



Introduction and funding opportunities

University of Ljubljana, Faculty of Pharmacy

PSSRC Funding Workshop 2021



Faculty of pharmacy University of Ljubljana (UL FFA)





The Chair of Pharmaceutical Technology

Head: Prof. Mirjana Gašperlin

University teachers: 8 + 2

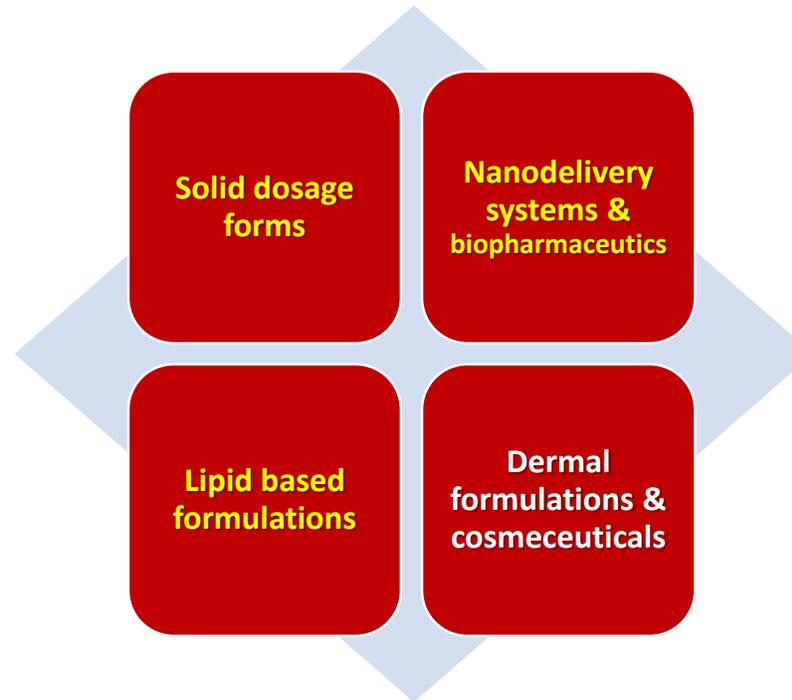
Assistants: 7

Researchers: 1

Young researchers: 2 + 2

Technical staff: 3

Research associates: 2

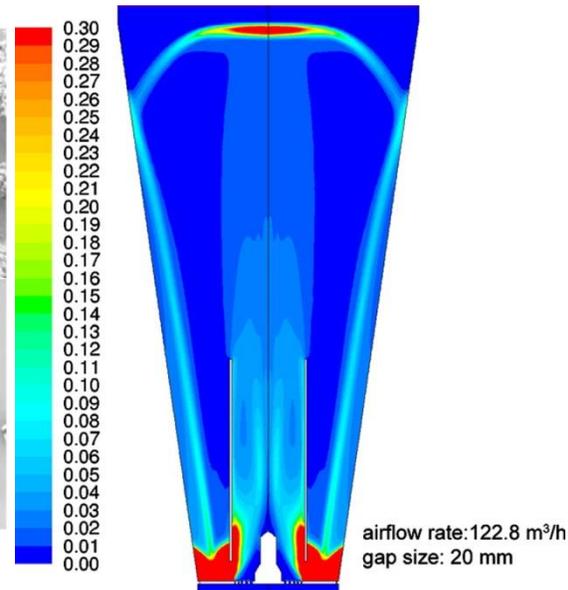
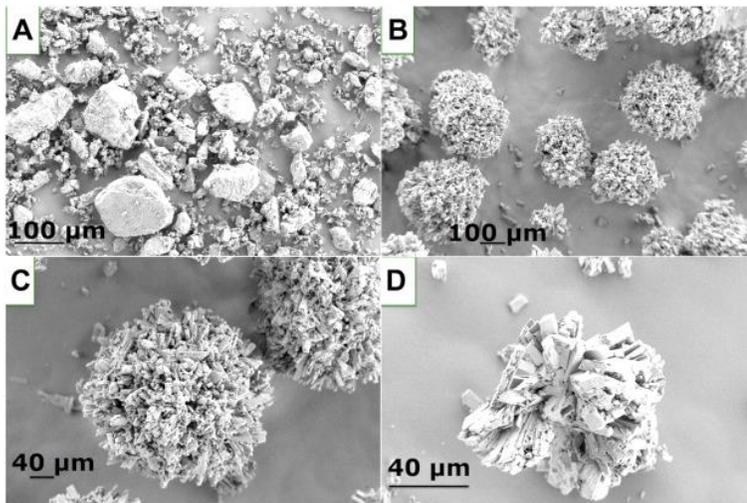




