



the BIOTechnologist

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The Biochemical Technology Division of the American Chemical Society

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BIOT Programming August 16-20, 2009, Washington, DC Call for Papers is NOW Open

Dear Fellow BIOT Members,

On behalf of the BIOT Executive Committee, I would like to invite all of you to attend the [238th ACS National Meeting](#) in Washington D.C., August 16-20, 2009, which will feature another outstanding BIOT program. Program Chairs Humin Zhao, Ajoy Velayudhan, David Roush, have already recruited area coordinators and session chairs, and are putting together a great technical program, which includes over 45 sessions and a tremendous line-up of Keynote speakers in a diverse set of topics. The meeting will also feature many Award Lectures, as part of the BIOT programming tradition by now. Additional program details are available in this newsletter. I encourage you to contribute to the program by submitting abstracts for oral and poster presentations (on-line submission deadline March 9th).

BIOT is also bringing you more quality technical content outside of the National Meeting. A number of webinars are planned for 2009. For more details on the webinar lectures and other BIOT activities, please check our new website www.acsbiot.org, which has been greatly improved by our Newsletter Editor Claire Komives.

BIOT is a volunteer organization and I encourage you to get involved. In addition to the efforts towards an excited program and annual meeting, there are many opportunities for the involvement of BIOT members. Under the leadership of the past-chair Erik Fernandez, BIOT started to develop a long-term strategic plan for the next four years. This plan includes four major goals to enable that BIOT will be the premier organization providing biochemical technology professionals with enhanced programs and efficient processes for globally disseminating information and for networking. You can find details on the website

<http://sites.google.com/site/biotstrategicplan>.

I would like to thank, in advance, all of you whose efforts will make BIOT a valuable organization for all of the members. I would also like to acknowledge all the BIOT Executive Committee members whose names are listed in this newsletter, and the outgoing members, including Dana Andersen (2007 Chair), Nedim Altaras (Secretary), and Jonathan Coffman (Web Programming), for their efforts. I would also take this opportunity to welcome Theresa Good (Chair-Elect), Anne Robinson (Awards Coordinator), Jayanth

Sridhar (Secretary), Peter Tessier (Membership), Scott Tobler (Web Programming) in their new roles.

As always, please feel free to contact one of our Executive Committee members or me, if you have been wondering how you can get involved with BIOT and help to shape our division with new ideas and efforts. We look forward to hearing from you.

Best Regards,

Weichang Zhou
BIOT Division Chair

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ACS BIOT Symposia and Sessions, Washington, DC, 2009

The call for papers is **now open (until March 9, 2009)** for participation in the BIOT Program at the 238th ACS National Meeting and Exposition in Washington, DC. To submit an abstract, you can enter the OASYS portal through the ACS website (<http://www.acs.org>) or go directly to the meeting submission site at <http://oasys.acs.org/acs/238nm/oasys.htm>

Upstream Processes

Area coordinators:

Patrick Cirino, Penn State University; Email: cirino@engr.psu.edu; Phone: (814)865-5790

Zhengjian Li, Bristol Myers Squibb; Email: zhengjian.li@bms.com; Phone: (315)432-2131

1. Advances in Biocatalysis

Carlos Martinez, Pfizer; Email: carlos.martinez6@pfizer.com; Phone: (860)686-2284

Burckhard Seelig, University of Minnesota, Minneapolis-St Paul; Email: seelig@umn.edu; Phone: (612)626-6281

2. Advances in Microbial Fermentation Process Development

Jayanth Sridhar, Biomarin Pharmaceutical Inc.; Email: jsridhar@bmrn.com; Phone: (415)506-3530

Tsu-shun Lee, Allegen; Email: Lee_Tsu-Shun@allergan.com; Phone: 919-414-1208, ext. 2692

3. Advances in Metabolic Engineering

Mariajose Castellanos, University of Maryland; Email: mariajose@umbc.edu; Phone: (410)455-8151

Scott Banta, Columbia University; Email: sb2373@columbia.edu; Phone: (212)854-7531

