

REVIEW



COSMECEUTICALS: ACCLAIMING ITS MOST FASCINATING POSITION IN PERSONAL CARE INDUSTRY

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ABSTRACT:

Cosmeceuticals have acclaimed its most fascinating position in skin care products across the globe. Performance cosmetics, functional cosmetics, dermaceuticals, Active cosmetics, nutricosmetics, quasi-drugs, therapeutic cosmetics, cosmetic drugs, active skin treatment and cosmetics with pharmaceutical benefits abound in the marketing of cosmeceuticals nutricosmetics personal care industry. Cosmeceuticals market is the fastest growing sector of the natural personal care industry. Being unregulated market, has gained the attraction of pharma giants and scientists to work in this segment. Currently nanocarriers like Liposomes, Niosomes, Silicone vesicles and matrices, Multi-walled Delivery systems based cosmeceuticals are launched in market. This review highlights the potential of cosmeceuticals advancements and current patent status.

KEY WORDS: Cosmeceuticals, Nutricosmetics, Patent

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INTRODUCTION

According to the FDA cosmetics are defined as “articles that are intended to be applied to the human body or any part of body for cleansing, promoting attractiveness, beautification, or modifying the appearance”. For the approval of cosmetics to the market, FDA does not have any legal authority for cosmetics to go on the market. Companies and individuals that go for market the cosmetics have a

legal responsibility in accordance of safety and labeling of their products.

Cosmeceuticals are the cosmetic products having biologically active ingredients which have medical or drug-like benefits.^{1,2} Cosmeceuticals is an ingredient that have medicinal properties which exhibits beneficial topical actions and be responsible for protection against degenerative skin conditions^{3,5}

Cosmetic Vs Cosmeceuticals^{3,4}

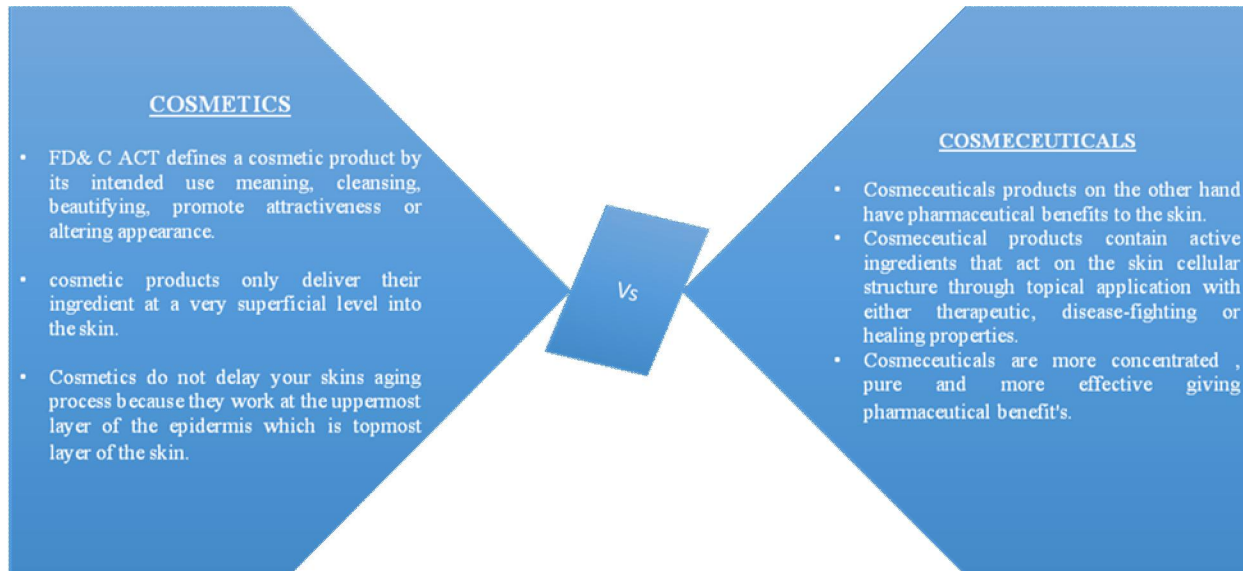


Fig 1: -cosmetic vs. cosmeceuticals

The word Cosmeceutical was invented by Raymond Reed and concept was popularized by Dr. Albert Kligman in late 1970s. It comprises cosmetic actives with therapeutic, disease fighting, or healing properties. Cosmeceuticals are the products that improve appearance of skin by delivering necessary

