage during embryonic development.

Collagen Type XXVIII: helps structural integrity, tissue repair, and regeneration in the skin and other tissues.

Each type of collagen has a specialized role, contributing to the structural integrity and function of various tissues throughout the body.

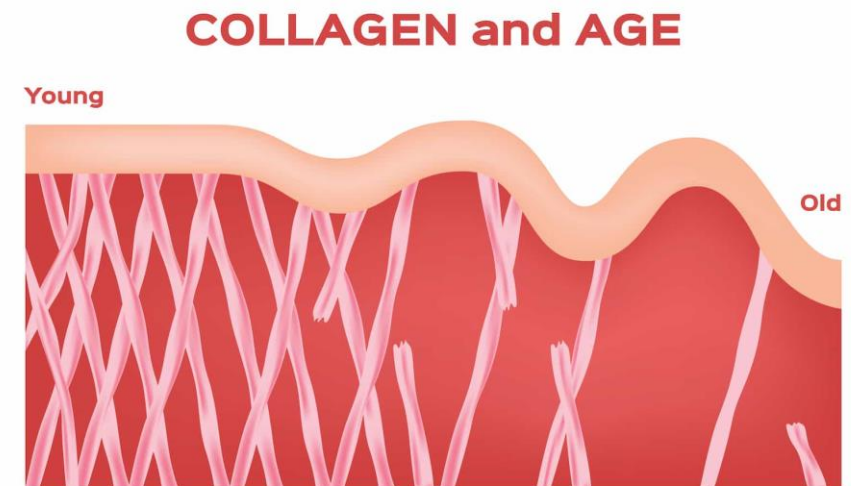
Collagen in Skin

Reduced collagen can cause thinning skin and increased susceptibility to damage and infections.

Type I and Type III Collagen: Critical for skin structure, elasticity, and repair.

Type VII Collagen: Involved in the anchoring fibrils in the skin.

Type V Collagen: Helps regulate the size of collagen fibrils and is found in the skin, contributing to the overall structure and function of the skin.

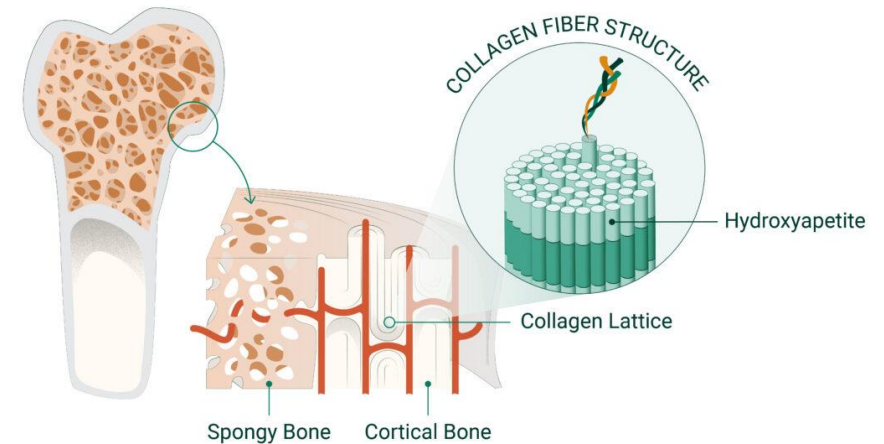


Conditions Linked to Loss of Collagen

Osteoarthritis: Decreased collagen leads to cartilage wear, causing joint pain, stiffness, and reduced mobility. Type II collagen

Osteoporosis: Reduced collagen weakens bone structure, decreasing bone density and increasing fracture risk. Type I collagen

Atherosclerosis: Less collagen weakens blood vessels, contributing to hardened and narrowed arteries, and raising heart disease and stroke risks. Type I and III



Aneurysms: Weakened blood vessel walls from reduced collagen can cause aneurysms, which may rupture and lead to severe bleeding. Type I and III

Chronic Wounds and Poor Healing: Lower collagen impairs wound healing, resulting in chronic wounds and higher infection risks. Type I and III

Gastrointestinal Disorders: Decreased collagen affects gut lining integrity, potentially leading to leaky gut syndrome and related disorders (Type III and IV).

