Greetings Dear Friends!

I hope you had a wonderful summer and are ready to embrace the excitement of fall! As warm weather gives way to cooler temperatures and colorful trees, and jackets make their reappearance alongside sandals worn defiantly over socks, the most notable adjustment for me is getting my kids settled into their new school routines.

The same is true for the new batch of graduate students settling in on campus. The opportunity to watch these incoming students mature into scientists during their time at the University is always a rewarding experience, for myself and other faculty.

While the Department looks forward to what these new students will achieve, it also prides itself on the accomplishments of this past year. Most notably, the external peer review and strategic planning for the next five years.

The external departmental review (EDR) was conducted due to recent and upcoming leadership changes and the need to articulate a cohesive departmental vision prior to the new deanship. Reviewers praised the Department for its strong reputation in pharmaceutical technology and PK-PD; its evolving strength in neuroscience research; its near 100% job placement for graduates; its diverse collaborations; and its leadership in the AeroCore and CTDD programs. Nonetheless, there is still room for growth. Several suggested areas of improvement were increasing the recruitment of domestic students, re-engaging PharmD students in Pharmaceutics curriculum, building more internal collaborations, and developing a clear succession plan.

Based on the EDR report, the resulting five main goals of the 2016-2021 strategic plan are 1) to retain expertise and diversify the research scope via new hires; 2) expand influence and gauge impact; 3) diversify the student base; 4) embrace flexible course delivery; and 5) create and maintain an innovative curriculum. A detailed strategic plan document will soon be sent to all our stakeholders.

This year we also celebrated the highly productive career of Professor Cheryl Zimmerman. While her research significantly impacted the areas of drug metabolism and tobacco carcinogenesis, Cheryl’s teaching impacted people. Many of her laboratory alumni returned to help celebrate her retirement and lauded her as a superb colleague and mentor. You can see some pictures from the event on page 20.

Also soon to be leaving the College of Pharmacy is Dean Marilyn Speedie, who has decided to step down after twenty years of outstanding leadership. Candidate interviews for the new deanship are scheduled for the first two weeks of November and we expect to have a new dean in office sometime next year.

Before that happens though, we have a busy year ahead. In addition to hiring for a new faculty line (the position description can be found at www.pharmacy.umn.edu/departments/pharmaceutics), we are also seeking avenues to establish another faculty position in materials science aspects of macromolecules. This position, along with the other position in quantitative macromolecular delivery, will nicely complement the existing strengths of the Department and further enhance industry ties. Any ideas for funding this position are encouraged from our alumni and friends.

As always, I welcome your feedback on any Department-related activity, including the strategic plan, and hope to see many of you at various professional meetings soon. If you plan to be in the Twin Cities, please stop by for a visit!

Until then,

Jayanth Panyam, PhD
Professor and Department Head
Alumni News (cont.)

Amardeep Bhalla, PhD [2007], has joined Celgene Corporation as a senior manager, working in biologics drug product development.

Makarand Jawadekar, PhD [1982], spent his entire professional tenure after earning his degree at Pfizer Global Research and Development. He worked for Pfizer for over 28 years and took an early retirement in 2010. Since then he has been on the boards of directors for various pharmaceutical and biotech companies. In August 2016, Mak was nominated as the new chief science officer for PreveCeutical Medical Inc., a health and wellness company based in Vancouver, British Columbia, Canada. He will be leading the company’s pre-clinical evaluation program and will be instrumental with external partnerships and alliances for research and drug development.

Mak also received a Lifetime Achievement Award from the Marathis Literary Society (known locally as the Annual Marathi Sahitya Sammelan). The event took place in January 2016 in Pune, Maharashtra State, India with a live audience of 10,000 people and televised nationally all over India.

Khushboo Kothari, PhD [2014], and her husband, Amit Gangar, Medicinal Chemistry PhD [2013], welcomed their daughter, Mishka Amit Gangar, on August 5, 2016.

Mehak Mehta, PhD [2016], recently accepted a position in the Protein Drug Development Group at Biogen in Cambridge, Massachusetts. She and Kshitij Jerath were married on July 14, 2016 in New Delhi, India.

Swati Nagar, PhD [2003], was elected to chair the 2018 Gordon Research Conference on Drug Metabolism. She will serve as the vice-chair in 2017.

Lin Niu, PhD [2015], and his wife, Jinny, welcomed their son, Raymond Niu, on August 6, 2016. Ray has the same pronunciation as his Chinese character given name.

Karen Parrish, PhD [2016], joined the Metabolism and Pharmacokinetics Group at Bristol-Myers Squibb in New Jersey after graduation. She and her husband, Anthony, welcomed a daughter, Clare Rose Parrish, on September 3, 2016.

Nidhi Sharda, PhD [2016], has joined Bristol-Myers Squibb as a research investigator in the Department of Metabolism and Pharmacokinetics.

Send your alumni news and pictures to pceuts@umn.edu!
Dear Friends and Colleagues,

How time flies! I feel the 2015 article should still be in my “recently” used computer folder. During the exciting past year, I have learned many things as DGS, enjoying the experience of closely working with our students and faculty. Here, I would like to thank my assistant, Ms. Katie James, for her exceptional work. Although we were both new on the job, Katie and I have worked seamlessly as a team to serve our faculty, students, and the College. I am also grateful for the support from Pharmaceutics faculty, especially Professor Timothy Wiedmann, who facilitated the transition.

