

# **Particulate Processes in the Pharmaceutical Industry III**

**24-29 July 2011**

**Hotel Grand Chancellor Surfers Paradise  
Gold Coast, Australia**

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**University of New South Wales, Australia**

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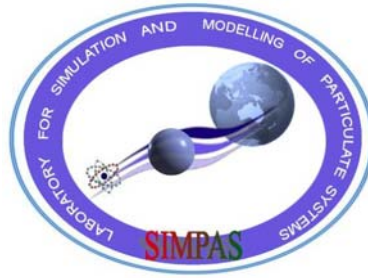
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**Sunday, July 24, 2011**

- 16:00 – 18:00 Conference Check-in
- 18:00 – 19:00 Welcome Reception
- 19:00 – 21:00 Opening Dinner (Buffet)

**Monday, July 25, 2011**

- 07:00 – 08:15 Breakfast
- 08:15 – 08:30 **Conference Welcome**  
Prof. Aibing Yu, Conference Chair  
Tressa Gaffaney, ECI Technical Liaison
- 08:30 – 09:10 *Plenary Speaker:* Prof. James N. Michaels  
DEVELOPMENT OF MATERIAL ATTRIBUTE DESIGN SPACES FOR  
PARTICULATE DOSAGE FORMS
- 09:10 - **Technical Session I (Synthesis/Crystallization/Characterization)**
- 09:10 - 09:40 *Keynote Presentation:* Dr. Gordon Xu  
“CONTROL PREPARATION OF LAYERED DOUBLE HYDROXIDE  
NANOPARTICLES AS EFFICIENT DELIVERY VEHICLES OF GENES AND  
DRUGS”
- 09:40 – 10:00 Michel Baron  
“GREENER PHARMACY USING SOLVENT-FREE SYNTHESIS”
- 10:00 – 10:20 Prof. Chuanbin Wu  
“ULTRA-FINE PARTICLE PROCESS SYSTEM (UPPS) AND ITS  
APPLICATION IN THE DEVELOPMENT OF PHARMACEUTICAL  
PRODUCTS”
- 10:20 – 10:50 Coffee break
- 10:50 – 11:20 *Keynote Presentation:* Prof. Huizhou Liu  
“PHARMACEUTICAL RELEASE PARTICULATE PROGRESS IN CHINA:  
FABRICATION OF STIMULT - RESPONSIVE MAGNETIC PARTICLES”
- 11:20 – 11:40 Martin Wijaya Hermanto  
“IMPLEMENTATION OF FBRM FOR ACHIEVING CONSISTENT PRODUCT  
QUALITY IN COMBINED ANTISOLVENT-COOLING CRYSTALLIZATION”
- 11:40 – 12:00 Ron Tau Yee Lim  
“DISSOLUTION ENHANCEMENT OF INDOMETHACIN VIA  
AMORPHIZATION USING SUPERCRITICAL, CO-PRECIPIATION  
PROCESSING AND CO-MILLING”

**Monday, July 25, 2011 (continued)**

- 12:00 – 12:20 David A V Morton  
“CONTROL OF PARTICLE ENGINEERING OF A MANNITOL-BASED POWDER FORMULATION
- 12:20 – 12:40 Frantisek Stepanek  
“FABRICATION AND STRUCTURAL CHARACTERISATION OF CHEMICAL ROBOTS FOR TARGETED DRUG DELIVERY”
- 12:40 – 13:00 Thanh T. Nguyen  
“A DENSITY BASED SEGMENTATION METHOD TO DETERMINE THE COORDINATION NUMBER OF A PARTICULATE SYSTEM”
- 13:00 – 14:00 Lunch
- 14:00 – 15:30 *ad hoc* discussions / free time
- 15:30 - 16:10 *Plenary Speaker:* Prof. Jinghai Li  
“MESO - SCALE MODELING - A KEY TO REAL - TIME SIMULATION OF PARTICLE - FLUID SYSTEMS”
- 16:10 – 16:40 Coffee break
- 16:40 – **TECHNICAL SESSION II (Coating/Drying)**
- 16:40 – 17:10 *Keynote Presentation:* Kohsaku Kawakami  
“PARTICLE DESIGN USING ELECTROSPRAY DEPOSITION TECHNOLOGY”
- 17:10 – 17:30 Shoucang Shen  
“DISSOLUTION ENHANCEMENT OF POORLY WATER-SOLUBLE DRUGS BY CO-SPRAY DRYING WITH MONODISPERSED MESOPOROUS CARBON SUBMICRON PARTICLES”
- 17:30 – 17:50 Prof. Xiaoshu Cai  
“PARTICLE SIZING WITH LIGHT AND ULTRASONIC METHODS”
- 17:50 – 20:00 Dinner Buffet
- 20:00 – 22:00 Poster Session (including brief talk @ 3min ea) + Social Hour

