
Formulation and Evaluation of Solid and Liquid Dosage Forms

„Our research team is concerned with the formulation, development and evaluation of solid and liquid dosage forms.“

Offer

- Formulation of solid and liquid dosage forms
- Evaluation of tablets using pharmacopoeial methods (disintegration time, tensile strength, friability, porosity, dissolution test)
- Flowability testing of particulate material (flow rate, angle of repose, bulk and tapped density, porosity, sieve analysis, microscopy)
- Evaluation of compressibility of tableting materials using the parameters of compaction equations, energy profile of compression, parameters of the stress relaxation test and the tablet crushing kinetic
- Evaluation of liquid dosage forms (density, viscosity, osmolality, surface tension)

We are open to a wide spectrum of collaboration with academic partners as well as with partners from the industry.

Expertise

- Formulation and evaluation of solid dosage forms, especially tablets and powders
- Formulation and evaluation of liquid dosage forms, especially oral, ophthalmic and parenteral dosage forms
- The study of the current and new excipients for solid and liquid dosage forms
- Testing of dissolution profile of API from dosage forms including nano- and microfiltrates using USP 4 Flow-Through Cell method and methods of Ph. Eur

Key Research Equipment

Study of Material Properties

- Fluorescence imaging system (Olympus BX51)
- Moisture analyser (Precisa Instruments AG)
- Granulate & powder flow tester (Erweka GT)
- Bulk density meter (Copley Scientific Scott Volumeter)
- Tapped density tester (Erweka SVM 102)
- Vibratory sieve shaker (Retsch AS 200 basic)
- Differential Scanning Calorimeter (Netzsch DSC 200 F3 Maia)
- Atomic force microscope (NanoSurf easyScan2 Flex AFM)
- Scanning tunneling microscope (NanoSurf easyScan2 STM)
- Zeta potential analyzer (Mavern Zetasizer Nano ZS)
- MASTERSIZER 3000 with AeroS for dry mode and Hydro MV for wet mode (Malvern)
- Force tensiometer (Krüss K100)
- Rotational rheometer (Malvern Kinexus)
- Viscometer (Brookfield DV-E)
- AccuPyc (Micromeritics)

Powder and Granule Preparation

- Zeta potential analyzer (Mavern Zetasizer Nano ZS)
- Force tensiometer (Krüss K100)
- Rotational rheometer (Malvern Kinexus pro)
- Viscometer (Brookfield DV-E)
- Fluid bed dryer/granulator (Glatt Uniglatt)
- All-purpose-equipment – motor drive (Erweka AR 401)
- Wet granulator (Erweka FGS)
- Stainless steel cube mixer (Erweka KB 15S)
- Turbula T2F (WAB)

- Planetary mill PM 100 (Retsch)

Preparation and Testing of Tablets

- Compression tool (Adamus HT)
- Material testing machine (Zwick/Roell T1-FRO 50)
- EP-1 single punch tablet press with compression force (Erweka)
- Digimatic indicator (Mitutoyo Absolute ID-S1012B)
- Tablet hardness tester (Dr. Schleuniger Pharmatron 8M)
- Tablet disintegration tester (Erweka ZT 301)
- Tablet friability tester (Sotax FT2)
- Calorimetric thermometer (Parr 6772)
- Dissolution system for USP apparatus 1, 2, 5 and 6 (Sotax AT7 Smart)
- Dissolution system for USP apparatus 4 (Sotax CE-1)
- UV/VIS spectrophotometer (Analytik Jena Specord 205)
- HPLC (Agilent 1200)
- Stability testing chamber

Liquid Dosage Forms

- Laboratory Density Meter DMA 4100 (Anton Paar)
- Semi-micro-osmometer DL (Knauer)

Partnerships & Collaborations

Main Projects

- Project No. 1286218/2018 of Grant Agency of Charles University. TRPĚLKOVÁ, Ž., ONDREJČEK, P., ŠKLUBALOVÁ, Z., et al: **Study of fractal aspects of flow and consolidation behaviour of pharmaceutical excipients as prospective carriers for interactive mixtures with drugs.** 2018–2020.
- Project No. 322315/2015 of Grant Agency of Charles University. HURYCHOVÁ, H., ŠKLUBALOVÁ, Z., et al: **The study of fractal aspects of flowability of particulate matter in pharmaceutical technology.** 2015–2018
- Project Technological Agency TAČR TA01010128: MOŠA, M., ŘEHULA, M., JABO, A., ŠKLUBALOVÁ, Z. **Development of freeze-dried tablets for allergen vaccines.** TAČR 2011–2015

Collaborations

- University of Applied Sciences Northwest, Institute of Pharma Technology, Switzerland
- University Bonn
- Martin-Luther Universität Halle-Wittenberg
- Faculty of Pharmacy VFU, Dept. of Pharmaceutics, Brno
- Zentiva, k.s., Praha
- Teva Pharmaceuticals, Opava
- Dr. Müller Pharma, s.r.o.
- VAKOS XT a.s., Praha
- mcePharma Bílovec
- SYNPO a. s., Pardubice
- Contipro, a.s., Dolní Dobrouč
- University of Pardubice, Faculty of Chemical Technology
- University of Chemistry and Technology, Prague
- Brno University of Technology, Faculty of Chemistry
- Ardeapharma, a. s., Ševětín
- Hospital pharmacy (FN Motol, Všeobecná FN, FN Královské Vinohrady)
- Masaryk University, Faculty of Science, Brno

Achievements

Publications in respected international journals, research reports.

Are you interested in this expertise?

Please contact CPPT UK

Web: www.cppt.cuni.cz/

Mail: transfer@cuni.cz

Phone: +420 224 491 255

Experts and their Department

Assoc. Prof. PharmDr. Zdeňka Šklubalová, Ph.D.

Department of Pharmaceutical Technology

Web: <https://portal.faf.cuni.cz/Groups/Drug-Delivery-Dosage-Form-Technology/>