

Preface

Delivery of drugs through skin has been an attractive area for research and for pharmaceutical companies as it can offer larger therapeutic window compared to systemic delivery.

Dermal drug development started back in the 1950s with corticosteroids as, despite impressive efficacy, corticosteroids use was limited because of the serious adverse events observed when administered systemically for long periods. The efficacy of topically delivered hydrocortisone then paved the way to further corticosteroid drug developments. Over the years the successful development of retinoids, vitamin D3 derivatives and immuno-suppressors has further proved the dermal potential for drug target classes with difficult safety profile.

In the last 15 years, the strong move of the pharmaceutical industry to focus on new mechanisms of action—rather than “me too” approaches—has multiplied the number of new target classes that could address skin diseases. Moreover because of the risk of target-related toxicity, a fair number of drug candidates for various targets are being abandoned as no viable indication for a systemic use can be found. This has created a renewed interest among the pharmaceutical industry to investigate the dermal route for these failed molecules.

Unfortunately, the desired profile of a dermal drug candidate is somewhat different to that of a systemic drug candidate. Moreover, if know-how to select and develop an oral/systemic drug is well established it is much less so for a dermal drug. All this together can often lead to the selection of poor drug candidates.

Offering the perspective from the industrial side, *Dermal Drug Selection and Development* aims to describe how the pharmaceutical industry faces the selection of dermal drugs complete with the challenges and opportunities of the field. It covers the various parameters important to consider when choosing a drug candidate, some tricks and pitfalls as well as the scientific gaps that exist in the drug selection process such as dermal pharmacokinetics and the resulting uncertainty for drug discovery teams.

The first chapter of the book allows the reader to get a grasp of what is at stake with the development and selection of a candidate medicine in general and the particular elements linked to a dermal drug. Chapter 2 then reviews the historical

development of the major classes of topical drugs. In Chap. 3, the learnings from past topical drug development are listed with a particular focus on the key factors affecting the efficacy of a dermal drug. In the following chapter, the dermal and oral/systemic drug discovery processes are compared. Dermal pharmacokinetics, dermal efficacy assessment as well as therapeutic index assessment and their gaps are then discussed in Chaps. 5, 6 and 7. Some interesting approaches in these three chapters are described which should hopefully help drug discovery teams in their drug candidate selection. A chapter is then dedicated to the dermal formulation. Chapter 9 lists the four main approaches that a pharmaceutical company may decide to take when developing a new dermal drug. In the next chapter, the various criteria to select a dermal drug candidate are discussed and an example of a screening cascade is given. Chapter 11 is somewhat provocative listing 14 quotations and rules that could be useful during the selection and development of a dermal drug. The final chapter tries to weigh the pros and cons of dermal drug development and gives some perspectives of potential emerging approaches which could make such development even more successful.

Dermal Drug Selection and Development

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