IJBPAS, October, 2022, 11(10): 4537-4556

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

COSMETICS: A BRIEF PRODUCT DEVELOPMENT REGULATORY OVERSIGHT IN UNITED STATES

VIKASH P* AND KOUSHIK Y

Department of Regulatory Affairs, Chalapathi Institute of Pharmaceutical Sciences (AUTONOMOUS), Guntur, Andhra Pradesh, 522 034, India

***Corresponding Author: Vikash Penki: E Mail: vikashpenki39@gmail.com**

Received 18th Dec. 2021; Revised 24th Jan. 2022; Accepted 16th March 2022; Available online 1st Oct. 2022

https://doi.org/10.31032/IJBPAS/2021/11.10.6455

ABSTRACT

The use of cosmetic products and their market growth in the United States has been evolved since the passage of the Food, Drug, and Cosmetics Act in 1938. Cosmetics have an impact on the global economy as well as the social life freedom of people all over the world. Since the Decades, the cosmetics industry and the U.S.FDA have struggled with laws, legislations, guidance & regulations over cosmetics to ensure the safety, quality, and efficacy of products intended to use by consumers. Cosmetics in the United States are governed less strictly than drugs and do not require FDA notice or premarket authorization. Cosmetic manufacturers on the contrary are needed to prove the safety of their products before releasing them to the market. This manuscript attempts to examine the extant regulatory position of cosmetic products, clinical advancement, registration, marketing, and approvals in the United States excluding children's cosmetics, Soaps, and OTC drug products.

Keywords: Cosmetics, Market, Pharmacovigilance, Registration, Safety, Voluntary Cosmetic Registration Program (VCRP)

INTRODUCTION

The Food and Drug Administration (FDA) is the regulatory body responsible for cosmetic product regulation and enforcement. The FDA established the guidelines to be followed and maintains its type of control over compliance with them through legislative rules and guidance papers that elucidate legislation. Cosmetics are defined as "products destined to be applied, sprinkled, poured, introduced into

and rubbed on the human body for ablution, enhancing beauty and charm, or modifying the appearance" by the Federal Food, Drug, & Cosmetic Act (FD&C Act). Here are some examples of cosmetic products: Makeup Products, Deodorants, moisturizers, Face scrubs, etc. The U.S.FDA is not only focusing on import and domestic production but also regulating the research occurring on cosmetic products thereby producing safe and high efficacy commodities for the benefit of human use. Some products that we generally interpret as cosmetics, on the contrary, can be governed as drugs. The FD&C Act can define a drug based on its intended use, among other factors. Cosmetics regulation is comparable to that of food and medications, yet it also differs significantly. Cosmetics and their constituents, unlike pharmaceuticals, do not require pre-market approval, except for some color additives. The U.S.FDA brought regulations on the safety of the color additives by implementing a safety testing program **[1-4]**. This manuscript will explore and addresses the laws & legislations, registration, science & research, labeling guidance and will investigate how the U.S.FDA currently governs them.

COSMETIC PRODUCTS AND INGREDIENTS

Based on the duration of skin application & its methods, all cosmetic products were divided into three categories which are as follows:

- Short Duration/Rinse-off Products – Toothpaste, Shaving Creams, Face Scrubs, etc
- Medium Duration/Leave-on Products – Moisturizers, Sunscreens, Perspirants, etc
- Long Duration/Make-up Products – Foundation, Lip Sticks, Mascara, etc
- Life-Long/Permanent Make-up - Tattoos

Generally, cosmetic products containing ingredients do not require any FDA approval for manufacturers to market their products to the public. There is an exception for a few of the ingredients that we will discuss below **[5]**.

Hair Dyes–The Food and Drug Administration in U.S has found that there is no scientific data on the use of lead acetate in cosmetics meant for coloring hair due to its hazardous nature to consumers and they reformed the new color additive regulations on using lead acetate. For use of color additives in cosmetics, manufacturers need FDA approval for permission into the market except for coal-tar hair dyes (as per FD&C Act) **[6-8]**.

Makeup- The FDA considers intradermal tattoo inks, including

permanent makeup, to be cosmetics. Colour additives, such as the pigments used in the inks, for lipsticks, foundation, mascara, etc require premarket approval under the Federal Food, Drug, and Cosmetic Act **[9]**.

Nail Products - The Food and Drug Administration regulates nail products for both home and salon usage. These products are normally regulated as cosmetics under the Federal Food, Drug, and Cosmetic Act (FD & C Act). No regulation specifically prohibits the use of ingredients like Acetonitrile in artificial nail removers, Formaldehyde in Nail removers, etc in cosmetic products **[10]**.

Soaps & Lotions- Regarding how they are manufactured or how they are meant to be used, cleansing products, many of which are advertised as "soap," maybe cosmetics or drugs regulated by the FDA or consumer products governed by the Consumer Product Safety Commission (CPSC) **[11]**.

'Organic' Cosmetics- In the United States, the Department of Agriculture (USDA) has an efficient marketing service for organic products which is called Agricultural Marketing Service and both supervised the National Organic Program (NOP). Cosmetics with organic declaration must adhere to both USDA and FDA regulations for organic claims as well as labeling and safety code standards for cosmetics **[12]**.

