



Nachrichten und Mitteilungen

International Association for Pharmaceutical Technology
Arbeitsgemeinschaft für Pharmazeutische Verfahrenstechnik e.V.
Gemeinnütziger wissenschaftlicher Verein

APV NEWS

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PBP

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13th World Meeting on Pharmaceuticals, Biopharmaceuticals and Pharmaceutical Technology

Rotterdam

The Netherlands, 28 - 31 March 2022

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Lokale Gruppen

Lokale APV-Gruppe Rhein-Main am 29. September 2021 ab 19:30 Uhr.

Weitere Informationen und Angaben zu dem Veranstaltungsort sowie den nächsten Terminen erhalten Sie bei Cathrin Pauly (pauly@aspiras.de).



Lokale APV-Gruppe Rhein-Neckar

Weitere Informationen und Angaben zu den nächsten Terminen erhalten Sie bei Dr. Viktoria Riedel (viktoriam.riedel@schwabe.de).



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



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Weitere Informationen und Angaben zu den nächsten Terminen erhalten Sie bei Katharina Tietz (katharina.tietz@uni-greifswald.de).



Lokale APV-Gruppe Oberbayern

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



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

Elena Richert, Ludwig-Maximilians-Universität, D-München

Optical cryomicroscopy and differential scanning calorimetry of buffer solutions containing cryoprotectants

Astrid Hauptmann, Georg Hoelzl, Thomas Loerting

In the pharmaceutical industry, cryoprotectants are added to buffer formulations to protect the active pharmaceutical ingredient from freeze- and thaw damage. We investigated the freezing and thawing of aqueous sodium citrate buffer with various cryoprotectants, specifically amino acids (cysteine, histidine, arginine, proline and lysine), disaccharides (trehalose and sucrose), polyhydric alcohols (glycerol and mannitol) and surfactants (polysorbate 20 and polysorbate 80). Hereby, we employed optical cryomicroscopy in combination with differential scanning calorimetry in the temperature range to -80°C . The effect of cryoprotectants on the morphology of the ice crystals, the glass transition temperature and the initial melting temperature is presented. Some of the cryoprotectants have a significant impact on ice crystal size. Disaccharides restrict ice crystal growth, whereas surfactants and glycerol allow ice crystals to increase in size. Cysteine and mannitol cause dehydration after thawing. Either one or two glass transition temperatures were detected, where arginine, surfactants, glycerol, proline and lysine suppress the second, implying a uniform freeze-concentrated solution. The initial melting temperature of pure buffer solution can be shifted up by adding mannitol, both disaccharides and both surfactants; but down by glycerol, proline and lysine.

Oral inhalation for delivery of proteins and peptides to the lungs

Eleonore Fröhlich, Sharareh Salar-Behzadi

Oral inhalation is the preferred route for delivery of small molecules to the lungs, because high tissue levels can be achieved shortly after application. Biologics are mainly administered by intravenous injection but inhalation might be beneficial for the treatment of lung diseases (e.g. asthma). This review discusses biological and pharmaceutical challenges for delivery of biologics and describes promising candidates. Insufficient stability of the proteins during aerosolization and the biological environment of the lung are the main obstacles for pulmonary delivery of biologics. Novel nebulizers will improve delivery by inducing less shear stress and administration as dry powder appears suitable for delivery of biologics. Other promising strategies include pegylation and development of antibody fragments, while carrier-encapsulated systems currently play no major role in pulmonary delivery of biologics for lung disease. While development of various biologics has been halted or has shown little effects, AIR DNase, alpha1-

proteinase inhibitor, recombinant neuraminidase, and heparin are currently being evaluated in phase III trials. Several biologics are being tested for the treatment of coronavirus disease (COVID)-19, and it is expected that these trials will lead to improvements in pulmonary delivery of biologics.