We have substantially updated the Pharmaceutics Graduate Program Handbook to reflect the faculty’s current philosophies and policies that guide graduate education. Major changes include refinement of the MS degree program (now available for direct admission) and in the required modules. The latter are intended to build a solid foundation in pharmaceutical sciences for all students in our program. You can access the updated handbook here: www.pharmacy.umn.edu/departments/pharmaceutics/pharmaceutics-graduate-program.

On the student front, we graduated seven PhD students and three MS students in the past year. The Department continues its tradition of 100% job placement with five PhD graduates joining pharmaceutical companies, one going on to pursue an MD, and one becoming a post-doctoral fellow to pursue further academic training. All three MS graduates successfully matriculated to our PhD program. This year, we also welcomed seven new students (six PhD and one MS). Currently, we have 25 students in our program, 22 PhD and three MS.

Our graduate program has enjoyed an excellent reputation for years. The quality was once again highly praised by reviewers during our intensive evaluation and external review this past summer. The reviewers affirmed that we are one of the leading pharmaceutical sciences graduate program in the nation. Several suggestions were given for improving our graduate program. One of them is to do more active recruiting for graduate students, especially from reputable colleges and universities in the Midwest, including University of Minnesota. Work is under way to implement this recommendation.

We continue to evolve under recent and major changes in leadership. These changes, coupled with the external review, paved the way for our current search for an additional faculty member with a research emphasis in the delivery of macromolecules. This new faculty member is expected to significantly expand and strengthen our research and graduate education endeavors. We must also anticipate further change. While our graduate program is fortunate to have the services of distinguished senior faculty, a succession plan is needed so that our Department can maintain its stature with their departure. The retirement of Professor Cheryl Zimmerman this year was a significant loss. Her caring, student-first approach to graduate and professional education set a high standard for all of us to emulate. You also may know of Dean Marilyn Speedie’s retirement plan in the coming academic year. A new dean will certainly bring changes, but will hopefully continue her strong advocacy of graduate education in the College. We are looking forward to working together with the new dean to enhance the prestige and impact of our graduate program for the benefit of the College.

Looking forward, we definitely have impending challenges that can be used to create new opportunities. We always want to hear the perspectives and insights of our alumni in shaping the future of our graduate program. It is you upon which our reputation is built, so please let us know how we can work together to enhance graduate education in the Pharmaceutics Graduate Program at the University of Minnesota.

Sincerely,

Chanquan Calvin Sun, PhD
Associate Professor and Director of Graduate Studies
Graduate Student News

Degrees Earned in 2015-2016

Stephen M. Kalscheuer, PhD
Thesis: Humanized Antibody Development Using Phage Display: Applications to Solid Tumor Metastasis
Advisor: Dr. Jayanth Panyam

Vidhi Devendra Khanna, MS
Thesis: Antibody Conjugated Nanoparticles for Targeting Metastatic Triple Negative Breast Cancer
Advisor: Dr. Jayanth Panyam

Garvey Liu, PhD
Thesis: Role of \( \beta \)-Glucuronidase in the Chemopreventive Efficacy of Oral Curcumin: A Prodrug Hypothesis
Advisor: Dr. Jayanth Panyam

Mehak Mehta, PhD
Thesis: Molecular Mobility in Pharmaceutical Glasses: Implications on Physical Stability
Advisor: Dr. Raj Suryanarayanan

Pinal Mistry, PhD
Thesis: Strength of Drug-Polymer Interactions: Implications on Molecular Mobility and Crystallization in Amorphous Dispersions
Advisor: Dr. Raj Suryanarayanan

Shail Panchamia, MS
Thesis: To Investigate the Impact of Gut Bacteria on Efflux Transporter Expression and Function
Advisor: Dr. Karunya Kandimalla

Karen Eileen Parrish, PhD
Thesis: Delivery and Efficacy of CDK4/6 Inhibitors in the Treatment of Brain Tumors
Advisor: Dr. William Elmquist

Saif Shahiraj Rahman, MS
Thesis: Design, Development, and Characterization of Imiquimod-loaded Chitosan Films
Advisor: Dr. Swayam Prabha

Nidhi Sharda, PhD
Thesis: Trafficking of Amyloid Beta Protein at the Blood Brain Barrier: Novel Insights in Alzheimer’s Disease Pathogenesis
Advisor: Dr. Karunya Kandimalla

2015-2016 Graduate Fellowship Recipients

The David J.W. Grant and Marilyn J. Grant Fellowship in Physical Pharmacy is awarded to students whose research is focused in physical pharmacy. Wei-Jhe Sun (Advisor: Dr. Changquan Calvin Sun) was this year’s recipient.

The Edward G. Rippie Fellowship in Pharmaceutics is awarded to students with a consistent and outstanding academic record. It has been awarded to Jiangnan Dun (Advisor: Dr. Changquan Calvin Sun).

The Ronald J. Sawchuk Fellowship in Pharmacokinetics is awarded to a graduate student whose research is focused in pharmacokinetics. Gautham Gampa (Advisor: Dr. William Elmquist) received this year’s award.

The Rory P. Remmel and Cheryl L. Zimmerman Fellowship in Drug Metabolism and Pharmacokinetics is awarded to students that have chosen a thesis advisor whose research encompasses drug metabolism or pharmacokinetics. This year Janice Laramy (Advisor: Dr. William Elmquist) was selected to receive the award.

The Bighley Graduate Fellowship was awarded to Pinal Mistry (Advisor: Dr. Raj Suryanarayanan). She was selected to receive this award for her significant
collaborative/interdisciplinary research in the fields of basic and applied pharmaceutical sciences.

