

Indispensable News

Minneceutics

University of Minnesota

Fall 2010

Department of Pharmaceutics

PHARMACEUTICS FACULTY

William F. Elmquist
Carolyn A. Fairbanks
Jayanth Panyam
Ronald J. Sawchuk
Henning Schroeder
Ronald A. Siegel
Calvin Changquan Sun
Raj G. Suryanarayanan
Timothy S. Wiedmann
Cheryl L. Zimmerman

AFFILIATE GRADUATE FACULTY

Walid M. Awani, Abbott Laboratories. **Richard C. Brundage**, Dept. of Experimental and Clinical Pharmacology, U. Minnesota. **Belinda W.Y. Cheung**, Dept. of Pharmaceutics, U. Minnesota. **William H. Frey, II**, Alzheimer's Institute, Regions Hospital, St. Paul, Minnesota. **Z. Jane Li**, Pfizer, Inc. **Evgenyi Y. Shalaev**, Pfizer, Inc. **Timothy S. Tracy**, College of Pharmacy, University of Kentucky. **Chun Wang**, Dept. of Biomedical Engineering, U. Minnesota.

FROM THE DEPARTMENT HEAD

Dear Friends,

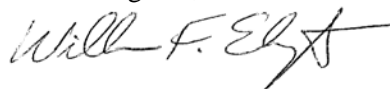
It is a pleasure for me to greet you again this year. The Department has been active with several events, including our successful graduate recruiting weekend, the first David Grant Symposium, the summer PK short course, and a research day at Cima Labs. The faculty have been busy with the normal duties of teaching, service, advising graduate students, writing grants, publishing cutting-edge research, and generally staying out of trouble (primarily because they do not have time to find trouble). Our graduate students and post-doctoral fellows remain in demand in spite of the downturn in the market. The Department is fortunate to have such a dedicated and talented group of students and postdocs. They are an inspiration every day.

One milestone in the Department this past year has been the completion of the phased retirement of Ron Sawchuk. He is now Professor Emeritus, but actually continues work on a research project here in the Department. We wish both he and his wife, Lyn, the best as they begin this new phase of life. Dr. Sawchuk has been a steady rock in the Department for several decades, and the influence of his guidance and contributions will be felt for many decades to come. He has our heartfelt appreciation for all he has done over the years, which includes but goes beyond his outstanding teaching, research and service contributions.

The current faculty and students in the Department also appreciate all of you, our alumni and friends, for the enriching environment you create around the Department of Pharmaceutics. It is with great pride that I see how well our graduates have done after they leave (read "escape from") our hallowed halls.

Best wishes to all for a safe and productive year ahead.

With kind regards,



William F. Elmquist, Pharm.D., Ph.D.



DAVID GRANT SYMPOSIUM

The first David J. W. Grant Symposium, *Solid State Pharmaceutics: The Present and the Future*, was held on June 2-4, 2010 in honor of the late leader who helped to define the field of solid-state science. More than 70 leading pharmaceutical scientists from both academia and industry, several of whom were Dr. Grant's graduate students and post-doctorals, presented current topics in cutting-edge drug product development. Professor Steve Byrn was keynote speaker, and Mrs. Marilyn J. Grant was the honored guest. The date and locale for the next David Grant Symposium will be announced in coming months.

FROM THE DIRECTOR OF GRADUATE STUDIES

Dear Friends and Colleagues:

The past year has brought many changes to graduate studies at the University of Minnesota. The re-organization of the Graduate School is fully in effect, and whether one agrees with what is happening, the Graduate Program in Pharmaceutics has to roll with the punches. The “new” Graduate School will retain coordination of the admissions process and many of the fellowship programs, but many of its previous oversight and functions will revert to ‘local’ control, i.e., within the College of Pharmacy (COP). The good news about the re-organization is that the COP graduate programs will now have a more clear reporting structure within the COP, which was somewhat opaque under the previous system. However, this requires developing a new governance system for the graduate programs within the COP, and this process will take time to complete.



After the re-organization was announced, a search for a new Dean of the Graduate School was opened. Our own Dr. Henning Schroeder, who had been the COP Associate Dean for Research and Graduate Education, was named as the new Dean of the Graduate School. Since he is on the Pharmaceutics faculty, we know that we won't have to explain to him what Pharmaceutics is!