nutrients for healthy skin. Cosmeceuticals market is the fastest-growing sector of the natural personal care industry.

Jimtaisong (2009), described the alternative terms for cosmeceuticals as follows;⁶

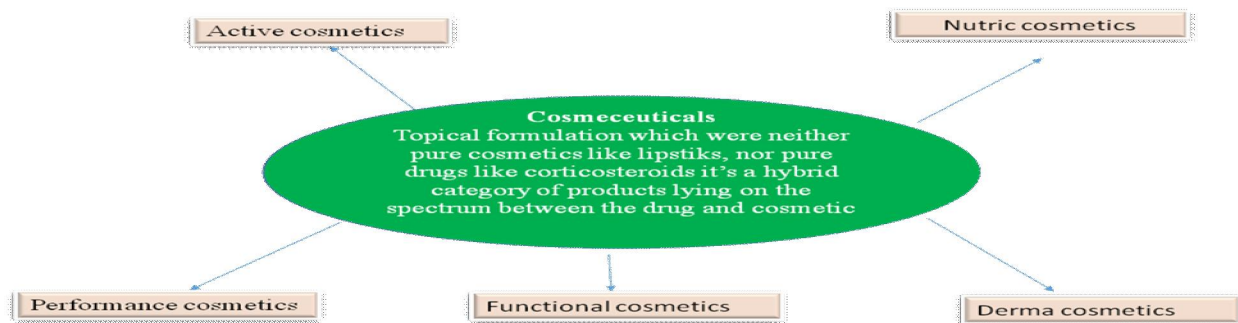


Fig 2: - Alternative terms for cosmeceuticals

In 2010, the cosmetic industry shown impressive sales worth Rupees 422.3 billion (US \$ 9.3 billion). Every year market of cosmeceuticals is growing around 10 to 15 percent that reports Health World Online. The cosmeceutical market, particularly skin care, continues to grow at about double the speed than cosmetic and toiletries market. The concept of cosmeceuticals is spreading its wings quickly all over the world. Pharmaceuticals are creating places in the cosmetic world at a great pace that resulting in the creation of “cosmeceuticals” which contains not only the cosmetic ingredients but also contains certain pharmaceutical ingredients.

COSMECEUTICAL INGREDIENTS^{6,7}

- Anti-Inflammatory agents
 - Salicylic Acid
 - Glycolic Acid

- Depigmenting agents
 - Arbutin
- Barrier Enhancing agents
 - Phosphatidyl Choline
 - Ceramide
- Antioxidants
 - Vitamin –C
 - Vitamin –E
 - Plant phenols
- Skin Renewal agents
 - Vitamin –A
 - Endogenous growth factors
 - Oligopeptide

Following are commonly used substances in cosmeceutical formulations.