4. Advances in Cell Culture Process Development

Susan Sharfstein, Rensselaer Polytechnic Institute; Email: sharfs@rpi.edu; Phone: (518)276-2166

Sanjeev Ahuja, MedImmune; Email: ahujas@medimmune.com; Phone: (301)398-4392

Frank Chaplen, Oregon State University; Email: chaplenf@engr.orst.edu; Phone: (541)737-1015

5. Applications of Systems Biology to Upstream Process Development

Nathan Price, University of Illinois at Urbana-Champaign; Email: ndprice@illinois.edu; Phone: (217)244-0596

Yiannis N. Kaznessis, University of Minnesota, Minneapolis; Email: yiannis@cems.umn.edu; Phone: (612)624-4197

Biotechnological Solutions to Global Security

***New this year!!**

Area coordinators:

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Rachel Chen, Georgia Institute of Technology; Email: rachel.chen@chbe.gatech.edu; Phone: (404) 894-1255

1. Industrial Biotechnology and Bioenergy

Abhijeet P. Borole, Oak Ridge National Laboratory; Email: borolea@ornl.gov; Phone: (865)576 7421

E. Kendall Pye, Lignol Innovations, Inc.; Email: kpye@lignol.ca; Phone: (610)638-1227

2. Antibiotics for Combating Infectious Diseases (Joint session(s) with BIOL)

Brian F. Pflieger, University of Wisconsin-Madison; Email: pflieger@engr.wisc.edu; Phone: (608)-890-1940

Clay Wang, University of Southern California; Email: clayw@usc.edu; Phone: (323)442-1670

3. Biomaterials and Tissue Engineering for Advancing Regenerative Medicines (Joint session(s) with POLY)

Szu-wen Wang, University of California, Irvine; Email: wangsw@uci.edu; Phone: (949)824-2383

Sarah Heilshorn, Stanford University; Email: heilshorn@stanford.edu; Phone: (650)723-3763

4. Bioremediation and Water Purification

Dacheng Ren, Syracuse University; Email: dren@syr.edu; Phone: (315)443-4409

Jerry Yang, Amgen; Email: xyang@amgen.com; Phone: (805)313-6362

5. International Collaborations in the Global Research Enterprise

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ACS BIOT Symposia and Sessions, Washington, DC, 2009

BIOT Programming also includes award and key-note lectures covering the most current science and technology of interest to BIOT members. In addition to technical sessions, receptions and other networking events will be held included at the conference. For more information, check the ACS BIOT website at <http://www.acsbiot.org>.

Downstream Processes

Area coordinators:

Christopher J. Roberts, University of Delaware; Email: cjr@udel.edu; Phone: (302)831-0838

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1. Product and Impurity Properties Impacting Design and Optimization of Downstream Processes

Sanchayita Gose, Bristol Myers Squibb; Email: sanchayita.ghose@bms.com; Phone: (315)431-7930

Wendy Luo, Grace Davison Discovery Sciences; Email: wendy.luo@grace.com; Phone: (847)282-2023

2. High Throughput Screening

Mark Teeters, Centocor; Email: MTeeters@its.jnj.com; Phone: (610)889-4610

John Moscariello, Amgen (Washington); Email: jmoscari@amgen.com; Phone: (206)265-7114

3. Advances in Purification Technology

Rob van Reis, Genentech; Email: vanreis.robert@gene.com; Phone: (650)225-1522

Mark Etzel, University of Wisconsin, Madison; Email: etzel@enr.wisc.edu; Phone: (608)263-2083

4. Downstream Processing Challenges for Mab and Mab-derived Proteins

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David Peers, Genentech; Email: peers.david@gene.com; Phone: (707)454-5142

5. Downstream Processing Challenges for Non-Mab Proteins

Angela Lewandowski, Genzyme; Email: angela.lewandowski@genzyme.com; Phone: (508)271-2975

Joseph Shultz, Amgen; Email: jshultz@amgen.com; Phone: (805)447-5133

6. Process Integration from a Downstream Perspective

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Kent Goklen, GSK; Email: kent.e.goklen@gsk.com; Phone: (610)270-4793