However, the FDA provides a list of ingredients that are prohibited in cosmetic products, including Bithionol, Mercury Compounds, Vinyl Chloride, Halogenated Salicylanilides, Zirconium, and Methylene Chloride. The FDA commissioner makes aerosol cosmetic products like Zirconium & Vinyl Chloride are deemed to be adulterated products due to showing side effects to consumers. Cosmetics containing Bithionol has been used as an antibacterial agent, but the new clinical evidence shows that it causes photosensitivity and is deemed to be adulterated as well for other cosmetic ingredients. Hence companies and individuals who manufacture or sell cosmetics have a legal obligation to ensure that their products are safe. To ensure the safety of the products containing ingredients the manufacturers must introduce a self-regulatory safety program for cosmetic ingredients **[13-15]**.

COSMETIC GUIDANCE AND REGULATION

Laws & Regulations

FDA is responsible for enforcing laws enacted by Congress and issuing regulations to carry out its legislative authority as authorized by Congress. Regulations have the power to create legally binding obligations **[16]**. The U.S.FDA mainly enforces three laws and regulations for cosmetics which are as follows:

(1) Federal Food, Drug, and Cosmetic Act
(2) Fair Packaging and Labeling Act
(3) Microbead-Free Waters Act of 2015

Federal Food, Drug and Cosmetic Act

The Federal Food, Drug, and Cosmetic Act (shortened as FFDCA, FDCA, or FD&C) is a set of laws enacted by Congress in 1938 that authorizes the Food and Drug Administration (FDA) to supervise the safety of food, medicines, medical devices, and cosmetics. The FDA also established the Drug Efficacy Study Implementation (DESI) to incorporate suggestions from a National Academy of Sciences investigation assessing the efficacy of previously marketed products into FD&C rules. In the Federal Food, Drug, and Cosmetic Act…they discussed the adulterated and misbranded cosmetics and their regulations which we already mentioned in the cosmetic products and ingredients section. The FDA shall proclaim regulations exempted from any labeling requirement of this cosmetics that are, in compliance with trade practice, to be processed, labeled, or sorted in significant amounts at establishments other than those where they were formerly processed or packed, provided that such cosmetics are not adulterated or misbranded upon removal from such processing, labeling, or repacking establishments **[17-19]**.

Fair Packaging and Labeling Act

The Fair Packaging and Labeling Act is a United States law that governs the labels on a wide range of consumer products. The label must include the following information: the product's identity, the manufacturer, packer, or distributor's name and address, and the net quantity of the contents. Below are the requirements for fair packaging and labeling of products **[19-21]**.

Prohibition of Unfair and Deceptive Packaging and Labeling: Apart from persons engaged in business as retail and/or wholesale distributors of consumer commodities, anyone involved in the packaging or labeling of any consumer commodity for distribution in commerce, or in the distribution in commerce of any packaged or labeled consumer commodity, is prohibited from doing so.

Requirements of Labeling: The product bearing label must include the identity of the product and identity & business address for manufacturing, Packing, and Distribution. The manufacturer should give a Statement of contents of quantity incorporate in the commodity that is ready for marketing.

Supplemental statement of quantity: If any defining statements exist in concert with the separate statement of the net quantity of contents required, no person subject to the restriction may distribute or

cause to be supplied in commerce of any packaged consumer item.

Microbead-Free Waters Act, 2015

Commencing on January 1, 2018, the Microbead-Free Waters Act of 2015 proposes to amend the Food, Drug, and Cosmetic Act to prohibit the sale of rinse-off cosmetics, including toothpaste, that contain purposefully added synthetic microbeads, as well as the manufacture of these cosmetics' outset on July 1, 2017. A plastic microbead is a solid plastic particle with a diameter of fewer than five millimetres that is used to detoxify the human body **[22]**.

GUIDANCE DOCUMENTS

Guidance documents portray the FDA's new status on a specific topic. They do not establish or impose any rights for or on anybody, and they do not bind the FDA or the public. Manufacturers may employ a different technique if it meets the standards of the applicable legislation and regulations **[23-25]**. The following are the guidance documents meant for the industry to prepare a cosmetic commodity by the Center for Food Safety and Applied Nutrition, Office of Cosmetics and Colours are:

Guidance for Industry: Lead in Cosmetic Lip Products and Externally Applied Cosmetics: Recommended Maximum Level - In this guidance FDA recommends a maximum level of lead as an impurity is 10 ppm and they recommended this maximum level of lead in cosmetic lip products and topically applied products will cause no medical issue. We believe that the proposed limit lead level is possible with adequate/good manufacturing processes and is commensurate with the 10-ppm maximum lead level established by other nations for similar items. This regulation applies to cosmetic lip products as well as externally applied cosmetics sold in the United States. This guidance does not apply to transdermal delivery drugs or hair dyes containing lead acetate as an active component **[26]**.

Guidance for Industry: Cosmetic Good Manufacturing Practices- This guidance updates the "Cosmetic Good Manufacturing (GMP) Guidelines/Inspection Checklist" to reflect current practice and clarify specific topic areas based on recent experience. Furthermore, the FDA agreed to modify this guideline in the context of the present International Organization for Standardization (ISO) standard for cosmetic GMPs as part of an international harmonization effort with the International Cooperation on Cosmetic Regulations (ICCR) (ISO 22716:2007). The FDA investigates & reviewed to add, amend, or remove certain parts of ISO 22716 based on the complete analysis of these documents **[27-29]**.

