

Indispensable News

MinneCeutics

University of Minnesota

Fall 2004

Department of Pharmaceutics

PHARMACEUTICS FACULTY:

William F. Elmquist
Carolyn A. Fairbanks
David J.W. Grant
Ronald J. Sawchuk
Ronald A. Siegel
Raj G. Suryanarayanan
Timothy S. Wiedmann
Cheryl L. Zimmerman

AFFILIATE GRADUATE FACULTY:

Walid M. Awni, Abbott Laboratories
Rene A. Braeckman, Pan Pacific Pharmaceuticals, Inc.
Keith K.H. Chan, GloboMax LLC
Belinda W.Y. Cheung, University of Minnesota
Janet M. Dubinsky, University of Minnesota,
Neuroscience Dept.
William H. Frey, II, Alzheimer's Institute at Regions
Hospital

Michael D. Karol, Abbott Laboratories
Aldo Rescigno, University of Parma, Italy
Evgeniy Y. Shalaev, Pfizer Pharmaceuticals
Ray Skwierczynski, 3M Pharmaceuticals
Timothy S. Tracy, University of Minnesota,
Experimental & Clinical Pharmacology Dept.
Lian Yu, Eli Lilly and Company

FROM THE DEPARTMENT HEAD

This past year was marked by two important events for the Department, one each within the 'solid state pharmaceuticals' and the 'pharmacokinetics' branches. First, we are proud to acknowledge the receipt of the 2004 AAPS Dale Wurster Award in Pharmaceutics by Professor David Grant. This is the top award given in the area of pharmaceutics and pharmaceutical technology, and David will receive the award at the AAPS meeting in Baltimore on Sunday, November 7. Congratulations, David! (By, the way, David also received the 2004 Award from the European Society for Applied Physical Chemistry!)

Second, we initiated an annual short course titled "Basic Pharmacokinetic Concepts for the Pharmaceutical Scientist." This course was offered July 14-16 this year, and the attendance (almost 50 attendees) far exceeded our expectations. We urge you to recommend this course to your colleagues seeking a guided tour of the basics of pharmacokinetics and pharmacodynamics, as can only be provided by our able Minnesota faculty (Sawchuk, Zimmerman, and Elmquist). More about this on page 11.

We are making good progress on the David J.W. Grant and Ronald J. Sawchuk graduate fellowships. We were able to use accrued interest for each fellowship to award partial support to two graduate students. We are still working toward our goal of full annual support from these fellowships. We are grateful to all who contributed to them, and thank Novartis, Inc., and 3M for their continuing support of our graduate students.

Two more faculty joined the "half-century" club this year (Siegel and Elmquist), while one became a parent (Fairbanks). Congratulations to Tim Wiedmann, who was promoted to full professor.

The influence of our Department in AAPS affairs continues. This year Ron Sawchuk joined Cheryl Zimmerman

as Member-At-Large of the AAPS Executive Council, while Raj Sury is the Chair of the Planning Committee of the 2005 Arden House meeting.

A number of developments in the College of Pharmacy and Academic Health Center are worthy of notice. Construction of the Translation Research Facility, a new building just a few blocks from Weaver-Densford Hall, is proceeding rapidly, with occupation slated for July 2005. As its name implies, this facility will be devoted to bringing new basic knowledge from the bench to the bedside. The College of Pharmacy has been allotted space in that building.

Professor James Cloyd of the Department of Experimental and Clinical Pharmacology has been named the Lawrence Weaver Endowed Chair in Rare Diseases. Dr. Cloyd will lead an institute dedicated to the rapid development of orphan drug therapies for rare diseases, and it is likely that the Department of Pharmaceutics will be involved in that institute's activities.

Pharmaceutics faculty continue to engage in collaborations with the Cancer Center, as well as the Departments of Laboratory Medicine and Pathology, Surgery, Medicinal Chemistry, Experimental and Clinical Pharmacology, Biomedical Engineering, Chemical Engineering and Materials Science, and Electrical and Computer Engineering.

We look forward to seeing you in Baltimore!



Ronald A. Siegel, Sc.D.
Professor and Head
Department of Pharmaceutics

ALUMNI NEWS

William Shifeng Wei [Ph.D. 1991] is the Associate Director of Pharmaceutical Product Development at NexMed (USA), Inc. in Robbinsville, New Jersey.

Soumojeet Ghosh [Ph.D. 1993] is Director of Biopharmaceutics and Product Enhancement in the Pharmaceutical Research and Development Division of Merck and Company, Inc. in West Point, Pennsylvania.

