BugSpeaks®

Facial Skin Microbiome Report

Overview Summary Report

This Report has been Researched & Developed by:

LEUCINERICHBIO™
enriching biology

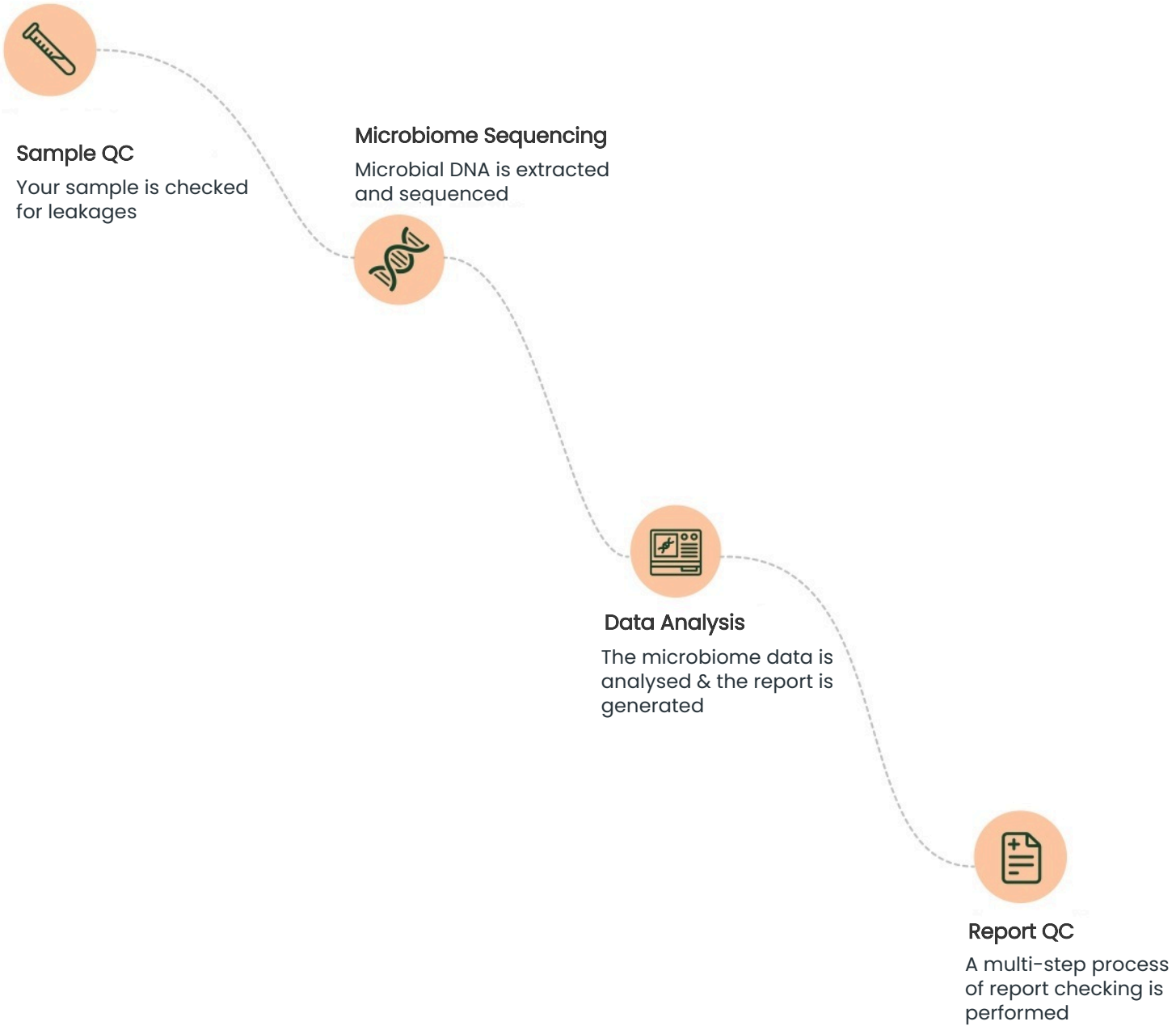
Personalised Skin Insights Backed by Microbiome Science

Your skin does not work alone. It lives with millions of microbes that protect against pathogens, guide your immune system, and support healing. Together they are called the skin microbiome, and they thrive on the outer layer of your skin, the epidermis.

Your face has a natural community of helpful microbes that protect your skin and keep it balanced. The mix shifts with climate, hormones, and the products you use; when it's thrown off, irritation or breakouts can show up. When this balance is disturbed, skin issues can appear. So caring for your skin means caring for its microbiome too.

What we do once we get your sample?

Brought to you by Leucine Rich Bio Pvt Ltd, a multiple award winning, South Asia's first microbiome company.



