

Journal of Pharmaceutical Advanced Research

(An International Multidisciplinary Peer Review Open Access monthly Journal)

Available online at: www.jpardonline.com

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New Trends of Innovative Emerging Cosmetic Materials

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Received: 24.03.2022

Revised: 05.04.2022

Accepted: 15.04.2022

Published: 30.04.2022

ABSTRACT: Numerous cosmetics products are available in the market across the globe. There is progressive innovation and in the development of products, integration, algorithms with proper knowledge of immersing technology such as Nanoparticles, Cosmeceuticals, it's enhancing the scope for development of cosmetics products and producing environment-friendly, inexpensive, products to meet the consumers need and make them more acceptable. In this review, skin aging is the complex problem addressed and it occurs due to the intrinsic and extrinsic factors and exploring the new emerging active substance like hyaluronic acid, PGA agents that are effective against wrinkles, xerosis, and dyspigmentation, however, Oils have some imperative role based on nature of skin and they are some therapeutic roles. Furthermore, Cosmetextile is another composition that gives sustainability to various parts of our body like skin protection, moisturizing, and antioxidant agents. This review put forward the direction of a wide variety of techniques utilized for preparing the cosmetextile like microencapsulation, doping, and coating techniques. Consumers acceptable of products look for self-care with multiple benefits and minimal side effects. Subsequently, microneedle, micro-patches, and microbiomes have some specialized designs and properties to impart therapeutic application for various cosmetic and cosmeceutical agents. These cosmetic materials and advanced technology will increase the trends and further scope of materials to impart benefits for a commercialized purpose and varied application of cosmetic products.

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Keywords: Cosmeceuticals, Ageing, Oil, Cosmetextile, Microneedle, Microbiomes, Nanoparticle.

INTRODUCTION:

The history of cosmetics spans many decades at least 7000 years and is used in every society present across the globe. The uses of cosmetic products have been recorded since the ancient time ^[1]. They had wide applications in personal care, cleansing, and beautifying with the purpose of enhancing the overall appearance of an individual ^[2], previously cosmetics were prepared from natural resources available. Atropa belladonna extract was applied to the eyes by females as it had mydriasis property ^[3], It dilates the pupil in turn to

enhance the ability for the appearance of the eyes of a female. Various tribes in Africa used to wash their hair with the urine of animals of bovine species and also camels to make their hair look red in color. Another example would be kohl's used by ancient Egyptians and castor oil used by Egypt as a lip balm skincare product made up of beeswax, olive oil, and rosewater as defined by Romans ^[4]. However, with the change in time cosmetic products have developed but the basic remains the same that is to mask, enhance, exfoliate and provide cleansing action. In western countries the usage of beauty products and cosmetics has been an age-old tradition in India, since the civilization of Indus valley circa 2500 and 1500 BC the use of cosmetics have been known to Indians. After independence, the beauty industries of the early nineties started growing rapidly as women started using cosmetic products ^[5]. According to the drug and cosmetic act 1940 and rules 1945 the application of cosmetic products may be rubbed, sprinkled, sprayed, poured, or introduced into or applied ant part of the human body for cleansing, beautifying, and promoting attractiveness, it might be altering the appearance and includes any article as a component of cosmetic product ^[6]. The basic content of any dosage form constitutes an active pharmaceutical Ingredient (API) and excipients, similarly, cosmetics products may or may not contain an active pharmaceutical ingredient (Table 1). Cosmeceuticals explore cosmetic products containing an active pharmaceutical product with excipients.

Table1. Ingredients use in Cosmetotextile.