Robert Keith Schultz [Ph.D. 1993] is president of REVA Medical, Inc. and Happy Valley Medical, Inc. in San Diego, California.

In May, **Belinda Cheung** [Ph.D. 1998], husband Ben Woo, and daughter Brianna, welcomed a new daughter and sister, Bella.

Abira Pyne [Ph.D. 2001] married Dr. Divakar Ramakrishnan and is employed in the Formulation Sciences group at Millennium Pharmaceuticals in

Cambridge, Massachusetts.

Rahul Surana [Ph.D. 2002] and his wife, **Meena Rani**, Ph.D. (postdoctoral associate for Prof. Raj Suryanarayanan) moved with their son, Rohan, to New York where Rahul is a research scientist in preformulation of solids at Forest Laboratories. His immediate supervisor is another Minnesota alumnus: **Jim Zhu** [Ph.D. 1997]. Rahul said, "Rohan is growing quickly and at the same time his naughtiness is increasing exponentially. It is a lot of fun to play with him. New York is an interesting place, and we are getting used to the aggressive driving. I remember all the Fall Flings at Dr. Z's place -- they were always great fun." They look forward to a winter milder than those in Minnesota, but miss Minnesota, the Department, and the people.

Deliang Zhou [Ph.D. 2003] joined Abbott Laboratories in March.

We invite you to join us !

MINNESOTA ALUMNI BREAKFAST

MONDAY, NOVEMBER 8, 2004

7:00 - 8:00 a.m.

Hyatt Regency Baltimore Hotel



AAPS Annual Meeting and Exposition

November 7-11, 2004

Baltimore Convention Center, Baltimore, Maryland

FROM THE DIRECTOR OF GRADUATE STUDIES

Dear Alumni, Students, Faculty, and Friends,

We have had an exciting year with a number of new and important changes. First, we have made both the David J. W. Grant Fellowship in Physical Pharmacy and the Ronald J. Sawchuk Fellowship in Pharmacokinetics available to students. The first recipients for these two awards are Yushi Feng and Zhihong Li, respectively. We are pleased to bestow this recognition on these two deserving students, and are grateful for the support provided by the contributors.

These new fellowships are critical in light of the major assessment of financing graduate education currently underway at the U. Below is a table providing a breakdown of the annual personnel costs for a graduate Research Assistant. I guess when we were students we all thought RAs were cheap labor, which is true if you only look at stipends. In the last five years, the University has increased tuition along with the number of credits required to graduate. In addition, the Pharmaceutics program has instituted annual increases in stipend to keep up with rising rents and food costs, and to remain competitive with comparable graduate programs. Thus, despite the increase in the number of faculty bringing additional grant support to our program, the number of students we are able to support has fallen due to these increasing costs. Continued support in the form of gifts from alumni and friends will help us keep pace with the spiraling costs of graduate education, and maintain the vitality and independence of our graduate program.

Description	2001 Costs	2002 Costs	2003 Costs	2004 Costs
Stipend	\$16,000	\$17,000	\$18,000	\$19,000
Health insurance	2,589	2,654	3,004	3,458
Tuition	5,863	6,801	7,363	8,172
University fee	--	300	600	800
Indirect cost recovery (NIH grant, 48.5 % excluding tuition)	9,016	9,532	10,187	10,892
Total	\$33,468	\$36,287	\$39,154	\$42,322

Enough about finances. A noteworthy event has been the establishment of the AAPS Student Chapter. This effort was driven completely by the students, which, in my opinion, is a distinctive mark of leadership. The students have also taken a proactive approach in addressing the usual concerns of student life. It is without doubt that we continue to attract strong and enthusiastic students who are destined to follow past graduates into rewarding careers in improving healthcare.

With our changing faculty composition we have new course offerings. These include *The New Drug Development Process*, taught by lecturers from 3M, and *Advanced Neuropharmaceutics*, directed by Dr. Carolyn Fairbanks. The latter course examines the delivery of therapeutic compounds to the central nervous system. Dr. Siegel directs *Special Topics in Pharmaceutics: Materials, Mechanisms and Models in Drug Delivery*. This course is cross-listed with Biomedical Engineering and covers diverse subjects related to drug delivery systems and the use of biomaterials for controlled delivery.

In closing, this year our College is producing a five-year strategic plan. As part of this process, we will address issues surrounding the funding and improvement of graduate programs. We look to you, our graduate alumni and readers of this newsletter, for advice on these matters.