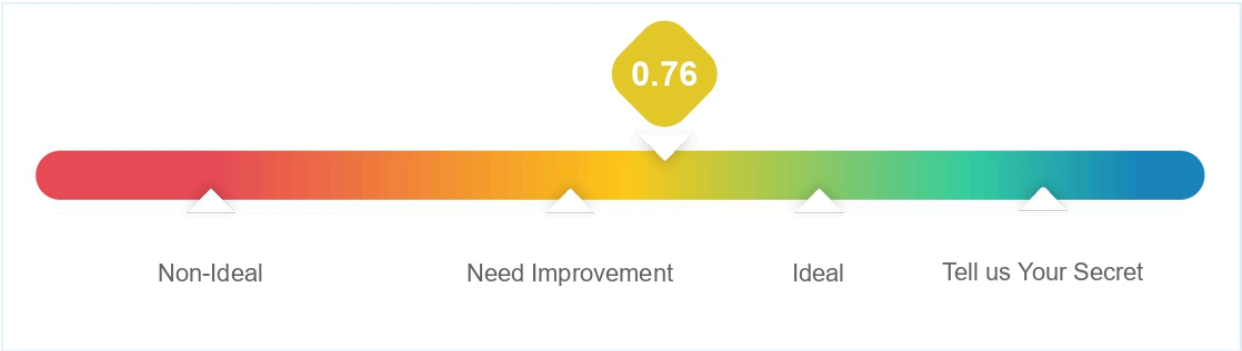
What we found about your skin

Based on the abundance of microbes on your skin, we have developed certain scores that give an insight on parameters like skin hydration, skin barrier, skin elasticity and skin ageing as highlighted below. Please note that this is an algorithm derived score based solely on the skin microbiota profile. Other factors like genetics, lifestyle, diet, disease conditions may impact these parameters as well.

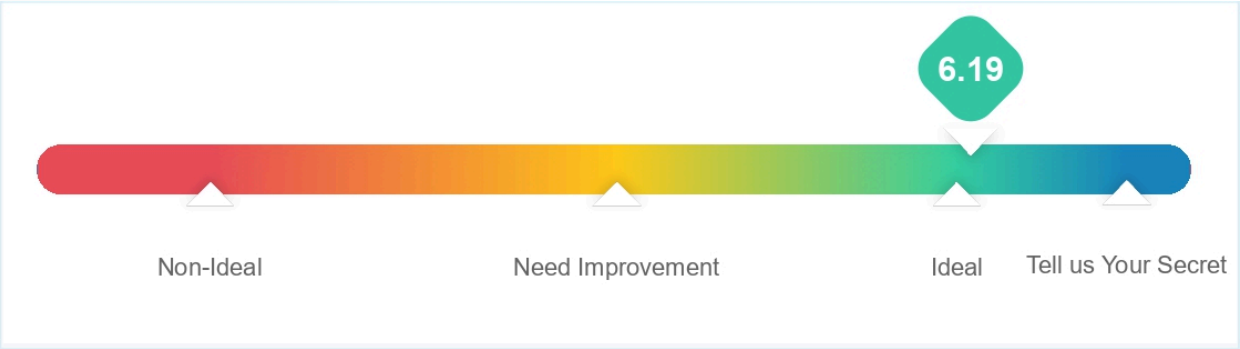
Skin Health Indicators:

