

Themed issue: Recent advances in transdermal drug delivery

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The concept of themed issues in the *Journal of Pharmacy and Pharmacology* was successfully introduced in 2005. In these, a series of invited, peer reviewed original papers within a common research theme is published in a single issue of the Journal. The objectives of these themed issues are to ensure both that the content is topical and that those papers selected are of the highest research quality, being peer reviewed in accordance with Journal policy. Selection of the themes is performed in conjunction with editorial board members. To date the Journal has published several themed issues, namely:

- (1) *Drugs from neotropical origin* (2005);
- (2) *Challenges, advances in vaccine delivery: unlocking the pharmaceutical conundrum* (2006);
- (3) *Applications of novel spectroscopic techniques to pharmaceutical systems* (2007);
- (4) *Radiation biology – can new concepts achieve better treatment outcomes?* (2008).

These issues have been enthusiastically received by the scientific community and have been extremely successful. Therefore, it is our great pleasure to present the fifth themed issue, *Recent advances in transdermal drug delivery*. The challenge to the Editor and the Editorial board is the identification of a theme that will generate interest within the specified research community but will also be of interest to the general readership of the Journal. We believe that the papers comprising this themed issue will address these challenges and highlight the scientific scope and quality of the *Journal of Pharmacy and Pharmacology*.

Using the skin as a means to mediate and facilitate systemic drug delivery has been a subject of intense interest since the 1960s. The main challenges to obtaining clinically relevant transdermal therapies are in understanding the physiological nature of the skin, particularly the stratum corneum, and in developing formulation strategies to overcome this barrier. As well as a wide range of formulation strategies many methods of enhancement have been employed to overcome this barrier, including chemical and physical strategies. These include the use of chemical penetration enhancers, such as ethanol, oleic acid, dimethyl sulfoxide and laurocapram (Azone), among others. The use of electrical currents (iontophoresis) or ultrasound (sonophoresis) to facilitate drug delivery has been widely reported. In recent years, the development of microfabricated microneedle technology appears to offer the promise of pain-free delivery of a wide range of therapeutic agents, including biomolecules that are normally impermeable to absorption by this route.

The field of percutaneous absorption has grown since the 1960s and continues to thrive, providing a clinically relevant interface with fields as varied as engineering, materials science, pharmaceuticals, skin physiology and pharmacology, and mathematics.

The themed issue begins by reflecting on recent advances in our understanding of skin barrier function. It then reviews a recent advance in formulation, namely the use of foams to enhance topical drug delivery. Methods for the enhancement of percutaneous absorption, including electrical and magnetic methods, are then considered. This is followed by two studies which use mathematical models to characterise different aspects of percutaneous absorption. Several studies on the development of drug delivery systems, including prodrug methods, are then presented. The themed issue then concludes with two articles from the emerging field of unguis (nail) drug delivery.

Overall, the themed issue aims to gather together current research in this field from both established researchers and new groups, providing a snapshot of the state of the art in pharmaceutical percutaneous absorption in 2010. All manuscripts have been fully peer reviewed to ensure that the Special Issue is of the highest quality.

As readers will observe, the current themed issue aims to present peer-reviewed research from established and emerging groups working in the field of percutaneous absorption. It is also a truly international edition, featuring work from groups in Australia, Holland, Italy, Singapore, the United Kingdom and the United States. The topics addressed by the papers in

the themed issue will be of interest to those directly involved in those fields, and also to those more broadly associated with the wider field of percutaneous absorption.

This breadth of interest is also highlighted by a unique feature of this themed issue. It includes pharmaceutically relevant abstracts from the 12th Perspectives in Percutaneous Penetration (PPP) conference. Having begun as a conference, established by Professor Jon Hadgraft (Cardiff University) and Bob Scott (ICI) on the 'Prediction of Percutaneous Penetration' in Manchester, UK, it has rapidly expanded and established a permanent home in La Grande Motte, in the south of France. This move also saw a change to the current title of the meeting, at the suggestion of Professor Brian Barry. The conference is now organised by Keith Brain and Ken Walters, both of Cardiff University. It is the aim of the PPP conference to provide a forum for researchers in all aspects of the field of percutaneous absorption, including those involved in pharmaceutical, dermatological, cosmetic and risk assessment – and related – fields.

The purpose of the PPP conference is to provide a forum for the presentation and discussion of all the latest research, development and technology concerning the penetration of exogenous compounds through the skin. The meetings are especially relevant to those involved in dermatological research, the development of formulations, risk assessment and regulatory affairs relating to the dermal effects of molecules within the

pharmaceutical, cosmetic and agrochemical and related fields within industrial, academic and governmental domains. It is currently the largest conference of this type.

Once again the *Journal of Pharmacy and Pharmacology* will ensure that the papers published will be disseminated to the key research groups who are involved in this field of research. It is hoped that this will both publicise the research of those groups who have contributed to this themed issue and additionally consolidate the profile of the *Journal of Pharmacy and Pharmacology* in the field. As mentioned previously, the provision of this themed issue has raised many logistical challenges and, accordingly, there are many people whom we would like to thank for their tireless efforts on behalf of the Journal. Firstly we must thank Mr Andrew Croskery and Mrs Grainne Caffrey at the Journal's editorial office in Belfast and the staff at Wiley for ensuring that the papers were carefully processed and published to their deserved high quality. We would also like to thank Dr Keith Brain, Cardiff University, for his help in organising the PPP conference abstracts for inclusion in this themed issue. Finally, the Editor wishes to record his gratitude to his colleague and friend Gary Moss for his enthusiasm, dedication, organisation and, finally, his ability to enlist key international research groups involved in this area to submit their research to the *Journal of Pharmacy and Pharmacology*.