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A Comprehensive Review on Cosmeceutical

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Abstract: ***Now days a new hot topic in the cosmetic industry is 'Cosmeceuticals', which is the fastest growing segment of the natural personal care industry. Cosmeceuticals are the future generation of skin care. They are the advances made within the world of dermatological products and the new backbone in skincare. All cosmeceuticals claim to contain functional ingredients with either therapeutic, disease-fighting or healing properties. The term Cosmeceutical was coined by Raymond Reed but the concept was further popularized by Dr. Albert Kligman in the late 1970's. Cosmeceuticals are topically applied as cosmetic Pharmaceutical hybrids, intended to enhance the beauty through ingredients that provide additional health-related function or benefit. That means they are applied topically as cosmetics, but contain ingredients that influence the skin's biological function. Today's Cosmeceuticals are serving as a bridge between personal care products and pharmaceuticals; also Cosmeceuticals are the fastest growing segment in skin care market. There is no regulatory category for Cosmeceuticals; hence this review tries to understand regulatory scenario as well the difference between drug and cosmetics is enlightened. The paper is an earnest endeavor to evaluate a Cosmeceutical product that claims a beneficial physiologic effect. This review paper is to give recent knowledge about the latest trend of cosmetic Industry Cosmeceuticals.***
Keywords: Cosmeceuticals, cosmeceutical chemistry, regulatory aspects, skin cosmeceutical.

I. INTRODUCTION

Cosmaceuticals are cosmetic products containing biologically active ingredients that provide pharmaceutical-like benefits, such as anti-aging or acne control, beyond simple aesthetic enhancement. The term is a portmanteau of "cosmetics" and "pharmaceuticals" and describes products intended to influence the skin's biological functions to improve its health and beauty. These products are not formally recognized as either a cosmetic or a drug by regulatory bodies like the US FDA or the EU.

Key characteristics of cosmaceuticals

1) Hybrid nature: They combine cosmetic and pharmaceutical aspects, containing active ingredients that aim to produce specific results.
2) Bioactive ingredients: They feature beneficial compounds that influence the biological functioning of the skin, rather than just its appearance.



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II. THERAPEUTIC BENEFITS

Cosmaceuticals aim to provide therapeutic benefits to the skin, such as improved texture, reduced wrinkles, or enhanced skin health.

A. Beyond Aesthetic Enhancement

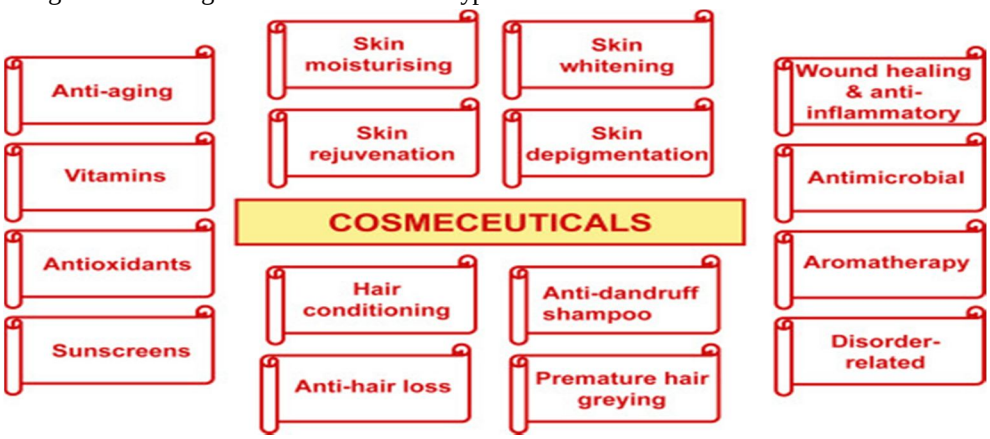
Unlike traditional cosmetics, which primarily focus on beautifying the skin, cosmaceuticals are designed to affect the skin at a deeper, biological level.

Examples of cosmaceutical products Products for acne control, Anti-aging serums, and Sunscreens with UV-blocking properties.