7. Process Modeling for Functional and Economical Predictions

Arne Staby, Novo Nordisk; Email: ast@novonordisk.com; Phone: +45 4443-9989

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Quality by Design (QbD)

Area coordinators:

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1. Experimental Design and Process Modeling for QbD

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2. Regulatory Aspects of QbD

Patrick Swann, FDA; Email: patrick.swann@fda.hhs.gov; Phone: (301)827-0850

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3. Practicing QbD Case Studies

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Poster Session

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ACS BIOT Symposia and Sessions, Washington, DC, 2009

Emerging Technologies

Area coordinators:

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Kristala Prather, Massachusetts Institute of Technology; Email: kljp@MIT.EDU; Phone: (617)253-1950

1. Design and Engineering of Novel Therapeutic Strategies

Pankaj Karande, Rensselaer Polytechnic Institute; Email: karanp@rpi.edu; Phone: (518)276-4459

J. Christopher Love, Massachusetts Institute of Technology; Email: clove@mit.edu; Phone: (617)324-2300

2. Stem Cell Engineering

David Schaffer, University of California, Berkeley; Email: schaffer@mit.edu; Phone: (510)643-5963

Chunhui Xu, Geron Corporation; Email: cxu@geron.com; Phone: (650)473-7795

3. Synthetic Biology

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Christopher Rao, University of Illinois at Urbana-Champaign; Email: chris@scs.uiuc.edu; Phone: (217)244-2247

4. Nanobiotechnology

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Biophysical & Biomolecular Processes

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1. Protein Folding and Biophysical Characterization

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2. Protein Aggregation

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Mary Cromwell, Genentech; Email: cromwell@gene.com; Phone: (650)225-1955

3. Characterization of Covalent Modifications in Proteins

Young Kwon, University of California, Irvine; Email: kwonyj@uci.edu; Phone: (949)824-8714

Dennis Bong, Ohio State University; Email: bong@chem.osu.edu; Phone: (614)247-8404

Jun Park, FDA; Email: jun.park@fda.hhs.gov; Phone: (301) 827-0663

4. Targeted Delivery of Proteins and Nucleotides

Chun Wang, University of Minnesota; Email: wangx504@umn.edu; Phone: (612)626-3990

Szu-wen Wang, UC Irvine; Email: wangsw@uci.edu; Phone: (949)824-2383

Paul A. Burke, Merck; Email: pburke@alum.mit.edu; Phone: (215)652-4063

5. Protein Engineering

Zhilei Chen, Texas A&M Univ; Email: zhilei.chen@chemail.tamu.edu; Phone: (979)862-1610

David Wood, Princeton University; Email: dwood@princeton.edu; Phone: (609)258-5721

Xinle Wu, Amgen; Email: xinlewu@amgen.com; Phone: (650)244-2545

6. Protein Stability during Bioprocessing

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Steve Bishop, MedImmune; Email: bishops@medimmune.com; Phone: (301)398-4672

Dave Pollard, Merck Bioprocess R&D; Email: david_pollard@merck.com; Phone: (732)594-2680

7. Current Challenges in Protein Formulations

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Ambarish Shah, MedImmune; Email: shaha@medimmune.com; Phone: (301)398-4036

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Meet the New BIOT Division Chair



Weichang Zhou - photo by Jacqueline Zhou

Many of you may remember his exquisite taste in having special wines made for the Biochemical Engineering XIII Conference, as Program Co-Chair, in Boulder, Colorado. Some of you may know him as the guy who, when stumbling over his English might break into a stutter, until by hitting himself in the face his sentence regained its course. If you have never worked with Weichang Zhou, you may not know the extent of his noteworthy contributions to the biotech industry over the course of his career. He has also provided many hours of service to the BIOT division as awards chair for the past three years, Industrial Program Chair in 2004, session chair for many meetings, and we now welcome him as our new Division Chair.

Weichang grew up in Fuzhou, China, in the province of Jiangxi. Starting high school at the age of 10, he was encouraged at an early age by his high school chemistry teacher to pursue studies in organic chemistry. In those years, China had a vested interest in developing the petrochemical industry in order to make synthetic fibers for textiles, which opened attractive career opportunities. He prepared to take the Chinese national college entrance exam, consisting of six different subjects over the course of three days. Passing the exam, he headed off to college at the age of 15 – the first in his family of seven children to leave home on his own – to attend the Jiangxi University of Technology.