Ingredients and Animal Derivatives	Use
Iron oxide, titanium oxide, zinc oxide, ZN particles bi reactive oxalic acid	Protection against UV radiations ^[26]
Copper Oxide	Show Antimicrobial Activity ^[27,28]
Chitosan	Stabilizes Moisture level and Antibacterial ^[29]
Squalene	Antioxidants ^[30]
Sericin	Anti-Aging Effects ^[31]

A wide varieties and classes of excipients have been used in cosmetics to make the product better acceptable to the consumer and to increase the stability of the product. Excipients are defined as a medium for giving medications and processed excipients cosmetic products are not only constrained with the use for skincare but it

has also been implied for hair care. Examples are shampoos and conditioners, perfumes have been used to impart fragrance to the body and also have therapeutic benefits excipient should be non-toxic, non-irritant and inert compatible with other excipients as well as Active pharmaceutical ingredients. Cosmetics were once considered a luxury, but with the change in time cosmetic has been used by both genders to satisfy their emotional and physical needs. It is still believed that cosmetics are only for beauty purposes, but it has evolved more than that with the inclusion of the drug. Otto pharmaceutical ingredient giving rise to cosmeceutical industry compliance with government regulation reports and strategies have been developed to put forward evidence-based approaches as of the factors that clinical implications and with the change in time and new technology have made its way in the cosmeceutical industry with their ultimate aim to provide benefit to consumers as always as to increase the product stability and performance in turn benefiting toward cosmetic and cosmeceutical industry.

Skin Aging:

Skin aging is a complicated process and has not been understood fully. It can briefly be divided into two types i.e., Intrinsic called innate and extrinsic aging. Innate aging cannot be avoided; it has the same effect on the skin as well as other organs in the human body ^[7]. It is majorly influenced by the hormonal imbalance due to increasing age and decreased production of sex hormones like estrogen and progesterone which may or may not be associated with menopause ^[8]. Deficiency of this hormone results in dryness, laws of elasticity, wrinkling of the skin, and collagen degradation. Extrinsic aging may be due to external factors like Ultraviolet radiation ^[9,10]. Aging is is influenced by several factors such as:

- Temperature fluctuation.
- Exposure to chemicals and gases.
- Exposure to sunlight.
- Environmental pollution.

Ultraviolet radiations from the sun penetrates the skin and accelerates the formation of free radicals which induces hyperpigmentation, inflammation, and wrinkles formation. Due to continuous over-exposure to UV radiation the collagen and elastin fiber of skin are disrupted by enzyme collagenase and elastase and the texture of the skin is impaired and ultimately deteriorates. Collagen and elastin are responsible for maintaining the elasticity and integrity of skin ^[11].

Invention -Blue Light Protection Sunscreen:

Blue light is 380 to 500 nanometer this range is derived from the sunlight or electronic devices such as

smartphones, tablets, computers, etc. this type of sunscreen is beneficial photodynamic therapy when they are used in a combination of photosynthesized drug and high-intensity light source. Blue light usually weakens the epidermal barrier, thereby damaging the extracellular matrix and accelerating the aging of the skin. Using the expertise, sunscreen products have improved the ability to protect against blue light. SPF 50 plus *City Skin Age Defense* (SPF from SKEYNDOR) launched a skincare product with ingredients such as rubiginosa, licochalcone A, turmeric, and algae to fight the adverse effect of blue light.

UV filters can also break through the boundaries of UV B and UV A to continue into the blue light spectrum. UV filters also contain vitamins and microalgae that can enhance the skin's defense system. During the period of pandemics, most people were connected to the world virtually through laptops and smartphones this device is unknown to emit blue light which damages the skin. Many companies are taking initiative to develop sunscreen products with innovative ingredients with advanced blue light protection. Their renewed technology interest is observed in some of the natural ingredients such as sea plasma, astaxanthin, marine collagen, and some algae, to combat aging due to blue light radiations ^[12].

Hyaluronic acid and its uses:

Hyaluronic acid (HA) is a disaccharide, composed of D-Glucuronic Acid and N-acetyl-D-Glucosamine, Linked via alternating beta (1-4) and beta (1-3) glycosidic bonds.