Guidance for Industry: Safety of Nanomaterials in Cosmetic Products- The purpose of this guidance document is to aid industries and other stakeholders in finding possible safety risks with nanoparticles in cosmetic goods and providing a framework for assessing them. This guideline also includes manufacturers and sponsors' contact data who want to address FDA safety concerns about the use of certain nanomaterials in cosmetic goods. The FDA provided a study on cosmetic items developed by its Nanotechnology Task Force ("Task Force") in July 2007. The Task Force report provides an analysis and evaluation of scientific and regulatory concerns relevant to the safety and efficacy of FDA-regulated goods utilizing nanomaterials. For the safety of Nanomaterials in cosmetic products, the manufacturers must use the traditional safety assessments which include product material characterization and toxicology. The current paradigm is for assessing safety, sufficiently durable and adaptable to be suitable for a wide range of materials, including nanomaterial-containing products **[30-32; 57-59]**.

Guidance for Industry: Labeling for Cosmetics Containing Alpha Hydroxy Acids[AHA's] -The Cosmetic, Toiletry, and Fragrance Association's Cosmetic Ingredient Review Expert Panel, the FDA's AHA Review Committee, and the FDA began reviewing the safety of topically applied AHAs in cosmetic products in 1994. The researchers examined human clinical data, which show that topically applied AHAs enhance skin sensitivity to UV radiation during application and that this heightened skin sensitivity to UV radiation declines after a week of discontinuation. The goal of this guidance is to guide consumers about the possibility of increased skin vulnerability to the sun caused by the topical use of cosmetics incorporating AHAs as ingredients, as well as to educate manufacturers about how to assure that their labeling for cosmetic products containing AHAs as ingredients is not false or misleading **[33-34]**.

FDA's guidance documents, including the above guidance, do not establish legally enforceable responsibilities. Instead, the guidance expresses the Agency's conventional understanding of a subject and should only be regarded as opinions unless precise regulatory or legislative requirements are specified **[35-36]**.

COSMETIC LABELING

Labeling Regulations

Proper labeling is a crucial element of launching a cosmetic product into the market. Cosmetic labeling is regulated by the FDA under the authority of the Federal Food, Drug, and Cosmetic Act (FD&C Act) and the Fair Packaging and Labeling Act

(FPLA). These rules and regulations are meant to protect customers from health implications and misleading tactics, as well as to assist consumers in making educated product purchasing decisions. A proper label is having two label panels that contain an identity statement and an accurate statement of the net quantity of contents in the Principal Display Panel as well manufacturer information, distributor statement, ingredients, warning & cautions statements in Information Panel. In terms of the restriction on false or misleading claims, no cosmetic may be labeled or commercialized with claims implying that the product has been authorized by the FDA **[37-39]**.

Labeling Claims

Cosmetic labeling must be accurate and not deceptive. Drugs seem to be products that are meant to alter the structure or function of the body, or for a medical purpose, such as treating or preventing disease. Some cosmetic products claim on their label that Alcohol-Free, Cruelty-Free, Non-Hypoallergenic, and Organic by the manufacturer to ensure safety for the consumers intended to be used **[40]**.

Expiration Dating

Under current US law, there are no guidelines or standards for cosmetic manufacturers to publish expiration dates or specific shelf life on the labels of cosmetic items, but cosmetic companies are responsible for the safety of their products **[41].**

Tamper-Resistant Packaging

A tamper-resistant packaging employs a warning or obstruction to the entrance that, when violated or misplaced, clearly indicates to customers that tampering has happened. To decrease the possibility of tampering with a tamper-resistant component, the warning or obstruction to entrance must be distinguishable by design (e.g., an aerosol product container) or by the usage of a recognizing attribute (e.g., a registered trademark). Cosmetic liquid oral hygiene products or vaginal products that lack tamper-resistant packaging or are improperly labeled are deemed adulterated **[42]**.

REGISTRATION PROGRAM

Unlike registration of pharmaceutical products/Drugs, the registration process for cosmetics is voluntary and called Voluntary Cosmetic Registration Program (VCRP). The FDA's Voluntary Cosmetic Registration Program (VCRP) is a reporting system for cosmetic product manufacturers, packers, and distributors for marketing authorization in the United States. The VCRP filing has two parts where 21 CFR part 710 discusses Voluntary Registration of Cosmetic Product Establishments and 21 CFR part 720 deals about Voluntary Filing of Cosmetic Product Ingredient Composition

Statements.

The proprietor or manufacturer that engages in the production or packing of cosmetic products should submit Form FD-2511, which requests manufacturer and/or packer information, for Registration of Cosmetic Product Establishment. There is no registration charge, and the proprietor of a cosmetic product firm must register within 30 days of the activity beginning. For Filing Cosmetic Product Ingredient Composition Statement, the manufacturer, packer, or distributor must seek to submit Form FD-2512 whether the cosmetic product enters interstate commerce. The Form FD-2512 gives information about manufacture data, brand name, product category, and ingredients present in it. Any product not covered within the 180 days should be filed on Form FD 2512 within 60 days of its commercial release. There is no filing fee is required. For confidentiality of statements, the owner must submit separate forms that were handled separately **[43-46]**.

