

# Skin Delivery Systems: Transdermals, Dermatologicals, And Cosmetic Actives

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## Transdermal Drug Delivery System (TDDS) - A Multifaceted Approach For Drug Delivery

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### ABSTRACT

**Background/aims:** This review article compiles the works on drug delivery system, typically the transdermal route, right from its traditionally evolved methods to the advanced and upcoming novel methods. As is known, the objective of any drug delivery system is to supply an appropriate proportion of drug to the desired site of action in the body; to accomplish the desired action. This supply has to be sustained for a specific duration of time, depending upon the drug and the ailment. Such systems, even though look simple, as compared to the oral routes, pose abundant challenges. Definition-wise, transdermal drug delivery systems are the topically administered medications in self-contained, discrete dosage forms of patches which when applied to the skin deliver the drug, through the skin portal to systemic circulation at a predetermined and controlled rate over a prolonged period of time in order to increase the therapeutic efficacy and reduced side effect of drug. **Method:** This review starts with the historical background of such developed systems. It explains the advantages and disadvantages of older methods: typically the diffusion and absorption routes. The principle transport mechanism across mammalian skin and the factors that affect the permeability of the skin are classified and its correlation with manufactured delivery systems is done. Physicochemical properties of the penetrant molecule, the drug delivery system and the physiological and pathological condition of the skin are discussed in detail. Recent techniques, based on enhancing the transdermal delivery is then introduced and explained in detail. Different components of such patches, their release mechanism are reviewed thoroughly. Vapor patch and micro-reservoir approach is also explained in detail. A new and evolving area of microneedles is introduced with various details of its fabrication procedures and the properly-domain is elaborated. The stimuli for release, which can also be engineered, falling under different categories such as electrically-based, ultrasound, pressure based, laser based, and so on. An extremely promising novel route, which introduces nanotechnology and nanomaterials to improve the conventional transdermal drug delivery system, is then elaborated. **Results:** We have discussed intricate issues such as enhancement (along with control) of drug release involving skin permeability, providing an added driving force for transport into the skin and avoiding injuries to deeper, living tissues. **Conclusions:** The article highlights the three generations of transdermal delivery system, which is poised to make significant impact on drug delivery because it concentrates its effects. This targeting enables stronger disruption of the skin barrier, and thereby more effective transdermal delivery, while still protecting deeper tissues. In this way, novel chemical enhancers, electroporation, cavitation ultrasound and more recently microneedles, thermal ablation and microderm-abrasion have been shown to deliver macromolecules, including therapeutic proteins and vaccines, across the skin in human clinical trials. The third generation TDDS, along with the continuous and regular invention of new devices and new drugs that can be administered via this system are hence set to revolutionise the domain of drug delivery in coming times.

**KEY WORDS:** Transdermal drug delivery, transport mechanism, skin permeability, microneedles.

### 1. INTRODUCTION

Proper drug selection and an effective drug delivery play pivotal role attaining optimum therapeutic outcomes. The objective of any drug delivery system is to provide an effective therapeutic amount of drug to the desired site of action in the body to accomplish promptly and sustain the desired drug concentration throughout the dose duration. For decades, oral route has been the most common drug delivery form and about 74% of drugs are taken orally but still are found

not as effective as anticipated<sup>1</sup>. Even though oral administration has notable advantage of easy administration, it also carries significant drawbacks – namely poor bioavailability due to hepatic metabolism (first pass mechanism) and the inclination to yield rapid blood level spikes (both high and low)<sup>2</sup>. To overcome these hurdles, there was a burning need for understanding /development of new drug delivery route/system, which can improve the therapeutic efficacy and safety of drugs by more precise spatial and temporal placement within the body thereby reducing both the size and number of doses and also increasing its effectiveness with optimum dose concentrations. To achieve these goals and improve such characters transdermal drug delivery system was emerged.

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With these considerations in mind, Skin Delivery Systems: Transdermals, Dermatologicals and Cosmetic Actives brings together the emerging fields of cosmetic.Skin Delivery Systems: Transdermals, Dermatologicals, and Cosmetic Actives: Medicine & Health Science Books @ jadootvbox.com With these considerations in mind, Skin Delivery Systems: Transdermals, Dermatologicals and Cosmetic Actives brings together the emerging.Skin delivery systems: transdermals, dermatologicals, and cosmetic actives. edited by John J. Wille. Ames, Iowa: Blackwell Pub., 1st ed. xi, pages ., English, Book, Illustrated edition: Skin delivery systems: transdermals, dermatologicals, and cosmetic actives / edited by John J. Wille. Wille, John J.12 Jun - 1 min - Uploaded by Felicia Moore Skin Delivery Systems Transdermals, Dermatologicals, and Cosmetic Actives. Felicia Moore.Skin Delivery Systems: Transdermals, Dermatologicals and Cosmetic Actives brings together the emerging fields of cosmetic actives with new advances in skin .Author(s): Wille,John J Title(s): Skin delivery systems: transdermals, dermatologicals, and cosmetic actives/ edited by John J. Wille. Edition: 1st ed. Country of.Table of Contents for Skin delivery systems: transdermals, dermatologicals, and cosmetic actives / edited by John J. Wille, available from the Library of.11 Dec - 23 sec Watch Skin Delivery Systems Transdermals Dermatologicals and Cosmetic Actives Download.Free Online Library: Skin Delivery Systems: Transdermals, Dermatologicals, and Cosmetic Actives.(Brief Article, Book Review) by "SciTech Book News";.For a drug to be delivered passively via the skin it needs to have of the skin shows the potential targets or site of action for cosmetics and Drug localization of this type is important in the treatment of dermatological conditions such as skin . The various classes of active systems under development are.An intradermal or transdermal delivery system for topical administration of element so as to enhance transdermal transport of an analyte or active substance . the skin of the subject, and a cosmetic or dermatological composition comprising.This chapter discusses the topical and transdermal drug delivery systems. available as medicines are dermatological products for topical application. drugs and cosmetic agents to the skin, depending on the property of active agents and.and transdermal delivery of active cosmetic ingredients requires effective, controlled and skin delivery systems as well as the marketing and dermatological.In book: Novel Delivery Systems for Transdermal and Intradermal Drug resistance for the transport of cosmetics ingredients into the skin [12]. .. vants commonly used in cosmetics, dermatological and ophthalmic fields, such as gelling.Novel drug delivery systems are used in herbal cosmetics and between them vesicular, particular and emulsion and during shelf life would be critical that need to fulfill long-term stability and dermatological safety. . of enhancing cosmetic ingredients to deeper skin tissues, .. Novel Delivery Systems for Transdermal.Transdermal Drug Delivery Systems; Review Article in which the delivery of the active ingredients of the drug occurs through the skin. In the past, the most commonly applied systems were topically applied creams and ointments for dermatological The use of transdermal gels has expanded both in cosmetics and in.The

origin of delivery systems in cosmetics and personal care stems from the is an example of a cosmetic active for which a delivery system would be desired. . Skin Delivery Systems: Transdermals, Dermatologicals and. Development of controlled release drug delivery systems requires The active pharmaceutical ingredient (drug) often gets most of the attention . A final report by the cosmetic ingredient review expert panel provides skin .. In: Skin Delivery Systems: Transdermals, Dermatologicals, and Cosmetic Actives. Buy Skin Delivery Systems: Transdermals, Dermatologicals, and Cosmetic Actives 1 by John J. Wille (ISBN: ) from Amazon's Book Store. all formulations applied to the skin except transdermal delivery systems (TDS) or transdermal patches that will cosmetically and aesthetically acceptable. . dermatological conditions. . and the content of the active substance in the dosage.

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