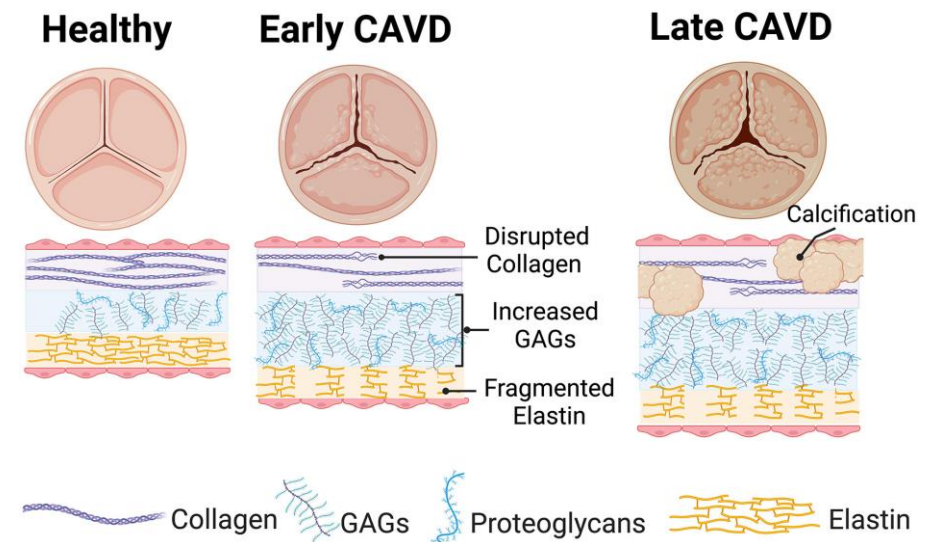


Varicose Veins: Weakened vein walls from less collagen can cause varicose veins, leading to discomfort and complications. Type I and Type III

Periodontal Disease: Less collagen weakens gums, raising the risk of periodontal disease and tooth loss. Type I

Sarcopenia: Reduced collagen is linked to age-related muscle mass and strength loss, affecting overall muscle health and function Type I and III.

Heart Valve Problems: Decreased collagen contributes to heart valve degeneration, leading to conditions like mitral valve prolapse or aortic valve stenosis. Type I and III



Nutrients For Collagen

Vitamin C: Crucial for the synthesis of collagen, it stabilizes the collagen molecule and helps in the hydroxylation of collagen precursors, allowing them to form strong fibers.

Proline: An amino acid that is a major component of collagen, aiding in its stability and strength.

Glycine: The most abundant amino acid in collagen, necessary for maintaining its structure.



Lysine: Another essential amino acid that plays a vital role in collagen cross-linking, which gives collagen its tensile strength.

Copper: An essential mineral that helps activate lysyl oxidase, an enzyme important for the cross-linking of collagen and elastin.

Zinc: Supports the synthesis of collagen by activating proteins needed for collagen formation and maintaining skin health.



Silicon: Involved in collagen synthesis and strengthening connective tissues.

Vitamin A: Necessary for collagen production and skin health, it helps repair and maintain skin tissues.

Antioxidants (e.g., Vitamin E, Selenium): Protect collagen from damage by neutralizing free radicals that can degrade collagen fibers.



Omega-3 Fatty Acids: Found in fish oil and flaxseeds, they help reduce inflammation, which can protect collagen from breaking down.

Sulfur: Found in foods like garlic, onions, and cruciferous vegetables, sulfur is important for collagen synthesis and maintaining skin health



Types of Collagen Products:

Marine Collagen: Fish skin and scales.

Type: Primarily Type I collagen and some III.

Benefits: High bioavailability, promotes skin health, supports joint and bone health, sustainable option.

Products: Powders, capsules, drinks, and skincare products.

Bovine Collagen: Cow hides and bones.

Types: Mainly Types I and III collagen.

Benefits: Supports skin, hair, nail health, and joint function; promotes gut health.

Products: Powders, capsules, and liquid supplements.

Porcine Collagen: Pig skin

Types: Primarily Type I collagen.

Benefits: Similar to bovine collagen, supports skin elasticity and joint health.

Products: Powders, capsules, and liquid supplements.

Chicken Collagen: Chicken cartilage and bones.

Types: Mainly Type II collagen.

Benefits: Particularly beneficial for joint health and cartilage support; promotes skin elasticity.

Products: Powders, capsules, and bone broth.

Eggshell Membrane Collagen:

Types: Combination of Types I, V, and X collagen.

Benefits: Supports joint and connective tissue health, promotes skin health.

Products: Powders, capsules, and topical creams.



Choosing the Right Collagen:

Marine Collagen: Best for those looking for high bioavailability and sustainable options, particularly for skin health.

Bovine Collagen: Ideal for overall health, including skin, joints, and gut health.

Porcine Collagen: Similar benefits to bovine collagen, often used in skincare products.

Chicken Collagen: Specifically beneficial for joint health due to Type II collagen.

Eggshell Membrane Collagen: Great for joint and connective tissue health.

Vegan Collagen Supplements

Collagen Precursors: Supplements that provide the nutrients needed for collagen production, such as vitamin C, amino acids, and minerals.

Algae-Based Supplements: Some products use algae and other marine plants to create formulations that support collagen production.

Herbal Supplements: Ingredients like aloe vera, hyaluronic acid (sourced from microbial fermentation), and specific herbs that promote skin health and hydration.

Example Products:

Garden of Life Organic Plant Collagen Builder: Contains silica from bamboo extract, vitamin C, biotin, and antioxidants from organic fruits and vegetables.

Moon Juice Collagen Protect: A blend of hyaluronic acid, silver ear mushroom, and tocos (rice bran solubles) designed to hydrate the skin and support natural collagen production.

Ora Organic Aloe Gorgeous Vegan Collagen-Boosting Powder: Combines aloe vera, protein from pea and rice, silica, and vitamin C to support collagen synthesis.