As Dr. Schroeder moved to his new post, two interim Associate Deans were named to take over the Research and Graduate Studies portfolios while the COP searched for a permanent replacement. Dr. Carolyn Fairbanks has functioned as the Interim Associate Dean for Research, and Dr. Richard Brundage is the Interim Associate Dean for Graduate Studies. Both interim Associate Deans have Pharmaceutics ties. I would like to thank both of them for keeping the ship afloat during this very tumultuous time for the COP and the University. In late October 2010, it was announced that Esam El-Fakahany, Ph.D., Professor of Psychiatry, Neuroscience and Pharmacology at the University of Minnesota, was named the COP Associate Dean for Research and Graduate Studies. He has had significant experience with graduate education at both the University of Maryland and here at the U of M, and will take up the post on March 1, 2011. We look forward to working with him.

My ongoing concern for the graduate program is the balance between the size of our program and the financial support available for graduate training. Our present graduate student population is around 20 students. We now have nine faculty members in the department, with hopes of adding one or two more faculty members in the foreseeable future. I would argue that we should expand the size of our program. For each of the past several years, we have had 50 outstanding applicants for admission but could only admit 4 or 5. As a graduate program we have made a commitment to admit only as many students as we are able to financially support at a stipend that is competitive with our peer programs.

May we ask you, our alumni and friends, for help? More than 90% of our Ph.D. graduates join the pharmaceutical industry, and even in this tough economy our graduates find positions. Our graduates are in high demand. We are exceedingly grateful to our industrial colleagues for supporting our students with summer internships and for donating to our many fellowships. The three departmental fellowships established in the names of David Grant, Ronald Sawchuk, and Edward Rippie, partially fund graduate students, but we hope that you will contribute to these fellowships so that we can fully support the recipients. We have so many talented applicants to our graduate program, it is a shame that we must turn many away for lack of funding. We are deeply grateful for the support contributed by 3M and Cima Labs.

A handwritten signature in cursive script that reads "Cheryl".

Cheryl L. Zimmerman, Ph.D.
Professor and Director of Graduate Studies

ALUMNI NEWS

Richard C. Brundage, Ph.D. [1996], was appointed the Interim Associate Dean for Graduate Studies in the College of Pharmacy. In this role he has guided the College in formulating a structure for local oversight of graduate programs that have been transferred from the Graduate School as a result of its restructuring. He will serve in this role until March 2011 when Prof. Esam El-Fakahany joins the College as the Associate Dean for Research and Graduate Studies.

Belinda Cheung, Ph.D. [1998], accepted a position as Associate to the Dean of the Graduate School at the University of Minnesota beginning in January 2010.

Paroma Chakravarty, Ph.D. [2010], received the AAPS 2010 Graduate Student Symposium Award in Manufacturing Science and Engineering for work titled "Effect of In-Situ Pphase Transformation on Thiamine Hydrochloride Tablet Properties and Performance." She presented the work at the AAPS-FIP meeting in November in New Orleans, LA.

Cory Goracke-Postle, Ph.D. [Neuroscience, 2007], has been promoted to Assistant Director of IACUC by the Office of the Vice President of Research of the University of Minnesota. She is responsible for compliance management, member relations, and faculty engagement. Her thesis advisor was Dr. Fairbanks.

Yue Huang, Ph.D. [2001], accepted a position as Senior Fellow, PKPD Expert in Biologics, at Novartis, Basel, Switzerland in the spring of 2010.

Helen Hou, Ph.D. [Materials Science, 2006], is employed at Abbott Laboratories in North Chicago, IL. She celebrated the birth of her daughter, Isabelle Huang, last November. Her thesis advisor was Dr. Siegel.

Mak Jawadekar, Ph.D. [1982], announced his retirement from Pfizer after 28 years of employment. Most recently he was Director of Portfolio Management and Analytics in Pfizer's Worldwide BioPharmaceutical Businesses Division in New London, CT.

Aparna Lakkaraju, Ph.D. [2001] and **Robert Thorne, Ph.D.** [2002] accepted faculty positions at the University of Wisconsin-Madison. Aparna is Assistant Professor in the Dept. of Ophthalmology and Visual Sciences, and Robert is Assistant Professor in the Division of Pharmaceutical Sciences and the Center for Neuroscience. They have a daughter, Isha.