Timothy S. Wiedmann, Ph.D.
Professor
Director of Graduate Studies

DRUG DELIVERY CENTER NEWS

The Drug Delivery Center's Sixth Annual Open House was held on October 21, beginning with a poster session by University of Minnesota graduate students, postdoctoral associates, and faculty, followed by a seminar presentation by Dr. John Carpenter, University of Colorado Health Sciences Center in Denver, on "Aggregation of Proteins in Aqueous Solutions: Pathways, Inhibitions and Reversal". As in previous years, this lecture was part of a monthly series sponsored by the Academic Health Center's Advanced Therapies Initiative, the Drug Delivery Center, and the Center for Cellular and Molecular Therapies.

In addition to the Open House, the Drug Delivery Center sponsored the following seminars during the year: Dr. Philip Low, Purdue University, on October 2, 2003; Dr. Andrew Owen, University of Liverpool, UK, on December 4, 2003; Dr. Frank Szokca, University of California, San Francisco, on January 29, 2004; and Dr. James Eisenach, Wake Forest University, on April 8, 2004. These seminars were also a part of the University's Advanced Therapies Initiative.

Present membership in the Drug Delivery Center comprises 14 faculty representing 4 academic departments and 14 companies. The Drug Delivery Center continues to bring together disparate faculty and groups having a common interest in drug delivery.



David J.W. Grant, D.Phil., D.Sc.
Professor and Director

UNIVERSITY OF MINNESOTA MEMBERS: ♦ Pharmaceutics ♦ Biomedical Engineering ♦ Electrical and Computer Engineering ♦ Laboratory Medicine and Pathology ♦ Regions Hospital in St. Paul, MN. **INDUSTRIAL ADVISORY BOARD:** ♦ Antares Pharma, Inc. ♦ Birchpoint Medical ♦ CIMA Laboratories ♦ Comedicus ♦ General Mills ♦ Hosokawa Bepex ♦ LecTec Corporation ♦ Medtronic ♦ 3M Pharmaceuticals ♦ Minnesota Technologies, Inc., Academic Health Center, University of Minnesota ♦ TSI, Inc. ♦ Upsher-Smith Laboratories, Inc. ♦ Amir Naqwi, Ph.D., Powerscope, Inc. ♦ David Madsen, Ph.D.

The **American Association of Pharmaceutical Scientists (AAPS) Student Chapter** at the University of Minnesota was established in February 2002 by graduate students in the Department of Pharmaceutics. Since then, the chapter has increased awareness of AAPS and its activities. Chapter membership has been expanded to include the postdoctoral staff and students from other programs at the University of Minnesota, such as Biomedical Engineering and Experimental and Clinical Pharmacology. Past and present committee and chapter members have been innovative in planning activities to increase involvement and interaction among the chapter members. Regular chapter activities include coffee hour discussions on varied topics and inviting guest speakers to give seminar presentations. For more information regarding our chapter, or for suggestions for guest speakers, please contact the AAPS Minnesota Student Chapter Chair, Nagdeep Giri, at giri0003@umn.edu.

GRADUATE STUDENT ACTIVITIES

DEGREES EARNED

Koustuv Chatterjee, Ph.D.

Thesis: Chemical Reactivity and Physical Stability of Lyophilized Solids (Advisor: Prof. Raj Suryanarayanan). Koustuv is employed at Amgen in Thousand Oaks, California.

Sharmistha Datta, Ph.D.

Thesis: Effects of Solvents, Additives and Supersaturation on the Crystallization of Phenylbutazone Polymorphs (Advisor: Prof. David Grant). Sharmistha is a senior analytical chemist with Eli Lilly and Company in Lafayette, Indiana.

Anish Peter Dhanarajan, Ph.D. (Biomedical Engineering)

Thesis: Mechanistic Studies and Development of a Hydrogel/Enzyme Drug Delivery Oscillator (Advisor: Prof. Ronald Siegel). Anish is employed at Pfizer in Kalamazoo, Michigan.

Ping Ji, Ph.D.

Thesis: Distribution Kinetics of Cefdinir Between Plasma and Middle Ear Fluid in the Chinchilla (Advisor: Prof. Ronald Sawchuk). Ping is employed at Bristol-Myers Squibb Pharmaceutical Research Institute in Princeton, New Jersey.

Zhihong Li, M.S.

Thesis: Mechanism of the Stereoselective Distribution of Nnal (Advisor: Prof. Ronald Sawchuk). Zhihong is currently pursuing a Ph.D. degree in Prof. Sawchuk's laboratory.

Wei Liu, Ph.D.