Table 1: - Antioxidants and anti-inflammatory^{2,13,17}

Ingredients	Mechanism of action	Sources	Marketed formulation
Beta-Carotene	Minimizes lipid peroxidation and cellular antioxidant	Carrots and tomatoes (Fm. Umbelliferae ,Solanacea)	Environ body cream
Arjunolic extract	Antioxidant and anti-inflammatory	Terminalia arjuna(Fm Combretaceae)	Himalaya Arjuna
Ginkgo	Antioxidant that smoothes, rejuvenates and promotes youthful appearance	Ginkgo biloba (Fm.Ginkgoaceae)	Embryo revitalizer cream
Green tea extract	Antioxidant	Green teas (Camellia sinensis)	Alchemy conditioner
Oleanolic extract	Antioxidant and antifungal	Olive leaf	Trioxil anti acne cream
Kinetin	Free-radical scavenger and antioxidant	Plants and yeast	Kinerase pro therapy
Rosemary Extract	Antioxidant and Anti-inflammatory	Rosemarinus officinalis	Loreal body conditioner
Vitamin A	Antioxidant	lemon,citrus fruits, oils from sunflower and safflower.	Everyuth peel

Table 2: - Astringent and antibacterial agents ^{13,18,20}

Ingredients	Mechanism of action	Sources	Marketed formulation
Aloe vera	Softens skin	Aloe vera (Fm Asphodelaceae)	Lotus herbal moisturizers
Arnica	Astringent and soothing	Arnica montane (Fm. Asteraceae)	Arnica herbal cream
Lupeol	Antioxidant and skin softening Agent	Crataeva nurvula (Fm.Capparidaceae)	Seatonic stretch mark removing cream
Licorice extract	Skin whitening properties, antimicrobial, and Anti-inflammatory	Glycyrrhiza glabra (Fm. Fabaceae)	Liquorice balm
Allatonin	Skin Soothing	Comfrey(Fm Boraginaceae)	Soft cleansing emulsion
Beta-Bisabolol	Anti-inflammatory and Antibacterial	Chamomile flower (Fm Asteraceae)	Adrien Arpel C, Vitamin C Facial Treatment Capsules
Beta hydroxyl acids(BHA)	Antibacterial	Salicylic acid (Salix alba)	Oxymed shampoo
Calendula	Skin Soothing	Calendula officinalis (Fm. Asteraceae)	Weleda calendula paste
Coleus forskoflii oil	Antimicrobial, aromatherapy/perfumer	Coleus sps.	Ayush neem plus
Turmeric oil	Antibacterial and anti-inflammatory	Curcuma longa (Fm. Zingiberaceae)	Vicco turmeric cream
Ursolic acid	Anti-inflammatory, collagen buildup	Rosemarinus officinalis (Fm.Lamiaceae)	Holy basil extract

Skin Cosmeceuticals

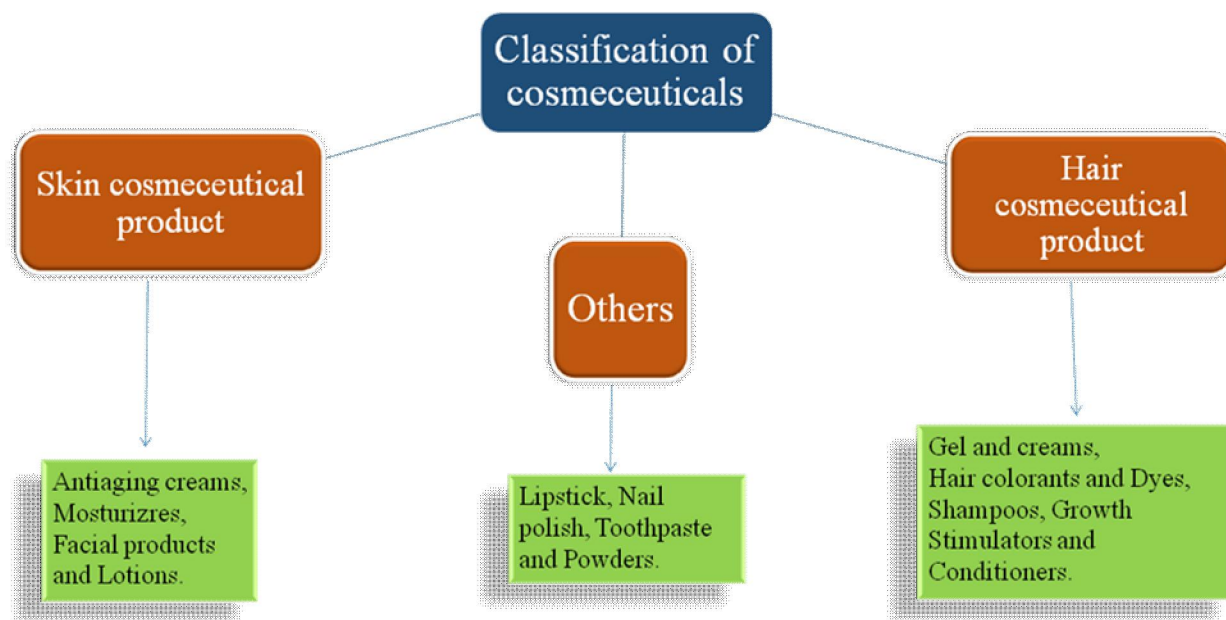
Cosmeceuticals have medicinal or drug-like benefits that are able to affect the biological functioning of skin. These products improve the texture of the skin by boosting collagen growth by combating the harmful effects of free radicals, so that maintaining the keratin structure in good condition and making the skin healthier.