These support collagen types I and III

Ingredients

Lecithin

Lecithin is used topically in skincare products for its moisturizing, emulsifying, and barrier-supporting properties. Here are some common topical uses of lecithin:

- 1. Moisturizer:** Lecithin helps hydrate the skin by forming a protective barrier that retains moisture, making it a valuable ingredient in moisturizers and lotions.
- 2. Emulsifier:** It acts as an emulsifier in skincare formulations, helping to blend water and oil-based ingredients, which improves the texture and consistency of products like creams, lotions, and serums.
- 3. Skin Barrier Support:** Lecithin supports the skin's natural barrier function, protecting against environmental stressors and promoting overall skin health.
- 4. Nutrient Delivery:** It enhances the penetration of other active ingredients in skincare products, allowing for better absorption and efficacy of beneficial compounds.
- 5. Anti-aging and Repair:** Lecithin's hydrating and nourishing properties can help reduce the appearance of fine lines and support skin repair processes, making it a common ingredient in anti-aging products.
- 6. Contains phospholipids –** Essential for cell membranes

Hyaluronic acid

Known for its ability to attract and retain moisture, holding up to 1,000 times its weight in water.

This helps keep the skin well-hydrated, which is essential for maintaining a healthy skin barrier and microbiome. (be careful in menopausal women – can draw moisture – best with lecithin)

Helps maintain the integrity of the skin barrier (when well-hydrated). Protects against environmental stressors and supports a balanced skin microbiome.

Non-comedogenic: Doesn't clog pores. This makes it suitable for all skin types, including sensitive and acne-prone skin.

Can help reduce inflammation and irritation, creating a favorable environment for a healthy skin microbiome.

Properly hydrated skin can better absorb and utilize other beneficial skincare ingredients, promoting overall skin health and microbiome balance.

Coconut oil

Contains lauric acid (antimicrobial properties): Reduces the presence of bad bacteria and fungi on the skin, supporting a healthier skin microbiome.

Can help maintain the skin's hydration and barrier function. A healthy skin barrier is crucial for a balanced skin microbiome.

Has anti-inflammatory properties that can help soothe irritated skin and reduce redness

Also rich in fatty acids and antioxidants, which can nourish the skin and support overall skin health.

Shea Butter

Provides deep hydration to maintain skin's barrier function essential for a balanced and thriving skin microbiome.

Contains triterpenes that have anti-inflammatory properties, reducing inflammation and supporting the skin microbiome

Mild antimicrobial properties that can help protect the skin from harmful bacteria while not disrupting the beneficial microorganisms

Rich in antioxidant vitamins A and E to protect the skin from damage and support skin health. Healthy skin is better able to maintain a balanced microbiome.

Helps protect against environmental stressors and potential irritants, contributing to a healthy and resilient skin microbiome.

Beneficial for conditions such as eczema, dermatitis, and other skin irritations that can disrupt the skin microbiome.

Lavender: Strong antimicrobial effects, which can help reduce harmful bacteria on the skin and support a balanced microbiome.

Anti-inflammatory properties to help soothe irritated skin and reduce redness, promoting a healthier skin environment.

Promotes wound healing and skin regeneration, maintaining the integrity of the skin barrier—a crucial aspect of a healthy skin microbiome

Chamomile: Reduces inflammation, which can calm irritated skin and support a healthy microbiome

Has antimicrobial properties, helping to control the growth of harmful microorganisms on the skin.

Soothes stress-related skin issues and maintains a balanced skin microbiome.

Aloe Vera

Contains compounds like acemannan and other polysaccharides that help reduce inflammation and soothe irritated skin.

Antimicrobial properties, can help reduce the presence of harmful bacteria and fungi on the skin. This helps maintain a balanced and healthy skin microbiome.

Hydrates and can help maintain the skin's moisture balance providing an optimal environment for beneficial microbes.

Promotes skin healing and repair, maintaining the integrity of the skin barrier

Aloe vera may have prebiotic effects

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Green Tea

Antioxidant Protection: The antioxidants in green tea can help protect the skin from damage caused by free radicals, which can contribute to aging and various skin issues.

Anti-inflammatory Properties: Green tea can reduce inflammation, which can help calm irritated skin and reduce redness.

Antimicrobial Effects: The catechins in green tea have been shown to have antimicrobial properties, which can help reduce the presence of harmful bacteria on the skin and promote a healthier skin microbiome.

Balancing Sebum Production: Green tea can help regulate sebum production, which can be beneficial for those with oily or acne-prone skin.

Improving Skin Barrier Function: By reducing inflammation and providing antioxidant protection, green tea can help maintain and improve the skin's barrier function, which is essential for a healthy skin microbiome.

Skin Microbiome

The skin microbiome is composed of bacteria, fungi, viruses, and mites. Common bacteria include *Staphylococcus*, *Corynebacterium*, and *Cutibacterium* species.

The composition of the skin microbiome varies by body site due to differences in skin properties such as moisture, pH, and sebum production. For example, oily areas like the face and back have different microbial populations compared to dry areas like the forearms.

The skin microbiome helps protect against pathogenic organisms by competing for nutrients and space, producing antimicrobial substances, and modulating the immune response.

An imbalance in the skin microbiome, known as dysbiosis, is associated with various skin conditions such as acne, eczema, psoriasis, and rosacea.

The skin microbiome is influenced by multiple factors, including genetics, age, diet, environment, hygiene practices, and the use of skincare products.