Identification of main influencing factors on the protein corona composition of PLGA and PLA nanoparticles

Hendrik Spreen, Matthias Behrens, Dennis Mulac, Hans-Ulrich Humpf, Klaus Langer

Poly(DL-lactic-co-glycolic acid) and poly(DL-lactic acid) are widely used for the preparation of nanoparticles due to favorable characteristics for medical use like biodegradability and controllable degradation behavior. The contact with different media like human plasma or serum leads to the formation of a protein corona that determines the NP's in vivo processing.

In this study, the impact of surface end group identity, matrix polymer hydrophobicity, molecular weight, and incubation medium on the protein corona composition was evaluated. Corona proteins were quantified using Bradford assay, separated by SDS-PAGE, and identified via LC-MS/MS. The acquired data revealed that surface end group identity had the most profound effect on corona composition in both quantitative and qualitative terms. Regarding matrix polymer hydrophobicity, adsorption profiles on NP systems with similar physicochemical characteristics resembled each other. The molecular weight of the matrix polymers proved to impact quantity, but not quality of corona bound proteins. The corona of plasma incubated NP showed adsorption of incubation medium-specific proteins but resembled those of serum incubated NP in terms of protein function, average mass and isoelectric point. Overall, the NP physicochemical properties proved to be easily adjustable determining factors of protein corona formation in physiological environments.

Improved multidetector asymmetrical-flow field-flow fractionation method for particle sizing and concentration measurements of lipid-based nanocarriers for RNA delivery

R. Mildner, S. Hak, J. Parot, A. Hyldbakk, S. E. Borgos, D. Some, C. Johann, F. Caputo

Lipid-based nanoparticles for RNA delivery (LNP-RNA) are revolutionizing the nanomedicine field, with one approved gene therapy formulation and two approved vaccines against COVID-19, as well as multiple ongoing clinical trials. As for other innovative nanopharmaceuticals



(NPhs), the advancement of robust methods to assess their quality and safety profiles—in line with regulatory needs—is critical for facilitating their development and clinical translation. Asymmetric-flow field-flow fractionation coupled to multiple online optical detectors (MD-AF4) is considered a very versatile and robust approach for the physical characterisation of nanocarriers, and has been used successfully for measuring particle size, polydispersity and physical stability of lipid-based systems, including liposomes and solid lipid nanoparticles. However, the unique core structure of LNP-RNA, composed of ionizable lipids electrostatically complexed with RNA, and the relatively labile lipid-monolayer coating, is more prone to destabilization during focusing in MD-AF4 than previously characterised nanoparticles, resulting in particle aggregation and sample loss. Hence characterisation of LNP-RNA by MD-AF4 needs significant adaptation of the methods developed for liposomes. To improve the performance of MD-AF4 applied to LNP-RNA in a systematic and comprehensive manner, we have explored the use of the frit-inlet channel where, differently from the standard AF4 channel, the particles are relaxed hydrodynamically as they are injected. The absence of a focusing step minimizes contact between the particle and the membrane, reducing artefacts (e.g. sample loss, particle aggregation). Separation in a frit-inlet channel enables satisfactory reproducibility and acceptable sample recovery in the commercially available MD-AF4 instruments. In addition to slice-by-slice measurements of particle size, MD-AF4 also allows to determine particle concentration and the particle size distribution, demonstrating enhanced versatility beyond standard sizing measurements.

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Arbeitsgemeinschaft für Pharmazeutische Verfahrenstechnik e. V. (APV)

Kurfürstenstr. 59 · 55118 Mainz · Germany
Telefon +49 6131 9769-0
Telefax +49 6131 9769-69
email apv@apv-mainz.de
web www.apv-mainz.de

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Leasing auch für andere Investitionsgüter

Leasing und Finanzierung von Investitionsgütern zu günstigen Konditionen:

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Sehr interessant auch für Nutzer von Maschinen für die Pharmaindustrie:

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- ✓ Abdeckung der kompletten Produktpalette

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Anfragen bitte an apv@apv-mainz.de, das Leasing-Unternehmen wird sich dann mit Ihnen in Verbindung setzen.

