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Review

A Review on Anti Ageing And Anti Acne Cream

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	Abstract
Published on: 17 Nov 2024	This article reviews advancements in anti-aging and anti-acne formulations, emphasizing the scientific mechanisms, contributing factors, and novel treatment methods. Acne, a prevalent dermatological condition, and skin aging, a multifactorial process influenced by intrinsic and extrinsic factors, are examined in detail. The review explores the roles of hormonal fluctuations, oxidative stress, and environmental influences in skin conditions, highlighting the impact of advanced cosmetic and pharmaceutical formulations. The study also presents novel trends in drug delivery systems, such as liposomes and niosomes, which enhance therapeutic efficacy and skin penetration. Through a comprehensive discussion of traditional treatments and cutting-edge technologies, the article provides insights into evolving strategies for managing skin health.
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INTRODUCTION

ACNE

Acne vulgaris or simply known as acne is a human skin disease characterized by skin with scaly red skin (seborrhea), blackheads and whiteheads (comedones), pinheads (papules), large papules (nodules), pimples and scarring [1]. Acne affects skin having dense sebaceous follicles in areas including face, chest and back [2]. Acne may be of inflammatory or non-inflammatory forms [3]. Due to changes in pilo sebaceous units lesions are caused by androgen stimulation. Acne occurs commonly during adolescence, affecting about 80–90% of teenagers in the Western world and lower rate are reported in rural societies [4–7]. Acne is usually caused by increase in androgens level like testosterone mainly during puberty in both male and female [8]. Acne reduces over time and tends to disappear over the age [9, 10]. The large nodules called as cysts and severe inflammatory acne called as nodulocystic

[11]. The cystic acne occurs on buttocks, groin, armpit area, hair follicles and perspiration ducts and affects deeper skin tissue than common acne. Acne causes scarring and psychological effects such as; reduced self-esteem and in rare cases depression or suicide [12, 13]. Reports showed the incidence of suicidal tendency in patients with acne as about 7.1% [14]. Acne usually occurs during adolescence [15]. The word acne refers to the presence of papules, scars, comedones and pustules. The common form of acne is known as acne vulgaris. Many teenagers suffer from this type of acne. Acne vulgaris shows the presence of comedones. Acne rosacea is synonym for rosacea and some persons not have acne comedones associated with their rosacea, hence the term rosacea. Chlor acne occurs due to exposure to polyhalogenated.