Amendments

To update the registration, a new Form FD-2511 must be filed within 30 days of any modification in the information included on a previously completed Form FD-2511. Changes to a cosmetic product's information must be reported by filing an updated Form FDA 2512 within 60 days after the product's commercial distribution. Other modifications may not necessitate immediate revision but should be documented by filing an updated Form FDA 2512 within a year of the occurrence of such changes. Form FDA 2514 should be used to file a notice of discontinuation of commercial distribution of a cosmetic product formulation within 180 days of the discontinuance of commercial distribution becoming known to the person filing **[43-46]**.

MARKETING AUTHORIZATION APPROVAL

Before going into the market/interstate commerce, the cosmetic products and ingredients other than color additives do not require to have FDA approval but there are laws we already mention above (FFD&C Act; FPLA) that should be followed and maintained. A cosmetic product Registration certificate shall be valid for 3 years from the date of issuance **[47-49]**.

COSMETICS INTERNATIONAL ACTIVITIES

The FDA participates actively in international cosmetics operations, assuring that their public health mandate remains their top priority while considering industry and other stakeholder concerns. Because of the globalization of the cosmetics sector, the FDA has been involved in a variety of multinational cosmetic operations.

Imports

To oversee imports, the FDA works

collaboratively with U.S. Customs and Border Protection (CBP). Imported cosmetics are exposed to CBP inspection at the point of entry. Cosmetics that appear to be tainted or misbranded may be denied entry into the United States. They must be brought into conformity, discarded, or shipped again. In addition, Import Alerts are issued by the FDA to notify inspectors of developments in breaches. Entities importing only cosmetics into the United States are not needed to register with the FDA, nor is a registration number required for importing cosmetics into this nation. The FDA invites both domestic and international cosmetic companies to register with their Voluntary Cosmetic Registration Program (VCRP) and file Cosmetic Product Ingredient Statements, although as the name implies, participation in this program is voluntary, not necessary **[50]**.

Exports

The manufacturer who wants to export his cosmetic product should apply a certificate through the Center for Food Safety and Applied Nutrition web-based Certificate Application Process (CAP). The CFSAN Export Certification Application and Tracking System (CFSAN eCATS), which may be accessible through the FDA Industry Systems, contains two modules: CAP and CFSAN eCATS. While seeking an export certificate the FDA system will ask whether the certificate is Product-specific or general. Cosmetic Certifications of Free Sale or other forms of cosmetic certificates are not issued by the FDA. No one should modify the terms in the certificates and do not notarize them.FDA may require multiple weeks to complete requests for cosmetic export certifications. After completion of the process, they will approve and grant a certificate for exporting the cosmetic product to other nations **[51]**.

COMPLIANCE AND ENFORCEMENT

Warning Letters/Statements

FDA provides Warning Letters to inform businesses that they have broken the laws they implement and to advise them on how to rectify the problem. FDA Warning Letters may have been exposed to follow-up interactions between FDA and the letter's receiver, which may have impacted the regulatory status of the concerns highlighted in the letter **[52]**. The cosmetic manufacturer must provide warning statements for the safe use of hazardous products and will mention the directions to use. Here below we are going to mention some of the guidances along with warning statements **[53]**.

- Cosmetic Product Labeling in the absence of Adequate Substantiation - The warning statement should be

like "The product safety has yet to be confirmed".

- Cosmetic Product Labeling when they are in Self-Pressurized Containers -The warning statement should be like "Avoid contact with eyes. Pressurized. Do not rupture it or burn up. Store at temperature below 120º F. Keep out of reach of children".
- Cosmetic Product Labeling for Feminine Deodorant Sprays – The caution must be like "Only for external use. Spray at least 8 inches away from the skin. Do not use on skin that is injured, sensitive, or itchy. If a rash, irritation, or discomfort arises, discontinue usage immediately".
- Cosmetic Product Labeling for Coal Tar Hair Dyes Posing a Risk of Cancer – The warning must be like "Contains a substance that can permeate your skin and has been shown in laboratory animals to cause cancer".

PHARMACOVIGILANCE

Adverse Event Reporting System

Any one of these can report an adverse event if they find it while using the product i.e., Consumer, Health care provider, Council, or member of the cosmetic industry. To report a complaint or adverse event about the cosmetic product, one could report through the following pathways **[54-55]**:

(1) Can call to FDA Consumer Complaint Coordinator
(2) Can submit Electronic Voluntary MedWatch Form through the online
(3) Can submit Paper Voluntary MedWatch Form through the mail

SCIENCE AND RESEARCH

Along with all the above, the FDA also focuses on researching safety assessment of the product as well on the use of Nanomaterial in cosmetic products without any harm to the consumers. For research material or guidance of nanomaterials for use in cosmetics.... check this guidance – Guidance for Industry: Safety of Nanomaterials in Cosmetic Products [56]. Along with the safety of nanomaterials in cosmetics, the manufacturer must focus and implement a new regulation on the safety of cosmetics to get rid of biological and physicochemical deterioration **[57-58]**. Also, the researchers researched herbals to procreate safe and efficacy herbal Cosmetics **[59-60]**. Apart from all these, the researchers bring new outcomes to ensure the quality control testing of cosmetic products for the consumer's beneficence **[61]**.