The Theodore H. Rowell Graduate Fellowship is awarded to graduate students who have completed at least two years of study in a pharmaceutical sciences program with a preference given to students interested in nutrition or drug delivery systems. The recipient this year was Michelle Fung (Advisor: Dr. Raj Suryanarayanan).

The 3M Science and Technology Fellowship is awarded to a promising student with interests in drug development. This year’s recipient was Vidhi Khanna (Advisor: Dr. Jayanth Panyam).

The Pharmaceutical Research and Manufacturers of America (PhRMA) Pre-Doctoral Fellowship was awarded to Michelle Fung (Advisor: Dr. Raj Suryanarayanan) for her project, “Rational Design of Amorphous Solid Dispersions with Considerations on Physical Stability During Storage and Dissolution.”

The American Foundation for Pharmaceutical Education (AFPE) Pre-Doctoral Fellowship in Pharmaceutical Sciences is awarded to students who possess the skill and aptitude to become outstanding scientists and leaders. This year Janice Laramy (Advisor: Dr. William Elmquist) received this award.

The National Institute on Drug Abuse (NIDA) Pre-Doctoral Fellowship was awarded to Kelsey Pflepsen (Advisor: Dr. Carolyn Fairbanks) which will support her neuroscience training in drug abuse research.

Welcome New Students!

Yiwang Guo
- MMed in Pharmaceutics, Beijing University of Chinese Medicine
- BE in Pharmaceutical Engineering, Shandong University of Traditional Chinese Medicine

Krutika Jain
- MS in Pharmaceutical Sciences, University of Southern California
- BPharm in Pharmacy, Manipal University

Navpreet Kaur
- MS in Pharmaceutics, National Institute of Pharmaceutical Education and Research
- BPharm in Pharmaceutical Sciences, Panjab University

Vidhi Khanna
- MS in Pharmaceutics, University of Minnesota
- BPharm in Pharmacy, Institute of Chemical Technology

Drishti Sehgal
- BTech in Biotechnology, D.Y. Patil University

Yafan Su
- BS in Pharmacy, Shenyang Pharmaceutical University

Ling Zhu
- BS in Pharmaceutics Science, Secondary Military Medical University
Graduate Student Activities

Michelle Fung has been selected to receive the 2016 American Association of Pharmaceutical Scientists (AAPS) Graduate Student Research Award in Analysis and Pharmaceutical Quality (APQ) for her poster, “The Use of Small Molecule Excipients for Improving the Physical Stability and Dissolution Performance of Ketoconazole Spray Dried Dispersions.”

Gautham Gampa presented his research at the 2016 American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition, Third Minnesota Neuro-Oncology Symposium 2016, and the 2016 Gordon Research Conference: Barriers of the CNS. He also served as the Treasurer of the University of Minnesota AAPS Student Chapter for the 2015-2016 academic year and represented the University of Minnesota Table Tennis team at the 2016 College Table Tennis National Championships.

Sampada Koranne has been selected to receive the 2016 American Association of Pharmaceutical Scientists (AAPS) Graduate Student Research Award in Formulation Design and Development (FDD) for her poster abstract, “Investigation of the Spatial Heterogeneity of Salt Disproportionation in Tablet Formulations.” This award is designed to recognize excellence in graduate education in the formulation design and development areas, including pre-formulation, biopharmaceutics, formulation strategies and technologies, and manufacturing process optimization. She will present her poster at the 2016 AAPS Annual Meeting and Exposition in Denver, Colorado in November.

Christina Larson has joined Dr. Fairbanks’ lab. She earned her DVM from the University of Minnesota and is currently pursuing a PhD in Comparative Molecular Biosciences in the College of Veterinary Medicine. She has also been selected as one of ten participants in the American Veterinary Medical Association's Future Leaders program for 2016-2017.

Pinal Mistry is a recipient of the 2016 American Association of Pharmaceutical Scientists (AAPS) Analysis and Pharmaceutical Quality (APQ) Travelship Award for her poster abstract, “Molecular Mobility as a Polymer Selection Tool for Amorphous Solid Dispersions.” She was also selected as a winner of the AAPS Physical Pharmacy and Biopharmaceutics (PPB) Best Manuscript Contest for her manuscript, “Role of the Strength of Drug-Polymer Interactions on the Molecular Mobility and Crystallization Inhibition in Ketoconazole Solid Dispersions.” The paper was published in the September 2015 issue of Molecular Pharmaceutics.

Vidur Sarma presented a talk titled “Alzheimer’s Disease Aß Peptides Disrupt the Dynamics of Insulin Transport Across the Blood-Brain Barrier” at the 2016 Pharmaceutics Graduate Student Research Meeting (PGSRM) held in Kansas City, Missouri. He also presented a poster with the same title at the 2015 American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition in Orlando, Florida.

Nidhi Sharda received the Pharmacokinetics, Pharmacodynamics, and Drug Metabolism (PPDM) Travelship Award to attend the 2015 AAPS Annual Meeting for her poster, “Trafficking Kinetics of Amyloid
Beta Protein at the Blood-Brain Barrier.” She also received the Graduate Student Research Award in Pharmaceutical Sciences from the American Association of Indian Pharmaceutical Scientists (AAiPS) 2015 for her thesis work. In March 2016, Nidhi won the Best Poster Presentation Award at the Advanced Imaging Microscopy Meeting at the University of California, Berkley. Her poster was titled “Amyloid Beta Interferes with SNAREs Exocytosis Machinery.” In May 2016, Nidhi was nominated by the graduate student class to give the student commencement speech at the 2016 commencement ceremony.