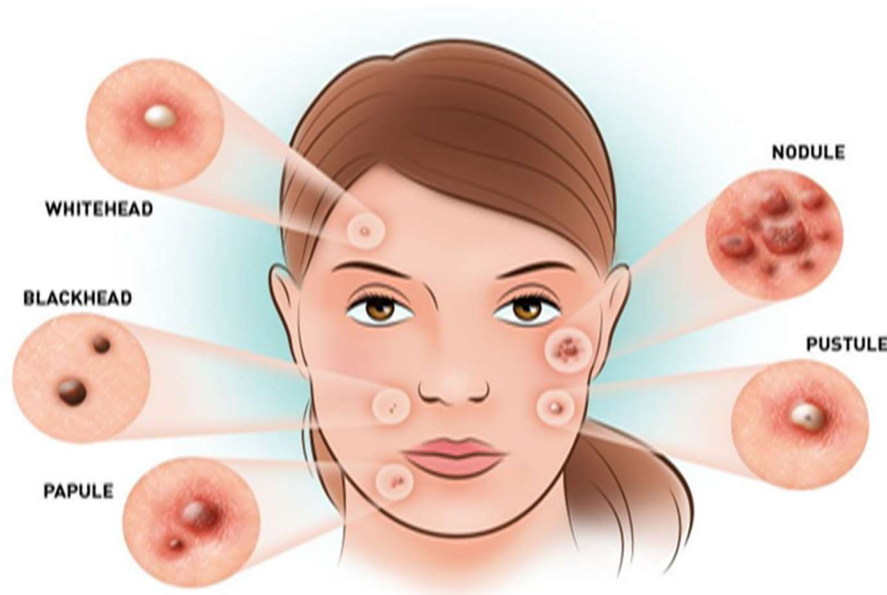


Fig 1: Different Types Of Acne

Human skin has pores (tiny holes) which connect to oil glands located under the skin. The glands are connected to the pores via follicle which are small canals. These glands produce sebum, an oily liquid which carries dead skin cells through the follicles to the surface of the skin. A small hair grows through the follicle out of the skin. Pimples grow when these follicles get blocked, resulting in an accumulation of oil under the skin. The skin consists of tiny holes called pores that can become blocked by oil, filth and bacteria which paves way to develop a pimple or "zit." Under the blocked pore, oil builds up. Skin bacteria then grow very quickly. This infection makes the skin become swollen and red, which becomes visible. And if skin is repeatedly affected by such state, acne may appear but it is not a life-threatening condition, though painful when it turns violent. In human beings the common places acne disease usually occurs are the face, neck, chest, back, and upper arms. Acne that appears on the face chronically may cause permanent scarring, yet not dangerous. Scientists from the Washington University school of medicine found that there are good and bad strains of bacteria that determine the severity and frequency of developing acne. They explained in the journal of investigative dermatology (March 2013 issue) that not all acne bacteria trigger pimples, in fact, one strain they identified can help keep the skin pimple free [2]. To express in a nut shell, skin cells, sebum and hair can clump together into a plug, which gets infected with bacteria resulting in a swelling. A pimple starts to develop when the plug begins to break down.

Fig 2: Factors For Acne

DIFFERENT FACTORS FOR ACNE

Hormonal Changes: Fluctuations in hormone levels, particularly during puberty, menstruation, pregnancy, or due to conditions like polycystic ovary syndrome (PCOS), can contribute to acne. **Excess Oil Production:** Sebaceous glands produce an oily substance called sebum. When these glands produce too much oil, it can clog pores and lead to acne. **Bacteria:** *Propionibacterium acnes* (*P. acnes*) is a type of bacteria that lives on the skin and can cause acne when it proliferates excessively within hair follicles.

Clogged Pores: Dead skin cells and debris can accumulate in pores, leading to blockages that result in acne.

Inflammation: Inflammatory responses within the skin can exacerbate acne. Inflammation can be triggered by factors such as bacteria, irritation, or hormonal changes.

Genetics: A family history of acne can increase one's likelihood of developing the condition. Genetic predispositions can influence factors like oil production and skin inflammation.

Diet: While the link between diet and acne is still under study, certain foods, particularly those high in refined sugars and carbohydrates, may exacerbate acne for some individuals.

Stress: Stress can trigger hormonal changes that may worsen acne. Additionally, stress may lead to behaviors like touching or picking at the skin, which can exacerbate existing acne.

Medications: Some medications, such as corticosteroids, hormonal medications (like birth control pills), and certain antiepileptic drugs, can contribute to acne.

Cosmetics and Skincare Products: Some cosmetics and skincare products contain ingredients that can clog pores or irritate the skin, leading to acne breakouts.

ANTIACNE AND ANTIAGEING 4 Environmental Factors: Exposure to pollutants, humid climates, or certain occupational factors (like exposure to oils or greases) can contribute to acne development.