Wei Liu, Ph.D. [2004], was recently promoted to Assistant Director at Abbott Laboratories.

Joanna Peng, Ph.D. [2002], currently works as a Quantitative Clinical Pharmacology Scientist at Merck Laboratories. She has been there since April 2008.

Abira Pyne, Ph.D. [2001], husband Divakar Ramakrishnan and son Arjun welcomed a baby girl named Anusha. They currently reside in Kinsale, Ireland.

Suneel Kumar Rastogi, Ph.D. [2000], was recently promoted to Research Manager at Covidien. He was awarded Covidien's 2009 Innovator of the Year for demonstrating leadership, creativity and inventiveness to advance an idea for designing and developing a novel oral controlled drug delivery technology that can provide prolonged, steady and safer delivery of medicines. This patented technology can serve as a platform for Covidien that can be applied to obtain the often desired zero-order drug release for multiple pharmaceutical drugs used to more effectively treat a variety of ailments. Only three Covidien scientists worldwide were selected to receive the award.

John C. Roberts, Ph.D. [2007], a graduate of Dr. Carolyn Fairbanks lab, recently joined the Novartis Clinical PK/PD Section in East Hanover, NJ as Senior Investigator in the areas of infection and immunology. John previously worked as a PK/PD scientist at AstraZeneca, where he provided human PK/PD predictions for multiple compounds in the psychiatric research area, including predictions of active metabolite contributions to parent compound efficacy. He received the 2009 AstraZeneca Gateway Award for implementation of novel methodology for human dose prediction. John has recently focused his expertise in applied PK/PD modeling, and while at AstraZeneca implemented brain electroencephalography as a means to improve quantitative pharmacology across early preclinical studies and human proof of concept studies. He was selected to present these findings at the 2010 Rozmann Symposium.

Prakash Sundaramurthi, Ph.D. [2010], received a 2010 AAPS graduate student research award, which was presented at the AAPS-FIP meeting in November in New Orleans, LA. The title of the presentation was "Lyoprotectant Crystallization in Frozen Systems and Its Phase Transition during Drying."

Phensri Thongnopnua, Ph.D. [1987], became the founding Dean of The Faculty of Pharmacy at St. Theresa International College, Ongkarak, Nakornnayok, Thailand on October 1, 2010.

Jon Urban, Ph.D. [BME, 2008], is a Research Manager at Medtronic's Physiological Research Laboratories. He is a co-author on two oral presentations that were presented at the American Heart Association Conference in November describing work on a biological pacemaker, i.e., gene therapy to replace pacemaking capability in the heart. His thesis advisor was Dr. Siegel.

Yanfeng Wang, Ph.D. [1994], was promoted in 2009 to Team Leader at Novartis, East Hanover, New Jersey.

Pengyun Zeng, Ph.D. [2010], and husband Gang Shen welcomed their first child, Amelia, on December 22, 2009.

GRADUATE STUDENT NEWS

NEW GRADUATE STUDENTS

The Department welcomed these new students in 2010.

Karen Grinnen received her B.S. in Biology (with a Chemistry minor) in 2005 from D'Youville College, and her Pharm.D. in 2009 from the University of Washington.

Ameya Kirtane received a B.Pharm. in 2008 from the K.B. Institute of Pharmaceutical Education and Research at Gujarat University in Ahmedabad, India. He received an M.S. in Pharmaceutics in 2010 from Northeastern University, Boston MA.

Mehak Mehta received her B.Pharm. in 2009 from the Delhi Institute of Pharmaceutical Sciences and Research, (DIPSAR), Delhi, India.

Rajneet Kaur Oberoi received her B.Pharm. in 2007 from the University of New Delhi, India.

Frederick Osei-Yeboah received his B.Pharm. in 2006 from Kwame Nkrumah University of Science, Kumasi, Ghana. Before joining the U of M, he worked as a pharmacist and in the pharmaceutical industry in Ghana.

Shruthi Vaidhyanathan received her B.Pharm. and her M.Sc. in Biological Sciences in 2002 from the Birla Institute of Technology, Pilani, Rajasthan, India. She received her M.S. in Pharmaceutics in July 2010 from the University of Cincinnati, Ohio.