Table 1: Cosmetic Overview in the United States

Parameters	Description	References
Regulatory Authority	**United States Food and Drug Administration**	**[63,65]**
Regulations Followed	**Federal Food, Drug and Cosmetic Act(FFD&C), Fair Packaging and Labeling Act(FPLA), Microbead Free Water Act (MFWA)**	**[62,65]**
Classification of Cosmetic Product	**Short Duration/Rinse-off Products, Medium Duration/Leave-on Products, Long Duration/Makeup Products, Life-Long/Permanent Makeup Products**	**[5]**
Guidance Documents	**Guidance for Industry: Lead in Cosmetic Lip Products and Externally Applied Cosmetics: Recommended Maximum Level, Guidance for Industry: Cosmetic Good Manufacturing Practices, Guidance for Industry: Safety of Nanomaterials in Cosmetic Products, Guidance for Industry: Labeling for Cosmetics Containing Alpha Hydroxy Acids, Guidance for Industry: Labeling for Cosmetics Containing Alpha Hydroxy Acids**	**[26-27,31,33-34,62,66]**
Labeling	**Should comply with FFD&C Act and FPLA Act**	**[63]**
Labeling Declarations	**FDA 21 CFR Part 701 – Labeling guidance, FDA 21 CFR Part 740 – Warning statements/Cautions placed on the label**	**[65,67]**
Label Language	**English**	**[65]**
Expiry Date	**No Date Required, indicated as 'Use before Date'**	**[63]**
Regulations for Safety Use of Colour Additives	**21 CFR Part 73 – Listing of Colour Additives Exempt from Certification, 21 CFR Part 74 – Listing of Colour Additives Subject to Certification, 21 CFR Part 81 – General Specifications and General Restrictions for Provisional Colour Additives for Use in Foods, Drugs, and Cosmetics, 21 CFR Part 82 - Listing of Certified Provisionally Listed Colours and Specifications**	**[65,67]**
Assurance of Safety of a Cosmetic	**Responsibility of Manufacturer**	**[64,65]**
Cosmetic Ingredient Review	**Required**	**[64]**
Safety Cautions/ Warning Statements	**On Principal Display Panel**	**[65]**
Pre-Market Approval	**Not Required**	**[63]**
Post Marketing Report System	**Voluntary Cosmetic Registration Program (VCRP)**	**[62,63,65]**
Registration Filing Forms& Timeline	**Form FD-2511: Registration of Cosmetic Product Establishment (within 30 days), Form FD-2512: Filing Cosmetic Product Ingredient Composition Statement (within 60 days)**	**[46]**
Registration Fee	**NIL**	**[42]**
Registration Certificate Validity	**3 years**	**[42]**
Adverse Event Reporting System/ Complaint System	**FDA Consumer Complaint Coordinator (Contact), e-voluntary MedWatch Form (Online), Paper Voluntary MedWatch Form (Mail).**	**[54,62]**

CONCLUSION

From the beginning of the cosmetic era, In the U.S many regulations came over to control the standards of cosmetic products, sales, distribution, and safety guidance. Despite all these regulations, providing a safe and efficacy product to the consumers is the preliminary objective of this country. This manuscript accomplishes and shows the U.S. regulatory authority developed &

current laws, regulations, guidance documents, Labeling, Marketing, Pharmacovigilance, adverse event reporting, and safety of the cosmetic products. With all these considerations, the United States government marketed a product that includes safe components and safe Labeling to guarantee that the marketed product demonstrates safe, quality, and efficacy requirements to customers.

AUTHORS' CONTRIBUTIONS

V.P. raised the basic theme and extracted the information for writing the paper. He was a major contributor in writing the manuscript. Y.K. and R.R.N. provided guidance for content selection and referencing and provided guidance for terms and language use and shared certain tips to minimize plagiarism. All the authors read and approved the final manuscript.

FUNDING

No funding sources.

CONFLICTS OF INTEREST

The author(s) declared no potential conflicts of interest concerning the review, authorship, and/or publication of this review article.

ETHICS STATEMENT

This article does not contain any studies with human and animal subjects performed by any of the authors.

REFERENCES

[1] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetics Laws & Regulations. [Cited 2021 May 17]. Available from: https://www.fda.gov/cosmetics/cosmetics-laws-regulations/fda-authority-over-cosmetics-how-cosmetics-are-not-fda-approved-are-fda-regulated.

[2] McNamara SH, Hyman, Phelps. Regulation of Cosmetics in the United States – An Overview. In: Estrin NF, editor. *The Cosmetic Industry: Scientific and Regulatory Foundations*. New York: Taylor & Francis Group; 1984. p. 1-15.

[3] Wallack G. Rethinking FDA's Regulation of Cosmetics. Harvard Journal on Legislation, 2019; 56(1):311-339. https://harvardjol.com/wp-content/uploads/sites/17/2019/05/HLL107_crop.pdf.