Wei-Jhe Sun has been selected to receive the 2016 American Association of Pharmaceutical Scientists (AAPS) Graduate Student Research Award in Manufacturing Science and Engineering (MSE) for his poster abstract, “Enabling Direct Compression of Low Dose Sustained-Release Tablets by Integrated Particle Engineering.” He will present his poster at the 2016 AAPS Annual Meeting and Exposition in Denver, Colorado in November.

Kunlin Wang presented on “Differential Surface and Bulk Crystallization Behavior of Amorphous Celecoxib” at the Midwest Organic and Solid State Chemistry Symposium (MOSSCS) at the University of North Dakota in June 2016.
2016 Fall Picnic Hosted by the 2015-2016 Pharmaceutics Graduate Student Representatives
Janice Laramy and Saif Rahman

Pharmaceutics Department students, faculty, and staff along with their families and friends enjoyed excellent food and fun activities at this year’s annual picnic! Even though inclement weather forced the event inside, everyone had a great time!
Graduate Student Organizations (cont.)

AAPS Student Chapter News

The AAPS Student Chapter continued work on their mission to increase awareness of career opportunities in pharmaceutical sciences, support professional advancement, provide leadership development, and foster development of values of integrity and teamwork at the University of Minnesota during the 2015-2016 academic year! The chapter supported their mission through the offering of several professional development seminars on a variety of topics including networking skills, presentations, work-life balance, academia and industry careers, and mentoring as well as co-sponsoring the Pharmaceutical Patents and Regulatory Exclusivity seminar and Rho Chi Research Day. They also hosted a number of social events like the annual kick-off meeting, meet and greet happy hours, Skate with a Date, and their annual bowling event.

The AAPS Student Chapter is looking forward to presenting a series of professional development seminars with invited speakers as well as social and charity events during the 2016-2017 academic year!
Jiamei Chen is a visiting scholar in Dr. Sun’s lab. She is a professor from Sun Yat-Sen University in Guangzhou, China.

Naga Kiran Duggirala joined Dr. Sury’s lab as a post-doctoral associate in March 2016. He obtained his PhD from the University of Limerick’s Crystal Engineering Research Group in Professor Mike Zaworotko’s lab.

Samuel Erb, a recent PhD graduate of the Department of Pharmaceutical Sciences at the University of Illinois-Chicago, joined Dr. Fairbanks’ lab as a post-doctoral associate.

William H. Frey II, a former adjunct faculty member, was featured in a Neurology Reviews cover story written by their editor. The article, “Intranasal Drug Delivery Bypasses the Blood-Brain Barrier,” describes intranasal treatments Dr. Frey has developed for Alzheimer’s, Parkinson’s, multiple sclerosis, stroke, traumatic brain injury, spinal cord injury, and other central nervous system disorders.

Takehisa Hanawa, a former visiting scientist in Dr. Siegel’s lab, is currently a Professor of Pharmaceutical Sciences at the University of Tokyo in Chiba, Japan. His research interests are in preparing hydrogels by neutron beam irradiation of various water soluble polymers and the development of the method to improve the solubility of water insoluble active pharmaceutical ingredients using wet-milling. There are currently 15 undergraduate students and five graduate students in his lab. His wife, Tomoko, works at the School of Medicine at Kyorin University in Tokyo, Japan as an associate professor; his son, Takanori, is studying fluid mechanics at Osaka University’s Graduate School of Technology; and his daughter, Nozomi, entered the University of Tokyo last year and will join the Pharmaceutical Sciences department next year.

Amanda Hokanson joined the Pharmaceutics departmental office as an executive office and administrative specialist in December 2015. She settled right in with the international members of the department upon arrival, having taught English in France for four years prior. She now uses her skills to assist with writing projects and event planning, and handles general financial and purchasing needs. Et, bien sûr, elle adore parler le français!

Hassaan Khan, a master’s student with the Medical Devices Center, is working in Dr. Siegel’s lab on shape-shifting hydrogels.

Buddhadev Layek, a post-doctoral associate working in Dr. Prabha’s lab, was selected to receive the Baxter Young Investigator Award. This award program was developed to stimulate and reward research that can be directly used for critical care therapies and the development of medical products that save and sustain patients’ lives.

Samuel Lee, an undergraduate student, is working in Dr. Siegel’s lab on shape-shifting hydrogels.

Shuyu Liu is a visiting scholar in Dr. Sun’s lab. She is a professor from Shanghai University of Engineering Science in Shanghai, China.

Sidhartha Jena, a former visiting scientist in Dr. Siegel’s lab, joined as a senior scientist in the Indira Gandhi Center for Atomic Research’s Material Science Division. After working there for about three years, he then joined the Physics and Astronomy Department at the National Institute of Technology Rourkela, where he currently works as an associate professor. He and his wife, Suman, have a six-year old son, Ishaan.

Eric Nuxoll, a former post-doctoral associate in Dr. Siegel’s lab, has been promoted to associate professor with tenure in the Department of Chemical and Biochemical Engineering at the University of Iowa.

Rajesh Omtri successfully defended his thesis and joined Dr. Kandimalla’s lab as a post-doctoral associate.