Dynamic Nature: The skin microbiome can change over time due to changes in any of the influencing factors, including hormonal changes during puberty, pregnancy, or menopause.

The skin microbiome interacts with the skin's immune system, playing a role in the development and function of the immune response.

A healthy microbiome helps maintain the skin barrier, protecting against environmental stressors, pathogens, and moisture loss.

As we age, changes in the skin microbiome can compromise this barrier, leading to increased dryness and vulnerability.

The skin microbiome can modulate inflammation.

An imbalanced gut microbiome (dysbiosis) in older individuals can lead to chronic low-level inflammation, contributing to skin aging and conditions such as eczema and psoriasis.

Antioxidant Production: Some skin microorganisms produce antioxidants, which combat oxidative stress—a major factor in skin aging.

Reduced microbial diversity and function with age can decrease this protective effect, leading to more pronounced signs of aging like wrinkles and sagging.

Beneficial microbes produce metabolites that can nourish and protect the skin.

Aging can alter microbial composition and reduce the production of these beneficial compounds, impacting skin health and appearance.

The skin microbiome interacts with the immune system, helping to train and modulate it.

Age-related changes in the microbiome can affect this interaction, potentially weakening the skin's immune defenses and making it more susceptible to infections and inflammatory conditions.

Environmental Response: The microbiome helps the skin respond to environmental factors such as UV radiation and pollutants.

With age, the microbiome's protective response may diminish, leading to greater damage from these external factors and accelerating the aging process.

Common Probiotic Strains in Natural Skincare

Lactobacillus acidophilus: Known for its soothing and anti-inflammatory properties, it helps maintain the skin's natural balance.

Lactobacillus ferment: Often used for its antimicrobial benefits, helping to protect the skin from harmful bacteria while promoting beneficial bacteria.

Lactobacillus casei: Helps to strengthen the skin's natural defenses and improve moisture retention.



Bifidobacterium bifidum: Supports the skin's barrier function and helps reduce the impact of environmental stressors.

Bifidobacterium longum: Known for its ability to enhance skin hydration and improve the overall health of the skin.

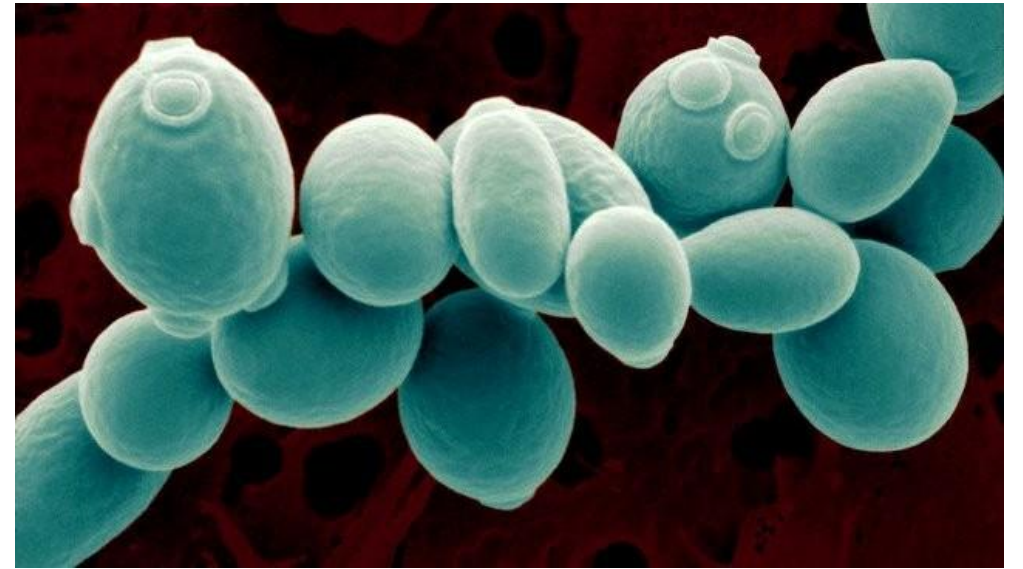
Streptococcus thermophilus: Known for its moisturizing properties and ability to support the skin's barrier function, making it suitable for dry and sensitive skin types.



Propionibacterium: *Propionibacterium acnes* lysate: Often used in acne treatments, it helps to balance the skin microbiome and reduce acne-causing bacteria.

Saccharomyces cerevisiae: A type of yeast that helps to detoxify the skin, improve its texture, and support the natural barrier.

Bacillus ferment: Known for its enzyme activity, it helps exfoliate the skin gently, promoting a smoother and more radiant complexion.



Benefits of Probiotic Strains in Skincare

Probiotics help maintain a healthy balance of bacteria on the skin, which is crucial for overall skin health.

Many probiotic strains have anti-inflammatory properties that help soothe irritated skin and reduce redness.

Can enhance the skin's moisture retention, leading to better hydration and a healthier appearance.

Help protect the skin against harmful pathogens and environmental stressors.

Target acne-causing bacteria, helping to reduce breakouts and improve skin clarity.

