

## *Program*

# Particulate Processes in the Pharmaceutical Industry IV

September 14 – 18, 2014

Potsdam, Germany

Conference Chair:

*Chuan-Yu (Charley) Wu*  
University of Surrey, United Kingdom



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Prof. Chuanbin Wu, Sun Yat-Sen University, China  
Prof. Aibing Yu, University of New South Wales, Australia  
Prof. Zhibing Zhang, University of Birmingham, UK

**Sunday, September 14, 2014**

16:00 – 18:00	Conference check-in
18:00 – 20:30	Reception and dinner
20:30 – 21:00	Organizing and Scientific Committee meeting

**Notes**

- Meals will be in the Restaurant “Templiners” (with exception of banquet-location to be announced)
- Taping and photography of any presentations are prohibited.
- Speakers – Please leave at least 5 minutes for questions and discussion.
- Please do not smoke at any conference functions.
- Turn your cellular telephones to vibrate or off during technical sessions.
- Please write your name on your program so that it can be returned to you if misplaced..
- After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.

## **Monday, September 15, 2014**

- 08:30 – 08:45            Opening remarks  
Conference Chair: Charley Wu  
ECI Technical Liaison: Herman Bieber
- 08:45 – 10:15            **Plenary Session 1**  
Chair: Chuan-Yu Wu
- 08:45 – 09:30            *Plenary Lecture 1*  
**Continuous manufacturing in pharmaceutical industry: a perspective**  
Jonathan Seville, University of Surrey, United Kingdom
- 09:30 – 10:15            *Plenary Lecture 2*  
**Coupling materials characterization methods with various design and process models to develop formulations for continuous manufacturing**  
Joseph Bullard, Vertex Pharmaceuticals, USA
- 10:15 – 10:45            Tea and coffee break
- 10:45 – 12:25            **Session 1: Continuous Manufacturing**  
Chair: Jonathan Seville
- 10:45 – 11:05            **Modular overall high-pressure microsystem for the integrated production and loading of colloidal drug carrier systems**  
Arno Kwade, TU Braunschweig, Institute for Particle Technology, Germany (109)
- 11:05 – 11:25            **Production of composite particles using a continuous dry coating process**  
Fanny Cavailles, Ecole-Des-Mines, Albi, France (106)
- 11:25 – 11:45            **Mixing and distribution in twin screw granulation**  
Tim Chan Seem, University of Birmingham, United Kingdom (115)
- 11:45 – 12:05            **Developing the design space for continuous and batch wet granulation**  
Tim Freeman, Freeman Technology, United Kingdom (102)
- 12:05 – 12:25            **Microsystems for emulsification: Efficient continuous production of colloidal drug carrier systems**  
Jan Henrik Finke, TU Braunschweig, Institute for Particle Technology (108)
- 12:25 – 14:30            Lunch
- 13:30                        Horizon 2020 partnership building informal meeting - primarily for interested EU participants. Theme: Solids handling for intensified process technology, ITN etc.)
- 14:30 – 16:00            **Keynote Session 1**  
Chair: Satoru Watano
- 14:30 – 15:15            *Keynote Lecture 1*  
**Drag forces in the simulation of particle-fluid flows**  
Aibing Yu, Monash University, Australia

**Monday, September 15, 2014 (continued)**

- 15:15 – 16:00      *Keynote Lecture 2*  
**Multi-scale modelling of dispersion of a carrier-based dry powder inhalation system**  
Hidehiro Kamiya and Zhenbo Tong, Tokyo University of Agriculture and Technology, Japan
- 16:00 – 16:30      Tea and coffee break
- 16:30 – 18:10      **Session 2: DEM Modelling**  
Chair: Aibing Yu
- 16:30 – 16:50      **Dynamic analysis of the FT4 powder rheometer**  
Mojtaba Ghadiri, University of Leeds, United Kingdom (132)
- 16:50 – 17:10      **Numerical analysis of contact electrification of non-spherical particles in a rotating drum**  
Chunlei Pei, University of Surrey, United Kingdom (121)
- 17:10 – 17:30      **DEM based determination of the breakage kernel for the population balance model of fluidized bed granulation**  
Sergiy Antonyuk, Hamburg University of Technology, Germany (112)
- 17:30 – 17:50      **Discrete particle simulation of liquid dispersion by particle contacts in a granulator**  
Koki Miyazaki, Osaka University, Japan (137)
- 17:50 – 18:10      **Characterization and optimization of a prismatic spouted bed: Combined experimental and numerical investigations**  
Stefan Heinrich, Hamburg University of Technology/Institute of Solids Process Engineering and Particle Technology, Germany (119)
- 18:10 – 19:30      Social hour & Posters
- 19:30 -              Dinner