Swayam Prabha, a former research assistant professor, recently accepted a tenure-track assistant professor position in the University of Minnesota Department of Experimental and Clinical Pharmacology. Dr. Prabha will continue as an adjunct faculty member in the Department of Pharmaceutics.
Subarna Samanta, a post-doctoral associate who joined Dr. Sury’s lab in April 2016, received the Debye Award at the Broadband Dielectric Spectroscopy Meeting in Pisa, Italy in recognition of his doctoral dissertation research. The Peter Debye Prize for Young Investigators for Excellence in Dielectric Research is established to encourage and support young scientists to continue research in dielectric spectroscopy and its applications. Dr. Samanta has played an essential role in studying the effects of a dc bias, rather than ac electric field, on the dielectric response of supercooled liquids as motivated by the notion that high field reduces the entropy, which in turn increases the viscosity and relaxation times. He has performed research at the forefront of the field and has demonstrated his creativity and in-depth understanding of the science involved. He earned his PhD from Arizona State University in Professor Ranko Richert’s lab.

Amy Sun has joined Dr. Sun’s lab as lab manager.

Suresh Swaminathan, a researcher in Dr. Kandimalla’s lab, presented a poster titled “Insulin Mediated Regulation of the Beta Amyloid Peptide Trafficking at the Blood-Brain Barrier” at the 2015 American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition in Orlando, Florida. He and his wife, Sambhavi, welcomed their first child, a baby boy, who they named Tharun in 2016.

Naveen Thakral left Dr. Sury’s lab in April 2016 and joined Amgen in Los Angeles, California as a scientist in Materials Chemistry and Characterization.

Seema Thakral, a research associate in Dr. Sury’s lab, presented a poster on "Inhibition of Crystallization of Citric Acid by Co-Lyophilization with Cationic Polymer" at the International Society for Lyophilization and Freeze-Drying in Chicago. She also presented a poster titled "Estimation of Grain Size by Two-Dimensional X-Ray Diffractometry: Applications to Powders and After Compression into Tablets" at the Pharmaceutical Powder X-Ray Diffraction Symposium (PPXRD) in Florida. Seema participated in the research project titled "Formulation Optimization for a Low-Volume Resuscitation Fluid for Hemorrhagic Shock" which was presented by Andrea Wolf at Translation Science in Washington, D.C. Seema was selected as a winner of the AAPS Physical Pharmacy and Biopharmaceutics (PPB) Best Manuscript Contest for her manuscript, “Salt Formation During Freeze-Drying: An Approach to Enhance Indomethacin Dissolution.” The paper was published in the November 2015 issue of Pharmaceutical Research.

Jon Urban, a 2008 Biomedical Engineering PhD graduate and former advisee of Dr. Siegel, is a lead research and development engineer for FocusStart, LLC, a medical device company in the Minneapolis/St. Paul area, that licenses technologies at the feasibility stage and develops them for strategic sale, licensing, or formal spinout. Current partners include the University of Minnesota and Mayo Clinic.

Harsha Verma has joined Dr. Fairbanks’ lab in the Department of Genetics, Cell Biology, and Development as a post-doctoral associate.

Amber Vyas joined Dr. Sury’s lab as a University Grants Commission (UGC) Raman Fellow in August 2016. He was an Assistant Professor at the University Institute of Pharmacy, Pandit Ravishankar Shukla University, Raipur, Chhattisgarh, India. He obtained his PhD from the University Institute of Pharmacy, Pandit Ravishankar Shukla University under the supervision of Professor Swarnlata Saraf and Professor Shailendra Saraf. He completed his MPharm degree at the Karnataka Lingayat
People (cont.)

Education Society’s (K.L.E.S.) College of Pharmacy in Belgaum, Karnataka, India, and BPharm at the B.R. Nahata College of Pharmacy in Mandsaur, Madhya Pradesh, India. He received the Young Scientist Award for Medical Sciences, including Pharmaceutical Sciences, in 2010 from the Chhattisgarh Council of Science and Technology’s Eighth Young Scientist Congress was also recommended for the UGC Research Award for 2013-2014 and 2014-2015. He currently has 30 research and review papers, three book chapters, two books, and funding for two research projects to his credit. He advises one PhD student and nine Master’s students; two of his former PhD advisees have graduated and are working in the field.

Chenguang Wang joined Dr. Sun’s lab in July 2016 as a post-doctoral associate. He earned his PhD from the Huazhoag University of Science and Technology in Hubei, China. His research interest is in design and characterization of new solid form drugs.

Mingjun Wang is a visiting scholar in Dr. Sun’s lab. He is a professor from Xiamen Medical College in Xiamen, Fujian, China.

Wenxi Wang is a visiting scholar in Dr. Sun’s lab. He is a professor from Zhejiang University of Technology in Hangzhou, China.

Hiroyuki Yamashita is a visiting scientist in Dr. Sun’s lab from Astellas, Japan.

Shuangling Zhang, a former post-doctoral associate in Dr. Elmquist’s lab, has begun her new career in Salubris-Genekey Biotech Co., Ltd. located in Chengdu, China. She is working on pre-clinical efficacy studies of therapeutic gene and antibodies intended to treat cancer, diabetes, osteoporosis, and cardiovascular diseases. She also attended the American Association for Cancer Research (AACR) Annual Meeting and the Annual Protein and Antibody Engineering Summit (PEGS), both in April 2016.

Dean Marilyn Speedie

In February 2016, Marilyn Speedie announced her plan to retire as Dean of the University of Minnesota College of Pharmacy in early 2017 or when a replacement is in place. For more than 20 years, Dr. Speedie has served as the dean of the College of Pharmacy, which is currently ranked second in the nation among 134 pharmacy schools by U.S. News and World Report.