Kfz-Leasing

Hersteller/Typ	Listenpreis	mtl. Rate
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Audi A3 Sportback advanced 40 TFSI e 150kW/204PS S tronic inkl. 2-Zonen-Komfortklimaautomatik, Businesspaket inkl. MMI Navi Plus, Sitzheizung vorn, Einparkhilfe hinten, 17" LMR etc.	33.708,00 €	239,00 €
Audi Q4 40 e-tron advanced 150kW inkl. MMI Navigation pro, Assistenzpaket plus, Klimaautomatik, Einparkhilfe plus mit Kamera, Komfortpaket, Sitzheizung vorn, 19" LMR etc.	44.391,00 €	379,00 €
BMW 116i Advantage 80kW/109PS inkl. Klimaautomatik, Connected Package, Sitzheizung vorn, Lordosenstütze vorn, PDC hinten, Tempomat, Ablagenpaket, 17" LMR Vielspeiche 546 etc.	25.849,00 €	249,00 €
BMW 220i Coupé Advantage 135kW/184PS Automatic inkl. Live Cockpit Plus, Connected Package, Klimaautomatik, PDC hinten, Tempomat, Sitzheizung Fahrer/Beifahrer, 17" LMR etc.	35.336,00 €	429,00 €
BMW X2 xDrive25e 162kW/220PS Sport-Automatic inkl. Business Paket mit Navigation, Klimaautomatik, Park Assistent mit PDC v+h/Kamera, LED-Scheinwerfer, Tempomat, 17" LMR etc.	42.437,00 €	329,00 €
CUPRA Formentor 1.4 e-Hybrid 150kW/204PS DSG inkl. Navigationssystem, Fahrassistenz-Paket XL, Parklenkassistent mit Einparkhilfe/Kamera, Winter-Paket, Ambient Light, Climatronic etc.	36.168,00 €	189,00 €
Ford Kuga Cool & Connect 2,5 I Duratec PHEV 165kW/225PS Automatic inkl. Navigation, Klimaautomatik, Lenkradheizung, PDC v+h, Ganzjahresreifen, Winter-Paket I etc.	34.244,00 €	119,00 €
Ford Mondeo Turnier Trend 2,0 I Ti-VCT Hybrid 138kW/187PS inkl. Business-Paket, Navigationssystem SYNC3, Park-Assistent mit PDC v+h/Kamera, Winter-Paket, Ganzjahresreifen etc.	34.580,00 €	249,00 €
Mercedes A 250e Limousine AMG-Line 193kW/262PS Autom. inkl. MBUX Advanced-Paket, Business Paket, Klimaautomatik, Sitzheizung, Aktiver Park-Assistent mit PARKTRONIC, 18" LMR etc.	35.230,00 €	299,00 €
MINI Cooper SE 3-Türer 135kW/184PS inkl. Connected Navigation Plus, Klimaautomatik, Fahrassistenzpaket Plus, LED-Scheinwerfer, Sportsitze, 16" LMR Victory Spoke schwarz etc.	30.756,00 €	239,00 €
Renault ZOE INTENSE R135 Z.E. 50 inkl. 9,3" Multimediasystem EASY LINK, Navigation, Klimaautomatik, PDC v+h, Tempopilot, Toter-Winkel-Warner, Winter-Paket, 17" LMR etc.	32.899,00 €	109,00 €
Seat Leon Sportstourer FR 1.4 e-Hybrid 150kW/204PS DSG inkl. Navigation, Connectivity Box Wireless Charger, Fahrassistenzpaket XL, Winter-Paket, PDC hinten/Kamera, 17" LMR etc.	33.311,00 €	189,00 €
Skoda Octavia Combi Ambition 1,4 TSI iV 150kW/204PS DSG inkl. Infotainmentpaket Columbus inkl. Navi, Klimaautomatik, PDC v+h, Sitzheizung vorn, Tempomat, 17" LMR etc.	34.773,00 €	139,00 €
Skoda ENYAQ IV 50 55kWh Automatic inkl. Metallic, Design Selection Loft, Ausstattungspaket Infotainment mit Navigation, Paket Comfort 50, Climatronic, Sitzheizung vorn etc.	31.790,00 €	129,00 €