**Tuesday, September 16, 2014**

- 08:30 – 10:00      **Keynote Session 2**  
Chair: Changquan C. Sun
- 08:30 – 09:15      *Keynote Lecture 3*  
**Design and control in pharmaceutical manufacturing processes**  
Satoru Watano, Osaka Prefecture University, Japan
- 09:15 – 10:00      *Keynote Lecture 4*  
**Particle engineering in pharmaceutical solids processing: Surface energy considerations**  
Daryl Williams, Imperial College, United Kingdom
- 10:00 – 10:20      Tea and coffee break
- 10:20 – 12:30      **Session 3: Manufacturing Processes**  
Chair: Tim Freeman
- 10:20 – 10:40      **A formulation strategy for solving the overgranulation problem in high shear wet granulation**  
Changquan C. Sun, University of Minnesota, USA (111)
- 10:40 – 11:10      **Granulation by fragmentation: A paste re-powdering technology**  
Eric Rondet, INRA Université Montpellier 1, faculté de pharmacie, France (127)
- 11:10 – 11:30      **Poly-caprolactone melt extrusion of pharmaceutical products: Rheological and structural properties**  
Ahmad Albadarin & Gavin Walker, University of Limerick, Ireland (124)
- 11:30 – 11:50      **Compaction behavior of bilayered tablets of mannitol and cellulose**  
David Souriou, Ecole des Mines d'Albi Carmaux, France (107)
- 11:50 – 12:10      **Wet milling of poorly-water soluble pharmaceutical components: formulation approach and milling parameters for enhanced product quality**  
Frederik Flach, TU Braunschweig, Institute for particle technology, Germany (103)
- 12:10 – 12:30      **Fine grinding of organic crystals in stirred media mills**  
Christoph Konnerth, Institute of Particle Technology (LFG), University of Erlangen-Nuremberg, Germany (128)
- 12:30 – 14:00      Lunch
- 14:00 – 18:30      Free time and *ad hoc* sessions  
Optional Excursion
- 18:30 – 19:30      Social hour
- 19:30 -              Dinner



**Wednesday, September 17, 2014**

- 08:30 – 10:00      **Plenary Session 2**  
Chair: Stefan Heinrich
- 08:30 – 09:15      *Plenary Lecture 3*  
**Quantification of segregation in multi-component powders: A general methodology for practical testing, re-formulation, and process design**  
Michael Gentzler, Merck, USA
- 09:15 – 10:00      *Plenary Lecture 4*  
**Biocompatible stripfilms for the delivery of poorly water soluble drugs via particle engineering**  
Rajesh Dave, New Jersey Institute of Technology, USA
- 10:00 – 10:30      Tea and coffee break
- 10:30 – 12:10      **Session 4: Characterization and Measurement**  
Chair: Abder Michrafy
- 10:30 – 10:50      **Characterization of bulk density distribution of roll-compacted ribbons using terahertz spectroscopy**  
Chuan-Yu Wu, University of Surrey, United Kingdom (120)
- 10:50 – 11:10      **Measurement of recompaction potential using tabletability measurements on an instrumented laboratory tablet press**  
Chinyere Oparaeché, Gamlen Tableting Ltd., United Kingdom (116)
- 11:10 – 11:30      **Evaluation of experiments employing confined compression of single granules**  
Henrik Jonsson, Uppsala University, Sweden (104)
- 11:30 – 11:50      **Compaction behaviour of dry granulated binary mixtures**  
Lucia Perez Gandarillas, Ecole des Mines d'Albi, France (101)
- 11:50 – 12:10      **Influence of coating on the wetting and mechanical behaviour of highly porous cylindrical aerogel pellets**  
Sergiy Antonyuk, Institute of Solids Process Engineering and Particle Technology, Hamburg University of Technology, Germany (110)
- 12:10 – 14:00      Lunch
- 14:00 – 15:30      **Keynote Session 3**  
Chair: Daryl Williams
- 14:00 – 14:45      *Keynote Lecture 5*  
**Novel drug delivery systems for macromolecule drugs**  
Chuanbin Wu, Sun Yat-Sen University, China
- 14:45 – 15:30      *Keynote Lecture 6*  
**Remote control of in-situ drug production and release using chemical robots**  
Frantisek Stepanek, Institute of Chemical Technology, Czech Republic

**Wednesday, September 17, 2014 (continued)**

- 15:30 – 16:00            Tea and coffee break
- 16:00 – 18:10            **Session 5: Formulation and Drug Delivery Systems**  
Chair: Rajesh Dave
- 16:00 – 16:20            **Effect of ultrasound on the physico-chemical properties of poorly water soluble drugs: Melt and anti-solvent sonocrystallization of Ketoprofen.**  
Nassim Belkacem, University Abderrahmane Mira of Bejaia, Algeria (129)
- 16:20 – 16:40            **Spray-dried Mannitol-Chitosan as Blend Carrier for Dry Powder Inhalation**  
Xin Pan, Sun Yat-Sen University, China (post106)
- 16:40 – 17:00            **Molecular dynamics simulation of nanoparticle permeation across model cell membrane**  
Hideya Nakamura, Osaka Prefecture University, Japan (126)
- 17:00 – 17:20            **Apparent bulk friction and cohesion of a slightly humid granular media**  
Haithem Louati, Centre Rapsodee Ecole des Mines d'Albi, France (122)
- 17:20 – 17:40            **CFD prediction of spray drying and scaling effects in pharmaceutical fluidized beds**  
Martin Weng, Aixprocess GmbH, Aachen, Germany (138)
- 17:40 – 19:00            Social hour & Posters
- 19:00                      Conference Banquet