[4] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetics Laws & Regulations. [Cited 2021 May 21]. Available from: https://www.fda.gov/cosmetics/cosmetics-laws-regulations/it-cosmetic-drug-or-both-or-it-soap.

[5] Hallagan JB, Allen DC, Borzelleca JF. The safety and regulatory status of food, drug and cosmetic color

additives exempt from certification. *Food Chem Toxicol*. 1995; 33(6):515-528. doi: https://doi.org/10.1016/0278-6915(95)00010-y.

[6] De Groot AC, White IR. Cosmetic and Skin Care Products. In: Rycroft RJG, Menné T, Frosch PJ, Lepoitteven JP, editors. *Textbook of Contact Dermatitis*. Berlin: Springer; 2001. p. 661-685. doi: https://doi.org/10.1007/978-3-662-10302-9_32.

[7] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetic Products & Ingredients. [Cited 2021 May 29]. Available from: https://www.fda.gov/cosmetics/cosmetic-products/hair-dyes.

[8] Kamla P, Akhtar N. Hair Care Cosmetic Regulation in Different Countries – A Comparative Study. *Applied Clinical Research, Clinical Trials and Regulatory Affairs*. 2019; 6(1):34-45. doi: http://dx.doi.org/10.2174/2213476X06666190128150054.

[9] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetic Products & Ingredients. [Cited 2021 May 30]. Available from: https://www.fda.gov/cosmetics/cosmetic-products/makeup.

[10] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetic Products & Ingredients. [Cited 2021 Jun 06]. Available from: https://www.fda.gov/cosmetics/cosmetic-products/nail-care-products.

[11] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetic Products & Ingredients. [Cited 2021 Jun 10]. Available from: https://www.fda.gov/cosmetics/cosmetic-products/soaps-lotions.

[12] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetics Labeling Claims. [Cited 2021 Jun 17]. Available from: https://www.fda.gov/cosmetics/cosmetics-labeling-claims/organic-cosmetics.

[13] US Food and Drug Administration, Electronic Code of Federal Regulations, Cosmetics, 21 CFR Part 700, Requirements for Specific Cosmetic Products. [Cited 2021 Jun 22]. Available from: https://www.ecfr.gov/current/title-21/chapter-I/subchapter-G/part-700/subpart-B.

[14] Bergfeld WF, Elder RL, Schroeter AL. The Cosmetic Ingredient Review Self-Regulatory Safety Program. *Dermatol Clin*. 1991; 9(1):105-122. doi: https://doi.org/10.1016/S0733-8635(18)30439-X.

[15] Bergfeld WF, Belsito DV, Marks Jr JG, *et al*. Safety of Ingredients used in Cosmetics. *J Am Acad Dermatol*. 2005; 52(1):125-132. doi: https://doi.org/10.1016/j.jaad.2004.07.066.

[16] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetic Guidance & Regulation. [Cited 2021 Jun 25]. Available from: https://www.fda.gov/cosmetics/cosmetics-guidance-regulation/cosmetics-laws-regulations.

[17] US Food and Drug Administration, Cosmetics, 21 USC 361, Adulterated Cosmetics. [Cited 2021 Jun 29]. Available from: http://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title21-section361&num=0&edition=prelim

[18] US Food and Drug Administration, Cosmetics, 21 USC 363, Regulations Making Exemptions. [Cited 2021 July 01]. Available from: http://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title21-section363&num=0&edition=prelim.

[19] Zeliger HI. Cosmetics: Toxicity and Regulatory Requirements in the US. In: Betton CI, editor. *Global Regulatory Issues for the Cosmetics Industry*. Elseiver Inc; 2007. p. 63-70. doi: https://doi.org/10.1016/B978-081551567-8.50009-7.

[20] Janetos TM, Kwa M, Xu S. Regulation of Cosmetics. *JAMA Intern Med*. 2018; 178(7):1000-1001. doi: https://doi.org/10.1001/jamainternmed.2018.2452.

[21] US Food and Drug Administration, Fair Packaging and Labeling Act (2015 amendment). [Cited 2021 July 17]. Available at: https://www.govinfo.gov/content/pkg/COMPS-385/pdf/COMPS-385.pdf.

[22] US Government Publishing Office, 114th Congress Public Law 114, H.R.1321-Microbead-Free Waters Act of 2015. [Cited 2021 July 20]. Available from: https://www.congress.gov/bill/114th-congress/house-bill/1321/text.

[23] Marie B. Gender, Race & the Inadequate Regulation of Cosmetics.

Yale Journal of Law and Feminism. 2018, 30(2):275-325.

[24] Greff JA. Regulation of Cosmetics that are also Drugs. *Food Drug Law J.* 1996; 51(2):243-272. http://www.jstor.org/stable/26659641.

[25] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetic Guidance & Regulation. [Cited 2021 July 24]. Available from: https://www.fda.gov/cosmetics/cosmetics-guidance-regulation/cosmetics-guidance-documents.

[26] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Draft Guidance for Industry: Lead in Cosmetic Lip Products and Externally Applied Cosmetics: Recommended Maximum Level. [Cited 2021 Aug 07]. Available from: https://www.fda.gov/regulatory-information/search-fda-guidance-documents/draft-guidance-industry-lead-cosmetic-lip-products-and-externally-applied-cosmetics-recommended.