**Tuesday, July 26, 2011**

- 07:00 – 08:30 Breakfast
- 08:30 – 09:10 *Plenary Speaker:* Prof. G.V. Rex Reklaitis  
PROGRESS AND CHALLENGES IN INTEGRATED PRODUCT AND  
PROCESS SYSTEMS ENGINEERING OF SOLID PHARMACEUTICALS
- 09:10 - **TECHNICAL SESSION III (Packing/Compaction/Tabletting)**
- 09:10 - 09:40 *Keynote Presentation:* Prof. Teresa Carvajal  
“STRUCTURAL DIVERSITY AND EVOLUTION OF PHARMACEUTICAL  
AND FOOD RELEVANT MATERIALS AFTER MECHANICAL ACTIVATION:  
EXPERIMENTAL AND NUMERICAL METHODS APPROACH”
- 09:40 – 10:00 Mazel Vincent  
“ORIGINAL PREDICTIVE APPROACH TO THE COMPRESSIBILITY OF  
PHARMACEUTICAL POWDER MIXTURES BASED ON KAWAKITA  
EQUATION”
- 10:00 – 10:20 Virginie Busignies  
“CHARACTERIZATION OF POROUS STRUCTURE OF  
PHARMACEUTICAL COMPACTS BY PGSTE-NMR IN RELATION WITH  
MECHANICAL PROPERTIES”
- 10:20 – 10:40 Zhengbiao Peng  
“NUMERICAL SIMULATION OF PACKING STRUCTURE OF SEDIMENTS”
- 10:40 – 11:00 Coffee break
- 11:00 – 11:30 *Keynote Presentation:* Prof. Clive E. Davies  
“IN-LINE MEASUREMENT OF THE BULK DENSITY OF FINE POWDER”
- 11:30 – 11:50 Hideya Nakamura  
“EVALUATION OF CAPPING TENDENCY USING FORCE-DISPLACEMENT  
CURVE DURING TABLETING OF PHARMACEUTICAL POWDERS”
- 11:50 – 12:10 Chong Zhou  
“A PARTICLE SCALE INVESTIGATION OF PROGRESSIVE STRAIN  
LOCALISATION INVOLVING SPHERICAL AND NON-SPHERICAL  
PARTICLES”
- 12:10 – 12:30 Lian Liu  
“INFLUENCE OF PARTICLE SIZE ON THE DIRECT COMPRESSION OF  
IBUPROFEN AND ITS BINARY MIXTURES”
- 12:30 – 12:50 Prof. Kunio Shinohara  
“ADAPTATION OF VOID SIZE DISTRIBUTION MODEL TO SIMULATED  
PACKED BED OF SPHERES”
- 12:50 - 14:00 Lunch
- 14:00 – 15:30 *ad hoc* discussions / free time