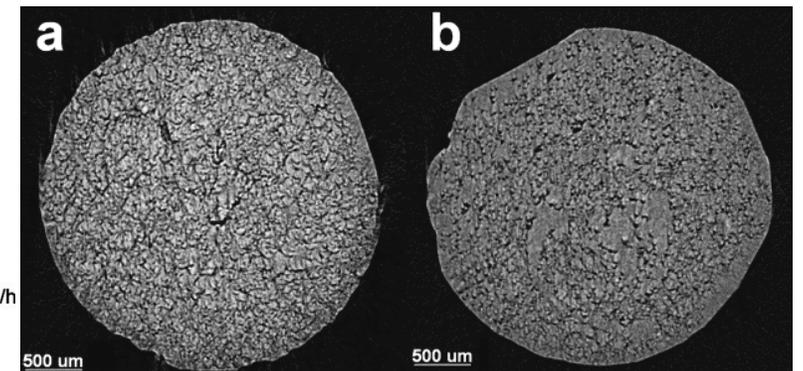
Characterisations, troubleshooting, studies of...

Solid dosage forms and process development:

- solid surface
- flow properties, segregation
- amorphous state stability
- solubility and dissolution rate
- investigation of mechanical properties of materials
- influence of mechanical characteristics of solids on tablet compression, chipping
- particle and tablet coating
- crystallization, tableting
- extrusion and 3D printing
- granules, pellets, capsules and tablets
- patient friendly dosage forms (mini and (oro)dispersible tablets, medicated wafers, films, straws)
- modified release
- microcapsules



Team: Prof. dr. Stane Srčič
Prof. dr. Odon Planinšek
Assoc. Prof. dr. Rok Dreu
Assoc. Prof. dr. Ilija German Ilič



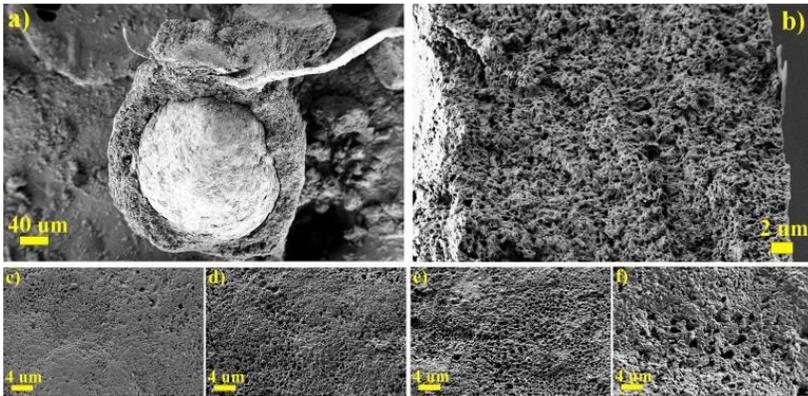


Characterisations, troubleshooting, studies of...

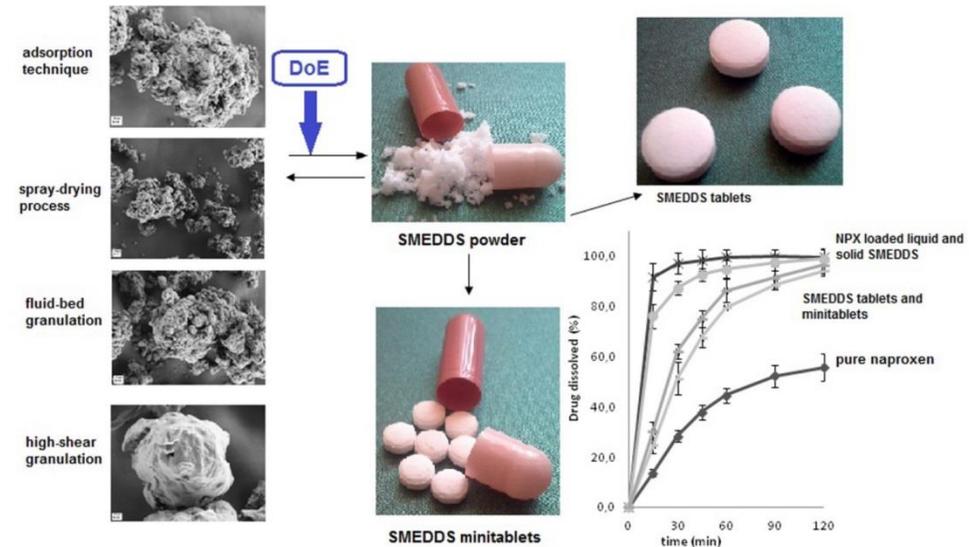
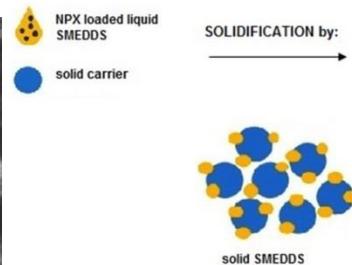
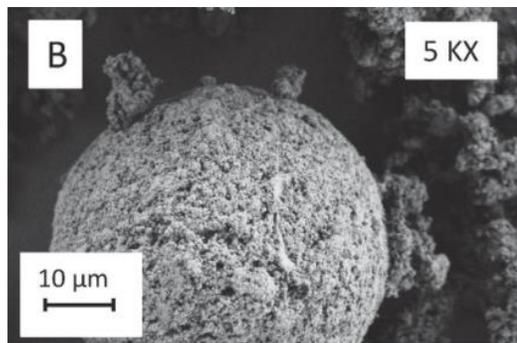
Lipid based formulations and process development:

