

## Book review

*Mechanisms of Transdermal Drug Delivery* (Drugs and Pharmaceutical Sciences Series, vol. 83), Potts, R.O., Guy, R.H. (Eds.), Marcel Dekker, New York, ISBN 0-8247-9863-5, US\$150.0.

In their preface, the editors state that the rationale for this book was based on the increased understanding of the physical principles of molecular diffusion across the stratum corneum. As a result, the stratum corneum has been the subject of scrutiny by a range of biophysical techniques.

This text is primarily concerned with updating the reader on the use both of these techniques and of the analytical methods to examine transdermal penetration. Throughout the book the nature of the passive penetration barrier and the effect of chemical and physical penetration enhancement on the skin barrier are considered.

The first chapter reviews microscopic visualisation of the stratum corneum, and also the direct imaging of both passive and enhanced transdermal penetration pathways. Chapter 2 examines the application of small- and wide-angle X-ray diffraction in obtaining structural information on the stratum corneum lipid domains. The bulk of this chapter is taken up by consideration of the passive barrier, but the influence of chemical penetration enhancers on these domains is mentioned. The next chapter comprehensively considers the tandem application of differential scanning calorimetry and infrared spectroscopy in

the study of the stratum corneum lipids. Mechanisms of penetration enhancement are also examined by these methods, and the novel application of Raman spectroscopy is considered. The application of other spectroscopic techniques ( $^2\text{H}$  NMR, fluorescence and AC impedance) to the transdermal field is discussed in the next three chapters. The use of neutron scattering to examine the ordering of stratum corneum lipids is considered in the following chapter. The transdermal penetration of polar and ionic permeants is examined in the last two chapters of the text. Firstly, the evidence for a controversial polar pathway for simple transdermal diffusion of polar and ionic permeants is examined, then mathematical models are applied to describe the iontophoretic penetration of various solutes.

The underlying principles behind all the biophysical techniques are well explained to the unfamiliar reader, and their application to the study of the skin barrier is well explained by the use of high-quality figures throughout. As the text gives an evaluation of what is happening now in the field, it is certain to be of interest to both the novice and the experienced researcher in molecular transdermal penetration.

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