Thesis: Distribution Kinetics of the Ketolide Antibiotic, Cethromycin, to Chinchilla Middle Ear (Advisor: Prof. Ronald Sawchuk). Wei is employed at Quintiles, Inc., in Kansas City, Missouri.

Agam Rajendra Sheth, Ph.D.

Thesis: Relationship Between Crystal Structure and Solid-State Properties of Pharmaceuticals (Advisor: Prof. David Grant). Agam is a senior research chemist at Merck and Company in West Point, Pennsylvania.

Chitrallekha Dilip Telang, Ph.D.

Thesis: Pharmaceutical Lyophilization: Physical Stability Issues and Application of Ternary State Diagram (Advisor: Prof. Raj Suryanarayanan). Chitra is employed at Boehringer Ingelheim Pharmaceuticals, Inc., in Ridgefield, Connecticut.

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NEW GRADUATE STUDENTS

The Department welcomed these new students in Fall 2004:

Ms. Paroma Chakravarty holds a B.Pharm. from Jadavpur University in Calcutta, India, and an M.S. in Industrial Pharmacy from the University of Toledo, Ohio. In India she received a state ranking of 32 of 400,000 examinees in the 1998 Higher Second State Board examinations, the Indian Pharmaceutical Association Award for highest marks in the B.Pharm. examination at Jadavpur University, and Jadavpur University's Gold Medal for securing first position in the B.Pharm. (1998-2002).

Ms. Li Li earned a Bachelor's of Engineering in Pharmaceuticals at Shenyang Pharmaceutical University in China and a Master's in Bio-pharmaceutical Sciences from Leiden University, Netherlands. She worked as regulatory affairs associate for Eli Lilly Asia, Inc., in Beijing, and as a research assistant for the National Institutes of Pharmaceutical Research and Development (NIPRD) in the Division of Pharmaceuticals. She was the recipient of the 1999 First Prize for the Contest of Pharmaceutical Knowledge in the NIPRD, the 2001 Outstanding Employee of the NIPRD, and the DELTA and LUF Scholarships in 2003 from U. Leiden.

Mr. Enxian Lu holds a B.S. in Pharmacy and an M.S. in Pharmacokinetics from Shanghai Medical University, and an M.S. in Pharmaceutical Science from the University of Illinois at Chicago. He was the recipient of the 1998 Excellent Undergraduate of Shanghai, the Guanghua Scholarship in 1999 and 2000, the Top Student of 1999-2000, and the 2001 Shanghai University Fellowship.

Ms. Laura A. Maertens earned a B.S. in Chemical Engineering from the University of Minnesota and worked as a scientist in Prof. Cheryl Zimmerman's laboratory for a year before joining the Pharmaceutics graduate program. She is the first recipient of the new 3M Science and Technology Fellowship. Last year Laura organized and managed the "Surfin' Surfactants", the first Pharmaceutics softball team.

GRADUATE STUDENT ACTIVITIES

Amardeep Bhalla married Harmeet Sehgal in Mumbai, India in May.

Sharmistha Datta was awarded one of six Fellowships in Drug Standards by the USP, from July 1, 2003 to June 30, 2004.

Shyeilla Dhuria, a second-year graduate student, recently joined the laboratory of Dr. William Frey II at Regions Hospital where she is working on intranasal drug delivery to the CNS. She is a proud recipient of The Big Fish Award in Dr. Frey's research lab.

Yushi Feng is the first recipient of the new David J.W. Grant Fellowship in Physical Pharmacy. He has been selected to give a presentation on "Prediction of Tableting Behavior from Slip Planes Using the Parabens Series as a Model" at the Graduate Student Award Symposium in Drug Delivery and Pharmaceutical Technologies, sponsored by Bristol-Myers Squibb, at the *2004 AAPS Annual Meeting* in Baltimore, Maryland.

Cory Hitzman is the recipient of the 2004-05 Ted Rowell Graduate Fellowship. He gave a presentation at this year's *Engelbreton Symposium* in Fargo, North Dakota on "Inhalation Aerosols for Lung Cancer Chemoprevention". He attended the June 2004 *Pharmaceutics Graduate Student Research Meeting (PGSRM)* in Iowa City, Iowa and gave a presentation on "Lung Cancer Chemoprevention Through Aerosol Delivery."

Zhihong Li is the first recipient of the new Ronald J. Sawchuk Fellowship in Pharmacokinetics.