Commonly Used Skin Cosmeceuticals

Hydroxy Acid

These contain α -Hydroxyacids such as glycolic acid, lactic acid and β -Hydroxyacids (salicylic acid). These

are used all over the world and most probably as active dermatological drug and cosmetic ingredients for centuries. The main mechanism of action of hydroxyl acid remains unknown and is largely controversial. Some specialists claims that the use of AHAs cause increase in the synthesis of glycosaminoglycans (GAGs), which increase quality of elastic fibers, and also increase density of collagen. However BHAs have dermolytic properties and helps in various xerotic and ichthyotic disorders.

Classification of Cosmeceuticals^{6,7,8,21,24}**Skin Cosmeceuticals**

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Sunscreen agents

Sunscreen agents are regarded by dermatologists as the only most essential formulation that should be applied daily in today market. UVA and UVB

radiation cause the disruption of the extracellular matrix. Broad-spectrum UVA and UVB sunscreens are founded for the photoaging therapy. Enzophenones such as dioxybenzone, oxybenzone sulisobenzene give protection in the UVB and UVA range (320–340 nm).

Retinoid

A great amount of research has focused on its use as an antiaging and for cutaneous disorders. Two main functions of vitamin A and its derivatives are: first they act as antioxidants, and second they activate specific genes and proteins. The structural changes for the cosmetic benefits are correction of epidermal atrophy, breaking down of collagen and enhancement of mitogenesis. The capability of topical retinoid is to improve the appearance of aged and photo-damaged skin.

Some key retinoid include retinoic acid (tretinoin), retinol, retinaldehyde etc.

Antioxidants

Antioxidants reduce free radical damage so that preventing impairment at cellular level. They also inhibit the inflammation which leads to the breakdown of collagen. In addition to external insults like UV radiation, drugs, air pollutants and the skin also has to cope with endogenous mitogens, most prominently reactive oxygen species and other free

radicals. Common antioxidants are alpha-lipoic acid, L-ascorbic acid, niacinamide, N-acetyl-glucosamine, α -tocopherol, and ubiquinone.

Botanicals¹⁴

These covers the major category of cosmeceutical additives that are found in the marketplace today. Some of that may profit the skin include: extract of green tea, ferulic acid, and grape seed extract.

Ferulic acid: This compound derived from plants, which is considered to be a potent antioxidant, and has been shown to provide photo protection to skin. When ferulic acid is combined with vitamins C and E, the product offer substantial UV protection for human skin. Moreover, Murray et al. account that because its mechanism of action is different from other sunscreens, this acid could be estimated to supplement the sun protection provided by sunscreens.

Grape Seed Extract: This extract has been established as a potent antioxidant. The extract has been shown to speed wound contraction and closure. Topical application of this extract has also been shown to enhance the sun protection factor in humans.

