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Preface

Challenges in Nano- Micro- and Macro-systems

This special issue of *International Journal of Pharmaceutics* entitled *Challenges in Nano- Micro- and Macro-systems* arises as a result of scientific efforts connected with the 7th Central European Symposium on Pharmaceutical Technology and Biodelivery Systems which was organised by the Slovenian Pharmaceutical Society and the Faculty of Pharmacy, University of Ljubljana in Ljubljana, Slovenia, from 18th to 20th September 2008. Contacts with 14 European pharmaceutical associations including Austria, Bosnia and Herzegovina, Czech Republic, France, Croatia, Italy, Hungary, Macedonia, Germany, Poland, Slovak Republic, Serbia, and the European Federation of Pharmaceutical Sciences as the main patron association, were established to reveal the present status of pharmaceutical sciences related to design, development and evaluation of drug delivery systems and to make the event more visible in international scientific environment.

The symposium exceeded our expectations in many ways. More than 280 experts from 21 countries from all five continents participated the symposium. There were 6 plenary lectures, 7 invited lectures, 25 short oral presentations and 157 posters presentations. During the symposium there was an exhibition with different pharmaceutical companies, which presented novelties in technological equipment, analytical methods, and new materials. Moreover, the symposium proved to be an efficient forum to exchange the knowledge and ideas among the scientists and experts from different areas of interest and different fields: academic institutions, R&D divisions of pharmaceutical companies and regulatory authorities.

Most acknowledged presentations at the symposium were selected and the authors were asked to prepare full length papers to be included in this issue of IJP.

The contents of the issue are devoted to drug delivery systems that are embraced in their widest scope; from selection of excipients, according to their structure and functionality, to their implementation into new pharmaceutical dosage forms or new technological processes. Moreover, the physico-chemical characterisation of excipients in connection with their efficacy and safety *in vivo* are fully presented. The main part of the papers originate in the development and evaluation of macro-, micro- and nano-delivery systems, all being the hottest topics in modern pharmaceutical technology. Liposomes, nanoparticles, stem cells, nanobubbles, microcapsules and pellets are the examples of advanced drug delivery systems that are presented in different modalities. Furthermore, new possibilities, applicable in industry, are introduced for incorporating poorly soluble small molecules of chemical origin and newly developed biopharmaceuticals into drug delivery systems. Additionally, different experimental models (*in vitro*, *ex vivo*, *in vivo*, *in silico*) for the study of mechanisms and kinetics of LADME processes are critically evaluated and directions for their further development are proposed. Our aim is to demonstrate by the use of presented articles the diversity of modes how to convert a drug, either small sized pharmaceutical of chemical origin or macromolecular biopharmaceutical, into a medicine.

Overall, the contents of the issue show the solutions of some challenges in modern pharmaceutical development. At the same time many questions still remain unanswered. However, some unsolved problems will lead to further, even more intensive and exciting research.

Finally, we wish to thank Prof. A.T. Florence and Elsevier for giving the opportunity to show by this issue of IJP recent achievements in the field of drug delivery systems. We also want to thank the authors of the papers, as without their contribution this issue would not be available to those who are interested in the progress of this fast growing scientific area.

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