Skin Hydration

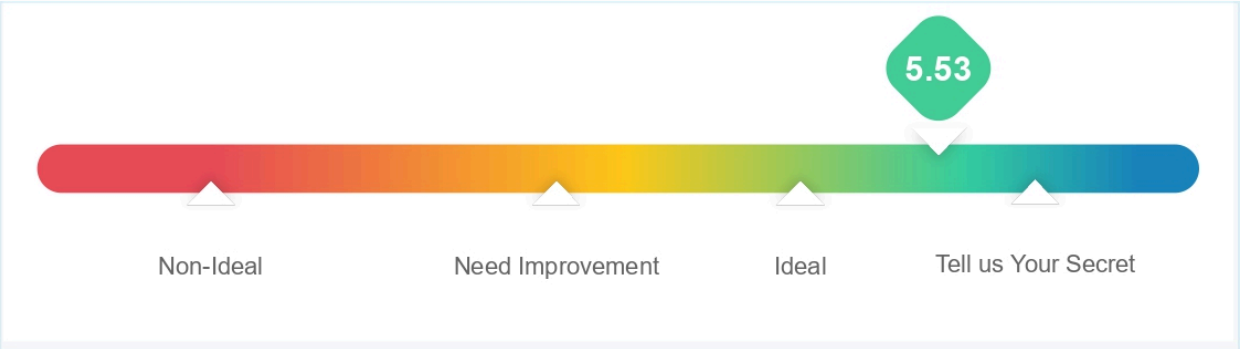
Skin Barrier



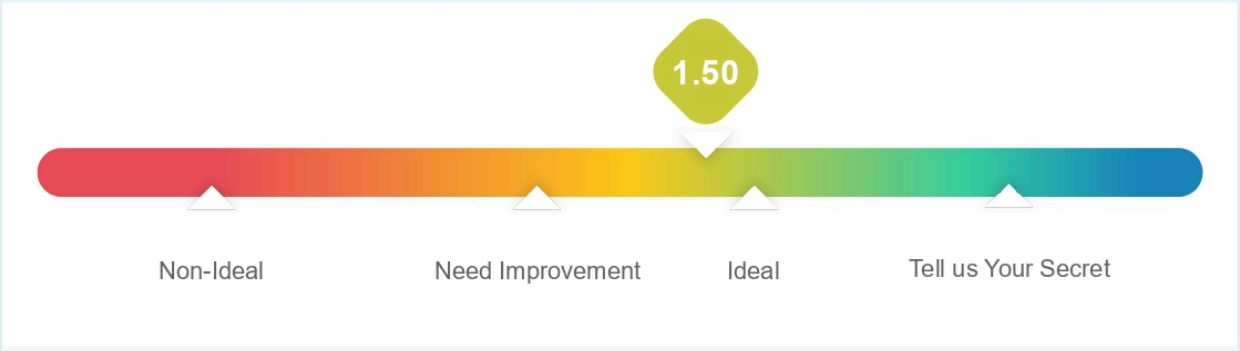
Skin Elasticity



Skin Aging



Sebum Over Production



Skin Hydration

-5.72 Non-Ideal

Skin hydration is understood as the water content of the skin, and is essential for the normal functioning of the skin. Hydrated skin is essential for maintaining the skin barrier and protects the skin from dryness and the overproduction of oils.

Signs that indicate that your skin hydration needs improvement


Dryness


Roughness


Scaling


Flaking


Itchiness

Skin Barrier

0.76 Needs Improvement

The skin barrier refers to the ability of the skin to protect the body from the entry of harmful chemicals or pathogens, and to prevent the exit of water. These functions are carried out by the proper arrangement and development of the skin cells themselves, and their ability to communicate with the immune system.

Signs that indicate your skin barrier need improvement


Scaling


Flakiness


Dullness


Redness


Roughness


Scarring

Skin Elasticity

6.19 Ideal

The skin is held up by a network that contains proteins like collagen and elastin. These proteins are responsible for the skin ' s ability to retain its structure. However, over time, skin loses this ability due to the faster breakdown of this protein network. UV radiation from the sun further accelerates this process, leading to visible signs like wrinkles, sagging, and reduced firmness.

Signs that indicate your skin elasticity need improvement


Scalling


Scarring

Skin Aging

5.53 Tell us Your Secret

Skin aging is a complex phenomenon that is in fl uenced by the natural aging process along with the environmental factors like pollution, UV radiation, as well as lifestyle choices like smoking. These result in long-term damage to the skin, which appear in a variety of ways like wrinkles, sagging, skin thinning, hyperpigmentation and dark spots.

Signs that indicate your skin aging need improvement


Wrinkles


Sagging


Hyperpigmentation


Spots


Skin Thinning

Sebum Overproduction Potential

1.50 Ideal

Sebum is an oily substance made by specialised glands, and is essential for the maintenance of a healthy skin barrier, helping prevent water loss and external damage. Excessive sebum production leads to an increased risk of clogged pores and acne. Oily skin makes a suitable environment for the bacterial growth that could eventually lead to acne breakouts. Excess oils along with dead cells and bacteria can block the pores and cause whiteheads, black heads and pimples.

Issues associated with sebum overproduction


Oily skin


Blackheads


Whiteheads


Scarring


Acne

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Personalised Recommendation

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Topical Recommendation

Your skin is unique, and so should your skincare routine be. Based on your individual skin microbiome profile, selecting personalized active ingredients is key to optimizing your skin health. Below are carefully chosen primary and natural topical ingredients, along with tailored topical probiotic lysates, specifically suited to enhance your unique skin parameters. These can be seamlessly incorporated into your skincare routine through customized serums or moisturizers designed for your specific needs.

Primary Topical Ingredients

Ingredient Name	Why its recommended
Bakuchiol	Bakuchiol is popularly known as a gentler retinol analogue. It is known to reduce visible signs of photoaging , improve collagen synthesis and reduce its degradation.
Hyaluronic acid	Hyaluronic acid is a key molecule involved in skin moisturization. It attracts and retains water molecules thus contributing to skin hydration and improving the skin's barrier function.
Silymarin	Silymarin is beneficial for skin health due to its anti-inflammatory and anti-oxidant properties. It also confers photoprotection and inhibits collagenase and elastase therefore reducing the wrinkle formation.
Vitamin A	Topical application of Vitamin A has been shown to promote collagen synthesis,thereby reducing wrinkles and fine lines. It also regulates sebum production and prevents clogged pores and breakouts.
Vitamin B3	Vitamin B3 is popularly known as Niacinamide. It offers numerous skin health benefits which include improving skin hydration, regulating the sebum production, promoting collagen synthesis and strengthening the skin barrier integrity.
Vitamin B5	Topical application of Vitamin B5 has shown to improve skin hydration and helps to reduce dryness and flakiness. It is also known to reduce the appearance of wrinkles and fine lines.
Vitamin C	Topical application of Vitamin C has been shown to promote collagen production and reduce wrinkles and dark spots. Its antioxidant properties protect the skin from UV radiations. It has also been found to render antibacterial effects on Cutibacterium acnes along with its anti-inflammatory properties.

Note: The top options for your skincare are selected based on their safety and efficacy for users. Alternate options are provided for flexibility and in case of any allergies. If you are facing severe skin issues/ disorders/ allergies it is best to consult a dermatologist.