Sachin Lohani was a summer intern at the SSCI Inc. Purdue Research Park in West Lafayette, Indiana. He worked with

Dr. Leonard Chyall on crystallization of polymorphs by anti-solvent addition.

Agam Sheth received a travel grant to Japan in May to make presentations at the *5th Globalization of Pharmaceutics Education Network (GPEN) Meeting* at Kyoto University and the Pharmaceutical Sciences World Congress.

Yan Song will give a presentation on "The Spatial Distribution of Intrathecally Administered Antiviral Nucleosides in CSF" during the Graduate Student Symposium in PPDM at the *2004 AAPS Annual Meeting* in Baltimore, Maryland. She will also receive the PPDM and Clinical Sciences Graduate Student Symposium Award. Yan received the 2004 Novartis Fellowship from the Novartis Pharmaceutical Corporation.

Brian Willis received a National Research Service Award from the National Institute on Drug Abuse (NIDA, part of NIH) for his project on "Opioid Metabolism and Analgesia in Sickle Cell Anemia." Brian and his wife, Darcy, are the proud parents of Kevin Andrew Willis, born in June.

STAFF

Gabe Ganser, Sun Prairie, Wisconsin is the Department's work study student and provides assistance to the faculty and office staff. Currently a sophomore at the University of Minnesota, Gabe enjoys music and Gopher football in his free time, and is in the process of determining his major.

Genevieve Kluender rejoined the Department this spring as an Office Specialist. Prior to her return to the University, she tracked crude oil shipments and was a safety team leader at Flint Hills Resources. She was involved in Living Lands and Waters, which has cleared the Mississippi River shoreline of more than a million pounds of garbage. Genny is also taking classes at the University.

Oanh Nguyen, a research laboratory coordinator for Prof. Carolyn Fairbanks, married Peter Anderson on October 2 with Archbishop Harry Flynn officiating. Oanh is currently

working on characterizing a molecule called agmatine, also known as decarboxylated arginine. Peter is an electrical engineer at Honeywell.

Earlier this year, **Anne Waltz** worked as a script writer for a science fiction role-playing game called *EverQuest II*, which is being produced by Sony Online Entertainment. Anne is the staff person for the *Journal of Pharmaceutical Sciences*. In addition to being a published science fiction writer, she has the great distinction of having won the 1999 St. Paul Pioneer Press "Jesse Ventura Song Contest."

Tate Winter joined the laboratories of Profs. Carolyn Fairbanks and William Elmquist, and will begin his Ph.D. studies in Pharmaceutics in January 2005. He earned a B.S. in Neuroscience in May 2004 from the University of Minnesota.

SCHOLARS

Yuchuan Gong, Ph.D. is a postdoctoral associate for Prof. David Grant. He obtained a B.S. in Chemical Engineering from Southeast University in Nanjing, China; a M.S. in Pharmaceutical Sciences from the University of Puerto Rico—Medical Sciences Campus, and a Ph.D. in Physical Chemistry from the University of Puerto Rico—Rio Piedras Campus.

Cory Goracke-Postle was a scientist for Prof. Carolyn Fairbanks, and is now in her second year of the Neuroscience graduate program. She was married in October 2003 to

Roman Postle.

Stephanie Harris, a pre-pharmacy student at the University, has been volunteering in Prof. Zimmerman's lab since summer 2004. She has been assisting graduate student Brian Willis.

Jonathan Holt, a third-year Pharm.D. student, worked as a volunteer in Prof. Zimmerman's lab in summer 2004, and assisted graduate student Jee-Eun Lee with her work on intestinal metabolism.

Meenakshy Iyer, Ph.D. is a postdoctoral associate for Prof. Raj Suryanarayanan. She earned a Ph.D. in Pharmaceutical Sciences from Duquesne University in Pittsburgh, Pennsylvania with her dissertation on the development of a near-infrared spectroscopic method for the analysis of intact tablets.

Lori Kaminski, a third-year Pharm.D. student working with Prof. Carolyn Fairbanks, received an APS Young Investigator Travel Award to attend the American Pain Society Meeting in May in Vancouver, Canada to present her work. Her abstract was one of 36 chosen from 600 submissions for oral presentations. She also received the College of Pharmacy's 2004 Dean's Research Award for her outstanding achievement in research activities.

Xiangmin Liao, Ph.D. is a postdoctoral associate for Prof. Raj Suryanarayanan and is working on lyophilization of protein drugs. He obtained his Ph.D. in Chemistry from Kansas State University. He and his wife, Xia Zhou, have a 2½-year-old daughter, Kimberly.