**Tuesday, July 26, 2011 (continued)**

- 15:30 -                   **TECHNICAL SESSION IV (Granulation/Mixing)**
- 15:30 - 16:00           *Keynote Presentation:* Satoru Watano  
“DEVELOPMENT OF A NOVEL HIGH SPEED KNEADING GRANULATION  
AND ANALYSIS OF ITS GRANULATION MECHANISM BY COMPUTER  
SIMULATION”
- 16:00 - 16:20           Rachel Smith  
“NUMERICAL INVESTIGATION OF LIQUID BINDER DISTRIBUTION IN  
FLUIDISED BED GRANULATION USING THE SINGLE PARTICLE SPRAY  
FLUX”
- 16:20 – 16:40           Peiyuan Liu  
“DEM STUDY OF THE GRANULATION OF WET PARTICLES IN  
ROTATING DRUMS”
- 16:40 - 17:00           Coffee Break
- 17:00 – 17:30           *Keynote Presentation:* Dr. Karen Hapgood  
“USING THE UNIFIED COMPACTION CURVE TO BRIDGE THE WET  
GRANULATION AND TABLETTING PROCESSES”
- 17:30 – 17:50           Michele Marigo  
“COMPARISON OF THE MIXING EFFICIENCIES IN A CYLINDRICAL  
VESSEL UNDER DIFFERENT MOTIONS: ROTATING DRUM, HOOP  
MIXER AND TURBULA MIXER”
- 17:50 – 18:10           Prof. Edward White  
“COMPARATIVE STUDY ON THE EVALUATION OF THE GROWTH RATE  
COEFFICIENT FOR IBUPROFEN IN ETHANOL BY INSITU PAT AND  
CONVENTIONAL TECHNIQUES”
- 18:10 – 20:00           Chinese Dinner/Break
- 20:00 – 22:00           Poster Session (including brief talk @ 3min ea) + Social Hour

**Wednesday, July 27, 2011**

- 07:00 – 08:30            Breakfast
- 08:30 – 09:10            *Plenary Speaker:* Prof. Warren H. Finlay  
“RESPIRABLE POWDERS CONTAINING BACTERIOPHAGES ACTIVE AGAINST BURKHOLDERIA CEPACIA COMPLEX AND PSEUDOMONAS AERUGINOSA GRAM-NEGATIVE BACTERIA”
- 09:10 -                    **TECHNICAL SESSION V (Flow/Fluidization/Interparticle Forces)**
- 09:10 - 09:40            *Keynote Presentation:* Kunikazu Moribe  
“PHYSICO-CHEMICAL CHARACTERIZATION OF DRUG NANOPARTICLES IN SOLID AND SUSPENDED STATES”
- 09:40 – 10:00            Martin Robinson  
“NUMERICAL MODELLING OF FLUID-PARTICLE SYSTEMS USING TWO-WAY COUPLED SMOOTHED PARTICLE HYDRODYNAMICS AND THE DISCRETE ELEMENT METHOD”
- 10:00 – 10:20            Zhifu Zhou  
“COMPARISON AND EVALUATION OF EVAPORATION MODELS FOR SINGLE MOVING DROPLET WITH A HIGH EVAPORATION RATE”
- 10:20 – 10:40            Coffee break
- 10:40 – 11:10            *Keynote presentation:* Hidehiro Kamiya  
“Surface interaction control and characterization of microcapsule and fine particles for pharmaceutical application”
- 11:10 – 11:30            Shyamal Das  
“SURFACE ENERGY DISTRIBUTION PROFILES BY INVERSE GAS CHROMATOGRAPHY TO UNDERSTAND CHANGES IN SURFACE ENERGY ON PARTICULATE SURFACES”
- 11:30 – 11:50            Qi (Tony) Zhou  
“NANO-SCALE SURFACE ENGINEERING VIA MECHANICAL DRY COATING FOR IMPROVING FLOW, FLUIDIZATION AND AEROSOLIZATION OF FINE COHESIVE POWDERS”
- 11:50 – 12:10            Dr. Z.Y. Zhou  
“NUMERICAL SIMULATION OF THE HEAT TRANSFER OF ELLIPSOIDAL PARTICLES IN A FLUIDIZED BED”
- 12:10 - 13:30            Lunch
- 13:30 – 21:00            *ad hoc* discussions / free time / optional excursion / dinner on your own