Natural Topical Extracts

Ingredient Name	Why its recommended
Green Tea Extract	Topical green tea extract is known to improve skin hydration, reduce redness and inflammation, and provide some photoprotection. It is also able to reduce non-beneficial organisms like S. aureus on the skin.
Aloe vera	Aloe Vera is beneficial for the skin due to its ability to improve skin hydration, elasticity, and reduce wrinkles. Some of its components also have antimicrobial properties against S. aureus and Streptococcus pyogenes.
Coffee	Coffee extracts help reduce skin wrinkles, lines, and improve pigmentation.

Note: Please apply these in the form of products containing extracts of these ingredients.

Topical Probiotic Lysates

Ingredient Name	Why its recommended
Lactobacillus plantarum	Topical applications, both active and lysed, have been shown to improve skin hydration, texture, and barrier, reduce wrinkles, reduce redness. Lysates were also shown to positively influence the skin microbiome by reducing Cutibacterium and increasing normal skin flora like Streptococcus and Staphylococcus.
Streptococcus thermophilus	Microbial lysates have been shown to improve skin hydration status, increase skin ceramides, and contribute to better lipid barrier function and healthy skin ageing.
Bifidobacterium longum	Lysates of this microbe are known to help in skin barrier restoration, skin inflammation, and reduce sensitivity.
Nitrosomonas eutropha	

General note regarding topical ingredient recommendations:

- The list of ingredients provided under each category- 'Primary Topical Ingredients', 'Natural Topical Ingredients', and 'Topical Probiotic Lysates', is based on your skin parameter scores.
- Please note that we do not recommend using all the listed ingredients at once. Instead, we suggest selecting a combination of ingredients from each category- Primary, Natural, and Probiotic.
- Look for products-such as serums, moisturisers, or sunscreens-that contain these selected ingredients, and incorporate them into your skincare routine accordingly. A suggestion for a minimal and effective skincare regimen is given in the 'General Guidelines' section, page 14.

Nutritional Recommendation

Your skin health is deeply influenced by your diet, and a one-size-fits-all approach simply won't do. Our recommendations are uniquely tailored to your individual skin microbiota profile, ensuring that the nutrients and foods we suggest are specifically chosen to target, support, and enhance your distinct skin parameters. By aligning your diet with your personalized skin microbiome insights, you can optimize your skin's health and radiance from within. Below, we've curated a list of nutrients and foods customized to address your specific skin concerns, designed to work in harmony with your unique microbiome.

For even more precise and comprehensive nutritional guidance, we recommend considering a gut microbiome test. This additional analysis can provide deeper insights into how your gut health influences your skin, allowing us to refine our recommendations further and create a holistic approach to your wellness. By understanding both your skin and gut microbiota, we can offer a fully personalized plan to nourish your skin from the inside out.

Food Recommendations

Items	Items
 CHIA SEEDS	 CANTALOUPE
 FLAXSEEDS	 COCOA
 WALNUTS	 MACKEREL
 ALMONDS	 HERRING
 BLACKCURRANT	 RED PEPPER
 CUCUMBER	 LIQUORICE
 PUMPKIN	 BROAD BEANS
 CINNAMON	

Oral Probiotic Recommendations

There is substantial evidence to suggest that orally consumed probiotics are capable of altering skin properties positively, due to the existence of gut microbiome communications with the rest of the body, including the immune system and the skin. Below listed are probiotics according to your skin microbiome analysis.

Ingredient Name	Why its recommended
Lactobacillus bulgaricus	Consumption of this probiotic could help in fighting acne and reduce inflammation
Lactobacillus lactis	Oral consumption is known to improve skin hydration and elasticity
Lactobacillus delbrueckii	Lactobacillus delbrueckii has wide benefits for the skin, potentially improving moisture status, elasticity, and can be effective in acne reduction.
Bifidobacterium lactis	Known for its anti-inflammatory properties, this microbe can improve skin inflammation and may even reduce wrinkles.
Bifidobacterium longum	Bifidobacterium longum is known to have the potential to act as an immune regulator, and has been shown to improve skin inflammation
Streptococcus thermophilus	Microbial lysates have been shown to improve skin hydration status, increase skin ceramides, and contribute to better lipid barrier function and healthy skin ageing.

Note:

- These recommendations are largely beneficial, with no or minimal negative impact on your health. Even though these nutritional recommendations are evidence based, we would strongly suggest you consult a physician/nutritionist, before implementing these in your lifestyle. This is specifically true about the extent of inclusion and exclusion of a specific food and for individuals who are either diabetic, hypertensive and/or having special dietary needs.
- It's common to experience mild stomach discomfort (such as bloating or gas) when starting probiotic supplementation. If discomfort persists for more than a week, discontinue use and consult your healthcare provider.