- pseudo ternary phase diagrams construction
- *in vitro* cell toxicity
- penetration & permeability studies
- solidification of liquid SMEDDS
- evaluation of liquid and solid SMEDDS

- microemulsions
- dry emulsions
- SMEDDS – Self Micro Emulsifying Drug Delivery Systems
- hot-melt technologies (granulation, spray conegealing)



Team: Prof. dr. Mirjana Gašperlin
Assoc. Prof. dr. Alenka Zvonar Pobirk
Assoc. Prof. dr. Rok Dreu



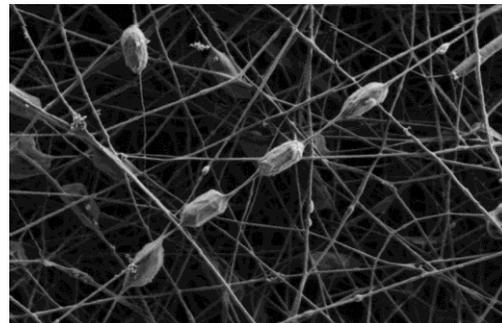
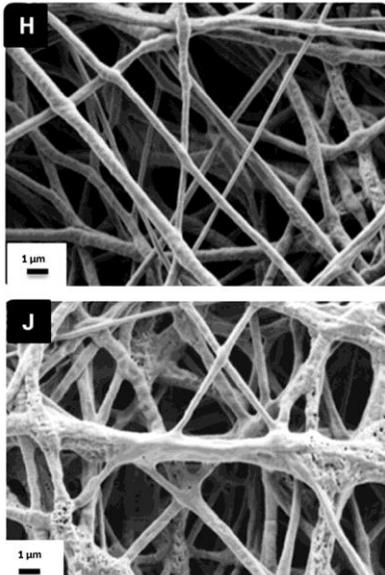


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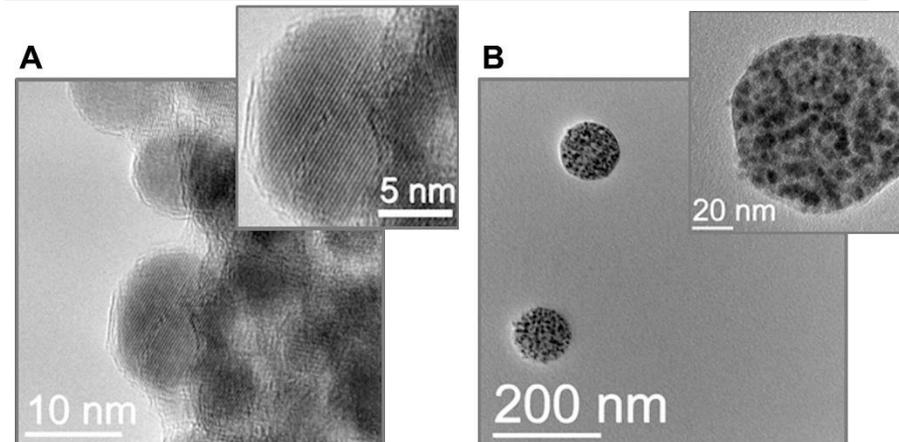
- characterization of nanomaterials
- development of mild condition based technologies for preparation of nanomedicines with biopharmaceutics or probiotics (lyophilization, electrospinning)
- safety and toxicity of nanomedicines (in vitro biological characterization)

Nanodelivery systems development:

