Program

Biological and Pharmaceutical Complex Fluids II: Novel Trends in Characterizing Interactions, Microstructure and Rheology

August 10 – 14, 2014

Durham, North Carolina, USA

Conference Chairs:

Samiul Amin
Malvern Instruments, USA

Tapan Das
Bristol Myers Squibb, USA

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Sunday, August 10, 2014

15:00 – 16:20	Conference Check-in (Presidents Gallery)
16:20 –	Welcome and Introductory Remarks
	Protein interactions, phase behavior and stability Chair: Tapan Das, Bristol Myers Squibb, USA
16:30 – 16:55	**Protein Interactions, stability, and aggregation mechanisms from low to high concentrations** Christopher Roberts, University of Delaware, USA
16:55 – 17:20	**Gauging colloidal and thermal stability in human IgG1 – sugar solutions through diffusivity measurement** Andreas S. Bommarius, Georgia Institute of Technology, USA
17:20 – 17:45	**Characterizing protein-protein interactions in solution** John van Zanten, BTEC-North Carolina State University, USA
17:45 – 18:10	**Characterizing phase behavior of highly concentrated protein solutions by dynamic light scattering** Katharina Christin Bauer, Karlsruhe Institute of Technology, Germany
18:30 – 20:00	Opening reception with heavy hors d'oeuvres and social hour (Presidents Terrace)

Notes

- *Technical sessions will be in Presidents I.*
- *Poster Sessions and exhibit tables will be in the Presidents Gallery.*
- *Meals will be in the Presidents II.*
- *Audiotaping, videotaping and photography of presentations are prohibited.*
- *Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).*
- *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.*
- *Be sure to check your contact information on the Participant List in this program and make any corrections to your name/contact information online. A corrected copy will be sent to all participants after the conference.*

Monday, August 11, 2014

07:30 – 08:30	Breakfast
	Protein aggregation, dynamics, cluster formation and characterization I Chair: Christopher Roberts, University of Delaware, USA
08:35 – 09:00	**Spontaneous formation of oligomers and fibrils in large scale molecular dynamics simulations of peptides** Carol Hall, North Carolina State University, USA
09:00 – 09:25	**On the large scale functional dynamics of proteins in solution** Dieter Richter, Jülich Centre for Neutron Science, Germany
09:25 – 09:50	**Exploring dynamics in concentrated protein solutions** Anna Stradner, Lund University, Sweden
09:50 – 10:15	**Structural investigation of protein and peptide fibrillation, using solution SAXS analysis as a central method** Bente Vestergaard, University of Copenhagen, Denmark
10:15 – 10:50	Coffee/Tea Break
	Protein aggregation, dynamics, cluster formation and characterization II Chair: Peter Schurtenberger, Lund University, Sweden
10:50 – 11:15	**Reversible cluster formation in concentrated monoclonal antibody solutions** Yun Liu, NIST, USA
11:15 – 11:40	**Characterization of dynamic clusters of mAbs using high shear rheology, small angle scattering and neutron spin echo** Isidro (Dan) Zarraga, Genentech, USA
11:40 – 12:05	**X-Ray and neutron scattering to study monoclonal antibodies in various phases** Nicholas Clark, NIST, USA
12:05 – 12:30	**Kinetic analysis of therapeutic protein aggregation from low to high protein concentration** Lucrèce Nicoud, ETHZ, Switzerland
12:30 – 12:55	**Physicochemical attributes and colloidal properties of dimeric and monomeric albumin** Michael Marlow, Regeneron, USA
13:00 – 14:30	Lunch
14:30 – 15:30	*ad hoc* discussions/free time
15:30 – 16:00	Afternoon Coffee/Tea

Monday, August 11, 2014 (continued)

Emerging techniques: Protein aggregation, aggregate characterization, formulation, stability
Chair: Isidro Zarraga, Genentech, USA

16:00 – 16:25 **High resolution mass spectrometric monitoring of early aggregates**
Elizabeth Topp, Purdue University, USA

16:25 – 16:50 **Automated chemical denaturation as a tool to evaluate protein stability and optimize the formulation of biologics**
Ernesto Freire, Johns Hopkins University, USA

16:50 – 17:15 **Combining dynamic light scattering and Raman spectroscopy to achieve new insights into the measurement of protein stability, aggregation and high order structure**
Neil Lewis, Malvern Instruments, USA