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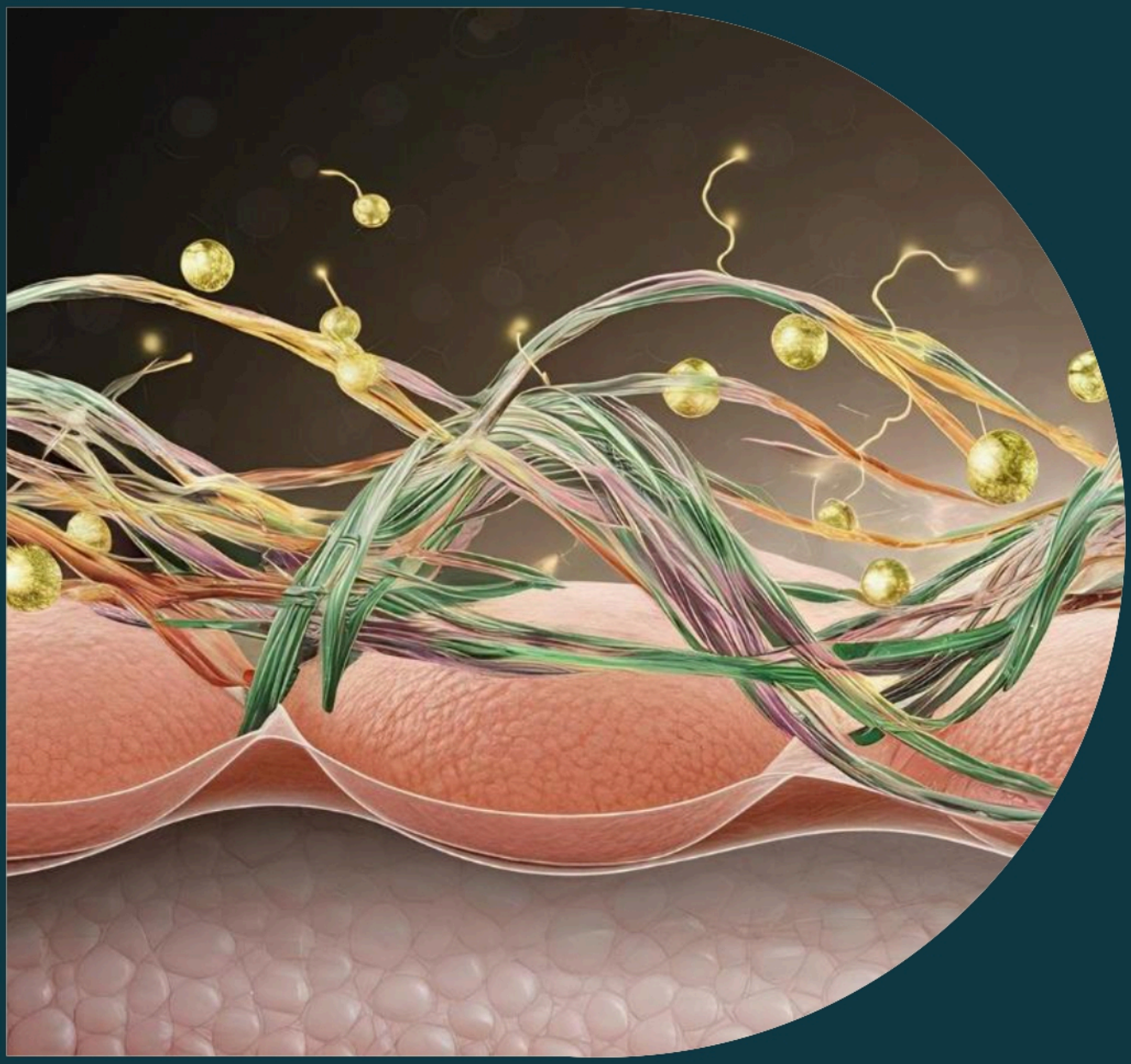

Meet Your Microbiome

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Opportunistic Skin Pathogens

BugSpeaks® identifies and characterizes many pathogens commonly known to cause skin infections and other health issues. These pathogens are reported with "indicative tags", which can be interpreted as described below.

- We found a high amount of these microbes. This is more than what's usually seen on healthy skin and could be a factor in skin issues. The provided nutritional, supplement, and skin ingredient recommendations are designed to help reduce the risk of these microbes causing any skin problems.
- These microbes are at a moderate level, which is slightly higher than normal. While they're not currently at a level that typically causes major problems, it's something to keep an eye on.
- These microbes are either at a low level or were not found at all. This is a positive sign and is what's commonly seen on healthy skin.

General Guidelines:

See a dermatologist if you're concerned. If you have any skin symptoms that don't go away or seem to be getting worse, it's best to consult a dermatologist for professional advice.