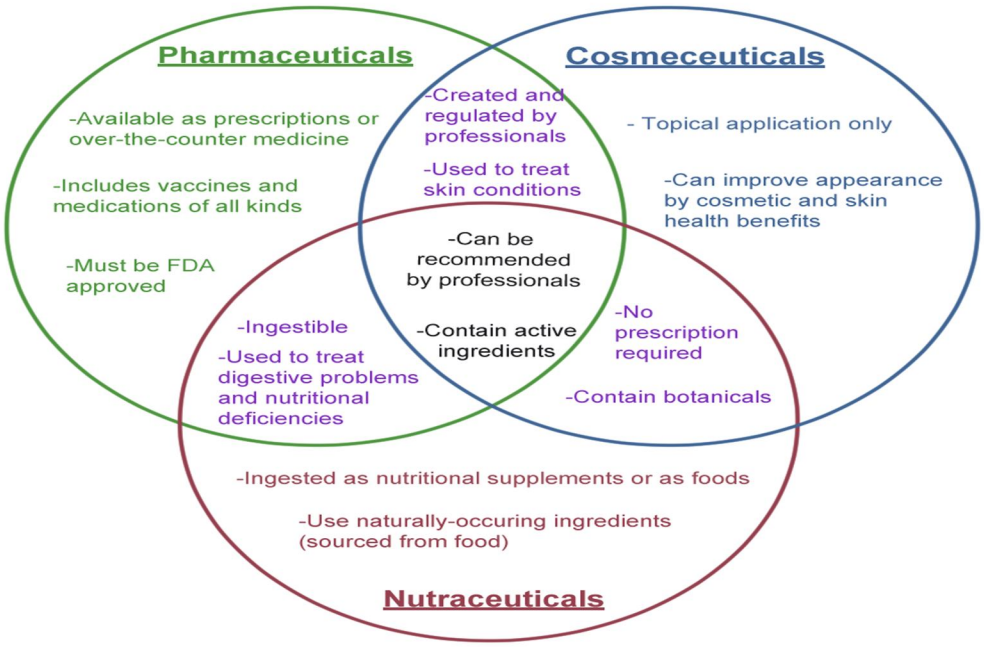
Regulatory status

Cosmaceuticals are not a legally defined or recognized category in many regions, including the United States and the European Union.

This is because they fall into a gap between traditional cosmetics and pharmaceuticals; they don't have the stringent proof of efficacy required for drugs but are designed to do more than a typical cosmetic.



While cosmeceuticals contain active ingredients meant to restore the skin, they are not classified as drugs. A drug, by medical definition, is a product designed for the treatment and prevention of disease. Although dermatologists may recommend cosmeceuticals for people with specific skincare needs, cosmeceuticals are readily available for anyone to purchase.



Ingredient	Function	Examples
Sunscreens	● Prevent damage from the sun's UV rays.	Zinc Oxide; Titanium Dioxide
Antioxidants	● Clear the skin of oxides, which build up over time from sun exposure, pollution, smoking, and going about your daily life. ● Protect the skin from sundamage. ●Reduce inflammation and redness. ● Regulate skin tone and pigmentation.	Alpha-lipoic acid VitaminC (L-ascorbic acid) Vitamin B3 (Nicotinamide) Vitamin E (alpha-tocopherol) Date Palm Extract Curcuminoids (Turmeric)
Botanicals	● Plant extracts from leaves, bark, flowers, roots, stems, and fruits. ●May contain antioxidant effects. ● Soothe and moisturize the skin.	Aloe Vera Coconut Extract GreenTea Extract Witch Hazel Ferulic Acid Silymarin
Hydroxy Acids (AHAs, BHAs, PHAs)	● Improve skin texture via exfolation and skin cell turnover ● Reduce signs of aging in the skin. ● Hydrate skin cells (PHA)	Alpha-Hydroxy Acids (lactic acid, glycolic acid, malic acid) Poly Hydroxy Acids (gluconolactone) Beta Hydroxy Acids (salicylic acid)
Peptides	● Repair and regulate processes surrounding skin aging. ● Anti-glycation agent ● Building blocks of collagen and elastin	Copper peptide-GHK SH-polypeptide-51 Argireline Matrixyl 3000 Palmitoyl peptide 38
Retinoids	● Encourage skin cell turnover ● Reduce wrinkles and fine lines. ● Improve skin texture, regulate pigmentation.	All retinoids are forms of Vitamin A, like retinol, retinaldehyde, and tretinoin.
Skin Brighteners	● Regulate skin pigmentation to reduce dark spots and discoloration. ● Act on melanin pathway	Liqorice Extract Vitamin C(Ascorbic ACID acid) Azelaic Acid Kojic Acid Arbutin

Cosmeceuticals are organized into several categories based on their effects:

III. COSMECEUTICAL TYPES

With the many types of cosmeceuticals available, some products emphasize their unique ingredients over others. For example, cosmeceuticals made from botanicals can be organized into subcategories based on their ingredients: organic cosmeceuticals feature non-GMO botanicals, while essential oil cosmeceuticals contain oils and extracts from various plant-based products. CBD cosmeceuticals contain hemp or THC products as active ingredients, which come directly from plants as botanical oils.