Its polymers are available in different compositions ^[13], configuration depending on the shape, pH, concentration, and associated cation ^[14]. In an extracellular matrix composed of dermis and epidermis layer hyaluronic is the essential component having moisturizing and skin-repairing properties ^[15]. Hyaluronic acid is one of the widely used ingredients in cosmetic formulations it serves skin regeneration and anti-aging effect. Some of the specific properties of Hyaluronic acid are high hygroscopicity, viscoelastic nature, biocompatibility, and non-immunogenicity. The mechanism of penetration is still unknown, many efforts and research are still ongoing to increase skin penetrability, unfortunately, but is unable to penetrate deep skin because of the large molecular size and acid concentration found in the skin were 10,000 times greater than in skin.

Polyglutamic Acid (PGA) - An Alternative:

It is a component of the mucilage of the fermented soybean food product called NATTO in Japanese. It is a film-forming agent and has been known due to its wound healing properties and immense tissue repair capacity. It has made its way into a large number of skincare products due to its inherent hydrating properties and replenishing moisture level of skin ^[16].

Applications in Cosmetics ^[17]:

Polyglutamic acid has the ability to form a smooth elastic, self-moisturizing, and form soft film on the skin resulting in the protection of the outer layer of the skin ^[18]. It has excellent effective humectant properties and the key ability to draw moisture to the skin and hold it underneath the water that is to trap water. Dobos describes hydrating agents help to form a soft film that has occlusive properties and to bring elasticity ^[19].

Anti-wrinkle and Anti-aging Properties:

- Polyglutamic Acid has anti-aging properties. A study conducted by Meiji Seika examined the ingredient's potential as a natural replacement for collagen or hyaluronic acid ^[20].
- Polyglutamic Acid also enhances the skin's capability to produce moisturizing factors like urocanic acid and lactic acid, which can result in making skin look more hydrated and also decreases wrinkles and fine lines and skin appears softer and smoother.
- Polyglutamic Acid also decreases the breakdown of natural hyaluronic acid, by inhibiting the enzyme Hyaluronidase. PGA is considered to be safe for all skin types, PGA is a gentle humectant and does not offer many side effects. It goes well with other additives while formulating different types of cosmetic products. However, a Spot test is recommended.

PGA holds up to 5,000 times its weight in water and 5 times that of hyaluronic acid. Comparing polyglutamic acid and hyaluronic acid will not be appropriate. PGA is not found naturally in the body like HA. HA and PGA would be more effective when they are formulated together. Though HA due to its smaller sized molecules are able to penetrate deep inside the skin and better able to attract water to deeper layers of skin, PGA has its own benefits it acts as an occlusive and helps to seal in that moisture for enhanced benefits and product stability and performance it also turns to benefit the industry.

Advanced Approaches:

Niosomes were first discovered by Handjanivila, *et al.* In 1979, Niosomes also called non-ionic surfactant vesicles are microscopic lamellar structures formed by an admixture of non-ionic surfactant and cholesterol. A group of scientists developed a Novel ethosomes delivery system that encapsulates HA with a skin-penetrating peptide (SPACE) conjugated to phospholipids to improve its topical delivery. It is found that hyaluronic acid concentration found in the skin was 10,000 times greater than in the skin.

Shiseido's IoT-Based Skincare System "Optune":

The Japanese beauty brand Shiseido declared on 13th December 2017 that it is going to launch its β version of the skincare system called 'Optune' in spring 2018 in Japan. This is a personalized app that gets modified and adapted according to the skin environment of each individual. They have their own algorithm that can choose the best adaptable conditions of the skin along with the tones to achieve a moisturized state in each individual. Optune couples digital technology with cutting-edge beauty research and skin science to optimize the personalized skincare experience.

The Optune system consists of 2 parts:

- 'Optune Zero' / 'Optune App', monitors the change and collects all relevant information regarding a menstrual cycle, mood, and environmental conditions like temperature and humidity and determines patterns of necessary skincare in real-time. The user can access provided data and review a record of their changes.
- 'Optune Shot', describes Shiseido for skin perfectly fitness. This product is filled in the cartridge it has placed in a sophisticated machine called this", TimeTune® care and focuses on the daily biological rhythm. TimeTune® care consists of serum care adapted to skin conditions at different times and moisturizer care for morning and night.