Species : Bacteria			
Corynebacterium diphtheriae		Aeromonas hydrophila	
Serratia marcescens		Stenotrophomonas maltophilia	
Streptococcus pyogenes		Eikenella corrodens	
Actinomadura madurae		Klebsiella granulomatis	
Klebsiella rhinoscleromatis		Morganella morganii	
Nocardia asteroides		Nocardia brasiliensis	
Staphylococcus aureus		Staphylococcus lugdunensis	
Streptococcus anginosus		Streptomyces somaliensis	
Treponema carateum		Treponema pallidum	
Treponema pertenue		Bartonella quintana	
Bartonella henselae		Actinomyces viscosus	
Actinomyces turicensis		Actinomyces radingae	
Actinomyces odontolyticus		Borrelia burgdorferi	
Actinomyces neuii		Actinomyces naeslundii	
Actinomyces meyeri		Actinomyces israelii	

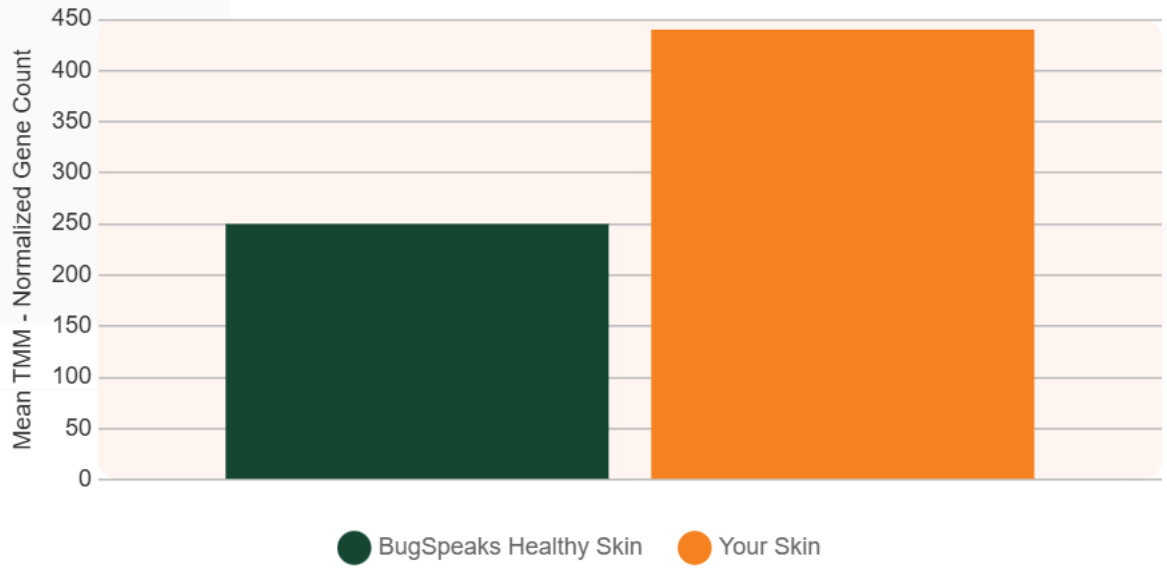
Species : Bacteria			
Actinomyces gerencseriae	🟢	Corynebacterium minutissimum	🟢
Actinomadura pelletieri	🟢		

Species : Fungi			
Trichoderma citrinoviride	🔴	Fonsecaea erecta	🔴
Fonsecaea nubica	🔴	Blastomyces dermatitidis	🔴
Candida albicans	🔴	Fonsecaea pedrosoi	🔴
Malassezia globosa	🔴	Scedosporium apiospermum	🟠
Trichophyton rubrum	🟠	Trichoderma harzianum	🟠
Exophiala spinifera	🟠	Fonsecaea monophora	🟠
Fusarium moniliforme	🟠	Fusarium oxysporum	🟠
Sarocladium kiliense	🟢	Microsporum canis	🟢
Acremonium egyptiacum	🟢	Arachnomyces nodosetosus	🟢
Parengyodontium album	🟢	Petriella setifera	🟢
Phialophora americana	🟢	Phialophora chinensis	🟢
Phialophora macrospora	🟢	Phialophora verrucosa	🟢
Fusarium moniliforme	🟢	Purpureocillium lilacinum	🟢
Rhinocladiella aquaspersa	🟢	Rhinocladiella mackenziei	🟢
Trichophyton tonsurans	🟢	Sporothrix schenckii	🟢
Trichophyton mentagrophytes	🟢	Trichoderma viride	🟢
Trichoderma pseudokoningii	🟢	Trichoderma longibrachiatum	🟢
Trichoderma koningii	🟢	Talaromyces marneffei	🟢
Trematosphaeria grisea	🟢	Trichoderma bissettii	🟢
Trichoderma atroviride	🟢		

Species : Fungi			
Lacazia loboi	●	Exophiala jeanselmei	●
Falciformispora senegalensis	●	Fonsecaea brasiliensis	●
Microsporum audouinii	●	Exophiala dermatitidis	●
Fonsecaea pugnacius	●	Fusarium chlamydosporum	●
Fusarium solani	●	Exophiala alcalophila	●
Malassezia sympodialis	●	Malassezia slooffiae	●
Madurella mycetomatis	●	Malassezia furfur	●
Malassezia japonica	●	Malassezia obtusa	●
Malassezia restricta	●	Malassezia pachydermatis	●

Resistome - Understanding Your Skin's Resistome:

Your skin's resistome is the collection of genes within your microbiome (the community of bacteria and other microbes living on your skin) that help these microbes resist antibiotics. Think of it as a built-in toolkit that microbes use to protect themselves—it's a natural part of your skin's ecosystem and plays a role in maintaining balance.