Used in creams, lotions, serums cleansers, and masks

Benefits of Red Light/Near-Infrared Light Therapy for Aging Skin

Collagen Stimulation: Red light (620-750 nm) and near-infrared light (750-1200 nm) stimulate collagen and elastin production, reducing fine lines and wrinkles.

Improved Circulation: Enhances blood flow, delivering more oxygen and nutrients to skin cells.

Anti-Inflammatory: Reduces skin inflammation and redness, beneficial for rosacea and acne.

Cellular Repair: Boosts ATP production, aiding in cellular repair and regeneration.

Oxidative Stress Reduction: Increases antioxidant activity, protecting skin from free radical damage.

Enhanced Skin Tone and Texture: Promotes even pigmentation and reduces scars and blemishes.

Benefits for Aging Skin

Reduces Fine Lines and Wrinkles: Increased collagen smooths out fine lines and wrinkles.

Improves Elasticity: Enhances skin resilience and firmness.

Enhances Hydration: Better circulation and cellular function improve moisture retention.

Evens Skin Tone and Texture: Reduces hyperpigmentation and improves skin texture.

Accelerates Healing: Speeds up wound healing and reduces scar appearance.



Peptides

Mechanism of Action:

Collagen and Elastin Synthesis: Many peptides stimulate the production of collagen and elastin, crucial proteins for maintaining skin structure and elasticity.

Anti-Inflammatory Properties: Peptides can reduce inflammation, which is a significant contributor to skin aging.

Cell Communication: Peptides act as signaling molecules that can influence cell behavior, promoting repair and regeneration processes.

Neurotransmitter Inhibition: Some peptides inhibit neurotransmitter release, reducing muscle contraction and preventing wrinkle formation.

The body synthesizes peptides by linking amino acids through peptide bonds, guided by genetic instructions from DNA, which are transcribed into mRNA and translated by ribosomes.

Newly formed polypeptides often undergo post-translational modifications, such as cleavage and glycosylation, to become functional.

Specific peptides like collagen are synthesized through a detailed process involving the formation of procollagen, which is then processed into mature collagen fibrils.

Hormones and growth factors regulate peptide synthesis, ensuring the body's needs are met.

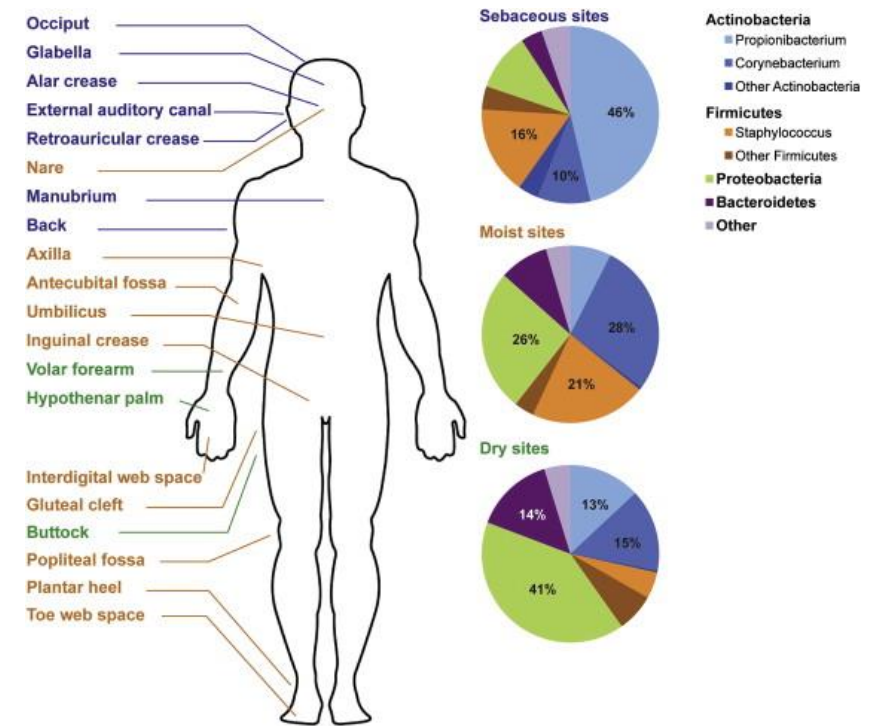
This process can decrease with age

Skin Microbiome

Peptides support the growth of beneficial bacteria on the skin by strengthening the skin barrier, reducing inflammation, and maintaining hydration.

Help create a stable environment that favors good bacteria

Peptides also have selective antimicrobial properties that control harmful bacteria, ensuring a balanced and healthy skin microbiome.



1. Anti-Inflammatory Properties

- Possess anti-inflammatory properties that can help calm irritated skin and reduce redness and swelling.
- Beneficial for individuals with sensitive or reactive skin conditions.

2. Promoting Wound Healing

- Peptides like GHK-Cu (Glycyl-L-histidyl-L-lysine-Copper) promote skin regeneration and repair, aiding in the healing of wounds, scars, and other skin injuries.
- Help in the remodeling of damaged tissue, leading to improved skin texture and appearance.
- Hydration: A stronger skin barrier prevents transepidermal water loss, leading to plumper, healthier-looking skin.