Oils for cosmetic Applications:

Different types of oils are used in cosmetics. The most vital uses of oil in cosmetics are such that oil is blended into the product, it is because of its active ingredients. The purpose of base oil, or carrier oil, is not to bring any new chemicals into the skin. The purpose of carrier oil is to strengthen the amount of naturally occurring fatty acids on the skin. Oils are divided into two types non-

organic essential oils and organic oils. The term 'organic' refers to a formal and overarching standard of quality in relation to fruits, vegetables, meat or animal products, beauty products, cosmetic raw materials, and more. According to the US Department of Agriculture (USDA), substances that are 'certified organic' represent adherence to various requirements during the sourcing, production, and processing phases. The NOP (National Organic Program) is the official enforcing body within the USDA responsible for maintaining the national standards of manufacturing and labeling of organic goods. Depending on the extent that requirements are met, companies are allowed to use one of four labels on their products: '100 % Organic', 'Organic', 'and Made with Organic', or 'Organic Ingredients'.

Essential oil means:

The cosmetic beauty industry claims essential oils are organic and adhere to maintain standards set by local governing authorities as well as any other labeling regulations or restrictions in the area they are being sold. In the U.S. the organic oil claims compliance to USDA conventions and FDA regulations for cosmetic labeling and safety, as stated under the Federal Food, Drug, and Cosmetic Act (FD&C Act) and the Fair Packaging and Labeling (FP&L) Act. In Canada, products must additionally conform to Health Canada label regulations. Furthermore, True 'organic' essential oil organic essential oils represent practice and philosophy that are designed to be environmentally friendly, sustainable, healthy, and more supportive towards the agricultural community as a whole.

DIFFERENT TYPES OF OIL ACCORDING TO SKIN TYPE ^[21]:**Normal skin:****Argan Oil:**

This oil is often called 'liquid gold' it has various benefits for appearing skin rich and soothing effect. The face oil has composed of vitamin E and has antioxidant properties that can prevent those pesky and unwanted dark spots, fine lines, and other kinds of skin damage.

Squalene Oil:

Squalene oil is produced from the skin and also obtained from olives and rice bran. It is unstable, and reactive with oxygen and it blocks the pores. Whereas, squalene face oil has a stable, longer shelf life and is structurally similar to skin secretion. This allows it to be easily absorbed by your pores to target specific skin concerns at a cellular level.

Retinol Oil:

Retinol oil has hydrating properties for skin, it enhances brightens your tone, and clears your breakouts without irritating your skin.

Dry skin:

It produces less sebum than normal skin which results in cracking, peeling, and even itchiness. Typically, you should look for face oils that are rich in oleic acid to help hydrate the skin, lock in moisture, and lessen irritation from dryness.

Marula Oil:

Marula oil is composed of omega fatty acids which help condition dry skin. It gives essential moisture to the skin and can even reduce any redness you might encounter.

Almond Oil:

Almond oil has been used to treat conditions of the skin, such as eczema, psoriasis, and dermatitis. This oil contains vitamin A and can stimulate for rejuvenation of the skin cells.

Avocado Oil:

Avocado face oil contains rich nutrients that benefit for skin such as vitamin E, Lecithin, and potassium which nourish and moisturize the property of dry skin. It gets ease absorbed through the epidermis and formed new skin.

Oily skin:

This skin type is characterized by more visible pores than usual and a shiny complexion. However, you might argue about how face oils can benefit your already oily skin. On the contrary, it can help control the secretion of excess sebum which ultimately makes you less oily.

Peppermint Oil:

Peppermint has application in face oils that can regulate your skin's sebum production and prevent clogged pores. It will be readily useful to those annoying skin concerns by adding this face oil.

Grapeseed Oil:

Grapeseed oil is a natural astringent that has the ability to get rid of excess grease on your face. It can also tighten your pores, leaving your skin mattified.