17:15 – 17:40 **Accurate counting of protein particles**
Dean Ripple, NIST, USA

17:40 – 18:05 **Image is everything: Sub-visible particle characterization of biopharmaceutical**
Angelica Olcott, ProteinSimple, USA

18:30 – 20:00 Dinner

20:00 – 21:00 Poster Session & Exhibition (Oral Introduction-4 minutes/poster)

21:00 – 22:00 Poster Session, Exhibition and Social Hour

Tuesday, August 12, 2014

07:30 – 08:30	Breakfast
	Proteins & biological complex fluids in foods Chair: Saad Khan, North Carolina State University, USA
09:00 – 09:25	**Protein-based structures in foods: Factors determining texture and satiety** Allen Foegeding, North Carolina State University, USA
09:25 – 09:50	**Stress-temperature limits for structuring of casein concentrates** Balz Baehler, University of Hohenheim, Germany
09:50 – 10:15	**Soft matter science and modern approaches for the food industry** Deniz Gunes, Nestle, Switzerland
10:15 – 10:50	Coffee/Tea Break
	Protein surface interactions and interfacial properties Chair: Orlin Velev, North Carolina State University, USA
10:50 – 11:15	**Dynamics of complex interfaces: protein-laden and bacteria-laden interfaces** Kathleen Stebe, University of Pennsylvania, USA
11:15 – 11:40	**Buckling phenomena and particle formation at the interface between air and monoclonal antibody** Gerry Fuller, Stanford University, USA
11:40 – 12:05	**Effect of shear and surface on aggregation of protein** Indu Sharma, IIT-Delhi, India
12:05 – 12:30	**Solid-liquid interfacial shear as a source of antibody aggregation in bioprocessing** Daniel Bracewell, University College London, United Kingdom
12:30 – 14:00	Lunch
14:00 – 15:30	Discussions with Exhibitors
15:30 – 16:00	Afternoon Coffee/Tea
	Emerging techniques: Proteins and biological complex fluids Chair: Kathleen Stebe, University of Pennsylvania, USA
16:00 – 16:25	**Active and passive measurements of local properties of complex fluids using low-coherence dynamic light scattering** Aristide Dogariu, University of Central Florida, USA
16:25 – 16:50	**Nanoparticle analysis using optofluidic and nanotweezer technology** David Erickson, Cornell University, USA
16:50 – 17:15	**Real time determination of surface charge in microfluidic channels to investigate surface adsorption of proteins** Julio Alvarez, Virginia Commonwealth University, USA

<u>Tuesday August 12, 2014</u> (continued)

17:15 – 17:40	**Characterization of protein surface adsorption by quartz crystal microbalance with dissipation (QCM-D)** Sambit Kar, Bristol Myers Squibb, USA
17:40 – 18:05	**Surface enhanced Raman spectroscopy sensing of chemical and biological molecules on low-cost microporous device** Ian White, University of Maryland, USA
18:05 – 18:30	**Mass spectrometry-based proteomics strategy for protein-ligand binding analysis in complex biological mixtures** Michael Fitzgerald, Duke University, USA
	Free evening / Dinner on your own

Wednesday, August 13, 2014

07:30 – 08:30	Breakfast
	Protein and peptide self association and aggregation Chair: Anna Stradner, Lund University, Sweden
09:00 – 09:25	**Peptide aggregation reduces the bioactivity of the HIV selective-inhibitor peptide D-Ala-Peptide-T amide (DAPTA)** Cait Macphee, University of Edinburgh, United Kingdom
09:25 – 09:50	**Self-assembly kinetics and mechanism of the amphiphilic peptide RADA 16-I** Marta Owczarz, ETHZ, Switzerland
09:50 – 10:15	**Investigating the influence of glycerol, PEG 1000 and glycine on the phase behavior of lysozyme and their impact on the stability of the native conformational state** Lara Galm, Karlsruhe Institute of Technology, Germany
10:15 – 10:50	Coffee/Tea Break
	Rheology and dynamics: Proteins and biological complex fluids Chair: Daniel Blair, Georgetown University, USA
10:50 – 11:15	**Microrheology of protein solution** Eric Furst, University of Delaware, USA
11:15 – 11:40	**How molecular conformation and clustering impact the concentration dependence of viscosity of protein solution** Prasad Sarangapani, Medimmune, USA
11:40 – 12:05	**Thermal denaturation of proteins leading to protein gels; reversible verses irreversible denaturation and microstructural properties of the gels** Alice Blumlein, National University of Ireland, Ireland
12:05 – 12:30	**Characterization and prediction of protein phase behavior by means of squeeze flow rheometry** Marie-Therese Schermeyer, Karlsruhe Institute of Technology, Germany
12:30 – 12:55	**Rheology and fizzics of protein-surfactant mixtures** Vivek Sharma, University of Illinois, USA
13:00 – 15:30	Free afternoon / Lunch on your own
15:30 – 16:00	Afternoon Coffee/Tea
	Rheology and dynamics: Complex fluids and colloids Chair: Samiul Amin, Malvern Instruments, USA
16:00 – 16:25	**Confocal-rheology of biologically derived materials: connecting microstructure to mechanical properties** Daniel Blair, Georgetown University, USA