[27] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Draft Guidance for Industry: Cosmetic Good Manufacturing Practices. [Cited 2021 Aug 13]. Available from: https://www.fda.gov/regulatory-information/search-fda-guidance-documents/draft-guidance-industry-cosmetic-good-manufacturing-practices.

[28] Gayatri K, Prasad P. Quality System in Cosmetic Industry: Global vs Indian Context. *Supply Chain Pulse*. 2019; 10(1):14-21. https://www.proquest.com/scholarly-journals/quality-system-cosmetics-industry-global-vs/docview/2260396082/se-2.

[29] Mildau G. General Review of Official Methods of Analysis of Cosmetics. In: Salvador A, Chisvert A, editors. *Analysis of Cosmetic Products*. Elsevier Inc; 2018. p. 67-83. doi: https://doi.org/10.1016/B978-0-444-63508-2.00004-7.

[30] Bilal M, Iqbal HMN. New Insights on Unique Features and Role of Nanostructured Materials in Cosmetics. *Cosmetics.* 2020; 7(2):24. doi: https://doi.org/10.3390/cosmetics7020024.

[31] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Guidance for Industry: Safety of Nanomaterials in

Cosmetic Products. [Cited 2021 Aug 18]. Available from: https://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-safety-nanomaterials-cosmetic-products.

[32] Albert M, Natalia F, Maria S. Current Status and Future Prospects of Nanotechnology in Cosmetics. *Progress in Material Science*. 2012; 57(5):875-910. doi: https://doi.org/10.1016/J.PMATSCI.2011.10.001.

[33] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Guidance for Industry: Labeling for Cosmetics Containing Alpha Hydroxy Acids. [Cited 2021 Aug 21]. Available from: https://www.fda.gov/regulatory-information/search-fda-guidance-documents/guidance-industry-labeling-cosmetics-containing-alpha-hydroxy-acids.

[34] Heymann LA. The Cosmetic/Drug Dilemma: FDA Regulation of Alpha-Hydroxy Acids. *Food Drug Law J*. 1997; 52(4):357-375. https://www.jstor.org/stable/26659885 .

[35] Millikan LE. Cosmetology, Cosmetics, Cosmeceuticals: Definitions and Regulations. *Clin Dermatol*. 2001; 19(4):371-374. doi: https://doi.org/10.1016/s0738-081x(01)00195-x.

[36] Tecson J. Total Makeover: Federal Cosmetics Regulation and Its Need for Legislative Overhaul to Ensure Consumer Protection. *Golden Gate University School of Law Review*. 2021; 51(2):127-145. https://digitalcommons.law.ggu.edu/ggulrev/vol51/iss2/5.

[37] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetics Labeling Regulations. [Cited 2021 Aug 26]. Available from: https://www.fda.gov/cosmetics/cosmetics-labeling/cosmetics-labeling-regulations.

[38] Ravi P, Sudarshan Reddy D, Ramu B, *et al*.Comparative Study on Cosmetics Legislation in India, US and EU. *World Journal of Pharmacy and Pharmaceutical Sciences*. 2016; 5(6):508-516. doi: 10.20959/wjpps20166-6862.

[39] Mohammed NB, Medina IG, Romo ZG. The Effect of Cosmetics Packaging Design on Consumers' Purchase Decisions. *Indian Journal of Marketing*. 2018; 48(12):50-61. doi:

https://doi.org/10.17010/IJOM%2F2018%2FV48%2FI12%2F139556.

[40] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetics Labeling. [Cited 2021 Sep 08]. Available from: https://www.fda.gov/cosmetics/cosmetics-labeling.

[41] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Shelf Life and Expiration Dating of Cosmetics. [Cited 2021 Sep 13]. Available from: https://www.fda.gov/cosmetics/cosmetics-labeling/shelf-life-and-expiration-dating-cosmetics.

[42] US Food and Drug Administration, Code of Federal Regulations, 21 CFR Part 700, Requirements for Specific Cosmetic Products. [Cited 2021 Sep 23]. Available from: https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=700.25.

[43] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Voluntary Cosmetic Registration Program. [Cited 2021 Oct 10]. Available from: https://www.fda.gov/cosmetics/voluntary-cosmetic-registration-program.

[44] Deepthi V, Sudheer M. Regulation of cosmetics and its advertisement in India with an overview of us regulation. *PHARMANEST: An International Journal of Advances in Pharmaceutical Sciences*. 2013; 4 (6):1661-1674. www.pharmanest.net

[45] John WA. The FDA's Scientific and Regulatory Programs for Cosmetics. In: Estrin NF, editor. *The Cosmetic Industry: Scientific and Regulatory Foundations*. New York: Taylor & Francis Group; 1984. p. 17-36.

[46] US Food and Drug Administration, Code of Federal Regulations, 21 CFR Part 710, Voluntary Registration of Cosmetic Product Establishments. [Cited 2021 Oct 14]. Available from: https://www.ecfr.gov/current/title-21/chapter-I/subchapter-G/part-710.

[47] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics. [Cited 2021 Oct 17]. Available from: https://www.fda.gov/cosmetics/cosmetics-laws-regulations/fda-authority-over-cosmetics-how-cosmetics-are-not-fda-approved-are-fda-regulated.