Depigmenting Agent⁹

Some of the common depigmenting ingredients contain ascorbic acid (vitamin C), hydroquinone, kojic acid, and licorice extract (glabridin).

Ascorbic Acid (Vitamin C): It is a natural antioxidant found in citrus fruits and leafy green vegetables. Skin penetration is low because of its hydrophilic nature.

Hydroquinone: It has been the agent of choice for skin lightening. The concentrations between 1.5% and 2% in skin lighteners by US FDA has proposed. A recent report suggested that, studies with animal models utilize long-term contact at high dosages are carcinogenic.

Kojic Acid: It is a less commonly used bleaching agent. When it is combined with dipalmitate, skin penetration improved with greater stability, but there is minute research to maintain its efficacy.

Licorice Extract (Glabridin): Several studies on miasma have shown good efficacy. Only gentle irritation that left with discontinuation.

Exfoliants

Exfoliants promote skin turnover. They remove supporter cells in the stratum corneum. Common

exfoliants include lactic acid salicylic acid (SA), and glycolic acid. The frequent use of SA and AHAs could cause the dermis and epidermis to be more-weak to penetration by UV radiation. Due to this, patients should be advised to use sufficient sun precautions. The Cosmetic Ingredient Review Expert Panel accomplished that SAs are safe to use when formulated to keep away from skin irritation and to be non-photosensitizing or daily application of sun protection.

Moisturizers

Moisturizers usually restore water content to the epidermis that provide a soothing protective film. Improve the appearance, tactile properties of dry and aging skin, and restore the normal barrier function of the skin, reduce the release of inflammatory cytokines. Moisturizers manage various skin conditions (e.g., aged skin, eczema, pruritus, and, psoriasis).

Topical Peptides

Topical peptide generally regarded as cellular messengers that are derived from amino acids. Designed to mimic peptide remains with endogenous biologic activity. These pentapeptides (e.g., KTTKS) are consist of a sub fragment of type I collagen propeptide. These pentapeptides play a signaling role in fibroblasts in skin to produce collagen, which can improve the wrinkles appearance.

Hair Cosmeceuticals^{11,12}

Hair cosmetic events in Ancient Egypt were hair setting by the use of sludge and hair coloring with henna. In ancient Greece and Rome, tonics and countless ointments were recommended for the prettification of the hair, for the treatment of scalp diseases. While shampoos for cleaning the hair and scalp, current formulations for hair quality, hair care practice, and exact problems such as treatment of oily hairs, and for androgenic alopecia related to the external condition of the scalp. Cosmetics are applied topically to the scalp and hair for the treatment of hair. A hair care cosmetic includes a suitable carrier which is a nonallergenic dried out extract of yarrow that is obtained by oxidation of a water– alcohol solution yarrow flower extract. This extract contains less than 0.5% poly-phenolic derivatives. Buck method for management of androgenic alopecia in which Liquor Carbonic Detergents are applied

topically. A hair cosmeceutical product contains – special care ingredients, conditioning agents, and hair growth stimulants. A number of ingredients are, fatty ingredients, quaternized cationic derivatives, hydrolyzed proteins, cationic polymers, and silicones. Therefore, current antidandruff ingredients are antifungal agents that are– octopirox, zinc pyrithione, and ketoconazole. A minoxidil-related compound (2,4-diamino-pyrimidine-3-oxide) is a cosmetic agent acting as a topical hair growth stimulant used to prevent inflammation and perifollicular fibrosis.