Tea Tree Oil:

Tea tree oil is a significant property of skin treatment for those with oily skin because of its antifungal and antibacterial properties. It can help stabilize your sebaceous glands by penetrating deep into the skin and unclogging your pores.

Acne-prone skin:

It's best to skip irritating acne treatments and opt to apply face oils instead. It can restore the nourishment of

your skin which is stripped away by the harsh ingredients usually found in most beauty products.

Pomegranate Oil:

Pomegranate oil is effective against bacteria in your pores causing inflammation and break-outs in your face best use of this oil content over oily skin.

Rosehip Oil:

Loaded with skin-nourishing vitamins and essential fatty acids, rosehip oil shows rationale properties to treat inflamed and acne-prone skin. Phenols are the constituents that are proven to have antibacterial and antifungal properties without clogging your pores.

Coconut Oil:

Coconut oil used as a depth good cleanser gently exfoliates the skin and unclogs your pores leading to healthier skin. It shows anti-viral and anti-microbial properties and controls the growth of bacteria and reduces the appearance of swelling acne.

Combination skin:

Combination skin consists of dryness in some areas of the face and oiliness in other parts, such as the T-Zone (forehead, nose, and chin). Since the skin type varies, the type of face oil you apply should also adapt to the different areas of the face.

Jojoba Oil:

Jojoba oil can break down and dissolve sebum to control excessive oiliness in some parts of your face. However, it's a light weight and breathable oil that provides a bit of moisture for drier areas. This is the reason why it's perfectly suited for those with combination skin.

Marula Oil:

Marula oil has antioxidant properties that help protect your skin away from pollution and other environmental stressors. It can also be easily absorbed by your skin which makes it a great moisturizer. Overall, this essential oil can reduce the amount of grease in your face while still keeping your face hydrated.

Sensitive skin:

Those with sensitive skin types often experience itching, drying, redness, and even burning. That's why you have to be careful of what you apply to your face as it can further trigger these complications. Here are the types of face oils suited for your skin.

Aloe Vera Oil:

Packed with antioxidants, anti-inflammatories, and fatty acids, aloe vera is the perfect face oil for sensitive skin. These properties help protect skin from harmful bacteria, calm irritation, and nourish damaged skin. In addition, it

is a natural astringent which makes it suitable for sensitive skin that's also acne-prone.

Moringa Oil:

Much like aloe vera, moringa oil also has anti-oxidant and anti-inflammatory properties to heal sensitive skin. It can also be used as a moisturizer for sensitive skin with dryness. Just simply layer this lightweight oil under your makeup.

Castor Oil:

Castor oil can reduce swelling and puffiness in your face. It's also effective in treating inflamed acne and eliminating eye bags to give you skin that looks fresh and healthy. However, simply knowing the best face oil for your skin type is not enough. You should also know how to properly apply it to maximize the benefits it brings to your skin.

L'Oreals Kerastase Hair Coach:

The Kerastase Hair Coach explores technology powered by Nokia-owned Withings provides features a microphone an accelerometer and a gyroscope (to analyze brushing patterns and count brush strokes); and sensors (to determine if the brush is being used on dry or wet hair). Via connection with an app, the brush can tell a user how often hair is brushed and also warn consumers if they are brushing too hard. The brush vibrates to warn against overbrushing. Various apps have been developed which are designed in such a manner to have a personalize use and kind of algorithm which understands user routine and suggests to use of the product on daily basis also notifies the user about climatic changes taking place and suggests the kind to remedies which can help and prevent further damage. Some of these apps are:

- Estee Lauder's Nighttime Expert App.
- Perfect Corp's YouCam Makeup App.

White Diamond - An alternative for TiO₂:

Titanium dioxide has a wide variety of applications. In the pharmaceutical and cosmetic industry, it has been used as an opacifying agent; it has many limitations the potential health hazards are as follows:

- **Inhalation:** At high concentrations: can irritate the nose and throat.
- **Skin Contact:** May cause mild irritation.
- **Eye Contact:** May cause slight irritation as a "foreign object". Tearing, blinking and mild temporary pain may occur.
- **Ingestion:** Not harmful.