3. Improving Skin Elasticity

- Alongside collagen, peptides improve skin elasticity, making the skin more resilient and less prone to sagging.
- Contributes to overall skin firmness, giving a more youthful and lifted appearance.

4. Antioxidant Effects

- Help protect the skin from oxidative stress caused by free radicals, which can accelerate aging.
- Antioxidant peptides can help prevent the degradation of collagen and elastin, maintaining skin structure and integrity.

5. Targeting Specific Skin Concerns

- Can help reduce hyperpigmentation and promote a more even skin tone by inhibiting melanin production.
- Antimicrobial peptides can help reduce acne by targeting acne-causing bacteria without disrupting the skin microbiome.

6. Supporting the Microbiome

- Peptides can support the skin's natural microbiome by promoting a balanced environment that favors beneficial microorganisms.
- By enhancing the skin barrier, peptides indirectly support a healthy microbiome, which is essential for overall

7. Enhancing Overall Skin Appearance

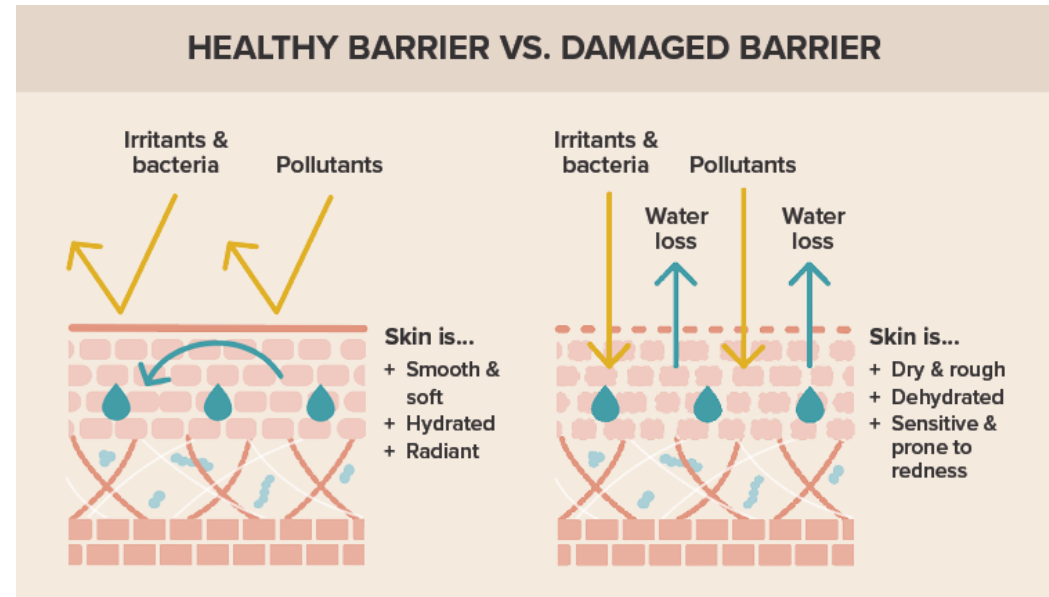
- Regular use of peptides can lead to smoother skin texture and a more refined appearance.
- Improves hydration, elasticity, and collagen production

8. Anti-Aging Benefits

- Can help stimulate collagen production, leading to a reduction in the appearance of fine lines and wrinkles.
- With increased collagen and elastin, the skin becomes firmer and appears more lifted.

9. Strengthening the Skin Barrier

- Makes it more effective at retaining moisture and protecting against environmental stressors.
- Improves resilience against damage and dehydration.



Synthetic Peptides

OS-1 peptides, or "senolytic peptides," (synthetic) are bioactive molecules designed to target and modulate senescent cells, counteracting cellular senescence in the skin.

Help reduce the number of senescent cells, potentially reversing their state and diminishing their negative impact on skin health. OS-1 peptides exhibit anti-inflammatory properties, reducing chronic inflammation associated with aging and improving overall skin appearance.

They stimulate collagen and elastin production, preserving skin elasticity and firmness.

Additionally, OS-1 peptides enhance skin barrier function, improving moisture retention and protection against environmental stressors.

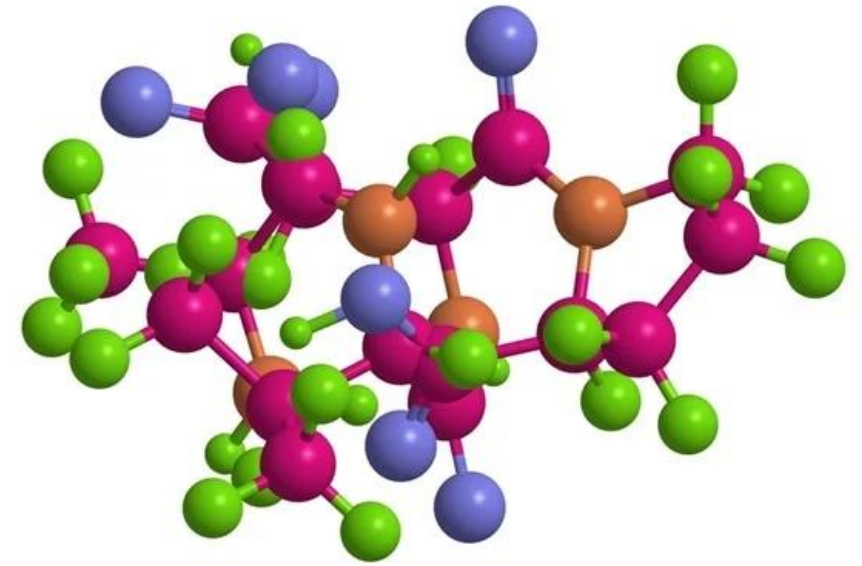
By promoting skin regeneration and repair, these peptides lead to faster healing and rejuvenation of the skin.