2010-2011 FELLOWSHIPS AWARDED TO PHARMACEUTICS GRADUATE STUDENTS

The University of Minnesota Graduate School awards the *Doctoral Dissertation Fellowship* to graduate students in their final year, as they are preparing to defend their Ph.D. theses. One of these highly competitive fellowships was awarded to **Sagar Agarwal** to support his dissertation work titled "Improving Delivery of Molecularly targeted Agents to Glioma." (Advisor: Elmquist)

The *David J.W. Grant and Marilyn J. Grant Fellowship in Physical Pharmacy* is awarded to students whose research is focused in physical pharmacy. **Sunny Bhardwaj** received the award. (Advisor: Suryanarayanan)

The *Edward G. Rippie Fellowship* is awarded to students with a consistent and outstanding academic record. It has been awarded to **Jing Wang**. (Advisor: Zimmerman)

The *Ronald J. Sawchuk Fellowship in Pharmacokinetics* is awarded to a graduate student whose research is focused in pharmacokinetics. It was awarded to **Tianli Wang**. (Advisor: Elmquist)

DEGREES EARNED

Paroma Chakravarty, Ph.D in Pharmaceutics, 2010. Thesis: Phase Behavior of Thiamine Hydrochloride Physical Forms (Advisor, Dr. Raj Suryanarayanan). Currently employed at Genentech, Inc., South San Francisco, CA as an Associate Scientist in the small molecules pharmaceuticals group.

Li Li, Ph.D. in Pharmaceutics, 2010. Thesis: Efflux Transport and CNS Distribution of the Novel Antifolate Pemetrexed (Advisor, Dr. William F. Elmquist). Currently employed at the FDA, Rockville, MD.

Laura A. Maertens, Ph.D. in Pharmaceutics, 2010. Thesis: The Metabolism NNK and the Enantiomers of NNAL in the Isolated Perfused Rat Lung System (Advisor, Dr. Cheryl L. Zimmerman). Currently employed as a post-doctoral fellow in Dr. Ronald Sawchuk's group at the University of Minnesota.

Prakash Sundaramurthi, Ph.D. in Pharmaceutics, 2010. Thesis: Solute Crystallization in the Frozen and Freeze-Dried Systems: Inhibition of Crystallization to Enhance Pharmaceutical Stability (Advisor, Dr. Raj Suryanarayanan). Currently employed at Teva Parenteral Medicine, at Irvine, CA.

Pengyun Zeng, Ph.D. in Pharmaceutics, 2010. Thesis: Thermo-Activated Drug Release (Advisor, Dr. Timothy Wiedmann).



The College of Pharmacy awards the *Ted Rowell Graduate Fellowship* to a pharmaceutical sciences graduate student with an interest in nutrition or drug delivery systems. **Alex Grill** was the recipient of this fellowship in 2010. (Advisor: Panyam)

The University of Minnesota Graduate School awards the *3M Science and Technology Fellowship* to students from a large number of graduate programs in the Academic Health Center and the Institute of Technology. **Caroline Baum** holds the fellowship for 2010-2011. (Advisor: Fairbanks). Caroline has also recently been appointed as a Pre-Doctoral Fellow to the *PharmacoNeuroImmunology Training Program (NIDA)*. (Advisor: Fairbanks)

GRADUATE STUDENT ACTIVITIES AND AWARDS

Sagar Agarwal received the 2010 AAPS Graduate Student Symposium Award in Pharmacokinetics Pharmacodynamics and Drug Metabolism, and presented his work at the AAPS-FIP meeting in November in New Orleans, LA. His presentation was entitled "Sorafenib Brain Distribution is Restricted by BCRP (ABCG2) Mediated Efflux at the Blood-Brain Barrier."

Sunny Bhardwaj received the 2010 AAPS Graduate Student Symposium Award in Analysis and Pharmaceutical Quality for his work "Use of Broadband Dielectric Spectroscopy to Predict the Water Sorption Potential of Amorphous Pharmaceuticals." He presented the work at the AAPS-FIP meeting in November in New Orleans, LA.