- **Effects of Long-Term (Chronic) Exposure:** Conclusions cannot be drawn from the limited studies available.
- **Carcinogenicity:** Possible carcinogen may cause cancer-based on animal information and has been associated with: lung cancer.
- International Agency for Research on Cancer (IARC): Group 2B - Possibly carcinogenic to humans. American Conference for Governmental Industrial Hygienists (ACGIH): A4 - Not classifiable as a human carcinogen under review by ACGIH.
- **Teratogenicity / Embryotoxicity:** Not known to harm the unborn child.
- **Reproductive Toxicity:** Not known to be a reproductive hazard.
- **Mutagenicity:** Not known to be a mutagen ^[22].

White Diamond- The Natural TiO₂ replacer:

Designed and developed by Dohler, to meet the increasing demand for an alternative to TiO₂. White Diamond delivers a whitening effect to the formulation. It is a color additive, available in an anhydrous form to act as an additive in pigmented makeup powder; it can also be used as filler as it keeps moisture away. It finds its application in Lip Care, Lipstick Cream, Makeup, Shampoo, Powder, and many more ^[23].

COSMETEXTILE:

Cosmetextile is one type of composition which gives sustainability to various parts of our body like skin and can show some properties like protecting the skin etc. Cosmetotextile depends on different types of ingredients and fabrics also. The agents used in cosmetotextile are moisturizing agents and antioxidant agents. There are different types of techniques for preparing the cosmetotextile like microencapsulation, doping, and coating technique ^[24]. The definition of cosmetotextile was declared in 2006 by Standardization of Textile and Clothing Industries (BNITH). Cosmetotextile says that the property of textile material is similar to the cosmetic product we used. There are different types of cosmetotextile

- Moisturizing.
- Anti-wrinkle and whiten.
- Antimicrobial and antifungal.
- UV protection.
- Aromatic and perfumes.

Textile gives a moisturizing effect on human skin. Squalene adds an oil layer to the skin for suppressing the

water loss. It contains some hydrophilic groups that form hydrogen bonds with water molecules that are present on the skin. It reduces wrinkles and fine lines because of its humectant potential ^[25]. There are different techniques such as;

Microencapsulation technique:

This technique gives a shelf life to ingredients volatile and non-volatile by delaying oxidation and evaporation. Microcapsules preparation based on diameter range and mechanical robustness. Integration of microcapsule with textile substrate done by two methods, covalent grafting, and exhaust method. Covalent Grafting basically used a skin-selected binder ^[32]. Whereas the Exhaust method process carried out depends on temperature and pH and use for treating woven garments and knits ^[33].

The coating on Textile Products:

Different active ingredients are coated on the surface or fabric surface and it is based on suitability. Host-Guest molecule technology is used ^[34].

Cosmetotextile for UV Protection:

Ultra Violet radiations can damage our skin like burning, allergies, various skin problems, and skin cancers. This textile provides us protection against radiation called cosmetotextile for UV protection. Fabric is the most important factor here. Iron oxide 1, 2 ethanediol, carbon black, titanium oxide, and dianitide derivatives to increase the UV protection factor of textile ^[35-36]. Changes in cosmetotextile as an imagination. Various natural ingredients for commercial use through cosmetotextile. It gives some benefits but on the other hand, there are some disadvantages because some ingredients or polymers we use in this have some volatile, heat-sensitive, and oxidative properties. Therefore, manufacturing cosmetotextile material in such a way that it gives a good result and fulfills the needs of consumers.