After college, he worked for a year at the Chinese Academy of Forestry developing technologies for processing forest products. After one year, he tried a second time on the entrance exam for a Master's program and received the top score of all the applicants for the institute, enabling him to obtain a scholarship to go to Germany for his graduate studies. With Germany in his future, he headed off on his own at the age

of 20 to Shanghai, where he stayed a year and a half to learn German at a “branch” of the Goethe Institute. But we cannot assume that young Weichang spent all his time studying German; there he met Fei, who became his wife and joined him in Germany where their first daughter, Li, was born.

In Germany, Weichang worked for Professor Dr. Karl Schügerl in the University of Hannover as one member of a group of more than 80 graduate students. Based on a literature search, he chose to work for Prof. Schügerl in order to pursue his interest in bio-processing. In Prof. Schügerl's lab, one necessarily learned to work independently, as meetings with the professor occurred every three months. Weichang fondly remembers his professor's kindness by entertaining the foreign students at his home for an annual Christmas party. Weichang was the first Chinese student to attend the institute in Hannover, and also the youngest. As his research advanced, other Chinese students enrolled in the program, and he was happy to mentor them. To complete his PhD program, which he did in 3.5 years, he wrote and defended his thesis in German and published three articles in English on his work.

Because of visa issues, it was difficult to obtain an industrial position in Switzerland or in Germany, he spent next three years at academic institutions as post doc, first at the German DECHEMA-Institute, and then at the Swiss Federal Institute of Technology (ETH-Zurich) working with Professor Armin Fiechter in several biochemical engineering areas. In 1992 he headed to the USA to the University of Minnesota where he did another postdoctoral project for Professor Wei-Shou Hu. He chose to work on process monitoring and control, as it more closely matched his previous experience than the artificial liver project he was also offered. His work in Minnesota meant shifting gears, as it focused on the growth of mammalian cells. In Germany, many projects at the institute had been sponsored by European industries, and as a result, the projects were very applied in nature. Even though his research in the US was sponsored by Merck, it had a more basic focus. In his year and a half in Minnesota, by controlling the glucose concentration through a programmed feeding strategy to alter the cell metabolism, he was able to obtain the highest cell concentration in a fed batch reactor as had been reported to date for mammalian cell cultures. He published about five articles on this work.

Weichang's productivity reached home, as well, with his second daughter, Jacqueline,

arriving just three months before he completed his postdoctoral work in Minnesota. His first daughter Li, now in preschool, was recognized as the only girl in the class and neighborhood who could speak German, Chinese, and English in the same sentence! He found the culture entirely different in the US, with frequent meetings at work. Between department meetings, seminars, and group meetings, he learned to prepare and give a seminar at a moment's notice. He also found the amount of energy consumption in Minnesota to be remarkably high, particularly in the winter. He was surprised that the lab was relatively unsophisticated at the time, and he had to set up his own experimental system.

He interviewed at a few places and found Merck particularly impressive, so he moved his family to Rahway, NJ in 1994, to work as an Engineering Associate in the Fermentation and Cell Culture Group, working primarily with mammalian cells. John Aunins was his chief supervisor for most of his time at Merck. His first project was to produce recombinant rat and mouse growth hormone to inject rats and mice for safety studies. Purchasing the commercial proteins was prohibitively expensive and not feasible at the quantities needed at that time, as they were extracted from the animals and purified. Thus, the goal was to make their proteins in-house. As the demand for products from cell culture grew, Merck built a biologics facility, so Weichang moved to West Point. He led development of Merck's licensed manufacturing process for the pentavalent bovine-human reassortant live, oral Rotavirus vaccine, RotaTeq® from cell culture to sterile bulk, oversaw development of a large-scale PER.C6™ cell growth, Adenovirus propagation and recovery process for manufacturing of Merck's trivalent Adenovirus vectored HIV-1 vaccine candidate. One of his lesser known feats during his time at Merck, as reported by Aunins, was to modify the two-liter Braun bioreactor control boxes to measure the oxygen uptake rate in mammalian cell cultures. Because the air flow rates in these systems must be kept low, it is not possible to directly measure the oxygen concentration real time in the offgas with a mass spectrometer, but the measurement can be made by the dynamic method. Weichang worked with the folks from Braun, programmed in the necessary control functions and non-linear regression routines, and the system was able to work quite well. Braun then went and added this new feature to their control boxes – to be sold for their