Tanmoy Sadukha and his Ph.D. advisor, **Dr. Jayanth Panyam**, received a 3-year "Mentor-Predoctoral Fellow Research Award" in April 2010 for research on "Targeted

Magnetic Hyperthermia for Lung Cancer." Co-Investigators are **Prof. Timothy Wiedmann** in the Dept. of Pharmaceutics and Prof. Robert Kratzke in the Dept. of Medicine. **Tanmoy** was also inducted into the Rho Chi Pharmacy Honor Society.

Jing Wang spent the summer of 2010 on an internship in the Department of Clinical Pharmacology at Pfizer in La Jolla, CA.

Tianli Wang participated in a summer internship at Pfizer at the Groton/New London site.

AAPS STUDENT CHAPTER, University of Minnesota

2010-2011 AAPS Student Chapter Officers

Chair: Isha Koonar (Pharmaceutics)
Chair-Elect: Sayantan Chattoraj (Pharmaceutics)
Secretary: Ameya Kirtane (Pharmaceutics)
Treasurer: Aaron Teitlebaum (Medicinal Chemistry)
Web Coordinator: Lin Niu (Pharmaceutics)

2010-2011 Pharmaceutics Student Representatives

Sayantan Chattoraj
Lin Niu

The AAPS Student Chapter invited Dr. Joseph W. Polli from GlaxoSmithKline to meet with students and present a talk on "Clinical Drug and Toxicological Interactions Involving Drug Transporters: A Case Study of Lapatinib" in February 2010. The Chapter plans to host more guest speakers in the coming year.

Another event, the AAPS Student Research Day, is being planned for July/August 2011. Students from local departments, including but not limited to Pharmaceutics, Experimental and Clinical Pharmacology, Medicinal Chemistry and Social and Administrative Pharmacy, will be invited to present research posters. The event will encourage interaction among students from various departments and expose the participants to research conducted in other disciplines.

Social activities this year included the 4th Annual Bowling Nite at Goldy's Gameroom on campus, and a Happy Hour in December. The chapter will organize another Bowling Nite sometime early December. Some of our members also attended the U of M Annual Etiquette Dinner.

SCHOLARS

Dr. Danir Bairamov, who worked in Dr. Siegel's group while a graduate student at the Russian Academy of Sciences in Moscow, is a scientist at Corium International, Inc. in Menlo Park, CA developing bioabsorbable microneedles for drug delivery into the skin.

Dr. Bakul Bhatnagar, a former postdoctoral associate and scientist in Dr. Suryanarayanan's lab, recently joined Pfizer BioTherapeutics in Andover, MA as a Principal Scientist.

Dr. Patrick D. Braun, a Research Associate in Prof. Carolyn Fairbanks' group, is continuing his work on the Future Leaders in Pain Small Research Grant from the American Pain Society on "Signaling mechanism of novel peptides in the pain pathway".

Magdalena Burstrom, a pharmacy student from the University of Uppsala, Sweden, has joined the Elmquist group. **Professor Eric Shusta** from the University of Wisconsin-Madison is spending a sabbatical leave with Dr. Elmquist's research group.

Joining Dr. Calvin Sun's lab in 2010 were post-doctoral scientists **Dr. Miles Chen**, **Dr. Reddy Perumalla**, and **Dr. Sarsvat Patel**. A visiting scientist, **Dr. Byoung Hwa Son**, has also joined the Sun group.

Arma Cinaroglu, a student from the Faculty of Pharmacy, Yeditepe University, Istanbul, Turkey, joined Dr. Wiedmann's group in 2010 to work on his Bachelor's thesis entitled "Microemulsions: Providing a Path for Generating Aerosols of Superparamagnetic Particles."

Professor Takehisa Hanawa, a visiting scholar in Dr. Siegel's lab, continues his work in drug delivery at the University of Yamanashi in Japan. His work focuses on preparing nanoparticles of water-insoluble drugs, and preparing hydrogels by gamma-ray irradiation in order to extend their adhesion time to mucosa.

Dr. Aditya Kaushal, a former postdoctoral associate in Dr. Suryanarayanan's lab, recently joined Bend Research in Bend, Oregon as a Formulation Scientist

Dr. Dora Babu Madhura, a former postdoctoral associate in Dr. Sawchuk's lab, has accepted a post-doctoral position at the University of Tennessee-Memphis.

Dr. Laura Maertens joined Dr. Sawchuk's lab as a Research Associate in the spring of 2010, and was appointed as Postdoctoral Fellow in August, 2010.