- nanofibers
- polymeric & solid lipid nanoparticles
- nanosuspensions
- liposomes
- thermoresponsive micelles and hydrogels
- SPION-based nanotheranostics



Team: Prof. dr. Julijana Kristl
Assoc. Prof. dr. Petra Kocbek
Assoc. Prof. dr. Pegi Ahlin Grabnar



Processing equipment

- mixing (*Bioengineering Inversina*)
- high shear granulation (*4M8-TriX, ProCept*)
- fluid bed granulation (*top-spray, GPCG1, Glatt*)
- fluid bed hot-melt granulation (*BX-CGD1, Brinox, Tornado chamber*)
- fluid bed pelletization and powder layering (*rotor chamber, GPCG1, Glatt*)
- film coating and layering of pellets, granules, mini-tablets (*Wurster and swirl-Wurster chamber; GPCG1, Glatt and BX-CGD1, Brinox*)
- Capsule filling granules, pellets, multicomponent; (*MG Futura, MG2*)
- Twin screw Extruder/granulator (*Leistritz ZSE 12 HP-PH – 40T*)
- tableting (conventional, mini-tablets, of pellets, bilayer) (*SP300, IMA Killian*)
- pan coating of tablets (*Glatt GMPC I, Glatt*)
- spray drying/congealing (*B-290, Büchi*)
- high pressure homogenisation (*APV-2000, Invensys*)
- ultrasound homogenisation (*CV33, Omni*)
- separation (*Ultracentrifuge Sorwall WX 100*)
- lyophilisation (*Beta 1-8K, Martin Christ*)
- microencapsulation (*IE 50R, Inotech*)
- electrospinning/electrospraying (*Fluidnatek LE100, Bioinicia*)

Analytical tools

Resident analytical instruments

- DSC and TGA (*Mettler Toledo*)
- ATR-FTIR (*Nexus, Nicolet*)
- contact angle meter (*DSA 100, Krüss GmbH*)
- UV/VIS spectrophotometer (*HP 8453, Agilent*)
- chromatography systems (*1100, Agilent; UPLC, Waters*)
- IGC- Inverse Gas Chromatography (*Gas Chromatograph, Agilent*)
- modular rheometer (*Physica MCR 301, Anton Paar*)
- particle sizing instruments (*Mastersizer 3000, Malvern; Zetasizer Nano ZS, Malvern*)
- FT- IR spectrometer (*1600 FTIR, Perkin–Elmer*)
- Coupled RAMAN and AFM (*XploRA PLUS (Horiba Scientific) + OmegaScope (AIST-NT)*)
- PAT equipment:

FBRM probe C35, Mettler Toledo

PATVIS APA, Sensum

Accessible research tools

- ^{14}N NQR - Nuclear Quadrupole Resonance
- AFM - Atomic Force Microscopy (*Nanoscope IIIa system, Veeco*)
- Nanoindentation
- SEM (*Supra 35 VP, Carl Zeiss*)
- TEM (*CM100, Philips*)
- fluorescence microscopy,
- XRPD (*PANalytical X'Pert PRO MPD*)

SI - funding opportunities

3rd cycle study – PhD candidates:

- Erasmus+ KA131 doctoral mobility in a form of Studies or Traineeship

Both type of mobility support thesis research.

Study mobility depends on a call, traineeship type can be applied anytime (at your University or national coordinator).

Is currently limited to minimum of 3 months, shorter mobility will be available from September 2021 onwards.

University of Ljubljana, Faculty of Pharmacy has currently Erasmus inter-institutional agreements that include 3rd cycle signed with the following PSSRC members:

University of Helsinki and University of Lille (this is not limiting Traineeship mobility).

SI - funding opportunities

Post-Doc position:

- MSCA COFUND EUTOPIA-SIF postdoctoral fellowship

Eligibility: recognised Researchers (stage 2), PhD holders without permanent research position

Duration: 2 years, with a monthly average gross salary of 4.350 € and a supplementary budget for research and travel expenses.

Key Research areas: materials engineering, health

Application selection: rigorous two-stage selection process including an external review of all eligible proposals by renowned experts and interviews with short-listed candidates

Next call for applications: Autumn 2021

Past PSSRC collaborations

PhD student:

Aleksander Aleksovski (2014, Ghent)

Academic exchange:

Assoc. prof. dr. Rok Dreu (2014, Düsseldorf)

Assoc. prof. dr. Ilija German Ilić (2018, Graz)

Alexander von Humboldt Research Fellowship

Dr. Rok Šibanc (2017-18, Düsseldorf)

Collaborations resulted in 8 papers with Düsseldorf, Graz and Ghent.