Replexium (synthetic) is a branded ingredient used in skincare for its anti-aging benefits, combining acetyl tetrapeptide-11 and acetyl tetrapeptide-9.

It boosts collagen and hyaluronic acid production, reducing wrinkles and fine lines for smoother, firmer skin.

Also enhances skin barrier function and supports skin regeneration, promoting repair and improving overall texture.

Its anti-inflammatory properties help soothe the skin and reduce irritation.



Other Synthetic Peptides:

GHK-Cu (Glycyl-L-histidyl-L-lysine-Copper)

Palmitoyl Tripeptide-5

Acetyl Hexapeptide-8 (Argireline)

Generally safe but can cause skin irritation, dryness, or allergic reactions in some individuals.

The severity of side effects can vary based on the product's quality, concentration, and the user's skin type.

Conducting a patch test and consulting a dermatologist before extensive use can help minimize potential risks.

Research on peptides includes both natural and synthetic peptides

This is how natural peptides might appear on a label:

Hydrolyzed Algae Extract (Marine Peptides)

Glycine Soja (Soybean) Peptide (Plant-Derived Peptides)

Hydrolyzed Rice Protein (Plant-Derived Peptides)

Milk Protein Extract (Milk Peptides)

Serica (Silk) Protein (Silk Peptides)



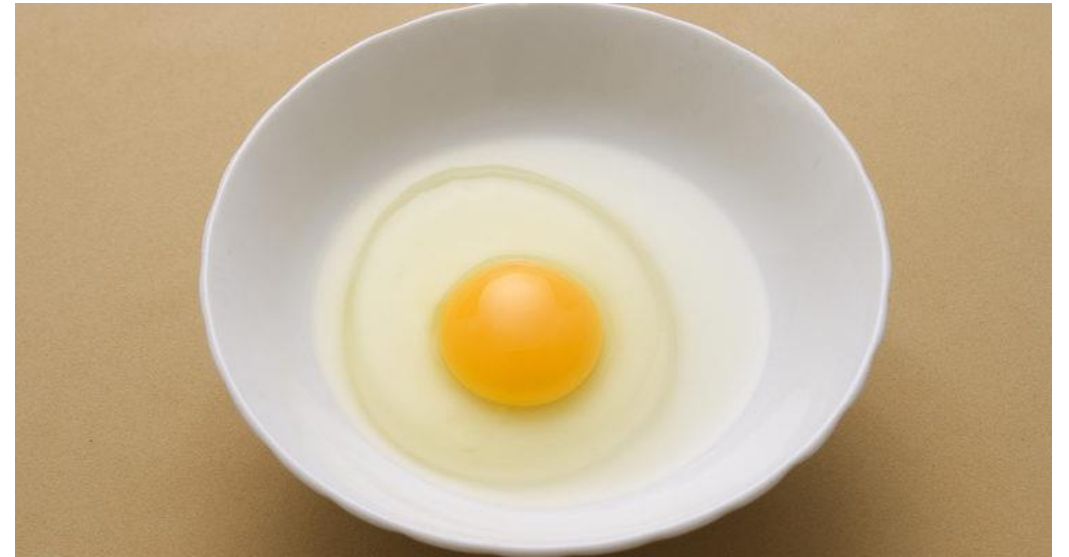
Sources of Natural Peptides

Sources: Egg whites and yolks.

Benefits: Eggs contain peptides and proteins that can help tighten and nourish the skin.

Sources: Silk fibroin extracted from silk.

Benefits: Silk proteins contain peptides that can help improve skin hydration and elasticity.



Natural Ingredients That Promote Peptide Production:

Aloe Vera: Contains gibberellins and polysaccharides that can help stimulate collagen production and support skin healing.

Promotion of Peptides: By promoting collagen synthesis, aloe vera indirectly supports the skin's natural peptide production, as collagen is composed of peptide chains.

Green Tea: Rich in antioxidants that protect the skin and can promote the production of collagen and other structural proteins.

Promotion of Peptides: Antioxidants in green tea help prevent collagen breakdown, thereby maintaining the peptide-rich collagen structure and encouraging the skin's natural production of peptides.

Ginseng: Known for its revitalizing properties, ginseng can help boost collagen synthesis and improve skin elasticity.

Promotion of Peptides: Ginseng stimulates collagen production, which is made up of peptides, thus enhancing the skin's natural peptide content and improving structural integrity.

Centella Asiatica (Gotu Kola): Contains compounds that stimulate collagen production and promote wound healing.

Promotion of Peptides: By enhancing collagen synthesis, Centella Asiatica supports the formation of peptide chains within collagen, aiding in skin repair and maintaining a healthy peptide balance.