Some of her notable accomplishments include expanding the college to the Duluth campus, which helped solve the then-serious pharmacist shortage in the state; implementing the Doctor of Pharmacy as the only professional degree for pharmacists; working with professional organizations in the state to develop cutting-edge practices of pharmacy throughout Minnesota; creating practice environments where pharmacists use their clinical knowledge to provide compensated medication management to patients; leading the way for the passage of legislation in Minnesota that allows pharmacists to administer immunizations and recognizes pharmacists as health care providers; expanding the number of faculty from 35 to 105; growing the college’s research productivity almost ten-fold in funding; increasing the college’s endowment significantly which now supports eight endowed chairs; building modern classrooms; and implementing a new curriculum that serves as a model for others around the country.

A national search for the new dean is currently underway.

Source: www.pharmacy.umn.edu/news-and-events/marilyn-speedie-retire-dean
**Faculty News & Activities**

**Professor William F. Elmquist**

Dr. Elmquist was selected as a Distinguished Professor under the Pharmacy Scholars program in 2016. This program is designed to recognize senior faculty members who are leaders in their discipline with a "Distinguished Professor" title and a salary augmentation. They are appointed for a five-year period. The principal criteria for the award are the duration and significance of the person's contributions to the development of his/her discipline, and the impact of the person's scholarly endeavors on a national and international level. Selection was made by a panel of outside reviewers who were nominated by the department heads.

Dr. Elmquist was invited to give the following presentations this year:

- **Role of Efflux Transporters in CNS Drug Delivery.** Scandinavian Blood-Brain Barrier Network Meeting, Uppsala University, Uppsala, Sweden (January 2016).
- **Role of Efflux Transporters in CNS Drug Delivery.** Department of Pharmaceutical Biosciences, Uppsala University, Uppsala, Sweden (January 2016).
- **Impact of Blood-Brain Barrier on Efficacy of Targeted Therapy in Brain Tumors.** Masonic Cancer Center Seminar Series, University of Minnesota, Minneapolis, Minnesota (February 2016).
- **Small Molecule Permeability Across an Intact BBB: Necessary for Effective Treatment of Brain Tumors?** Blood-Brain Penetrant Inhibitors Conference, Drug Discovery Chemistry, Cambridge Healthtech Institute (CHI), San Diego, California (April 2016).
- **BBB Permeability of Molecularly-Targeted Anti-Tumor Agents: Necessary for Effective Treatment of Brain Tumors?** Third Neuro-Oncology Symposium, Brain Tumor Program, University of Minnesota, Minneapolis, Minnesota (May 2016).

**Influence of BBB Transporters on the Delivery of Molecularly-Targeted Agents to Primary and Secondary Brain Tumors.** Second Annual Blood Brain Barrier Conference, Preclinical World Congress, Cambridge Healthtech Institute (CHI), Boston, Massachusetts (June 2016).


Dr. Elmquist received the following funding this year:

- NIH-NS073610-05, *Targeting Kif11 to Treat Glioblastoma Invasion and Proliferation* (2016-2021)
- NIH-U54CA210180-01, *MIT/Mayo Physical Sciences Center for Drug Distribution and Efficacy in Brain Tumors* (2016-2021)

**Professor Carolyn A. Fairbanks**

In 2015-2016, Dr. Fairbanks and her research team continued to contribute their expertise in intrathecal and epidural drug delivery for translational research collaborations with industry and other academic groups (e.g., the University of Minnesota Center for Translational Medicine). Her research interests focus on targeted delivery of gene therapeutics to specific CNS neuronal subpopulations. This research is supported in part by the National Institute on Drug Abuse (NIDA) to investigate mechanisms of inhibition of opioid-induced tolerance. Her program also includes a strategy to develop
gene therapeutics for the treatment of opioid addiction, an effort generously supported by another gift from the Noble Family to the College of Pharmacy. Additionally, in September 2015, Dr. Fairbanks received a three-year Neurosensory and Rehabilitation Research Award from the Department of Defense for her study, "Controlling Neuropathic Pain by Novel Non-Opioid Pharmacological and Gene Therapeutic Approaches." Collaborators include Professor R. Scott McIvor (Genetics, Cell Biology, and Development), Professor Lucy Vulchanova (Neuroscience), and Professor Herb Nagasawa (Medicinal Chemistry).

One of Dr. Fairbanks’s team members, Ms. Kelsey Pflepsen, a second year Pharmaceutics graduate student, received a Pre-Doctoral Fellowship in the NIDA Training grant “Neuroscience Training in Drug Abuse Research” which will span the duration of her training.

In 2016 Dr. Fairbanks welcomed several new members to her lab including Dr. Samuel Erb, PhD, a recent graduate of the Department of Pharmaceutical Sciences of University of Illinois-Chicago; Dr. Harsha Verma, PhD, Department of Genetics, Cell Biology, and Development; and Dr. Christina Larson, DVM, who is pursuing her PhD in Comparative Molecular Biosciences in the College of Veterinary Medicine.

Dr. Fairbanks is currently being featured in the University of Minnesota’s 2016-2017 “Driven to Discover” campaign for her contributions to addiction research and development of gene therapeutics and peripherally restricted analgesic medications. You can view her story at z.umn.edu/fairbanksdriven.

Professor Karunya Kandimalla

Dr. Kandimalla will be organizing a Sunrise Session at the 2016 AAPS Annual Meeting and Exposition: “More Than a Gut Feeling: Role of Microbiome in Health, Disease, and Drug Therapy.” He hopes to see you there on Tuesday, November 15, 2016 from 7:30 to 8:45 AM.