Other Cosmeceuticals^{11,12}

As the skin become olds, it becomes thinner, rougher, and drier. Over-exposure to the constituent and to environmental pollution the condition worsens. Many topical skin soothing products get involved in this process, but products needs to be particularly

moderate and specially formulated with constituent that work from the inside out by interacting with the cells below the skin's surface – exclusive of irritating the eyes. There are several cosmeceutical eye creams that promote the skin with natural emollients and useful nutrients. The other useful ingredients include chamomile, butcher's broom, and vitamin E, antioxidants – vitamins A, and E, green tea and Ginkgo biloba, tiare flower, and also calendula, cucumber and α -bisabolol, an active ingredient of chamomile, to calm irritated skin. A key ingredient in the eye stimulating moisture cream – that treats inflammation, irritation, and also protects against future skin damage is mildew which helps to round up the wrinkles. The eye wrinkle cream helps to prevent the signs of aging and usually contains wheat germ and corn oil, and carrot extract.

Table 3: - Novel cosmetic delivery system^{15,22}

Sr. no.	System	Novel approach
1.	Vesicular Delivery systems	Liposomes, Niosomes, Silicone vesicles and matrices, Multi-walled Delivery systems
2.	Particulate Systems	Micro particulates, Porous polymeric systems, Nanoparticulates
3.	Emulsion Delivery Systems	Micro emulsions, Liquid crystals, Multiple emulsions, Nanoemulsions, Pickering emulsions
4.	Other Delivery systems	Cyclodextrin complexes, Dendrimers and Nano Crystals
5.	Delivery Devices	Iontophoresis, Cosmetic patches

Table 4: - List of marketed cosmeceutical products ^{5,10,14,16,19,23}

Product	Brand	Treatment	Company
Target Acne Spot Treatment	Celazome	Acne treatment	Celazome New Zealand Limited
Acne Kit	Wilma Schumann	Acne treatment	Wilma Schumann
Anti-Acne Gel	DS Laboratories	Acne treatment	DS Laboratories, Inc
Cooling sun spirtz	Lancome	After sun product	L'Oreal
Dr. Brandt Laser Tight	Dr. Brandt	Anti-aging	Cosmetic Dermatology, Inc.
Dual Action Lotion	Neova	Anti-aging	ProCyte Corporation
Cream for Wrinkles & Expression Lines	DS Laboratories	Anti-aging	DS Laboratories, Inc.
Eye Perfect Serum	PerfectRx	Around-eye cream	PerfectRx
Eye Treat with Lyphazome Technology	Eye	Around-eye cream	Ciba Vision Corporation
Nutra Luxé M.D. Lipo Reduction Anti-Cellulite Crème	Nutra Luxé M.D.	Body firming lotion	Nutra Luxé M.D.
Osmotic Lipoduction Body Perfecting Complex	Osmotic	Body firming lotion	Osmotic Corporation
DS Laboratories Hydroviton.CR Liquid Normalizing Soap 80g	DS Laboratories	Body wash/cleanser	DS Laboratories, Inc.
Colorescience Genie Sparkle Bottles (Flower Power)	ColoreScience	Bronzer/highlighter	ColoreScience
Colorescience Genie Sparkle Bottles (Sea of Love)	ColoreScience	Bronzer/highlighter	ColoreScience

Revlon Skin Lights Color Lighting for eyes & cheeks, Rosy	Revlon	Bronzer/highlighter	Revlon
Boscia Make Up Break Up Cool Cleansing Oil	Boscia	Facial cleanser	Fancl International, Inc.
Nouriva Repair Moisturizing Cream	Ferndale Nouriva	Facial moisturizer/treatment	Ferndale Laboratories, Inc.
DERMA doctor POUT Landis Hyper Moisturizing Lip Paint & Treatment SPF 15 With Nanotechnology, 2 ml, Clear	DERMA doctor	Lip balm/treatment	DERMA doctor
Luscious Lips Rejuvenation Duo	Luscious Lips	Lip balm/treatment	Vortex Health & Beauty Ltd.
Celazome Spoil Me Body Lotion	Celazome	Moisturizer	Celazome New Zealand Limited
Celazome Tip Treat Cuticle Exfoliator	Celazome	Nail treatment	Celazome New Zealand Limited
Awake Nano Lotion Whitener	Awake	Skin fading/lightener	Awake International
Korres Natural Products Red Vine Year Round Hair Sun Protection	Korres Natural Products	Sunscreen/tanning oil	Korres Natural Products Ltd.
DS Laboratories SPECTRAL DNC Hair Loss Treatment	DS Laboratories	Hair-loss treatment	DS Laboratories, Inc