(cont'd on page 6)

Weichang, cont'd from page 5

own profit, of course! According to Aunins, Weichang was able to tackle and solve any problem that was presented to him. He was extremely analytical, "a first principles kind of guy." At the same time he was lots of fun to work with, not to mention a fierce foosball competitor. By the time he left Merck, he held the position of Associate Director, his third promotion in seven years.

Presented with an opportunity to join a growing biotech company where he could serve in multiple functions, on October 2002 he left Merck and headed off to Fremont, California to Protein Design Labs as Senior Director of Process Development. At that time, PDL had two antibodies in Phase III clinical trials, and thus he saw the chance to participate in tech transfer, purification and other roles beyond cell culture, includ-

ing the integration of process development programs of two distant sites into a single group. At PDL he could have more impact in the progress of the company, as he saw it, and indeed, he was able to lead teams to scale up the production of the antibody process to 16,000 liters and obtained IND for seven antibody candidates. In the first large scale batch run the process developed and scaled up by his group produced more antibody than the sum of all the previous runs in the history of the company.

In March of 2008, Weichang left PDL BioPharma to join Genzyme Technology Development in Framingham, Massachusetts. Over the last 20 years Weichang has published over 45 scientific papers and holds two patents. He has given many presentations and lectures in international confer-

ences and professional education courses. Weichang has organized and chaired two conferences, many symposia in international conferences on topics related to bioprocess monitoring and control, bioreactor engineering, cell culture engineering, viral vaccines and vectors, monoclonal antibodies and other biologics. He was elected as a fellow of the American Institute for Medical and Biological Engineering (AIMBE) in 2002. Though this article does not pretend include all of Weichang's accomplishments, it is an opportunity to know him a bit better. Weichang has been an executive committee member of the BIOT division since 2003. The BIOT Division has had the good fortune to enjoy his service over the years. We welcome him as our 2009 Division Chair.

Article by Claire Komives

Reminder - Student Travel Subsidies Available

Did you know that students can apply for funds to subsidize their trip to the ACS meeting that includes BIOT programming? Students with limited financial resources may receive up to \$500 who will present an oral or poster presentation at the upcoming meeting. This funding is separate from the Peterson Award, which involves publicly acknowledging an outstanding student presentation. To be eligible for the funds, applicants must be student members of the BIOT division and should be presenting at the conference. Applications are available on the website. Faculty advisors must acknowledge financial need as part of the application process.

For application forms, go to the acsbiot.org website and click on the link to [Student Travel Subsidies](#).

Welcome New BIOT Division Officers 2009

The front page of this newsletter lists the division officers and committee chairs.

BIOT Division Chair:	Weichang Zhou , Genzyme, Inc.
Chair Elect for 2010:	Theresa Good , Dept. of Chemical and Biochemical Engineering, U MD Baltimore County
Secretary:	Jayanth Sridhar , BioMarin Pharmaceutical Inc.
Councilors:	Re-elected: Fred Heineken , National Science Foundation
Alternate Councilors:	Re-elected: Ilse Blumentals , GlaxoSmithKline
Awards Coordinator:	Anne Skaja Robinson , Dept. of Chemical Engineering, University of Delaware
Membership:	Peter Tessier , Dept. of Chemical Engineering, Rensselaer Polytechnic Institute
Web Programming:	Scott Tobler , Wyeth Biopharma

Upcoming BIOT Division meetings

Year	City	Dates
2009	Washington, DC	August 16-20
2010	San Francisco, CA	March 21-25
2011	Anaheim, CA	March 27-31