Dr. Kandimalla gave the following invited presentations this year:

- **Amyloid-Beta and Insulin Interactions at the Blood-Brain Barrier: Intimacy or Intrigue?** Citywide Endocrine Conference, Minneapolis, Minnesota (November 2015).
- **Plasma Amyloid Beta Levels: Does the Tail Wag the Dog?** Institute of Translational Neuroscience Conference, University of Minnesota, Minneapolis, Minnesota (December 2015).
- **Impaired Trafficking of Insulin and Amyloid Beta Proteins in Alzheimer’s Brain: Under Explored Dimension of Blood-Brain Barrier Dysfunction.** Doctoral College of Metabolic and Cardiovascular Disease, Medical University of Graz, Graz, Austria (July 2016).

Dr. Kandimalla received the following grants this year:

- Minnesota Partnership grant to develop molecular imaging probes to detect brain insulin resistance in Alzheimer’s disease patients.
- U01 grant from the Food and Drug Administration to investigate lidocaine transdermal drug delivery systems.
- University of Minnesota College of Pharmacy Grants Award Program to study the impact of gut microbiota on the bioavailability and disposition of orally administered drugs.
Faculty News & Activities (cont.)

- Mayo Clinic research contract to evaluate the effect of gut microbiota on the gastrointestinal permeability.

The Kandimalla lab submitted several publications this year. Partnering with their Mayo Clinic collaborators, they also developed a research database that harbors salient features of the blood-brain barrier genomic landscape: bioinformaticstools.mayo.edu/bbbomics.

Dr. Kandimalla and Dr. Les Drewes, Professor of Biomedical Sciences at the University of Minnesota Duluth and Pharmaceutics adjunct professor, represented the Brain Barriers Research Center (BBRC) at the 2016 Discovery Across Disciplines showcase sponsored by the University of Minnesota Graduate School.

Dr. Kandimalla was also promoted to Associate Professor this year.

Professor Jayanth Panyam

Dr. Panyam was invited to these talks this year:


- Phage Display Based Antibody Development for Detection of Circulating Tumor Cells in Breast Cancer. Divisional Seminar Series, University of Missouri-Kansas City School of Pharmacy, Kansas City, Missouri (January 2016).


Dr. Panyam contributed to the following posters and podiums:


Professor Swayam Prabha

Dr. Prabha received the following funding this year:

- Wallin Neuroscience Award (co-investigator), *Nanoliposomes for Delivery of Aminoguanidine in Diabetic Retinopathy*, $100,000 (2016-2017).
- College of Pharmacy GAP Award (principal investigator), *Targeting Solid Tumors Using Nano-Engineered MSCs*, $40,000 (2016-2017).
- NIH-R01EB022558 (principal investigator), *Targeting Solid Tumors Using Nanoengineered MSCs*, $1,318,000 (2016-2020).

Dr. Prabha gave the following presentations this year:

- Layek B, Sadhukha T, Prabha S. *Glycoengineered Mesenchymal Stem Cells as an Enabling Platform for Two-StepTargeting of Solid Tumors*. Pharmaceutics Graduate Research Student Meeting (PGRSM), University of Missouri-Kansas City, Kansas City, Missouri (June 2016).
- Layek B, Sadhukha T, Prabha S. *Glycoengineered Mesenchymal Stem Cells for Two-Step Targeting of Solid Tumors*. Globalization of Pharmaceutics Education Network (GPEN), University of Kansas, Lawrence, Kansas (November 2016).

Dr. Prabha accepted a tenure-track assistant professor position in the University of Minnesota Department of Experimental and Clinical Pharmacology. She will continue as an adjunct faculty member in the Department of Pharmaceutics.

Professor Ronald A. Siegel

Dr. Siegel presented invited lectures at the Harvard University School of Engineering and Applied Sciences and at Draper, both in Cambridge, Massachusetts; at the PacificChem Conference in Honolulu, Hawaii; at the “From Nano to Macrostructures Design and Characterisation of Soft Materials” Conference in Strömstad, Sweden; at EcoLab in St. Paul, Minnesota; at the University of Maryland College Park Chemical and Biomolecular Engineering; and at the National Institutes of Child Health and Human Development.

Dr. Siegel was chair of the College of Fellows Selection Committee for the Controlled Release Society this past year. He also continues to direct the Biomaterials and Pharmaceutical Materials program for IPRIME (Industrial Partners for Research in Interfacial and Materials Engineering) at the University of Minnesota and is on the International Scientific Advisory Board for SuMo, a consortium of Swedish universities, companies, and government, which focuses its research on biomaterials and other soft materials.

Dr. Siegel co-edited, with Dr. SuPing Lyu of Medtronic, a new book titled *Drug-Device Combinations for Chronic Disease* (Wiley-Society for Biomaterials).
Professor Chanquan Calvin Sun

Dr. Sun gave the following presentations this year:


- **Mechanical Properties of Amorphous Solid Dispersions.** Third David Grant Symposium, University of Minnesota, Minneapolis, Minnesota (June 2016).

- **Strategies to Expand Solid-State Landscapes of Drugs to Enable Successful Tablet Formulation Development.** Pharmaceutical Powder X-Ray Diffraction Symposium (PPXRD), Fort Myers, Florida (June 2016).

- **Development of Cocrystal Based Drug Products.** University of Macau, Macau, China (October 2016).

Dr. Sun obtained the following grants:

- Eli Lilly LRAP Grant (Lilly collaborator: Dr. Aktham Aburub)
- AstraZeneca Grant (AstraZeneca collaborator: Dr. Pirjo Tarjarobi)

Dr. Sun has been named an AAPS Fellow and will be recognized on November 13 at the 2016 AAPS Annual Meeting and Exposition in Denver, Colorado. Recognition as a fellow is awarded to faculty who have sustained remarkable scholarly and research contributions to the pharmaceutical sciences. He was also selected as a “2016 Top Reviewer” for the Journal of Pharmaceutical Sciences and received the University of Minnesota Distinguished Chinese Alumni Award this year.

