

## Themed Issue: Applications of Novel Spectroscopic Techniques to Pharmaceutical Systems

As the readership will be aware, the concept of themed issues in the *Journal of Pharmacy and Pharmacology* was successfully introduced in 2005. In these, substantial space within a single issue of the JPP is allocated to the publication of a series of invited, peer reviewed original papers within a common research theme. The objectives of these themed issues are to ensure that the content is both 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 two themed issues, namely *Drugs from Neotropical Origin* and *Challenges and Advances in Vaccine Delivery: Unlocking the Pharmaceutical Conundrum*, in the *Journal of Pharmacy and Pharmacology*. Both issues have been enthusiastically received by the scientific community and have been extremely successful. Therefore, it is our great pleasure to present the third themed issue: *Applications of Novel Spectroscopic Techniques to Pharmaceutical Systems*. 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 third themed issue will address both these challenges and highlight the scientific scope and quality of the JPP.

Two of the most important problems in pharmaceutical research and development of solid drugs and drug delivery systems are *solubility* and *crystallinity/polymorphism*. Many drugs have low aqueous solubilities, which as a result of their resultant low bioavailability may prevent their use as active ingredients in drug formulations. Increasing the solubility or the dissolution rate of a drug is therefore of highest significance. Solubility and dissolution rate are also influenced by polymorphism. Accordingly, it is very important to be able to accurately distinguish and control the polymorphic form of the drug present in pharmaceutical formulations. Ideally, such determination should be fast, allowing in-line/on-line measurements to improve efficiency and quality of the formulation process. With the advent of combinatorial chemistry in the drug discovery process, the molecular weight of drugs will become larger and contain more functional groups, allowing them to crystallize in even more different polymorphic forms. Thus, the problem of poor solubility and crystalline polymorphism will become considerably greater in the future. X-ray diffraction and thermal analysis can be used to detect and quantify crystalline forms of a drug, however, these techniques are often slow, cannot easily be used in-line, and importantly, they do not give molecular information. Despite these limitations, they are currently used as the gold standards for detection and quantification of crystalline polymorphs. However, progress in both instrument development and chemometrics now offers the pharmaceutical scientist a range of spectroscopic techniques that can be used to achieve a high degree of quantitative and structural information of pharmaceutical systems. These techniques include infrared, Raman, terahertz, solid state NMR, second harmonic and mass spectroscopy. In light of their emerging importance, the papers in this themed issue eloquently demonstrate the use of these novel spectroscopic techniques to investigate and characterize pharmaceutical systems. As the readers will observe, the collaborative contributions within this themed issue are multidisciplinary, often multinational, and have been received from research groups in Australia, Denmark, Finland, Ireland, New Zealand and the United Kingdom. The topics of the papers in the themed issue will be of great interest both to those directly involved in the areas of pharmaceutical analysis and dosage form design and, in addition, to those who have a general interest in novel developments in the physicochemical characterization of pharmaceuticals.

Once again the JPP 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 publicize the research of those groups who have contributed to this themed issue and additionally

consolidate the profile of the JPP 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 Mrs. Grainne Caffrey at the JPP editorial office in Belfast and the staff at Pharmaceutical Press for ensuring that the papers were carefully processed and published to their deserved high quality. In addition, the support of the Pharmaceutical Press, in particular Mr. Paul Weller, for the concept of the themed issue has been invaluable. Finally, the Editor wishes to record his grati-

tude to his colleague and friend Thomas Rades for his enthusiasm, dedication, organization and, finally, his ability to enlist key international research groups involved in this area to submit their research to the JPP.

Professor David S. Jones  
December 2006

Professor Thomas Rades  
December 2006