AGEING

Skin ageing is a process in which skin quality deteriorates with age due to the synergistic effects of chronological ageing, photo-ageing, hormonal deficiency and environmental factors [3]. In skin ageing, there is a reduction in the number of fibroblasts that synthesize collagen and vessels that supply the skin which leads to an increase in laxity and hence forms wrinkles[4](Fig.1). The sun-exposed skin gradually leads to sagging of skin. This leads to the loss of fibril and collagen type VII (Col-7) that retards the bond between epidermis and dermis leading to extrinsically aged skin [5]. Many theories of ageing have been proposed including DNA or genetic theory, free radical theory, neuroendocrine theory, membrane theory, Hay flick limit theory, telomerase theory and mitochondrial decline theory. In intrinsically aged skin, the histological changes occur within the basal cell layer due to the internal influences which produce skin sagging, thinning of skin[6], while in extrinsically sun-exposed aged skin due to the accumulation of abnormal elastic tissue in the mid and deep dermis, the solar elastosis or UV-irradiation, increase in elastin promoter activity which induces the elastin gene transcriptional activity and decreases the fibrillin-1 expression resulting in heavy deposition of elastic fibres, which are dystrophic and shorten. If the lysine derived cross-linked compound increases, then the photoaged skin is confirmed [7]. Generally, there are four types of skin ageing that occurs which include intrinsic ageing and characterized by unblemished, smooth, pale(r), drier, less elastic skin with fine wrinkles [8, 9] and occurs within the tissue itself via reductions in dermal mast cells, fibroblasts, collagen production (Fig. 1) and extrinsic ageing which can be caused due to extreme exposure to sun (i.e., photo-ageing) and various exogenous factors such as pro-oxidant and antioxidant influences on cell turnover via neuro-endocrine-

immune biological response modifiers [10] which affects mainly the face and neck. The third one is photo-ageing which is caused by sunlight which comprises mostly infrared (52-55%), visible (44%) and 3% UV light, which is harmful to the skin and is completely absorbed by the ozone layer [11]. Hormonal ageing is caused by decreased collagen synthesis, skin thickness, skin hydration and epidermal barrier function [12, 13]. Skin ageing can occur at any layer of the skin. There are generally two factors responsible for Skin ageing namely: Internal factor and External Factor. Skin collagen and elastin synthesis decrease by 1%, each year leading to disorganization of connective tissue. This depletion of collagen and elastin cause the development of skin wrinkles in the dermis layer [14].

