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International Association for Pharmaceutical Technology
Arbeitsgemeinschaft für Pharmazeutische Verfahrenstechnik e.V.
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APV NEWS

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Lokale Gruppen

Mittwoch, 30. August 2017
Lokale APV-Gruppe Mecklenburg-Vorpommern um 19:30 Uhr auf der Hornfischbar Pomeria (An den Ryckbrücken, 17489 Greifswald).
Anmeldung erforderlich bis zum 25. August 2017 bei Katharina Tietz (katharina.tietz@uni-greifswald.de).

Donnerstag, 31. August 2017
Lokale APV-Gruppe Köln/Bonn/Aachen um 19:00 Uhr im Peters Brauhaus (Mühlengasse 1, 50667 Köln).
Anmeldung erforderlich bis zum 25. August 2017 bei Dr. Heiko Spilgies (heiko@spilgies.de).

Mittwoch, 13. September 2017
Lokale APV-Gruppe Nord um 19:30 Uhr in dem Restaurant Opera (Dammtorstrasse 7, 20354 Hamburg)
Anmeldung erforderlich bis zum 03. September 2017 bei Dr. Alexandra Steckel (alexandra.steckel@t-online.de).

Mittwoch, 20. September 2017
Lokale APV-Gruppe Berlin um 19:00 Uhr bei der Bayer Pharma AG (Standort Berlin Wedding). Der genaue Treffpunkt wird noch bekannt gegeben.
Anmeldung erforderlich bis zum 13. September 2017 bei Dr. Andreas Sachse (andreas.sachse@cpl-sachse.de).

Mittwoch, 27. September 2017
Lokale APV-Gruppe Rhein-Main ab 19:30 Uhr. Der Veranstaltungsort wird noch bekanntgegeben.
Weitere Informationen und Angaben zu den nächsten Terminen erhalten Sie bei Cathrin Pauly (pauly@aspiras.de).

Lokale APV-Gruppe Oberbayern
Weitere Informationen und Angaben zu den nächsten Terminen erhalten Sie bei Dr. (USA) Julia Schulze-Nahrup (jsn@pharmoveo.de).

Lokale APV-Gruppe Westfalen
Weitere Informationen und Angaben zu den nächsten Terminen erhalten Sie bei Dr. Johanna Mosig (johanna.mosig@bayer.com).

Lokale APV-Gruppe Basel
Weitere Informationen und Angaben zu den nächsten Terminen erhalten Sie bei Dr. Lars Restetzki (lars.restetzki@roche.com).

What´s hot in European Journal of Pharmaceutics and Biopharmaceutics?

Christoph Marschall, Ludwig-Maximilians-Universität, D-München

D. N. Nguyen et al./European Journal of Pharmaceutics and Biopharmaceutics 113 (2017) 50–59

Encapsulating darunavir nanocrystals within Eudragit L100 using coaxial electrospraying

Duong Nhat Nguyen, Christian Clasen, Guy Van den Mooter

Electrospraying is renowned for its simplicity and versatility, and which can effectively produce particles with well-controlled size, size distribution, particle shape, morphology and microstructure at the nano/microscale. In this study, coaxial electrospraying was used to investigate its feasibility for preparing nanoparticles made up of nanocrystals encapsulated within a polymer shell. Firstly, aqueous nanosuspensions of darunavir were prepared by wet media milling. Then the nanosuspension and solutions of an enteric polymer, Eudragit L100, were used as the inner/core liquid and outer/shell liquid in a coaxial electrospraying setup, respectively. As long as a sufficiently high voltage was applied, a stable Taylor cone-jet mode was obtained to produce very fine core-shell structure nanoparticles with high darunavir encapsulation efficiency of approximately 90%. The influence of the starting nanosuspension and the flow rates on the characteristics of the final electrosprayed particles was also evaluated. Using an optimized nanosuspension with reasonable size, size distribution and flow rates, the enteric coating layer reduced the percentage of DRV release in acidic medium in the in vitro dissolution test to ca. 20%. This study indicates that coaxial electrospraying is a potential and unique technique for encapsulating drug nanocrystals within a polymeric shell.

P.-J. Van Bockstal et al./European Journal of Pharmaceutics and Biopharmaceutics 114 (2017) 11–21

Mechanistic modelling of infrared mediated energy transfer during the primary drying step of a continuous freeze-drying process

Pieter-Jan Van Bockstal, Séverine Thérèse F.C. Mortier, Laurens De Meyer, Jos Corver, Chris Vervaet, Ingmar Nopens, Thomas De Beer

Conventional pharmaceutical freeze-drying is an inefficient and expensive batch-wise process, associated with several disadvantages leading to an uncontrolled end product variability. The proposed continuous alternative, based on spinning the vials during freezing and on optimal energy supply during drying, strongly increases process efficiency and improves product quality (uniformity). The heat transfer during continuous drying of the spin frozen vials is provided via non-contact infrared (IR) radiation. The energy transfer to the spin frozen vials should be optimised to maximise the drying efficiency while avoiding cake collapse. Therefore, a mechanistic model was developed which allows computing the optimal, dynamic IR heater temperature in function of the primary drying progress and which, hence, also allows predicting the primary drying endpoint based on the applied dynamic IR heater temperature. The model was validated by drying spin frozen vials containing the model formulation (3.9 mL in 10R vials) according to the computed IR heater temperature profile. In total, 6 validation experiments were conducted. The primary drying endpoint was experimentally determined via in-line near-infrared (NIR) spectroscopy and compared with the endpoint predicted by the model (50 min). The mean ratio of the experimental drying time to the predicted value was 0.91, indicating a good agreement between the model predictions and the experimental data. The end product had an elegant product appearance (visual inspection) and an acceptable residual moisture content (Karl Fischer).