MICRONEEDLE PATCHES AND MICROBIOMICS FOR COSMETICS:

Consumers worldwide look for self-care products with multiple benefits and minimal side effects. Nowadays not only women but also men are concerned about their facial features. Cosmetics are the products applied topically to your skin for cleansing purposes, beautifying or altering the appearance, and enhancing attractive features. Also, it enhances the appearance or odor of the body. The most common methods for transdermal administration of drugs are hypodermic needles, creams,

and patches. The effect of therapeutic agents is limited due to the presence of the stratum corneum layer inside the stratum corneum acting as a barrier, therefore, allowing few molecules to reach the site of action. A newer form of drug delivery system known as microneedle is introduced which enhances the bioavailability and also overcomes the problems related to conventional formulations. It involves disruption in the skin layer, creating micro size pathways which lead the drug directly to the epidermis or upper dermis layer from where the drug directly enters the systemic circulation ^[37,38].

MICRONEEDLE PATCHES ^[39,40]:

These dissolvable patches are sticky bandages that contain thousands of dissolvable cone-shaped microneedles. Each microneedle is made up of water-soluble content that disintegrates as it comes in contact with the skin.

Various types of microneedles:

- Solid microneedle.
- Dissolving microneedle.
- Hydrogel microneedle.
- Coated microneedle.
- Hollow Microneedle.

Applications:

This system has increased its application to many fields as ^[41]:

- Oligonucleotide delivery.
- Vaccine delivery.
- Insulin delivery.
- Cosmetics.

Dimensions of microneedle:

Microneedles can be formulated depending upon the type of microneedle and the material which is used. The epidermis layer is 1500 micrometers thick therefore the needle length of 1500 micrometers is sufficient to release drugs into the epidermis layer. Microneedle tips are cylindrical, triangular, pointed, and pentagonal; octagonal they are also available in various shapes and sizes ^[42]. Microneedles contain ingredients such as hyaluronic acid, Vitamin C, and other ingredients that continue to seep into the skin once they are penetrated in the first two dermal layers. The size of these needles usually ranges from 50 microns long and 20 microns thick, which is less than the width of the strand of the hair. These needles are so small that you can barely see them with your eyes. Therefore, you won't feel any pain or bleeding while using them. Microneedles are

designed in such a way that they make punctures that are equivalent to pinpricks on the skin surface. Skincare products are supposed to penetrate the stratum corneum to reach a deeper layer of the skin known as the dermis. The reason for making such patches is that the outermost layer of your skin also known as the stratum corneum is a barrier composed of tightly packed cells and intercellular lipids. Dissolvable microneedles are a simple way to improve the delivery system of active ingredients deeper into the skin for better results. Dissolvable needles patch bricks the surface of the skin creating small tunnels for the active ingredient to pass through the dermis layer where they can be most effective. This mask act as a great shield to protect nutrients inside a body from escaping and to prevent toxins from entering ^[43].

Invention: Microbiomes for Cosmetics:

The skin acts as the largest organ and the body's first line of defense which protects against toxic environmental factors, such as pollution and UV light. The skin microbiome is considered an integral part of the skin barrier which plays an important role in maintaining the health of the skin.

Probiotics:

Probiotics deals with good bacteria which increases the number of favorable bacteria in the skin.

Prebiotics:

Prebiotics is a type of fiber that the human body cannot digest. It serves as food for the development of Probiotics.

Postbiotics:

It refers to soluble factors produced or metabolized by-products, that are secreted by live bacteria or released after bacterial lysis, such as peptides, enzymes, teichoic acids, polysaccharides, cell surface proteins, and organic acids. They can have a positive effect on skin health.

Skin microbiome:

“The skin microbiome is the billions of bacteria, fungi, and viruses that comprised the skin microbiota”. Nowadays scientists are focusing on undersigning health-enhancing skin products that contain live bacteria, bacteria extract all ingredients which are meant to enhance microbe activity in the skin. There are three main approaches to the microbiome for rebalancing whether protect it or trigger its forgiven benefits. Protecting is related to bookkeeping healthy microbiomes in balance by protecting good bugs and reducing the bad bugs. Triggering is related to the

microbiome to liver aging and its influence on the skin for desired benefits for example providing a precursor for skin whitening isn't active but upon contact with the skin, the microbiome is cleaved and initiates a cascade of events for the desired end results. Examples are Kinship self-reflect Probiotics Moisturizing Sunscreen SPF 32 ^[44].

