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THE SCIENCE BEHIND THE GLOW-UP: ANALYZING BEAUTY PRACTICES THROUGH BIOCHEMICAL EVIDENCE

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Abstract: This article written about popular glow-up and beauty practices. Because of many beauty tips are popular online, but their effectiveness is not always supported by science. By using methodology: Review scientific literature and compare evidence from reliable sources. The aim is to find out which glow-up practices are actually supported by science and explain how they work in the body. As Result**:** Identify the main patterns and determine which practices seem to be the most scientifically supported.

Keywords: Keratin, Lipids, Antioxidants, UV-Related Cellular Damage, Desquamation, AHA (Alpha Hydroxy Acid), BHA (Beta Hydroxy Acid), Dop, Reward pathways-Cortisol

Introduction: A “glow-up” represents a major transformation in appearance, confidence, and lifestyle, driven by the rise of skincare as preventive wellness. Social media accelerates this movement by globally spreading beauty advice, routines, and ingredient science. However, widespread viral popularity does not guarantee scientific efficacy. Many trends promote unverified ingredients that fail to penetrate the s kin or interact with cellular receptors, risking barrier damage and physiological harm.

Biological and biochemical frameworks test beauty claims by tracing how active compounds interact with cellular pathways. For example, while topical collagen is too large to penetrate the skin barrier, small-molecule vitamin C successfully drives internal collagen synthesis.

This paper aims to review popular "glow-up" practices against scientific literature to determine which methods are backed by evidence. It investigates key research questions regarding the cellular validity, safety, and true biochemical mechanics of these viral trends.

We faced such kind of research questions: Which popular glow-up practices have scientific evidence supporting their effectiveness?

What biological and biochemical mechanisms may explain their effects?

Which practices show the most consistent scientific support in the reviewed literature?

To answer these questions, we’ll discuss follow terms:

Skin: 1. Structure of the Skin and Continuous Renewal

The skin serves as the body’s primary protective shield, structured into three distinct layers that work together to maintain health and internal balance. The visible outer layer, the **epidermis**, continuously regenerates by producing new cells to replace the 40,000 dead skin cells shed daily—a turnover cycle completed roughly every 30 days. Directly beneath it lies the **dermis**, which accounts

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for 90% of the skin's thickness and houses hair follicles, nerve endings, blood vessels, and sweat glands that regulate body temperature and transmit tactile sensations. The deepest layer, the **hypodermis**, consists of connective tissue and fat that cushions muscles and bones while providing vital thermal insulation.

2. Essential Components: Collagen, Melanin, and Sebum

The integrity of this multi-layered system depends heavily on key structural proteins and specialized cells working in harmony. Within the dermis, **collagen** provides essential strength, firmness, and resilience, while elastin maintains flexibility. Interspersed throughout the epidermis are approximately 60,000 **melanocytes** per square inch, which generate **melanin**—the pigment responsible for skin, hair, and eye color, as well as defense against solar radiation. Additionally, oil glands located in the dermis continuously produce **sebum**, a natural lipid that coats the surface to keep the tissue soft, supple, and resistant to excess water absorption.

3. How Skin Structure Forms the Barrier Defense

The **skin barrier** is the direct functional result of these structural elements coming together in the outer epidermis. Working like a brick-and-mortar wall, keratin-rich cells act as bricks bound together by a lipid matrix of sebum and natural oils. This tight architecture prevents dehydration by locking in moisture while actively keeping out bacteria, toxins, and environmental hazards. Supported by immune-fighting Langerhans cells within the epidermis, this physical and biological defense system ensures the body remains shielded from daily external stress. (Cleveland Clinic, 2021)

Hair: 1. Hair Biology and Structural Integrity

Hair is a resilient keratin-based fiber made up of three layers—the outer cuticle, the thick cortex, and the central medulla—held together by chemical bonds that determine its physical properties. **Disulp hide bonds** form the structural core that gives hair its permanent shape, high tensile strength, and elasticity, while weaker **hydrogen bonds** dictate temporary styling that breaks with water and reshapes with heat. Natural oil produced by follicle-attached glands, known as **sebum**, coats the outer cuticle to seal in moisture, smooth the scale-like surface, and shield the inner cortex from environmental wear, heat, and friction.

2. Follicle Biology & Growth Cycle

Anagen (Growth): Lasts 2–7 years; matrix cells divide rapidly to synthesize keratin, determining maximum hair length. Contains ~85–90% of scalp hairs.

Catagen (Transition): Lasts 2–3 weeks; cell division stops, the follicle shrinks, and the hair detaches from its blood supply to form a "club hair."

Telogen (Resting/Shedding): Lasts ~3 months; the strand stays dormant until shed (50–100 daily) as a new anagen strand begins pushing from below(Philip Kingsley, n.d.).

Analysis of beaty practices

Effective ones: Lifestyle & Whole-Body Health

1.Sleep 7-8 Hours Every Day:

Getting 7–8 hours of sleep support tissue repair, growth hormone release, and melatonin regulation, which can benefit skin health and overall recovery

- Keep a regular sleep schedule — go to bed and wake up at similar times every day.
- Avoid screens before bed — reduce bright light and stimulating content for about 30–60 minutes.

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-Create a relaxing environment-keep your room cool,dark,and quiet before sleeping

Awal (2026), Olaithe et al. (2024

2. Drink 2L Of Water A Day:

Water supports chemical reactions and nutrient transport, improves mental focus and energy, and helps maintain physical performance, digestion, and healthy skin.