Other kinds of cosmeceutical subcategories include paraben-free cosmeceuticals and vegan cosmeceuticals. The white rabbit logo on a product's packaging is an easy identifier for vegan and cruelty-free cosmeceuticals.

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Aside from ingredients, their function is another way to classify cosmeceuticals. Depending on where you apply the product, a cosmeceutical may contain different levels of active ingredients or ingredients designed to be as gentle to the skin as possible. Eye cosmeceuticals, for example, tend to be tear-free and won't harm your eyes if you get a small amount of product in them. Lip cosmeceuticals, on the other hand, might feature more potent exfoliators to remove dead skin from the lips. In addition, both the eyes and lips have particularly thin and sensitive skin, meaning they'll need different ingredients than what you'd typically use for the rest of your face.

IV. EXPANDING TECHNOLOGY

Technological developments within the cosmeceutical industry have led to recent growths and improvements in safety and sustainability within the field. Most notably, the rise of cosmeceuticals within the clinical space and the use of the related term "dermaceuticals" have further separated cosmeceuticals from cosmetic products by emphasizing their use of active ingredients and the role they play in skin health. Sustainability efforts have also attributed to this, as more botanical substances are being tested to replace parabens and fossil-based ingredients in active and inactive spaces. The increase in ingredient screening has thus led to an increase in new product formulations and a new rising need for safe product testing.

A. Cosmeceutical Testing

The Food and Drug Administration does not include cosmeceuticals as an independent category from pharmaceuticals and cosmetics. Thus, professional dermatologists and estheticians regulate the industry under strict ingredient guidelines and testing procedures. With a recent increase in the need for sustainable skincare products, testing the active ingredients within these products is a necessity.

B. Nanotechnology in Cosmeceuticals

To create new, unique products or to provide more coverage than the average skincare product, the use of nanotechnology in cosmeceuticals is rising. In essence, nanotechnology involves the manipulation of molecules on a minuscule scale, including the creation, design, and application of ingredient structures. Already a significant component of modern medicine, cosmeceutical experts use nanotechnology to create new formulas that will provide users with safer, more effective results.

V. COSMECEUTICAL INGREDIENTS

The active ingredients are what set cosmeceuticals apart from cosmetics. With higher concentrations of active ingredients in cosmeceutical products, these items tend to promote visible, long-term changes in skin biology and function. Composed of various vitamins, minerals, and proteins, these active ingredients fall into one or more of the following categories: sunscreens, antioxidants, retinoids, botanicals, peptides and proteins, hydroxy acids, and skin-brightening agents.

Many cosmeceuticals share common ingredients with cosmetic products, including sunscreens and antioxidants like vitamins C, A, and E, botanicals like aloe vera and green tea extract, and other essential oils. In addition to active ingredients, all cosmetics and cosmeceuticals contain similar ingredients to create the texture of the products. Common examples include water and emulsifiers for liquid products, lipid or mineral-based thickeners, and pigmentation products like beet powder, iron oxide, and charcoal.

A. Recent Innovations in Cosmeceutical Ingredients

In recent years, the cosmeceutical industry has dramatically expanded its repertoire of ingredients, especially botanical and other organic ingredients. With a market pushing for greater care in sourcing active ingredients for both cosmeceuticals and cosmetics alike, many recent brands now boast the signature bunny logo for cruelty-free, vegan products. The industry has shifted and will continue to shift from fossil-based ingredients and parabens to botanicals.

B. Specialized Cosmeceuticals

Although cosmeceuticals are for everyone, some people need to avoid certain ingredients or have different active ingredient concentrations in their formula to keep their skin healthy. In this case, doctors recommend specialized cosmeceuticals. Although some of these products are prescription-based, many are available to consumers from select retailers. Specialized cosmeceuticals include cleansers and moisturizers for people with cystic acne, cosmeceuticals for people with dermatitis, rosacea, or melasma, and creams for treating diabetic rashes.

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Specialized cosmeceuticals don't stop at skincare either; you'll also find an array of hair care, lip care, nail care, and makeup products! For many people with chronic skin conditions, these products are excellent resources to allow for cosmetic use without increased risk of infection. For example, someone with diabetes will need makeup products for sensitive skin to reduce their risk of acne or skin irritation. Alternatively, people with eczema may need cuticle oils to reduce swelling and dryness.

