eXPRESS Polymer Letters Vol.2, No.6 (2008) 391
Available online at www.expresspolymlett.com
DOI: 10.3144/expresspolymlett.2008.46

Editorial corner – a personal view
Polymer systems for solid pharmaceuticals

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Macromolecular components of pharmaceuticals represent a segment of small quantity but high value within the polymer market. The knowledge built in these systems acts as driving force for other polymer fields. Their conventional roles, as the coating and bonding, have been extended recently due to new challenges. These challenges include the needs for stabilization and solubilisation of new drug types (the stability and water solubility of which are mostly not satisfactory). Need exists also for influencing the morphology of drugs, for controlling the site and kinetics of their release (e.g. targeted drug delivery) and for meeting the mechanical requirements. The currently increasing productivity means further challenges in many respects such as for film forming materials, for processing machines and for analytical control. On the other hand, the development is strongly limited by the extremely stringent regulation in the field of pharmaceuticals. Under the tension between the increasing challenges and the limited possibilities new concepts and strategies emerged. Composite structure of the corpus (core) of the tablets and of the coating materials, using medically accepted nanofillers of well designed interphases, provide improved strength, transport and drying features. Embedding of the drug molecules in solid macromolecular solutions, amphiphilic polymer micelles (or dendrimers), nanoparticles of mucoadhesive, responsive, targeted surface etc. provide them with enhanced stability, solubility and bioavailability. Controlling the T_g of the polymers, by means of blending or immobilization, increases the chance for controlling the polymorphic stability of the embedded drugs. Rapid development of the extrusion, (and injection molding) techniques can be expected but the current difficulties of cleaning and validation has to be solved. Supercritical methods will develop rapidly as well. Concerning the analyses introduction of new dissolution medium of better similarity to the gastrointestinal fluid is expected, which will influence the polymers to be used. The need for improved control of the composition, structure and molecular mobility of solid pharmaceuticals will enhance the importance of the micro-spectroscopic and Thermally Stimulated Current (TSC) methods, which may help in prediction of the changes of the stability.

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