Table 5: - Current Patents Status of Cosmeceuticals –A Glimpse

Patent No.	Field of Invention	Drug Candidate	Year of Publication	Inventors	Ref. No.
EP2852392 A1	Chondroitin for use in medicine	Chondroitin	2015	Rosa mario de, chiara schiraldi	25
US20150164770 A1	Dermal rejuvenation compositions and Methods	Perfluorocarbons (PFC'S)	2015	Kate somerville, fred khoury	26

US2015/0023908 A1	Skin cream	Exosomes and cell culture medium	2015	Ahmed h. Al-Qahtani	27
US2014/0228451 A1	Pharmaceutical activeIngredient containing composition and methods of manufacturing.	Imiquimod, tetracycline, streptomycin, niacina Mide,clindamycine, dapsone, naftidine, miconazole, eryth Romycin etc	2014	James a. Roszell, henderson, jie zhang etc.	28
US 2014/0357586 A1	Solid carriers for improved delivery of active ingredients in pharmaceutical compositions	Nutritionals, cosmeceuticals, and diagnostic agents.	2014	Mahesh V. Patel	29
US 8,128,913 B1	Sunscreen composition withEnhanced UV-a absorber stabilityAnd methods		2012	James a. Roszell, jie zhang, henderson,	30
US 8,299,122 B2	Method for stabilizing Retinoic acid, Composition and method of using	Retinoic acid	2012	James a. Roszell, Henderson	31
US 8,318,818 B2	Topical composition, precursor, andMethods for manufacturing		2012	James a. Roszell, Henderson, Bruce jezior, jupiter etc.	32
US2012/0107410 A1	Product for the preparation of cosmeceutical compositions for the skin treatment	Polysaccharides, proteins, glycoproteins, peptides and amino Acids etc.	2012	Marta dominguez valdes-hevia, aurora brievea d., francisco sanz rodriguez	33
US 7,674,471 B2	Topical composition precursor, and Methods for manufacturing and Using	Antimicrobials, anti-inflammatory Agents, anti-viral agents etc.	2010	James a. Roszell, henderson, bruce jezior, Jupiter	34
US 2003/0215496 A1	Solid carriers for improved Delivery of	Drugs, nutritionals, cosmeceuticals, and diagnostic agents	2003	Mahesh v. Patel, feng-jing chen	35

	ingredients inPharmaceutical compositions				
US 6,582,683 B2	Dermal barrier composition		2003	Bruce jezior, Jupiter	36

FUTURE PROSPECTS

By adding the of small amount of cosmeceutical agents in the cosmetic formulations that do not require any medical regulations and that would improve the production of cosmeceuticals which could help in the improvement of the skin, nail, and body mass growth. To government regulatory agencies new challenges will be presented as new chemicals with exact biological activity are invented and tested. Cosmeceuticals are not only the external improvement but also improves the internal beauty. The health group of professionals will display the importance of cosmeceutical products and develop the attentiveness about these products.

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CONCLUSION

The global development in the cosmetic industry on the way to developing 'medicinally' active cosmetics, and in the pharmaceutical industry headed for 'cosmetically' oriented medicinal products as portion of a present-day 'life-style' ideology. The usage of cosmeceuticals has radically slogged in recent years, which ultimately has increased the spectrum of the physician to widen their range of products to enhance the attractiveness of the patients related with dermal problems. However, at present times, where new generation are intensely worried for their beauty, plenty of manufacturing companies are conflicting and working hard to provide convincing results to meet necessities of the patients.

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