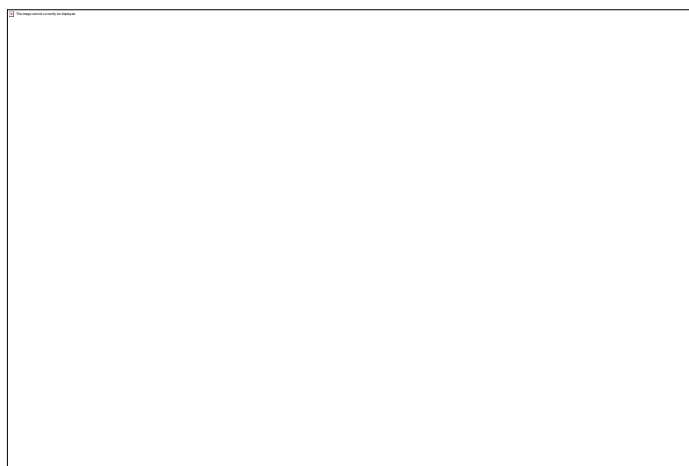


Fig 3: Ageing In Face Difference

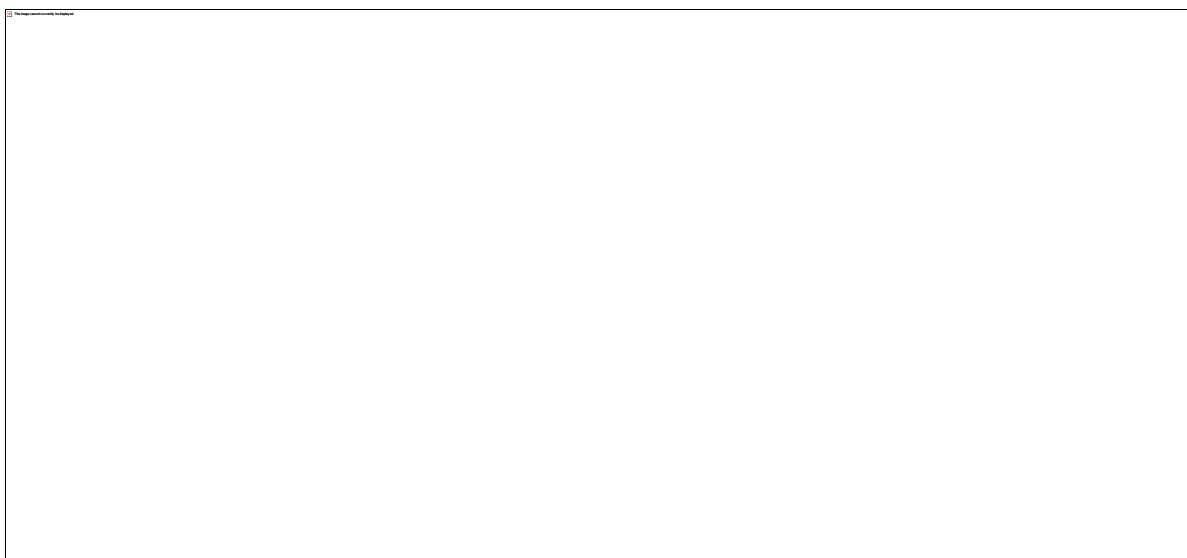


Fig 4: Sign Of Premature Ageing

In the early 1950s, nearly about 205 million people were in the age of 60s and by 2012 it continued to increase to almost 810 million. This number maybe increased to double and reaching up to 2 billion by 2050. Today, 15 countries comprising about 10 million old persons and out of those 15 countries, seven are developing and do not have enough resources for the proper betterment of those people [1]. Between 2010 and 2050 the number of older Individuals were in a smaller amount in the developed countries which expected to extend up to 250% compared to a 71% increase in developing countries. The world's population of people of 60 years of age and older is expected to increase by 22% from 10% (from 800 million to 2 billion) by 2050. Almost, one-fourth person would be older than the age of 60. It has been estimated that over 8% of the population of the Southeast Asian regions are above the age of 60 years [2]. Accordingly, it is expected that age-related diseases will also increase greatly in the coming decades.

DIFFERENT TYPES OF FACTORS FOR AGEINING

The factors are classified two types;

1. Intrinsic factor
2. Extrinsic factor

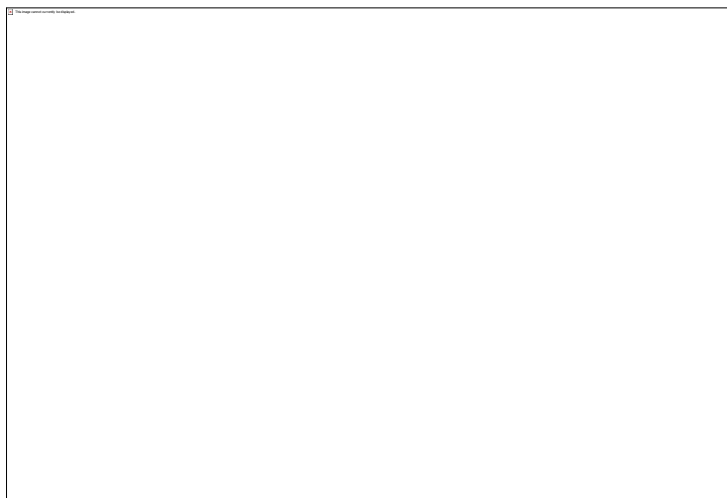


Fig 5: Factors For Ageing

Genetics: Genetic factors play a significant role in determining how quickly and visibly a person ages. Some individuals may have genetic pre dispositions to aggre lated conditions or have genes that influence skin elasticity and collagen production.

Cellular Senescence: As cells divide and replicate overtime, they undergo cellular senescence, approcess where cells stop dividing and become less efficient at performing their functions. This contributes to aging at the cellular level.

Decline in Collagen and Elastin: Collagen and elastin are proteins responsible for maintaining skin structure, elasticity, and firmness. As we age, the production of these proteins decreases, leading to wrinkles, sagging skin, and loss of elasticity.

Hormonal Changes: Changes in hormone levels, particularly during menopause or and ropause ,can contribute to various signs of aging, including changes in skin texture, hair thinning, and decreased bone density.