<u>Wednesday, August 13, 2014</u> (continued)

16:25 – 16:50	**Gelation by molecular self-assembly: Can we understand it and can we predict it?** Srini Raghavan, University of Maryland, USA
16:50 – 17:15	**Photo-activated gelation of alginate hydrogels: Real-time in situ rheology & evolution of microstructure** Saad Khan, North Carolina State University, USA
17:15 – 17:40	**Passive optical mapping of the phase transitions in triblock copolymer systems** Jose R Guzman-Sepulveda, University of Central Florida, USA
17:40 – 18:05	**Dynamics of cubic colloids** John Royer, NIST, USA
18:35 – 20:30	Conference Dinner
20:30 – 21:30	Poster Session and Social Hour

Thursday, August 14, 2014

07:30 – 08:30	Breakfast
	Protein interactions with nanoparticles, surfactants and bionanotechnology Chair: Eric Furst, University of Delaware, USA
09:00 – 09:25	**Bio-inspired multifunctional nanomaterials for highly-efficient drug/gene delivery** Zhongwei Gu, National Engineering Research Center for Biomaterials, China
09:25 – 09:50	**Engineering of bio-colloidal interactions for development of novel antibacterial and antiviral formulations** Orlin Velev, North Carolina State University, USA
09:50 – 10:15	**New insight into the characterization of protein-nanoparticle interactions** Marc Obiols-Rabasa, Lund University, Sweden
10:15 – 10:30	**Biocompatible composite hydrogels laden with crystalline active pharmaceutical ingredients of controlled size and loading** Huseyin Burak Eral, Massachusetts Institute of Technology, USA
10:30 – 10:45	Conference Close - Samiul Amin and Tapan Das (Co-Chairs)
10:45 – 11:15	Coffee/Tea Break
	Departures

Biological and Pharmaceutical Complex Fluids II: Novel Trends in Characterizing Interactions, Microstructure and Rheology

Poster List

1. **A comparison study of manual and automated particle characterization using Micro-Flow Imaging (MFI)**
   Angelica Olcott, ProteinSimple, USA

2. **Assessment of surfactants for efficient droplet PCR using the pendant drop technique**
   Kunal R. Pandit, University of Maryland College Park, USA

3. **Viscosity of colloidal and protein clustered solutions**
   P. Douglas Godfrin, University of Delaware, USA

4. **Automated, low volume viscosity and size measurements via micro-capillary Viscometry**
   Wei Qi, Malvern Instruments, USA

5. **Competition between isotropic and directional interactions in a toy model of protein solutions**
   Debra J. Audus, National Institutes of Standards and Technology (NIST), USA

6. **Characterization of the conformational ensembles of humanized IgG1, IgG2 and IgG4 in solution**
   Bente Vestergaard, University of Copenhagen, Denmark

7. **Investigation of surfactant-cell interactions for increased efficiency of commercial bioreactors**
   David Chang, North Carolina State University, USA

8. **Characterization and control of surfactant and copper-mediated norovirus interactions**
   Brittany S. Mertens, North Carolina State University, USA

9. **Microrheology of therapeutic protein solutions**
   Lilian Lam Josephson, University of Delaware, USA

10. **Identification and surface characterization of nanoparticles**
    Abbey Weith, Optofluidics, Inc., USA

11. **Simultaneous DLS and Raman scattering as a complementary technique to monitor protein aggregation**
    Gregory V. Barnett, University of Delaware, USA

12. **Gel point determination thanks to microrheology**
    Jonathan Denis, Formulaction Inc., USA

13. **Physical stability of nanoparticle dispersions**
    Jonathan Denis, Formulaction Inc., USA