Dr. Aaron Overland, a scientist in Prof. Carolyn Fairbanks' group, completed his Ph.D. in Neuroscience

(Pharmaceutics/Pharmacology minor) in August 2010. He is currently a post-doctoral fellow with Prof. Paul Insel at UCSD.

Dr. Komal Shahani, a research associate in Dr. Panyam's lab, joined Avantor (Mallinckrodt Baker) in 2010.

Dr. Venugopal Rao Vangala, accepted a Research Fellow position at the Institute of Chemical and Engineering Sciences in Singapore upon completion of postdoctoral work in Dr. Suryanarayanan's lab.

Dr. Carrie Wade, a scientist in Prof. Carolyn Fairbanks' group, completed her Ph.D. in Pharmacology (Neuroscience minor) in June 2010, and is currently a post-doctoral fellow at Scripps Institute with Prof. George Koob.

Dandan Yi, a visiting scholar in Dr. Wiedmann's lab in 2009-10, is at Huazhong University of Science and Technology in Hubei, China.

FACULTY NEWS AND ACTIVITIES

PROFESSOR WILLIAM F. ELMQUIST was elected to Fellowship status in the American Association of Pharmaceutical Scientists. The award was presented in November during the 2010 FIP-PSWC-AAPS meeting in New Orleans.

Dr. Elmquist was invited to give the following presentations:

- *Challenges and Opportunities to Improve CNS Drug Delivery*. Mayo Clinic, Rochester, Minnesota, February, 2010.
- *Pharmacokinetic Assessment of CNS Drug Distribution*, 16th Annual Blood-Brain Consortium Meeting, Sunriver, Oregon, March 2010.
- *Multiple Drug Transport Systems in the BBB: Impact on CNS Drug Delivery*. Great Lakes Drug Metabolism Discussion Group, St Louis, Missouri, May 2010.
- *Redundant Transport Systems in the BBB: Complex Impact on Drug Delivery*. Barriers of the CNS Gordon Research Conference (keynote address), Colby-Sawyer College, New London, New Hampshire, June 2010.
- *Improving Delivery of Molecularly-Targeted Agents to Invasive Brain Tumors*. Virginia Commonwealth University, Richmond, Virginia, October, 2010.

PROFESSOR CAROLYN A. FAIRBANKS was appointed Interim Associate Dean for Research for the College of Pharmacy in January of 2010. In this role she established a new College research community resource, The Research Advisory Committee. She will serve in her role until March 2011 when her esteemed colleague and friend, Prof. Esam El-Fakahany, comes on board. Dr. Fairbanks looks forward to working with him to continue improving the research environment in the College, and at the University level in her role as IACUC Vice-Chair for the University's Office of the Vice-President for Research.

Dr. Fairbanks also continues her activities in the Board of Directors of the American Pain Society. Her own research continues to focus on targeted delivery of gene therapeutics to

specific CNS neuronal subpopulations and delineating divergent and convergent mechanisms underlying the development of chronic pain and of addiction.

PROFESSOR JAYANTH PANYAM was promoted to Associate Professor with Tenure in June 2010. In December 2009, he was invited to the 61st Indian Pharmaceutical Congress, Ahmedabad, India, where he presented a talk entitled *Tumor-targeted Drug Delivery: Challenges and Opportunities*. In March 2010 he presented a talk entitled *Tumor Drug Resistance Mechanisms & Opportunities* at Medtronic, Fridley, MN. In October 2010, Dr. Panyam gave an invited presentation at the 6th Annual Minnesota Nanotechnology Conference, Minneapolis, MN titled *Targeted Nanoparticles for Drug Resistant Cancer*.

Dr. Panyam and his graduate student, **Tanmoy Sadukha**, received a 3-year Mentor-Predoctoral Fellow Research Award in April 2010 for research on *Targeted Magnetic Hyperthermia for Lung Cancer*. Co-Investigators are **Prof. Timothy Wiedmann** in the Dept. of Pharmaceutics and Prof. Robert Kratzke in the Dept. of Medicine.

PROFESSOR RONALD J. SAWCHUK, along with Dr. Belinda Cheung, received continued funding from Alcon Laboratories to support research on *Testing the Penetration of an Antibiotic into Chinchilla Middle Ear using Trans-tympanic Membrane Delivery Formulations-Phase II*.