Sun Exposure: Ultraviolet (UV) radiation from the sun is one of the primary external factors contributing to premature aging. UV radiation damages skin cells, accelerates collagen breakdown, and leads to the formation of wrinkles, age spots, and other signs of photo damage.

Lifestyle Choices: Unhealthy lifestyle habits such as smoking, excessive alcohol consumption, poor diet, lack of exercise, and inadequate sleep can accelerate the aging process and contribute to the development of age-related diseases.

Diet and Nutrition: A balanced diet rich in antioxidants, vitamins, and minerals can help protect against cellular damage and support skin health. Conversely, diets high in processed foods, sugar, and unhealthy fats can promote inflammation and accelerate aging.

Stress: Chronic stress can accelerate aging by promoting inflammation, suppressing the immune system, and contributing to the breakdown of collagen and elastin.

Environmental Factors: Pollution, toxins, and other environmental stressors can damage skin cells and contribute to premature aging. Additionally , exposure to harsh weather conditions such as extreme cold or wind can exacerbate skin aging.

Sleep Quality: Poor sleep quality or in sufficient sleep can impair the body's ability to repair and regenerate tissues, leading to accelerated aging and increased susceptibility to age-related conditions.

DIFFERENT TYPE OF FORMULATION TO BE USED

For Anti-Aging

Topical Creams and Serums: These formulations typically contain active ingredients such as retinoids (e.g., retinol, tretinoin), antioxidants(e.g. ,vitamin C, vitamin E), peptides, and hyaluronic acid. They are applied directly to the skin to target wrinkles, fine lines, and other signs of aging.

Moisturizers: Moisturizers play a crucial role in maintaining skin hydration and barrier function, which can help reduce the appearance of wrinkles and promote skin elasticity. Some moisturizers also contain anti-aging ingredients such as peptides and ceramides.

Sunscreen: Sunscreen is essential for preventing photo aging caused by UV radiation. Broad-spectrum sunscreens with SPF 30 or higher protect the skin from UVA and UVB rays, thereby reducing the risk of wrinkles, age spots, and other signs of sun damage.

Oral Supplements: Oral supplements containing vitamins, minerals, antioxidants, and collagen peptides are marketed for their anti-aging benefits. These supplements claim to support skin health, promote collagen production, and protect against oxidative stress.

Medical Procedures: Medical procedures for anti-aging purposes include botulinum toxin injections (e.g., Botox), dermal fillers (e.g., hyaluronic acid fillers), chemical peels, laser resurfacing, micro needling, and radiofrequency. These procedures target wrinkles, sagging skin, and other age-related concerns.

For Anti-Acne

Topical Treatments: Topical treatments for acne include creams, gels, lotions, and solutions containing active ingredients such as benzoyl peroxide, salicylic acid, retinoids (e.g., tretinoin, adapalene), antibiotics (e.g., clindamycin, erythromycin), and azelaic acid. These formulations target acne lesions, reduce inflammation, and prevent new breakouts.

Oral Medications: Oral medications may be prescribed for moderate to severe acne or for cases that are resistant to topical treatments. Common oral medications for acne include oral antibiotics (e.g., doxycycline, minocycline), hormonal medications (e.g., birth control pills for women with hormonal acne), and isotretinoin (Accutane), a powerful retinoid medication used for severe, nodular acne.

Cleansers and Exfoliants: Cleansers containing salicylic acid or benzoyl peroxide can help remove excess oil, dirt, and dead skin cells, preventing clogged pores and acne breakouts. Exfoliants containing alpha hydroxy acids (e.g., glycolic acid, lactic acid) or beta hydroxyl acids (e.g., salicylic acid) help unclog pores and promote cell turnover.

Light Therapy: Light-based therapies such as blue light therapy and photodynamic therapy (PDT) are used to target the bacteria (*Propionibacterium acnes*) that contribute to acne. These treatments can reduce inflammation and improve acne lesions.