Microbiome in cosmetics:

Microbiomes' role is to keep our skin healthy. An imbalanced microbiome causes skin problems which lead to pimples, acne, and other skin problems. Acne causes bacteria allergic reactions. Eczema bacteria are produced by an imbalanced microbiome; hence Skincare is important for healthy skin. Skincare products like cleansers, serum, and moisturizer cream help to keep your skin clear and pimple-free. They help us to maintain a balance of good bacteria on our skin or restore it ^[45]. We have a balanced microbiome in the following ways;

- Eat healthily and stay hydrated.
- Identify and remove trigger foods.
- Take care of your gut.
- Be smart about hand sanitizers and harsh soaps.
- Work up a sweat a few times a week.
- Keep your stress levels in check.

Following are some products for maintaining the skin healthy:

- Symbiome is the one restorative cream.
- Biophile BioBarrier nourishing oil.
- Osea Vitamin C probiotics polish.
- Mother dirt moisturizer.
- Marie Veronique Pre plus Probiotics daily mist.
- Aurelia probiotics skincare revitalize and glow Serum.

There are some ways to regrowth our microbiomes ^[46]:

- Eat fiber-rich food.
- Eat more veggies and fruits.
- Eat fermented foods.
- Drink plenty of water.
- Do exercise.
- Meditate for a while.
- Stay happy.
- Follow skincare routine.

NANOTECHNOLOGY:

This is a newly emerging branch of technology that deals with dimensions and tolerances of less than 100 nm, especially the manipulation of individual atoms and molecules.

Applications of nanotechnology:

- The presence of nanoparticles allows enhanced properties such as better skin absorption.
- It also provides UV protection and hydration of the skin.
- It enables us to pack many different ingredients in semi-soluble packets.

The applications of Nanoproducts in cosmetic are presented in Table 2.

CONCLUSIONS:

In conclusion, a wide variety of several materials and techniques have been used for cosmetics products and cosmeceuticals agents for enhancing the scope and cosmetic industrial applications. The product developed using modified technology has been environment friendly and acceptable in all aspects; it has a cheaper cost and meets the consumer's needs.

ACKNOWLEDGEMENT:

I could thankful to our Principal madam Dr. Ashwini Madgulkar for providing facilities and the Library Department of our college for a different journal subscription.

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Table 2. Application and Comments on Nano product preparation.

Nanoparticles	Comment
Nanoemulsion	These are dispersions of Nanoscale droplets in which one liquid is attached to another. These are metastable systems whose structure can be manipulated based on the type of preparation ^[45] .
Liposomes	They are Concentric bilayer vesicles in which the aqueous volume is packed in the bilipid layer composed of natural or synthetic phospholipids which are generally regarded as safe products ^[46] .
Nanocapsules	These are microscopic particles that are made of polymeric capsules which are surrounded by an aqueous or oily core. It has also been seen that the use of nanocapsules 20 degrees is the penetration of UV filter octyl methoxycinnamate when compared with conventional emulsions ^[47] .
Nanocrystals	They have aggregated crystals comprising thousands of atoms that combine into cluster formation typical sizes of these aggregates are between 10 to 400 nm and they exhibit different physical and chemical properties they also allowed safe and effective passage through the skin which provides us deeper penetration ^[48] .
Nanosilver and Nano Gold	These are nano-sized particles that are claimed to be Highly Effective in disinfecting the bacteria in the mouth and also have been added to toothpaste ^[49] .
Dendrimers	These are unimolecular monodisperse micellar structures around 20 nm in size with a well-defined symmetrically observed and a high density of functional and group at Periphery ^[50] .

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Conflict of Interest: None

Source of Funding: Nil

Paper Citation: Gajbe JW*, Vinay L, Saloni K, Gautami V, Akash P, Kalyani C. New Trends of Innovative Emerging Cosmetic Materials. *J Pharm Adv Res*, 2022; 5(4): 1501-1511.