Why the Resistome Matters for Skin Health

The resistome can act as a helpful marker for your skin's overall health and resilience. Changes in the resistome can signal shifts in your microbiome due to factors like antibiotic use, environmental exposures (such as pollution or occupational settings), aging, or skin conditions. A disrupted resistome might contribute to issues like chronic wounds, inflammation, or increased infection risk, as seen in conditions like atopic dermatitis or diabetic skin problems.

Why the Resistome Matters for Skin Health

- High Resistome (Elevated Abundance or Diversity of Resistance Genes): This could suggest your skin microbiome has been exposed to more antibiotics, pollutants, or stressors, leading to an expansion of resistance genes. While some resistance is normal, higher levels might point to dysbiosis (an imbalance in microbes), making your skin more prone to hard-to-treat infections or slower healing. It's common in environments with frequent antibiotic use or in aging skin, where it could reflect reduced barrier function.
- Low Resistome (Lower Abundance or Diversity of Resistance Genes): This often indicates a more balanced and undisturbed microbiome, with less selective pressure from antibiotics or external factors. It's generally a positive sign of good skin health, suggesting stronger natural defenses, better microbial harmony, and lower risk of resistance-related complications. In healthy individuals, lower resistome levels are linked to stable skin sites with minimal disruptions.

  To support a healthy resistome, consider gentle skincare routines, avoiding unnecessary antibiotics, and protecting your skin from environmental stressors. If your report shows unusual levels, consult a dermatologist for personalized advice.

General Guidelines

Essential Steps in Daily Skincare

It is important to follow a skin care routine to maintain healthy skin and to prevent premature aging. If you don't have a skin care routine yet, it's never too late to start with one. To begin with, a 4-step routine would be sufficient to maintain your skin health.

- ✓ Cleanser: It help to remove excess sebum, makeup, dead skin cells, and impurities, preventing clogged pores and breakouts.
- ✓ Serums: They are light-weight formulations which help in the effective delivery of active ingredients to the skin.
- ✓ Moisturizer: Plays a vital role in skin hydration by adding and sealing in moisture.
- ✓ Sunscreen: Protects the skin from harsh solar radiation, and are a powerful tool to prevent damage.

Being Mindful about Skincare:

- ✓ Create a minimal skincare routine.
- ✓ Stick with it! Skincare takes time, expect to start seeing results only a month or two in.
- ✗ Avoid overusage or high concentrations of active ingredients, this may lead to irritation and will not accelerate your skin wellness journey.

Skincare combinations that don't mix:

- ✗ Retinoids and exfoliating acids like AHA's and BHA's: Could be harsh and cause irritation.
- ✗ Retinoids or Vitamin C and benzoyl peroxide (BP): BP may cause retinoid or Vitamin C inactivation.
- ✗ Retinoids and Vitamin C: Work at opposite ends of the pH spectrum, use retinoids at night and Vitamin C during the day for best results.
- ✗ Avoid combining harsher ingredients like hydroquinone with other ingredients that could cause irritation or increase sensitivity.

For nutritional recommendations and lifestyle:

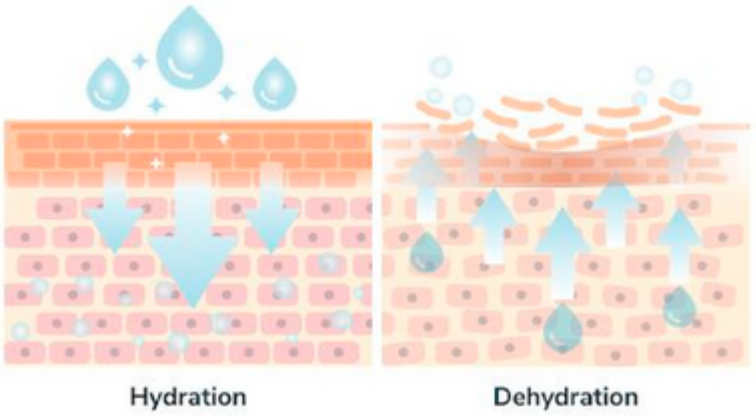
- ✓ Eat a healthy, balanced diet, and don't skip meals.
- ✓ Drink a minimum of 2 liters of water everyday.
- ✓ Get good and adequate sleep!
- ✓ Regular exercise can also boost skin health.

Difference between a Healthy Skin and a Damaged Skin

The skin is home to a dense, varied set of microbes, known as the skin microbiome. This microbiome thrives in the harsh, exposed conditions of the outer layer of the skin, the epidermis, and its composition varies between oily, dry, and moist sites. The major phyla present in the skin are Actinobacteria, Firmicutes, Proteobacteria, and Bacteroidetes. In a state of balance it provides nutrients and signalling molecules to the skin, and resists the overgrowth of pathogenic organisms. Overall, these interactions between microbes, the skin, and the local immune system enable the skin to carry out these essential functions, among others.