Medical Procedures: Medical procedures for acne treatment include chemical peels, microdermabrasion, and corticosteroid injections for large, inflamed acne lesions (cysts or nodules). Other treatments include retinoids, benzoyl peroxide, salicylic acid, and isotretinoin. Li-Wei (2011)

NOVEL TRENDS FOR ANTI-AGING

Several approaches have been developed to weaken this skin barrier. One of the approaches to achieve increased skin penetration of drugs and other cosmetic chemicals is through the use of vesicular systems, such as liposomes and niosomes. These carriers can act as drug reservoirs showing several advantages over conventional dosage forms. The major disadvantage of transdermal and dermal drug delivery is the poor penetration of most compounds across human skin. The main barrier of the skin is located within its uppermost layer, the stratum corneum (Carlotta *et al.*, 2011)

Cosmetic pharmaceuticals, or cosmeceuticals, are cosmetic products that contain biologically active ingredients and claim to have medicinal or drug-like benefits. Like cosmetics, cosmeceuticals are topically applied, but they contain ingredients that influence the biological function of the skin (Singhal *et al.*, 2011). This innovative reference highlights the uses of delivery systems in cosmetics, analyzing new approaches for obtaining sophisticated cosmetic products and examining the most common methods for enhancing the skin's penetration properties. More and more developments in delivery systems are being integrated to optimize the efficacy and cost effectiveness of the therapy. In cosmetics, the main concern is to reach cutaneous cells while limiting the passage into the blood circulation. Depending on the composition, a vehicle is used to exert mainly five types of effects on the skin: cleansing, decoration, care, hydration and protection. Carrier technology offers an intelligent approach for drug delivery by coupling the drug to a carrier particle such as nanoparticles, microspheres, liposomes, etc. which modulate the release and absorption characteristics of the drug. Almost all the major cosmetic manufacturers use novel delivery systems in their products. The application of novel delivery systems in cosmetic products has been the subject of continuous discussion in the media, scientific circles and among policy makers for the past few years. There are a number of classes of novel delivery technologies used, or proposed for use, in cosmetic applications. Further, the products launched by various cosmetic giants will be discussed at length (Nageen *et al.*, 2012). Advances in Cosmetic Formulation Technology There are a number of innovative cosmetic delivery systems used in cosmetic products. A cosmetic delivery

system is a composition or a process that can enhance perceptual or measured performance of cosmetic product (Mufti *et al.*, 2002). A pointed discussion of a select group of delivery systems (Table 3) of current interest shall be presented in this article.

CONCLUSION

Today's in our society every person wants to enhance their health and beauty. This report we have studied the Anti-aging preparation which enhance persons appearance. Thus anti-ageing formulations are becoming increasingly popular. There are a number of companies utilizing the novel approaches for the preparation of antiageing products in the market which due to their unique property of beneficial delivery to the skin renders extended efficacy. Thus, now days the novel approaches for drug delivery system has been given a great opportunity with a main focus on anti-aging cosmetics.