[48] Shivaji R, Apeksha G, Vikas P. Regulations of Cosmetics across the Globe. *Applied Drug Research, Clinical Trials and Regulatory Affairs*. 2015; 2(3):137-144. doi:

https://doi.org/10.2174/2213476X03666151125220117.

[49] Nayak M, Sreedhar D, Prabhu SS, *et al*. Global Trends in Cosmetics Use-Related Adverse Effects: A Bibliometric Analysis of Literature Published during 1957–2021. *Cosmetics*. 2021; 8(3):75. doi: https://doi.org/10.3390/cosmetics8030075.

[50] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetics International Activities, Cosmetic Importers. [Cited 2021 Oct 21]. Available from: https://www.fda.gov/cosmetics/cosmetics-international-activities/cosmetics-importers.

[51] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetics International Activities, Cosmetic Exporters. [Cited 2021 Oct 30]. Available from: https://www.fda.gov/cosmetics/cosmetics-international-activities/cosmetics-exporters.

[52] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetics Compliance and Enforcement, Warning Letters. [Cited 2021 Nov 02]. Available from: https://www.fda.gov/cosmetics/cosmetics-compliance-enforcement/warning-letters-related-cosmetics.

[53] Benson L, Reckzek K. A Guide to United States Cosmetic Products Compliance Requirements. National Institute of Standards and Technology, Department of Commerce. 2017. [Cited 2021 Nov 11]. doi: https://doi.org/10.6028/NIST.IR.8178.

[54] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetics Compliance and Enforcement, How to Report a Cosmetic Related Complaint. [Cited 2021 Nov 15]. Available from: https://www.fda.gov/cosmetics/cosmetics-compliance-enforcement/how-report-cosmetic-related-complaint.

[55] Kwa M, Welthy LJ, Xu S. Adverse Event Reported to the US Food and Drug Administration for Cosmetics and Personal Care Products. *JAMA Intern Med*. 2017; 177(8):1202-1204. doi: https://doi.org/10.1001/jamainternmed.2017.2762.

[56] US Food and Drug Administration, Centre for Food Safety and Applied Nutrition, Cosmetics, Cosmetics

Science and Research, Nanotechnology. [Cited 2021 Nov 27]. Available from: https://www.fda.gov/cosmetics/cosmetics-science-research/cosmetics-nanotechnology.

[57] Bowman DM, Calster GV, Friedrichs S. Nanomaterials and Regulation of Cosmetics. *Nat Nanotechnol*. 2010; 5(2):92. doi: https://doi.org/10.1038/nnano.2010.12.

[58] Fytianos G, Rahdar A, Kyzas GZ. Nanomaterials in Cosmetics: Recent Updates. *Nanomaterials*. 2020; 10(5):979. doi: https://doi.org/10.3390/nano10050979.

[59] Halla N, Fernandes IP, Heleno SA, *et al*. Cosmetics Preservation: A Review on Present Strategies. *Molecules*. 2018; 23(7):1571. doi: https://doi.org/10.3390/molecules23071571.

[60] Fathima A, Sujith Varma, Jagannath P, *et al*. General Review on Herbal Cosmetics. *International Journal of Drug Formulation and Research*. 2011; 2(5):140-165. http://www.ordonearresearchlibrary.org/.

[61] Dodou K. Special Issue "Current and Evolving Practices in the Quality Control of Cosmetics". *Cosmetics*. 2021; 8(4):100. doi: https://doi.org/10.3390/cosmetics8040100.

[62] Zai ID, Khan A, Gupta M. Comparative Study of Regulatory Requirement of Cosmetics in INDIA to USA and EU. *American Journal of Pharmacy and Health Research.* 2019; 7(10):1-11. doi: https://doi.org/10.46624/ajphr.2019.v7.i10.001.

[63] Abdullah BJ, Nasreen R, Ravichandran NA. A Comparative Study of Cosmetic Regulations in Different Countries of the World with Focus on India. *Int J Cur Res Rev*. 2012; 4(11):131-144. http://ijcrr.com/uploads/1797_pdf.pdf

[64] Nohynek GJ, Antignac E, Re T, *et al*. Safety assessment of personal care products/cosmetics and their ingredients. *Toxicol Appl Pharmacol*. 2010; 243(2):239-259. doi: https://doi.org/10.1016/j.taap.2009.12.001.

[65] Dhull K, Tripathy S, Dureja H. Cosmetics: Regulatory Scenario in USA, EU and India. *Journal of Pharmaceutical Technology, Research and Management*. 2015; 3(2):127-139. doi:

https://doi.org/10.15415/JPTRM.2015.32010.

[66] Singh BM, Jain A, Mishra A. Cosmetic Regulations in India vs. Globally and Challenges in Harmonization. *International Journal of Pharmaceutical Sciences and Drug Research*. 2018; 10(3):150-157. doi: https://doi.org/10.25004/IJPSDR.2018.100308.

[67] Ruhela M, Nagar L, Gupta A, *et al*. Cosmetics: Regulatory and market scenario for us and India. *The Pharma Innovation Journal*. 2018; 7(6):164-169.