Eric Nuxoll, Ph.D., is a postdoctoral associate for Prof. Ronald Siegel. He earned degrees in Chemistry and Chemical Engineering from the University of Idaho before obtaining a Ph.D. in Chemical Engineering and Materials Science, followed by a postdoctoral appointment, with Prof. Ed Cussler at the University of Minnesota. He and his wife, Kim, a student in the School of Nursing, have a 10-month-old son, Sebastian.

Guoyu Pan, Ph.D. is a postdoctoral associate for Prof. William Elmquist. He earned a B.A., Master's and Ph.D. in

Pharmacology from China Pharmaceutical University. His Master's degree focused on neuropharmacology and his Ph.D. on pharmacokinetics. He worked as a research scientist at Len-Ben Science Company, Ltd., before joining the University of Minnesota.

Ms. Yuanyuan Xie has been a volunteer in Prof. Cheryl Zimmerman's laboratory this summer and fall, and will begin her Ph.D. program in Pharmaceutics in January 2005. Yuanyuan holds a Bachelors in Pharmaceutics from China Pharmaceutical University in Nanjing.

Hiroyuki Yamada is a visiting scientist from Mitsubishi Pharma Company and is working in Prof. Raj Suryanarayanan's laboratory on developing analytical methods for pharmaceutical materials using X-ray diffractometry. He holds a M.S. degree from Rikkyo University in Tokyo, Japan.

Diana Yang, a senior at Brooklyn Center High School, worked in Prof. Zimmerman's lab in spring 2004 as part of the Mentor Connection Program of the Hennepin County Public Schools. She is now a freshman at the University of Minnesota-Duluth.

Guifang Zhang, Ph.D., is a postdoctoral associate in Prof. Timothy Wiedmann's laboratory. She earned a Ph.D. in Pharmaceutics from China Pharmaceutical University, and was the recipient of the French Ministry of Educational Fellowship for study at the Institute Charles Sadron (CNRS).

FACULTY NEWS AND ACTIVITIES

PROFESSOR WILLIAM F. ELMQUIST was invited to present "Bioactivity of the Block Copolymer Pluronic P85 and Its Application in Drug Delivery to the Brain, Release from Polymer Coatings and Particles" in March 2004 as part of the *IPRIME Workshop*, University of Minnesota. He was also invited to give a presentation in November 2003 on "Transport Proteins in the Blood-Brain Barrier: Implications for Drug Therapy" as part of the University of Minnesota's *Neurology Grand Rounds*.

Prof. Elmquist was invited to travel to Japan in May 2004 to present "Targeted Bioavailability: Role of Drug Efflux Transporters in the Delivery of Antiviral and Antitumor Agents to the Brain" by the Department of Molecular Biopharmacy and Genetics at Tohoku University in Sendai, and "Overview: Problems in Targeted Bioavailability" by the *Globalization of Pharmaceutics Education Network (GPEN)* at Kyoto University.

He served on the Scientific Committee of the *4th International Symposium: Microdialysis in Drug Research and Development* held in Vienna, Austria in June 2004, and

contributed to a presentation on "Distributional Kinetics of the Novel Multitargeted Antifolate, Pemetrexed, to the CNS".

PROFESSOR CAROLYN A. FAIRBANKS and her husband, Nick Kereakos, welcomed to the world a son, Kevin Aristides Kereakos-Fairbanks last December.

Prof. Fairbanks served as organizer and moderator for a symposium entitled *Analgesic Neuropharmacology and Drug Interactions for the Clinician* at the American Pain Society and Canadian Pain Society Annual Meeting in Vancouver, British Columbia in May 2004. She started a two-year term as co-chair of the American Pain Society Basic Science Interest Group. She also gave a lecture entitled "Drug Delivery in Pain Treatment at the Advanced Survey of Biomedical Neuroscience Workshop" held at the University of Minnesota in August 2004.

Prof. Fairbanks also developed a new graduate-level course entitled *Advanced Neuropharmacology* (PHM 8481), which is being offered for the first time this fall. This course

addresses issues of drug delivery and principles of pharmacokinetics and pharmacodynamics as applied to the unique environment of the central nervous system. The registrants of this course are pursuing Ph.D. degrees in a wide variety of disciplines including pharmaceuticals, neuroscience, pharmacology, oral biology and dentistry, and veterinary medicine. Twelve faculty from the College of Pharmacy, the Medical School and the Veterinary School and a representative from Medtronic are contributing lectures.