REFERENCES

1. Barnett JM and Scher RK. Nail cosmetics. *Int J Dermatol*. 1992;31: 675.
2. Buckton G and Harwood. *Interfacial phenomena in Drug Delivery and Targeting Academic Publishers, Switzerland*. 1995;154-155.
2. Carafa M, Marianecchi C, Lucania G, Marchei E and Santucci E. New vesicular ampicillin-loaded delivery systems for topical application: characterization, in vitro permeation experiments and antimicrobial activity. *J Contr Rel*. 2004;95: 67-74.
3. Carlotta M, Maria C, Luisa DM, Federica R, Chiara DM, Franco A, Pietro M and Tommasina C. A New Vesicle-loaded Hydrogel System Suitable for Topical Applications: Preparation and Characterization. *J Pharm Pharmace Sci*. 2011;14(3): 336-346.
4. Cevenini E, Invidia L, Lescai F, Salvioli S, Tieri P and Castellani G. Human models of aging and longevity. *Expert Opin Biol Ther*. 2008;8:1393-405.
5. Costin GE and Hearing VJ. Human skin pigmentation: Melanocytes modulate skin color in response to stress. *FASEB J*. 2007;21:976-994.
6. De Gray AD. The foreseeability of real anti-aging medicine: focusing the debate. *Exp Gerontol*. 2003;38: 927-34.
8. Draelos ZD. What is anti-aging? *J Cosmetic Dermatol*. 2007;6:73-4.
9. Di Marzio L, Marianecchi C, Petrone M, Rinaldi F and Carafa M. Novel pHsensitive non-ionic surfactant vesicles: comparison between Tween 21 and Tween 20 Colloids and Surface B: Biointerfaces. 2011;82:18-24.
8. Hussein MR. Ultraviolet radiation and skin cancer: Molecular mechanisms. *J Cutaneous Pathol*. 2005;32:191-205.
13. Joshi B, Agrawal P, Sahu D and Dashora A. Antiaging Cosmetics. *J Drug Del Ther*. 2013;3(3):158-162.
9. Kuno N and Matsumoto M. Skin beautifying agent, antiaging agent for skin, whitening agent and external agent for the skin. US Patent No. 6682763 B2.
10. Lasic DD. Novel Applications of Liposomes. *Trends Biotechnol*. 1998;16(7):307-321.
16. Lakshmi PK and Devi GS. Niosomal Methotrexate Gel in the Treatment of Localized Psoriasis: Phase I and Phase II Studies. *Indian J Dermatol Venereol Leprol*. 2007;73(3):157-
11. Lawrence MJ and Rees GD. Microemulsionbased media as novel drug delivery systems. *Adv Drug Deliv Rev*. 2000;45(1):89-121.
18. L'Oréal. Procédé de fabrication de dispersions aqueuses de spérules lipidiques et nouvelles compositions correspondantes French Patent 2315991,1975
12. L'Oréal. Cosmetic and pharmaceutical compositions containing niosomes and a watersoluble polyamide, and a process for preparing these compositions, US Patent 4830857,1989.
13. Masotti A, Vicennati P, Alisi A, Marianecchi C, Rinaldi F, Carafa M and Ortaggi G. Novel Tween® 20 derivatives enable the formation of efficient pHsensitive drug delivery vehicles for human hepatoblastoma. *Bioorganic and Medicinal Chemistry Letters*. 2010;2: 3021-3025.
14. Maibach HI and Choi MJ. Liposomes and niosomes as topical drug delivery systems. *Skin Pharmacol Physiol*. 2005;18:209-219.
22. Mithal BM and Saha RN.
15. A Handbook of Cosmetics. Vallabh Prakashan, New Delhi, 2006;1st Edn:12-17.
23. Moussaoui N, Cansell M and Denizot A. Marinosomes, marine lipid-based liposomes: Physical characterization and potential application in cosmetics. *Int J Pharm*. 2002;242:361-
16. Mufti J, Cernasov D and Macchio R. New Technologies in Topical Delivery Systems. *Happi*. 2002;39:75-82.
25. Muller RH, Radtke M and Wissing SA. Solid lipid nanoparticles (SLN) and nanostructured lipid carriers (NLC) in cosmetic and dermatological preparations. *Adv Drug Deliv Rev*. 2002;54: S131-S155

17. Nacht S. Encapsulation and other topical delivery systems. *Cosmet Toil*.1995;110:25–30. 2
18. Nageen A, Agarwal S and Murthy RSR. Latest Technology Advances in Cosmaceuticals. *Int J Pharma Sci Drug Res*. 2012;4(3):168-182. 28. Palm MD and O'Donoghue. Update on photoprotection. *Dermatol. Ther*. 2007;20:360-376.
19. Parison V. Active delivery from nylon particles. *Cosmet Toil*. 1993;108:97– 100. 30. Redziniak G and Perrier P. Cosmetic applications of liposomes. In: *Microencapsulation: Methods and Industrial Applications*. Edited by Benita S. Marcel Dekker Inc, New York. 1996;577–579.
20. Ruta G, Aikaterini IL, Athanasios T, Evgenia M and Christos CZ. Skin antiaging strategies. *Derma. Endo*. 2012;4(3):308-319