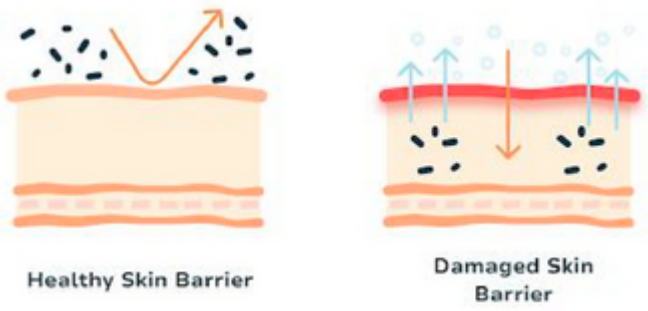
Skin Hydration

Skin hydration is understood as the water content of the skin, and is essential for the normal functioning of the skin. Within each layer of the skin, various cellular mechanisms work constantly to prevent the escape of water to the environment. The skin microbiome at any site is deeply linked to its level of hydration, as different microbes have different moisture preferences. Beneficial bacteria can help the skin retain moisture by producing useful compounds or by interacting with the skin's natural moisturising processes.



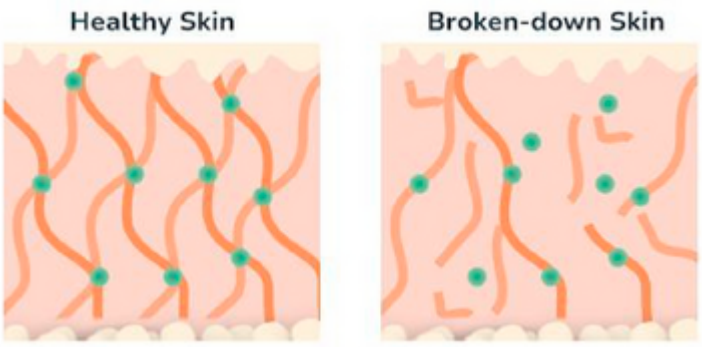
Skin Barrier

The skin barrier, as the name suggests, is the ability of the skin to protect the body from the entry of external harm in the form of harmful chemicals or pathogens and to prevent the exit of water. The skin cells and the molecules they secrete form complex arrangements to carry out these functions. They also communicate with the immune system, working in tandem to recognise invaders and ensure proper development. Various members of the skin microbiome contribute to this barrier effect, through the maintenance of hydration, or even through interaction with the immune system. Microbial balance is one of the strongest contributors to maintenance of a resilient skin barrier.



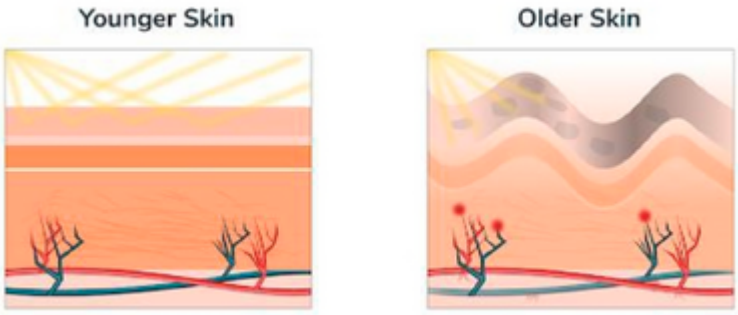
Skin Elasticity

The skin cells and the components they secrete form an intricate network that allow the skin to stretch, twist, and eventually return back to their original shape. Through gradual degradation with age or long-term UV exposure, these components degrade, and are eventually not replaced quickly enough to compensate. This may show up as texture on the skin, like wrinkles. While this is a part of natural aging, some microbes may help rejuvenate the skin's elastic nature by making these matrix components or encouraging the processes that encourage them to stay intact.



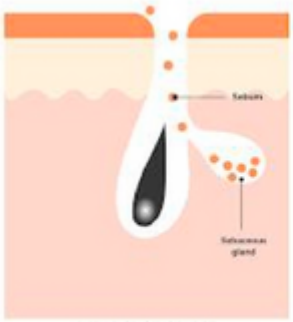
Skin Ageing

Ageing is a complex whole body phenomenon, influenced by 'intrinsic' factors such as one's genetics and hormonal changes, and 'extrinsic' factors such as exposure to UV or pollutants. In the skin, ageing manifests as wrinkles, folds, and pigmentation, which may be more intense with higher contribution of extrinsic factors. The skin microbiome changes through life, with microbial diversity typically going up with age. While there is no microbe that can 'reverse' ageing, some can help support the factors and processes involved in skin ageing, such as elasticity and barrier potential to keep the skin strong, healthy, and resilient through all ages.



Sebum Production

Sebum is made by specialised glands, and is essential for the maintenance of a healthy skin barrier, helping prevent water loss, external damage, amongst a variety of functions. It is composed of cell debris and a mixture of neutral fatty molecules. As a general trend, sebum production increases during puberty, and declines later in life, although other factors such as hormonal status, diet, time of year also affect production status. Certain bacteria thrive in sebum-rich zones, while others show preferences away from sebum. Increases in sebum production are commonly associated with oily skin, enlarged pores, and can potentially lead to overgrowth of acne-associated bacteria like Cutibacterium acnes.



Healthy Pores

Unhealthy Pores

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