- Drink regularly throughout the day instead of drinking a lot at once
- Eat water-rich foods such as watermelon, cucumber, oranges, and soups

-Keep a reusable and beautiful water bottle: makes you more likely to carry water with you

3.Move your body at least 4 times a week:

Regular physical activity improves mitochondrial energy production and blood circulation, supports brain chemicals such as endorphins, and strengthens muscles, bones, the heart,your posture, and overall physical health

- Walk more — take short walks between studying or after meals.

-Choose an activity you enjoy — swimming, dancing, cycling, or a sport makes consistency easier

- Stretch in the morning — gentle full-body stretching helps improve flexibility, circulation, mobility while reducing morning stiffness and most importantly you will feel fresh all the day around: García-Hermoso et al. (2021)

Skin: Exfoliate carefully

Exfoliation removes dead cells from the outer skin layer, supporting the natural process of desquamation and leaving the skin smoother and more even. Chemical exfoliants such as AHAs and BHAs help loosen the connections between dead cells, while salicylic acid can also help clear oily pores

- **Choose the right exfoliant:** AHA is useful for surface texture, while BHA is especially useful for oily or congested pores
- **Apply to clean, dry skin** so the product can work more predictably
- **Follow with moisturizer** to support the skin barrier and maintain hydration

Ananthapadmanabhan et al. (2013)

2. Keep Your Hands Away From Your Face

Avoiding frequent touching, picking, and squeezing acne can reduce the transfer of dirt and microorganisms and prevent additional inflammation, skin damage, and post-acne marks

-you should wash your hands if you want to apply a product

Zaenglein et al. (2016)

Hair: 1. Maintain a Healthy Scalp

Gently exfoliate the scalp only when there is noticeable buildup or flaking, preferably with a salicylic-acid product rather than harsh physical scrubbing, because it can help loosen excess scale and dead skin, but its overall benefit for a healthy scalp is moderate rather than essential

Dias et al. (2026)

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Shampoo the scalp regularly according to your hair type:

Scalp situation	Shampoo	How often
Oily	Gentle shampoo; mild cleansing ingredients	Daily or every other day if needed
Dandruff/flaking	Ketoconazole, selenium sulfide, salicylic acid, zinc pyridine or sulfur	Often ~1–2× weekly initially, according to product directions
Dry	Gentle, moisturizing shampoo	When needed
Normal	Gentle shampoo; mild cleansing ingredients	When oily/dirty

-Apply shampoo mainly to the scalp not the lengths

-Message gently with fingertips or hair massagers

-Double shampoo: Dias et al. (2026)

-Keep the scalp clean after sweating

Dias et al. (2026), Pediatric Hair Cosmetics: Physiology, Safety, and Product Considerations

Pediatric Hair Cosmetics: Physiology, Safety, and Product Considerations

2.Trimming hair ends

Hair ends are the oldest part of the hair fiber and have experienced the most environmental and mechanical stress. Once the fiber becomes significantly split or damaged, products can temporarily improve its appearance, but they cannot permanently rebuild the original hair structure

-Frequency depends on your own preferences

- Reduce friction from rough towels (use microfiber towels) and constant rubbing

-Try different leave-in products until you find the suitable for you

-Try different hairstyles (but not tight ones) and different lengths

Csuka et al. (2022)

Mental & social glow-up

1.Listening to podcasts

Podcasts can improve your ability to understand information without visual cues. This trains your brain to build meaning from tone, context, word choice, and the speaker's structure rather than relying on images or text

-Best podcast sites/apps: BBC, TED, SPOTIFY, YOUTUBE, British council

-Write down interesting or important information

-Choose topics you genuinely enjoy

-Listen to podcasts in the language you are learning: Syafei et al. (2025), Motamedynia & Nasrollahi Shahri (2022)

2. Practice Mindful Breathing

Slow, controlled breathing can activate the parasympathetic nervous system, helping reduce the body's stress response, lower physiological arousal, and improve emotional regulation.

- Practice for 5–10 minutes in a quiet place.

-Make your exhale slightly longer than your inhale.

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-Keep your body relaxed — drop your shoulders, unclench your jaw, and focus your attention on each breath

-Especially during cozy weather, fresh air or after rain

3. Read Every Day

Regular reading stimulates brain networks involved in language, attention, memory, and comprehension. It can also help reduce stress and support cognitive function**.**

-Read for 15–30 minutes every day at a consistent time.

-Choose books that are slightly challenging but still enjoyable.

-After reading, recall 2–3 main ideas without looking back to strengthen memory

-After reading the whole book make a summary and the main idea you got

Sun et al. (2024), Mak & Fancourt (2020), Vogrinčič Čepič et al. (2024**)**

4.Spend Quality Time with Close Ones on Weekends

Positive social interaction supports emotional well-being, helps regulate the stress response, and provides social connection and psychological support.

-Keep phones away during conversations to give each other full attention.

- Choose an active shared activity, such as walking, swimming, cooking, or playing a game.

-Have meaningful conversations rather than only discussing daily tasks

- Tell someone how grateful you are for them: It does good, not only for you but also to the person you are expressing your gratitude towards

-Perform an act of kindness: stress can be reduced and it can also improve your emotional well-being

Association between friendship quality and subjective wellbeing among adolescents (2022), Mobilizing social support to improve mental health for children and adolescents (2021)

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