**Thursday, July 28, 2011**

- 07:00 – 08:30 Breakfast
- 08:30 – 09:10 *Plenary Speaker:* Prof. John Bridgwater  
“CREATING POWDER MIXES - A VIEW FROM STARSHIP ENTERPRISE”
- 09:10 - **TECHNICAL SESSION VI (Emerging Techniques and Application I)**
- 09:10 - 09:40 *Keynote Presentation:* Prof. Jim Litster  
“QBD FOR WET GRANULATION IN PHARMACEUTICAL PROCESSING: IMPROVING MODELS FOR A PRIORI DESIGN AND SCALING”
- 09:40 - 10:10 *Keynote Presentation:* Prof. Mojtaba Ghadiri  
“ANALYSIS OF AERODYNAMIC DISPERSION OF COHESIVE CLUSTERS”
- 10:10 – 10:40 *Keynote Presentation:* Prof. Rajesh Dave  
“A PREDICTIVE FRAMEWORK FOR THE COHESION REDUCTION OF FINE PHARMACEUTICAL POWDERS VIA SURFACE MODIFICATION”
- 10:40 – 11:00 Coffee break
- 11:00 – 11:30 *Keynote Presentation:* Prof. Dong Chen  
“TOWARDS SYNCHRONIZATION OF THE SINGLE DROPLET DRYING STUDIES WITH REAL SPRAY DRYING STUDIES”
- 11:30 – 12:00 *Keynote Presentation:* Prof. Richard A Williams  
“SIMULATION OF MULTI-COMPONENT TABLET DISSOLUTION AND DISTINTEGRATION USING THREE DIMENSIONAL DIGITAL DISSOLUTION MODELLING METHODS”
- 12:00 – 12:30 *Keynote Presentation:* Prof. Zhibing Zhang  
“DETERMINATION OF THE ELASTIC MODULUS, YIELD STRESS, AND FRACTURE STRAIN OF ELASTIC - PLASTIC CORE-SHELL MICROCAPSULES USING MICROMANIPULATION AND FINITE ELEMENT MODELLING”
- 12:30 - 14:00 Lunch
- 14:00 **TECHNICAL SESSION VII (Emerging Techniques and Application II)**
- 14:00 - 14:30 *Keynote Presentation:* Prof. Tetsuya Ozeki  
“NANOPARTICLES FOR ORAL/PULMONARY DRUG DELIVERY USING SPECIAL SPRAY NOZZLES”
- 14:30 – 15.00 *Keynote Presentation:* Prof. Jennifer Sinclair Curtis  
“THE EFFECT OF PARTICLE SHAPE ON PHARMACEUTICAL AND GRANULAR FLOW PROCESSES”

**Thursday, July 28, 2011 (continued)**

- 15:00 – 15:30      *Keynote Presentation:* Prof. Stefan Luding  
“ABOUT COHESIVE POWDERS – FROM PARTICLES TO CONTINUUM THEORIES”
- 15:30 – 16:00      *Keynote Presentation:* Dr. Chuan-Yu (Charley) Wu  
“A NUMERICAL INVESTIGATION OF THE EFFECT OF SUCTION ON THE POWDER FLOW AND SEGREGATION DURING DIE FILLING USING DEM/CFD”
- 16:00 – 16.30      Coffee break
- 16:30 – 17.00      *Keynote Presentation:* Prof. Hamid Arastoopour  
“COMPUTATIONAL FLUID DYNAMIC (CFD) APPROACH TO SOLID PHARMACEUTICAL PROCESSING
- 17:00 – 17.30      *Keynote Presentation:* Prof. Jin Ooi  
“TOWARDS QUANTITATIVE DEM: VERIFICATION AND VALIDATION OF DISCRETE ELEMENT MODELING”
- 17:30 – 18.00      *Keynote Presentation:* Prof. Aibing Yu  
“MODELLING AND SIMULATION OF MULTIPHASE FLOW IN CYCLONES”
- 18:00 – 22:00      Gala Dinner