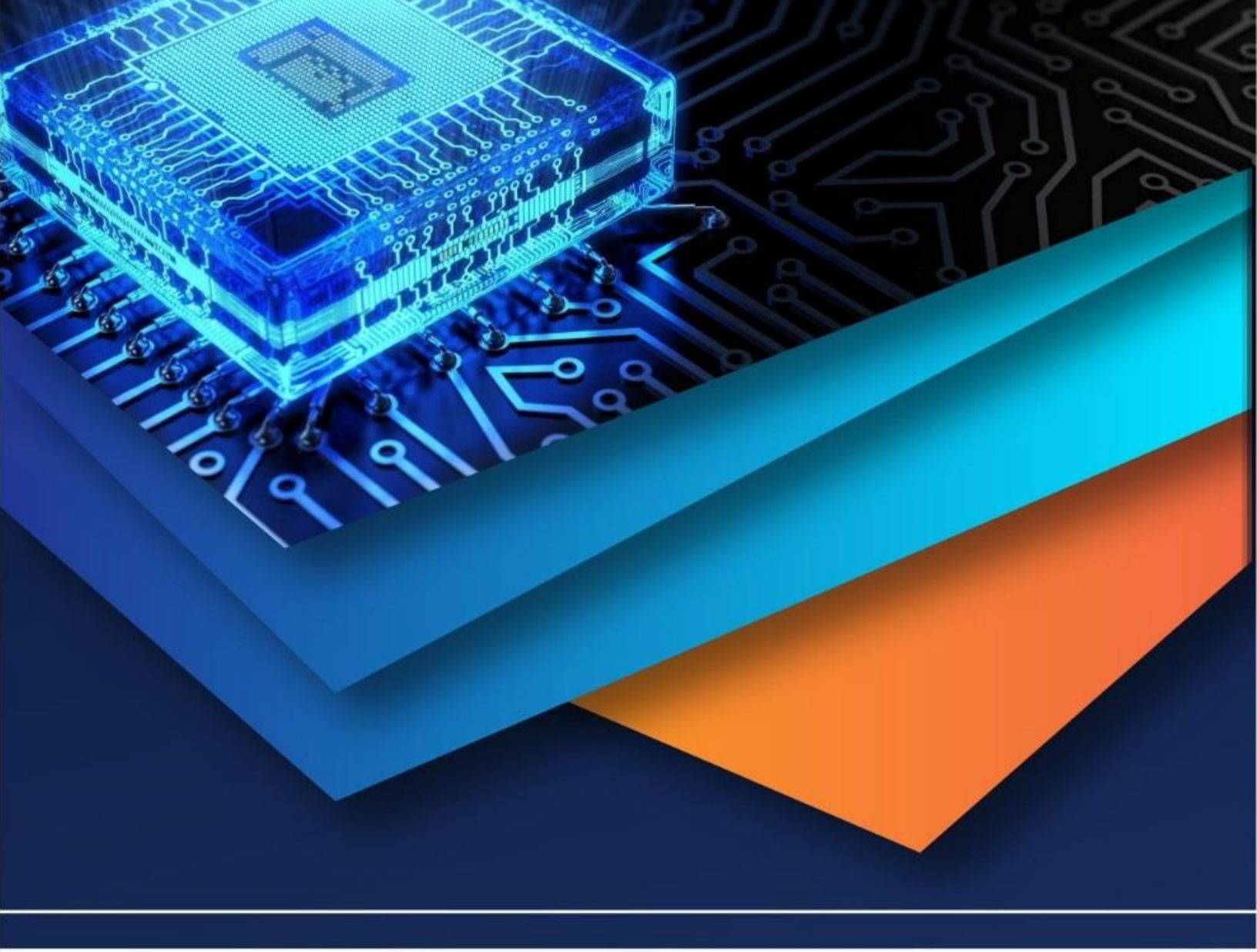
VI. CONCLUSION

Cosmaceuticals are cosmetic products containing biologically active ingredients that provide pharmaceutical-like benefits, such as anti-aging or acne control, beyond simple aesthetic enhancement. The term is a portmanteau of "cosmetics" and "pharmaceuticals" and describes products intended to influence the skin's biological functions to improve its health and beauty. These products are not formally recognized as either a cosmetic or a drug by regulatory bodies like the US FDA or the EU.

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