In May of 2010, Dr. Sawchuk presented a paper on *Trans-tympanic Membrane Delivery of an Antibiotic into Chinchilla Middle Ear: a Model for the Treatment of Otitis Media* at the European Society of Pediatric Infectious Diseases Meeting in Nice, France. In October of 2010, he gave lectures on *Cerebrospinal Fluid Flow, and the Convective/Diffusive Transport of Drugs in the CSF and The Neuropharmacokinetics of Hydrophilic Drugs during Intrathecal Infusion: the Concept of a Targeted Brain Delivery Advantage* at Abbott GmbH and Co., Ludwigshafen, Germany.

PROFESSOR HENNING SCHROEDER began his new role as Vice Provost and Dean of Graduate Education at the University of Minnesota in January 2010. Dr. Schroeder brings a fresh perspective to graduate education, which is critical to help the University achieve its goal of becoming one of the top three public research universities in the world. His international and comparative background is an important fit with the large international population of graduate and professional students at the University. He has directed the restructuring of the Graduate School that is shifting oversight to the graduate programs and colleges, with the goal of streamlining services and improving the graduate student experience University-wide.

PROFESSOR RONALD A. SIEGEL was inducted as Fellow of the Controlled Release Society. The Society is dedicated to the study of delivery systems for drugs and other bioactive molecular. He is past president and recipient of a Young Investigator Award and two Best Paper awards. During spring semester 2010 he took a sabbatical leave at the University of California, San Francisco during to work on a project titled *Novel Computational Studies in Pharmaceutics* with Profs. Frank Szoka and Ken Dill.

Dr. Siegel's invited lectures at conferences and universities this year included:

- *Top-Down and Bottom-Up Strategies for Sensors and Dynamic Hormone Delivery Systems Based on Stimuli-Responsive Hydrogels and Enzymes*, Sigma-Aldrich Lecture, Department of Chemistry, St. Louis University, St. Louis, MO, November 2009.
- *Mechanical Studies of Stimuli Responsive Hydrogels*, GelSympo 2009, Osaka, Japan, December 2009.
- *Novel Biosensors and Drug Delivery Devices Containing Hydrogels: Nonlinear Dynamics and Top-Down/Bottom-Up Fabrication*, Department of Chemical Engineering, University of Pittsburgh, Pittsburgh, PA, March 2010.
- *Integrated Glucose Sensing and Hormone Delivery using Hydrogels, Microchips, and Block Polymers*, Department of Bioengineering, University of California, Berkeley, CA, May 2010.
- *Integrated Glucose Sensing and Insulin Delivery Based on Hydrogels, Chips, and Block Polymers*, Controlled Release Society, Portland, OR, July 2010.

PROFESSOR CALVIN SUN received grants from PhRMA Foundation, Abbott Laboratories, Boehringer Ingelheim Pharmaceuticals Inc., and the University of Minnesota. He was recognized as one of the top tier reviewers in 2009 by *Molecular Pharmaceutics*. He also chaired the first David Grant Symposium, June 2-4, 2010 at the University of Minnesota.

Dr Sun's invited lectures this year include:

- *Addressing Tableting Challenges through Crystal Engineering*, University of Kansas (February 2, 2010)
- *Transforming Powder Processibility by Particle Surface Engineering*, TMS Annual Meeting, Seattle WA (February 17, 2010)
- *Expedited Development of High Quality Pharmaceutical Product*. Sundia MediTech, Shanghai, China (March 29, 2010)
- *Solving Pharmaceutical Manufacturing Problems Through Materials Science and Engineering*, IPrime Annual Meeting, University. of Minnesota (June 2, 2010)

- *API Form Changes to Address Stability, Manufacturability, Bioavailability Issues*, Land O'Lakes Conference, University of Wisconsin-Madison (June 10, 2010)
- *Powder Technology in Pharmaceutical Sciences*, Tianjin University of Traditional Chinese Medicines, Tianjin China (June 14, 2010)
- *Solving Problems in Product Development by Materials Science and Engineering*, Huazhong University of Science and Technology, Wuhan, China (June 21, 2010)
- *Science and Technology in Pharmaceutical Powder Processing*, Fudan University, Shanghai, China (July 5, 2010)

PROFESSOR RAJ G. SURYANARAYANAN received the 2010 AAPS Outstanding Educator Award. Nominees were evaluated based on their contributions to contemporary teaching and scholarship in pharmaceutical technology and its related science. This national award, which recognizes excellence in education in pharmaceutical technologies and related sciences, was bestowed at the joint 2010 FIP-PSWC-AAPS Meeting in New Orleans, Louisiana. Past recipients include Patrick DeLuca, George Zograf, Larry Augsburger, Joseph Schwartz, and Adel Sakr.