**Friday, July 29, 2011**

07:00 – 08:30	Breakfast
08:30 – 09:10	<i>Plenary Speaker:</i> Prof. Kim Chan “POWDER DISPERSION MECHANISMS IN PHARMACEUTICAL INHALERS”
09:10 -	<b><u>TECHNICAL SESSION VIII (Inhalation/Drug Delivery)</u></b>
09:10 - 09:40	<i>Keynote Presentation:</i> Yuichi Tozuka “DRAMATIC IMPROVEMENT OF DISSOLUTION AND ABSORPTION PROPERTIES OF API BY PREPARING SPRAY-DRIED POWDERS WITH TRANSGLYCOSYLATED MATERIALS
09:40 – 10:00	Zhenbo Tong “NUMERICAL STUDY OF THE EFFECTS OF MOISTURE AND ELECTROSTATIC CHARGE ON THE AGGLOMERATE AEROSOLISATION”
10:00 – 10:20	Dr. Handoko Adi “AEROSOL PERFORMANCE OF LYSOZYME NANO-MATRIX PARTICLES FOR INHALATION”
10:20 – 10:40	Coffee break
10:40 – 11:10	<i>Keynote Presentation:</i> Prof. Guanghui Ma “PREPARATION OF BIODEGRADABLE MICROSPHERES AND MICROCAPSULES WITH UNIFORM SIZE FOR BIOLOGICAL DRUG DELIVERY CARRIERS”
11:10 – 11:30	Mingxu Su “DROPLET SIZE ANALYSIS IN A PHARMACEUTICAL FAT EMULSION USING LIGHT EXTINCTION AND ULTRASONIC ATTENUATION SPECTRA”
11:30 – 11:50	Lian-Yan Wang “PREPARATION OF UNIFORM-SIZED CHITOSAN MICROSPHERES WITH AUTOFLUORESCENCE AND ITS APPLICATION IN VIVO
11:50 – 12:00	Conclusion
12:00 – 13:00	Lunch and Departure

## POSTERS

(2 hour session including a 3 minute PPT talk for each poster, social hour)

### Monday July 25, 2011

Zhanglian Hong	SYNTHESIS AND CHARACTERIZATION OF NANOCOMPOSITES FOR APPLICATIONS IN BIOSENSORS
Chuanbin Wu	PREPARATION AND IN VITRO EVALUATION OF SILK FIBROIN MICROSPHERES PRODUCED BY A NOVEL ULTRA-FINE PARTICLE PROCESSING SYSTEM
David A V Morton	INVESTIGATING THE EFFECT OF COATING MATERIAL ON THE FLOWABILITY AND COMPACTABILITY OF SURFACE COATED FINE COHESIVE POWDERS
Laurence Galet	EXPERIMENT AND SIMULATION OF THE DRY PARTICLE COATING
Wei Chen	EXPERIMENTAL AND NUMERICAL STUDY ON THE TABLET VELOCITY IN COMMERCIAL SCALE PAN COATERS
Hirohisa Takeuchi	NUMERICAL MODELING OF PARTICLE BEHAVIOR AND ITS BREAKAGE IN IMPACT PULVERIZER
Qi (Tony) Zhou	NANO-SCALE SURFACE COATING ON MICRONIZED DRUG PARTICLES VIA MECHANICAL DRY COATING FOR IMPROVED AEROSOL PERFORMANCE
Xiao Dong Chen	ON THE SURFACE CHEMICAL COMPOSITION OF A DROPLET DURING RAPID REMOVAL OF WATER IN SPRAY DRYING
Rohana Chandratilleke	INVESTIGATION OF FINE PARTICLE MIXING IN A VERTICAL BLADED-MIXER
X.Z. An	EXPERIMENTAL STUDY ON THE DENSIFICATION OF TWO-DIMENSIONAL VIBRATED EQUAL SPHERES
Q.F. Hou	NUMERICAL INVESTIGATION OF EFFECT OF TUBE ARRAY SETTINGS ON HEAT TRANSFER IN A GAS-FLUIDIZED BED
S. B. Kuang	"DISCRETE PARTICLE SIMULATION OF PARTICLES MOTION IN DIATOM PORES"
Z.Y. Zhou	PARTICLE SCALE SIMULATION OF HEAT TRANSFER BEHAVIOUR IN A MOVING BED
M. R. Rahimpour	MAGNESIUM HYDROXIDE PRECIPITATION FROM SEA BITTERN FOR USING IN PHARMACEUTICAL INDUSTRIES
Martin Ullrich	STABILITY AND CONTROLLED RELEASE CHARACTERISTICS OF MAGENTOLIPOSOMES
Dong Chen	SINGLE-STEP ASSEMBLY OF UNIFORM CORE-SHELL MICROPARTICLES FOR CONTROLLED RELEASE
Maxx William Capece	ROBUST MODELING AND PREDICTION OF COMMINUTION PROCESSES USING NON-LINEAR POPULATION BALANCE MODELS
Chunlei Pei	DEM/CFD MODELLING OF DEPOSITION OF CHARGED PARTICLES
Faten Fahmy	MEDICINAL HERB DRYING USING A PHOTOVOLTAIC ARRAY AND A SOLAR THERMAL SYSTEM