Peptide-Containing Products

While natural ingredients may not contain peptides in the same concentration or specificity as synthetic peptides, they can still offer benefits that support the skin's natural production of peptides and proteins. Here are a few examples:

Marine Collagen: Contains peptides that can support skin hydration, elasticity, and overall skin health.

Bee Venom Extract: Contains a mix of peptides, including melittin, which can stimulate collagen production and improve skin texture.

Hydrolyzed Rice Protein: Contains peptides that can enhance skin barrier function and provide hydration.

Bone broth, fish, and poultry: Rich in collagen, which breaks down into peptides during digestion. Consuming collagen-rich foods can support the body's collagen production, benefiting skin health.

Soy: Contains proteins and peptides that can help stimulate collagen production and improve skin elasticity.

Milk Proteins, particularly casein and whey, contain peptides that have moisturizing and anti-inflammatory properties when applied topically.

Colostrum: Contains peptides and growth factors that aid wound healing, stimulate collagen, has antimicrobial and antiinflammation properties, and stimulate cell growth, repair, and regeneration

General Protocol

Balanced Diet: Emphasizes a diet rich in antioxidants, healthy fats, and essential vitamins and minerals to support skin health.

Avoid Processed Foods: Recommends avoiding processed foods, sugars, and inflammatory foods to reduce skin inflammation.

Hydration: Encourages adequate water intake to maintain skin hydration and assist in detoxification.

Supplementation: Suggests supplements like probiotics, omega-3 fatty acids, and specific vitamins and minerals to support various body systems impacting skin health.

Antioxidants: Found in foods like berries, nuts, and green leafy vegetables, antioxidants neutralize free radicals, protecting the skin from UV radiation and pollution.

Healthy Fats: Omega-3 fatty acids in fish, avocados, and seeds maintain skin elasticity and moisture, reduce inflammation, and promote a hydrated complexion.

Collagen-Boosting Foods: Vitamin C-rich foods and protein sources like citrus fruits, bell peppers, strawberries, bone broth, and lean meats enhance collagen production, supporting skin structure and firmness.

Anti-Inflammatory Diet: Emphasizes fruits, vegetables, whole grains, and lean proteins while minimizing processed foods and sugars to reduce inflammation and promote overall skin health.

Gut health is essential for healthy skin aging:

Incorporate prebiotic-rich foods supports healthy gut flora.

Probiotics: Beneficial bacteria like *Lactobacillus* and *Bifidobacterium* help balance gut microbiota, reducing inflammation and oxidative stress.

Address dysbiosis



Hormonal Balance

Nutrient-rich diets, phytoestrogens, omega-3 fatty acids, physical activity, stress reduction, and adequate sleep support hormonal balance.

Bioidentical Hormone Replacement Therapy (BHRT)

Replenishes hormone levels with compounds identical to natural hormones, alleviating skin aging signs by restoring hormonal balance.



Lifestyle Factors

Stress Management: Mindfulness practices like meditation and yoga reduce cortisol, which can accelerate skin aging.

Quality Sleep: Essential for skin repair and regeneration, aiming for 7-9 hours per night supports skin health.

Physical Activity: Enhances circulation and toxin removal, benefiting skin complexion.

Minimizing Toxin Exposure: Daily sunscreen use, protective clothing, and antioxidants in skincare products combat free radical damage.

Support detoxification

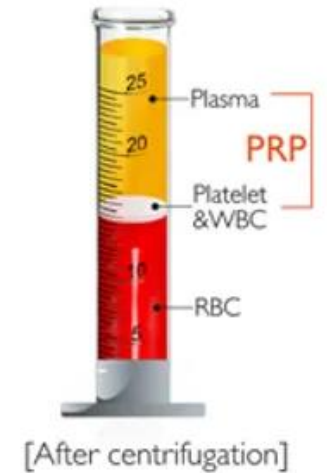
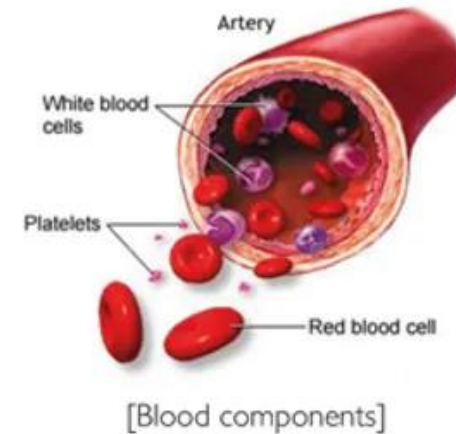
Do face exercises plus get regular exercise for the whole body

Consider using Red Light/Near-Infrared Light Therapy

Targeted Supplementation: Collagen, CoQ10, curcumin, ashwagandha, astaxanthin, DIM, and probiotics

Regenerative Therapies: Platelet-rich plasma (PRP) stimulates natural healing processes and enhances skin rejuvenation.

Peptide and probiotic skincare products



The skin aging process can be changed

It requires supporting all systems in the body, especially the gut and skin microbiomes

We should consider the skin the same as any other part

Providing the right nutrients and lifestyle measures is the key