Dr. Suryanarayanan was invited to present lectures:

- *New Frontiers in XRD in Pharmaceutical R&D* at the Pharmaceutical Powder X-ray Diffraction Symposium (PPXR 9), organized by the International Centre for Diffraction Data, Hilton Head, SC, February 22–25, 2010.
- *Monitoring phase transitions during freeze-drying – Potential implications on product performance* and moderated roundtable discussion (with Dr. Sarma Duddu) at the Dr. David J.W. Grant Symposium: Solid State Pharmaceutics Present & Future, University of Minnesota, Minneapolis, MN, June 3-4, 2010.
- *Processing-induced phase transformations – Potential implications on product performance* at the 21st IUPAC International Conference on Chemical Thermodynamics ICCT 2010, Tsukuba, Japan, July 31–August 6, 2010.
- *Processing induced phase transformations – Potential implications on product performance*, Irma Lerma Rangel College of Pharmacy, Texas A & M, Kingsville, TX, August 27, 2010.
- *Processing induced phase transformations – Potential implications on product performance*, University of Kentucky, Lexington, KY, September 3, 2010.
- *Processing induced phase transformations: Implications on product performance* at the Solvias Conference on Poorly Water Soluble Compounds 2010, Boston, MA, September 10, 2010.
- *Monitoring phase transitions during freeze drying: Potential implications on product performance* at Freeze-Drying of Pharmaceuticals and Biologicals Symposium, organized by University of Munich, University of Connecticut, and Dane O. Kilsig Center for Pharmaceutical Processing Research, Garmisch Partenkirchen, Germany, September 28–October 1, 2010.

PROFESSOR TIMOTHY WIEDMANN visited SurModics, Edina, MN in 2009 to deliver a presentation entitled *Aerosol drug delivery to the retina?* He was invited to Thailand in 2009 to give presentations on *Aerosol Delivery to the Retina during Pars Plana Vitrectomy* (Royal Jubilee Symposium, Pattaya, Thailand), and *Colloidal drug delivery: Solubility and aggregation properties of chlorhexidine salts* (Department of

Pharmaceutics, Prince of Songkla University, Hat Yai, Thailand).

Dr Wiedmann spoke at the meeting of the International Society of Aerosols in Medicine, Monterey, CA in 2009 on the topic of *Inhalation adjuvant therapy for lung cancer*. In 2010 he was invited to the University of Iowa, Iowa City, IA to deliver a talk entitled *Towards the development of a therapeutic system for lung disease*.

PROFESSOR CHERYL L. ZIMMERMAN has reoriented her research focus from preclinical pharmacokinetics and drug metabolism to the use of modeling and simulation. Her particular interest is the use of population pharmacokinetic approaches to assess the risk of carcinogenesis in tobacco users. To this end, she has taken training courses for *SimCyp*TM and the new Phoenix platform for *WinNonlin*TM.

RECENT PUBLICATIONS

BOOK CHAPTERS

Siegel, R.A., "Oscillatory Systems Created with Polymer Membranes," in *Nonlinear Dynamics with Polymers* (J. Pojman and T-Q. Miyata, eds.), Wiley-VCH, Weinheim, pp 189-217 (2010).

Sun, C.C., "Compressible Sugar" in *Handbook of Pharmaceutical Excipients* (R.C. Rowe, P.J. Sheskey, M.E. Quinn eds.), Pharmaceutical Press, New York.

Wiedmann, T.S., Xie, Y., Zeng, P. "Magnetic Targeted Drug Delivery" in *Nanomaterials for Health, Energy and Environment*, Farooqsarng, D., Srichana, T. (eds.), Prince of Songkla University, Hat Yai, Thailand, p 13-26.

JOURNAL ARTICLES

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