PROFESSOR DAVID J.W. GRANT gave invited talks at the University of Kentucky's College of Pharmacy, Boehringer Ingelheim, Symyx, Bristol-Myers Squibb, Pfizer La Jolla, and Nektar Therapeutics. He also gave invited presentations at the *ACS Conference on Polymorphism in Crystals* in Tampa, Florida, and at the *Symposium on Mechanochemistry* at the *AAPS Drug Delivery Conference* in Arlington, Virginia. He served as in instructor at two courses in Princeton, New Jersey, namely the PTI Training Program on Solid Dosage Forms and the IQPC Polymorphism and Crystallization Forum, where he delivered the keynote address. He also taught in the SSCI Pharmaceutical Solids Short Course in Arlington, Virginia, and served as Chair and presenter at a Barnett International short course held in Brussels, Belgium.

Prof. Grant served as the faculty organizer of the meeting of the NSF Center for Pharmaceutical Processing Research, held at the University of Minnesota's College of Pharmacy, and currently serves as Chair of the College's Technology Committee.

In September 2004, Prof. Grant received the 2004 Award from the European Society for Applied Physical Chemistry in Ascona, Switzerland, where he gave two invited presentations. At the AAPS meeting in November, he will receive the AAPS Dale E. Wurster Award in Pharmaceuticals.

PROFESSOR RONALD J. SAWCHUK has been appointed to serve from 2004 to 2007 on the NASA Human Health and Performance Clinical and Operational Working Group. He was elected to serve as a Member-At-Large on the AAPS Executive Council for a three-year term. He is currently Past Chair of the PPDM Section.

Prof. Sawchuk was invited to present "Microdialysis and Its Application in Preclinical Pharmacokinetic and Drug Delivery Investigations" by the CDER, Food and Drug Administration in Rockville, Maryland in March 2004. He was invited to present "Interspecies Scaling, PB-PK Modeling and Microdialysis in Antibiotic Drug Development" by the Novartis Institute for Biomedical Research in Cambridge, Massachusetts in April 2004.

At the *4th International Symposium on Microdialysis in Drug Research and Development* held in Vienna, Austria in June 2004, Prof. Sawchuk was invited to present "Microdialysis of Antibiotics"; he was a member of the Scientific Advisory Committee. He taught a special 2-day course with David Foster of the SAAM Institute on the "Use of SAAM in

Pharmacokinetic Data Analysis and Simulation" at the University of Minnesota in June 2004.

Prof. Sawchuk presented a lecture on "Assessing Drug Distribution to the Target Site and Predicting Tissue Exposure in Humans from Animal Data" at *The FDA Critical Path Initiative and the Role of Modeling/Simulation in Improving the Efficiency of Drug Development Symposium* held in Lake Forest, Illinois in September 2004.

PROFESSOR RONALD A. SIEGEL delivered invited talks on hydrogel- and microfluidic-based drug delivery systems at the *5th Gel Symposium* held in Kashiwa, Japan, and at the *8th Pacific Polymer Conference* held in Bangkok, Thailand, both in November 2003. He also presented invited lectures on his work at the Department of Pharmaceuticals at the University of Nebraska (February 2004), and at the Symposium on Chemical Biology held at the University of Minnesota (May 2004).

In cooperation with the Department of Chemical Engineering and Materials Science at the University of Minnesota, Prof. Siegel delivered introductory lectures on "Controlled Drug Delivery" and "Rheology in Pharmacy" in short courses organized by that department.

Prof. Siegel is Search Committee Chair for the new Medicinal Chemistry Department Head.

PROFESSOR RAJ G. SURYANARAYANAN organized a workshop at the *National Synchrotron Light Source (NSLS) Meeting on Pharmaceutical Applications of Synchrotron Radiation* at Brookhaven National Laboratory, New York and delivered a lecture on "Evaluation of the Degree of Crystallinity of Pharmaceuticals" in May 2004. Co-organizers were Evgenyi Shalaev and Peter Stephens.

Prof. Suryanarayanan delivered a lecture entitled "Use of X-ray Powder X-ray Diffractometry and DSC to Monitor Excipient Crystallization During Freeze-Drying" at the *Conference on Freeze-Drying of Pharmaceuticals and Biologicals* organized by the Center for Pharmaceutical Processing Research at Breckenridge, Colorado in July 2004.

He served on the organizing committee for *The Pharmaceutical Powder X-ray Diffraction Symposium (PPXRD 3)* at the International Centre for Diffraction Data, Hilton Head Island, South Carolina in February 2004. He delivered a lecture entitled "Use of X-ray Powder Diffractometry to Monitor Phase Transitions During Pharmaceutical Processing."