**Tuesday July 26, 2011**

H. Musha	COMPUTATIONAL STUDY OF THE MIXING BEHAVIOUR OF BINARY MIXTURES IN A BLADED-MIXER
L.Y. Yi	RADICAL TESSELLATION OF THE PACKINGS OF TERNARY MIXTURES OF SPHERES
Harumi Matsuzaki	STUDIES ON THE MECHANISM OF WEAR IN MICRO-BEADS, AND FOOD-SAFETY OF FINE PARTICLES CAUSED BY WEAR IN A MICRO-BEADS MILL
Bo Chen	NOVEL LIQUID DRUGS DELIVERY SYSTEM OF HOLLOW MESOPOROUS SILICA SPHERES: PREPARATION AND IN VITRO RELEASE
David A V Morton	UNDERSTANDING THE EFFECT OF NANO-SCALE SURFACE COATING ON THE FLOW BEHAVIOUR OF FINE COHESIVE POWDERS
Philip Chi Lip Kwok	CHARACTERISATION OF CYCLOSPORINE NANOPARTICLES EMBEDDED IN MANNITOL FOR RESPIRATORY DELIVERY
Q.F. Hou	EFFECT OF SAMPLE SIZE ON AVERAGING FLOW PROPERTIES IN GAS FLUIDIZATION
S. B. Kuang	APPLICATION OF PERIODIC BOUNDARY CONDITION TO CFD-DEM SIMULATION OF GAS-SOLID FLOW IN PNEUMATIC CONVEYING
Ying Zhou	REAL-TIME PARTICLE SIZE ESTIMATION BY IMAGE-BASED METHODS: INTEGRATING MULTIPLE IMAGE SEGMENTATIONS
Mazel Vincent	CONFOCAL MICRO-X-RAY FLUORESCENCE ANALYSIS AS A NEW TOOL FOR THE NON DESTRUCTIVE STUDY OF THE ELEMENTAL DISTRIBUTIONS IN PHARMACEUTICAL TABLETS
Santoso Adi	A NEW PERSPECTIVE FOR IMPROVING AEROSOLISATION OF PHARMACEUTICAL DRY POWDERS
James Kimber	MODELLING OF PHARMACEUTICAL TABLET SWELLING AND DISSOLUTION USING DISCRETE ELEMENT METHOD
Ondrej Kaspar	FABRICATION OF CORE-SHELL MICROPARTICLES BY SPRAY DRYING WITH A THREE-PHASE NOZZLE
Yin Yani	MOLECULAR DYNAMICS SIMULATION OF GLYCINE MOLECULES IN SUPERSATURATED SOLUTION
Xiaojun Bao	CFD VALIDATION OF SCALE-UP RELATIONSHIPS OF SPOUTED BEDS
Geoff Brims	NEW FOCUSED BEAM LIGHT OBSCURATION DETERMINES PRIMARY PARTICLE SIZE DISTRIBUTION AND LARGE-DIAMETER DROPLET TAIL OF PHARMACEUTICAL EMULSIONS