**Thursday, September 18, 2014**

- 08:30 – 10:00      **Keynote Session 4**  
Chair: Aleksander Mendyk
- 08:30 – 09:15      *Keynote Lecture 7*  
**Amorphous formulations for drug delivery systems**  
Ng Wai Kiong, Institute of Chemical and Engineering Sciences, Singapore
- 09:15 – 10:00      *Keynote Lecture 8*  
**Understanding of compaction processes using finite element methods**  
Abder Michrafy, Ecole des Mines d'Albi, France
- 10:00 – 10:30      Tea and coffee break
- 10:30 – 12:30      **Session 6: Modelling and Simulations**  
Chair: Frantisek Stepanek
- 10:30 – 10:50      **Heuristic modeling of fine particle fraction and optimization of formulation for pulmonary drug delivery**  
Aleksander Mendyk, Jagiellonian University, Poland (post115)
- 10:50 – 11:10      **Contact parameter determination of amorphous agglomerates via DEM simulations**  
Sergii Kozhar, Hamburg University of Technology, Germany (125)
- 11:10 – 11:30      **An extended truncated-sphere model for DEM simulations of confined powder compression**  
Göran Frenning, Uppsala University, Sweden (118)
- 11:30 – 11:50      **FEM simulation of the compaction of biconvex tablets: Effect of the thickness of the compact on the density distribution, the residual radial stress and the capping tendency**  
Harona Diarra, Université Paris Sud, France (105)
- 11:50 – 12:10      **A numerical analysis of thermomechanical behaviour of pharmaceutical powders during die compaction**  
Alexander Krok, University of Surrey, United Kingdom (113)
- 12:10 – 12:40      Wrap up and final remarks
- 12:40 – 14:30      Lunch and departures

# Particulate Processes in the Pharmaceutical Industry IV

## Poster List

1. **Numerical analysis of particle-particle adhesion via dynamic liquid bridge**  
Hiroyuki Kan, Osaka Prefecture University, Japan
2. **Study of formation mechanisms of pharmaceutical granules by spheronization**  
Sergiy Antonyuk, Hamburg University of Technology, Germany
3. **Temperature distribution in material after the roll pressing**  
Roman Fekete, Slovak University of Technology in Bratislava, Slovakia
4. **Interfacial mechanical strength of bilayer tablets: Effect of material elasticity and compaction pressure**  
Harona Diarra, Université Paris Sud, France
5. **Comparison of different failure test for pharmaceutical tablets: Applicability of the Drucker-Prager failure criterion**  
Harona Diarra, Université Paris Sud, France
6. **Particle breakage in a scirocco disperser**  
Mojtaba Ghadiri, University of Leeds, United Kingdom
7. **High shear process of a paste extrusion**  
Peter Peciar, Slovak University of Technology in Bratislava, Slovakia
8. **Enhanced dissolution of inhalable itraconazole hot melt extruded solid dispersions for the treatment of invasive pulmonary aspergillosis**  
Chuanbin Wu, Sun Yat-Sen University, China
9. **Spray-dried mannitol-chitosan as blend carrier for dry powder inhalation**  
Chuanbin Wu, Sun Yat-Sen University, China
10. **Exenatide loaded poly-lactide-co-glycolide microparticles as a novel pulmonary drug delivery system**  
Chuanbin Wu, Sun Yat-Sen University, China
11. **Soluplus® as an effective supersaturation stabilizer of solid self-nanoemulsifying drug delivery system**  
Chuanbin Wu, Sun Yat-Sen University, China
12. **Mapping density distributions of pharmaceutical compacts using terahertz pulsed imaging**  
Jianyi Zhang & Chunlei Pei, University of Surrey, United Kingdom
13. **Scale-up of pharmaceutical granulation with respect to structure-dissolution relationships**  
David Smrčka, Institute of Chemical Technology Prague, Czech Republic
14. **The impact of roll compaction on the properties of pharmaceutical granules**  
Serena Schiano & Chuan-Yu Wu, University of Surrey, United Kingdom

15. **DEM Modelling of fragmentation of pharmaceutical ribbons during impact**  
Simone Loreti & Chuan-Yu Wu, University of Surrey, United Kingdom
16. **Numerical analysis of contact electrification of elongated particles in a vibrating container**  
Chunlei Pei, University of Surrey, United Kingdom
17. **The interdependency of material, process and equipment parameters for extrusion-spheronisation formulations**  
Ahmad Albadarin, University of Limerick, Ireland
18. **A study on the effect of lubricants on the distribution of API in pharmaceutical formulae**  
Ahmad Albadarin, University of Limerick, Ireland
19. **Investigation of the granular dispersion behaviour in a fluid bed rotor processor**  
Stefan Heinrich, Hamburg University of Technology, Germany