Prof. Suryanarayanan was invited to present a lecture on "Discussion of a Pharmaceuticals Graduate Program in a Large Research University - Funding and Graduate Student Recruitment Issues" at the *Annual Meeting of the American Association of Colleges of Pharmacy* entitled *The Future of Graduate Education in Pharmaceuticals and Academia* in Salt Lake City, Utah on July 10-14, 2004.

PROFESSOR TIMOTHY S. WIEDMANN was recently promoted to Full Professor, and accepted his second term as Director of Graduate Studies in Pharmaceutics. He was awarded the Spring 2004 Teacher of the Semester by the third-year Pharm.D. students. Prof. Wiedmann was designated Outstanding Reviewer by the *Journal of Pharmaceutical Sciences*.

Prof. Wiedmann is Chair of a subgroup of the College's Pharm.D. Admissions Committee. He is also a member of the University Senate, the Senate Committee on Faculty Affairs, and the University's Biological Sciences Policy and Review Council. He is a member of the search committee for the Pharmaceutics faculty position at the University of Minnesota-Duluth.

He was invited by the British Columbia Cancer Research Institute in Vancouver, BC to present "Deposition and Pharmacokinetic Analysis of DFMO in Mice".

The Chinese Pharmaceutical Association in Han Zhou City, China invited Prof. Wiedmann to present "Modulation of Cancer Incidence and Progression by Respiratory Drug Delivery. Preclinical Studies in Rodent Models with Budesonide, Difluoromethylornithine, and 5-Fluorouracil."

PROFESSOR CHERYL L. ZIMMERMAN has been very involved with AAPS this year. She is a Member-At-Large on the Executive Council, and has also acted as the Chair of the Section Program Review Team as part of the AAPS Strategic Planning process. She represented AAPS at the *Pharmaceutical Sciences World Congress* in Kyoto, Japan in May.

Prof. Zimmerman participated in the *Residential School on Medicinal Chemistry*, June 14-18, 2004, at Drew University in Madison, New Jersey, and lectured on "Pharmacokinetics and ADME" for industrial medicinal chemists. She also visited Johnson and Johnson in Raritan, New Jersey, on June 16, 2004 to speak on "Pharmacokinetics and ADME" to development scientists.

RECENT PUBLICATIONS

Atamna H and Frey WH II. A role for heme in Alzheimer's disease: heme binds amyloid β and has altered metabolism. *PNAS* 101(30): 11153-11158, 2004.

Bairamov DF, Chalykh AE, Feldstein MM, Siegel RA and Platé N. Mutual diffusion of poly(N -vinyl pyrrolidone) and water, in *Water Transport in Synthetic Polymers* (AL Iordanskii, OV Startsev and GE Zaikov, eds.), Nova Science Publishers, New York, 2003.

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The first course on
***BASIC PHARMACOKINETIC CONCEPTS FOR THE
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was offered in July by the Department of Pharmaceutics, College of Pharmacy. The three-day course was organized and presented by Profs. William Elmquist, Ronald Sawchuk, and Cheryl Zimmerman, and was attended by almost 50 academic and industrial scientists from all over the U.S. The course was designed for scientists seeking a basic understanding of pharmacokinetics and pharmacodynamics essential to the evaluation of traditional dosage forms and innovative medical delivery systems and devices. This short course was considered a great success by the attendees and presenters alike, and an expanded course will be offered next year on July 12-15, 2005. For information regarding specific topics and registration, please visit

<http://ce.pharmacy.umn.edu/kinetics.htm> .



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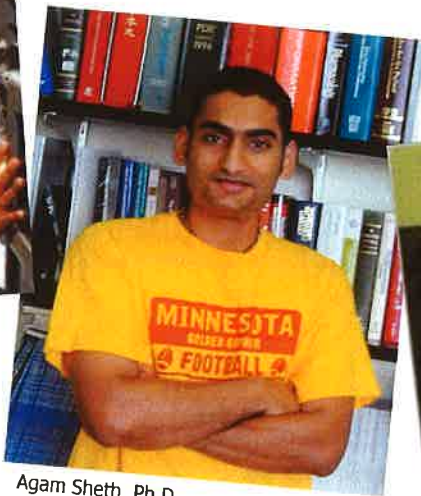


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2003-2004 Pharmaceutics Graduates



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Agam Sheth, Ph.D.



Wei Liu, Ph.D.



Ping Ji, Ph.D.



Anish Dhanarajan,
Ph.D. (BME)



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