A. Edwards et al./European Journal of Pharmaceutics and Biopharmaceutics 114 (2017) 164–174

Rationalising polymer selection for supersaturated film forming systems produced by an aerosol spray for the transdermal delivery of methylphenidate

A. Edwards, S. Qi, F. Liu, M.B. Brown, W.J. McAuley

Film forming systems offer a number of advantages for topical and transdermal drug delivery, in particular enabling production of a supersaturated state which can greatly improve drug absorption and bioavailability. However the suitability of individual film forming polymers to stabilise the supersaturated state and optimise delivery of drugs is not well understood. This study reports the use of differential scanning calorimetry (DSC) to measure the solubility of methylphenidate both as the free base and as the hydrochloride salt in two polymethacrylate copolymers, Eudragit RS (EuRS) and Eudragit E (EuE) and relates this to the ability of films formed using these polymers to deliver methylphenidate across a model membrane. EuRS provided greater methylphenidate delivery when the drug was formulated as the free base in comparison EuE because the lower solubility of the drug in EuRS provided a higher degree of drug saturation in the polymeric film. In contrast EuE provided greater delivery of methylphenidate hydrochloride as EuRS could not prevent its crystallisation from a supersaturated state. Methylphenidate flux across the membrane could be directly related to degree of saturation of the drug in the film formulation as estimated by the drug solubility in the individual polymers demonstrating the importance of drug

solubility in the polymer included in film forming systems for topical/transdermal drug delivery. In addition DSC has been demonstrated to be a useful tool for determining the solubility of drugs in polymers used in film forming systems and the approaches outlined here are likely to be useful for predicting the suitability of polymers for particular drugs in film forming transdermal drug delivery systems.

S. Wang et al./European Journal of Pharmaceutics and Biopharmaceutics 114 (2017) 263–277

Stabilizing two IgG1 monoclonal antibodies by surfactants: Balance between aggregation prevention and structure perturbation

Shujing Wang, Guoliang Wu, Xinyi Zhang, Zhou Tian, Ning Zhang, Tao Hu, Weiguo Dai, Feng Qian

Surfactants are widely used as stabilizers in the biopharmaceutical formulations to minimize protein aggregation. Under a fixed stress condition, the protecting and destabilizing effects of surfactants are hypothesized to be highly dependent on the species and concentrations of surfactants and mAb. Therefore, we here studied the aggregation-prevention and structure-perturbation effects of eight commonly used surfactants (Tw20, Tw80, Brij35, Chaps, TrX-100, SDS, Pluronic F68 and F127) on two IgG1 solution formulations under agitation, using analytical methodologies including visual inspection, OD350 measurement, HPLC-SEC, circular dicroism, fluorescence spectroscopy and differential scanning calorimetry. We found that: (1) With concentrations range from 0.02 to 2 mg/mL, nonionic surfactants were found to offer efficient aggregation-prevention effect, which is superior than the ionic surfactants; and higher surfactant concentration prevented mAb aggregation better especially under prolonged stability test under stress conditions. (2) The surfactant induced structure-perturbation emerged when even higher surfactant concentration (≥2 mg/mL) was used, and such effect was surfactant-property dependent; and (3) the two IgG1 demonstrated different aggregation mechanisms and surfactant dependency, especially at high mAb concentrations. In conclusion, surfactants usage in mAb formulations, including the types and concentrations, should strike an optimal balance between the desirable aggregation-prevention and the detrimental structure-perturbation effects, while the consideration of mAb aggregation mechanism and concentration is also required for surfactant assessment.

Impressum:

Redaktion
Prof. Jörg Breitkreutz (Präsident der APV)
Dr. Martin Bornhöft (Leiter Geschäftsstelle der APV)

Vorstand der APV
Dr. Rainer Alex · Dr. Hermann Allgaier · Dr. Kathrin Bartscher · Prof. Dr. Jörg Breitkreutz · Prof. Dr. Heribert Häusler · Prof. Dr. Sandra Klein · Dr. Alexandra Steckel · Dr. Andreas Rummelt

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Verlag
ECV · Editio Cantor Verlag für Medizin und Naturwissenschaften GmbH
Baendelstockweg 20 · 88326 Aulendorf · Germany
Telefon +49 7525 940-0
Telefax +49 7525 940-180
email info@ecv.de
web www.ecv.de

Druck
Holzmann Druck GmbH & Co. KG
Gewerbestr. 2 · 86825 Bad Wörishofen · Germany

Satz
Anna-Maria Pötzl · APV e.V.

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Vfw = Vorführwagen zu Sonderkonditionen, DW = Dienst-/Werkswagen (genannter Listenpreis = Kaufpreis)