Professor Raj G. Suryanarayanan

The International Pharmaceutical Excipients Council (IPEC) Foundation presented Dr. Sury with the 2015 Ralph Shangraw Memorial Award at the 2015 Annual Meeting of the American Association of Pharmaceutical Scientists in Orlando, Florida. The award is presented to any person who, in the opinion of the board, has provided outstanding research contributions in the study of excipients or excipient-related technology over a number of years. The goal of Dr. Sury’s research is developing a fundamental understanding of the material science properties of pharmaceuticals (both drugs and excipients) to prepare dosage forms with reproducible and predictable properties.

Dr. Sury was invited to give the presentations this year:

- **Crystallinity Evaluation by Powder X-Ray Diffractometry.** Allergan, Irvine, California (January 2016).
• Suryanarayanan R, Munson E. Advanced Characterization of Drug Substances and Drug Product. NIPTE/FDA Formulation Seminar, Silver Springs, Maryland (March 2016).

• Molecular Mobility in Pharmaceuticals and its Relevance to Predicting Stability of Solid Dispersions. American Association of Pharmaceutical Scientists (AAPS) Arden Conference, Baltimore, Maryland (April 2016).


• Molecular Mobility in Pharmaceuticals and its Relevance to Predicting Stability of Solid Dispersions. Bristol-Myers Squibb, New Brunswick, New Jersey (April 2016).

• Profiling Phase Transformations in Different Regions of Tablets by Two-Dimensional X-Ray Diffractometry. Third David Grant Symposium, University of Minnesota, Minneapolis, Minnesota (June 2016).

• Roundtable Discussion. Third David Grant Symposium, University of Minnesota, Minneapolis, Minnesota (June 2016).


Dr. Sury contributed to the following abstracts this year:


Dr. Sury received the following grants this year:

- $70,000 grant from Allergan, Plc for his “Characterization of Amorphous Solid Dispersions” project.
- $85,365 grant from Pfizer, Inc. for his “Accelerating Solid Form and Drug Product Design of Solid Oral Dosage Forms” proposal.
- $55,000 grant from Celista Pharmaceuticals for his “Development of Topical, Injectable, and Oral Dosage Forms” project.
- $78,947 from Allergan, Plc for his “Crystallinity of API and Excipients in Drug Delivery Systems” project.
- $69,156 from Sun Pharma for the his “Development of NIPTE Industrial Training Program” project (co-investigator).

### Professor Timothy S. Wiedmann

Dr. Wiedmann completed a semester leave last fall as a visiting professor at Shenyang Pharmaceutical University (SPU), Liaoning Province in Northeast China. He assisted in teaching biopharmaceutics in their five year BS program, which is an English-based curriculum. While there, he gave an invited talk at the Asian Inhalation Society, Shenyang, “Magnetic Hyperthermia for Lung Cancer.” This research was done in collaboration with Dr. Jayanth Panyam. At SPU, he advised students interested in pursuing graduate students in the US. This coming fall, Dr. Wiedmann will assist in the implementation of an internship program for SPU students who will spend the spring semester at the University of Minnesota doing research.

Also during his stay in China, he gave an invited talk at the Chinese Academy of Science, Beijing, “Magnetic Particles for the Treatment of Lung Cancer.” He was hosted by Dr. Liang Wei, a former post-doctoral fellow at the University of Minnesota. He met with Dr. Dandan Yi at the Tongji Medical College, Wuhan, to establish a collaboration involving inhalation treatment of lung cancer. In Wuhan, he gave a presentation to the Department of Pharmaceutics, “Inhalation Treatment of Lung Cancer.”

Dr. Wiedmann returned to Shenyang in spring 2016 to give a presentation at the Fourth Asian Symposium on Pharmaceutical Science and Technology, “Pharmaceutical Salts.” He agreed to be an assistant editor of the Asian Journal of Pharmaceutical Sciences and participated in the board meeting during his stay. He gave a joint presentation with Dr. Ray Wood to pharmacy students at SPU on graduate education, where industrial and academic perspectives were given.

He continues to manage activities in AeroCore, an internal/external research organization at the University of Minnesota that conducts inhalation research studies. AeroCore is currently supporting a project with Dr. Lisa Peterson, “Interactions Between Tobacco Smoke Constituents in Rodent Tumor Models.” New ventures include a contract with the Milwaukee Medical College, which was coordinated by Dr. Frank Ondrey, University of Minnesota Department of Otolaryngology. A new grant began in September 2016, “e-Cigarettes: Formaldehyde DNA Adducts, Oxidative Damage, and Potential Toxicity and Carcinogenesis,” with Dr. Stephen Hecht, University of Minnesota Cancer Center, as principal investigator.
Professor Cheryl L. Zimmerman

In July 2016, colleagues and students came together to wish Dr. Zimmerman a happy retirement and thank her for over 30 years of service to the University of Minnesota Department of Pharmaceutics! Former lab members shared the impact that she has had on their education and lives and colleagues shared the numerous ways she has impacted research and the industry. Alumni speakers included Swati Nagar [PhD 2003], Yazdi Pithavala [PhD 1995], Cristina Castelli [Post-Doctoral Associate 1994-1996], Prajakti Kothare [PhD 2001], Manthena Varma [Post-Doctoral Associate 2006-2008], Jing Wang [PhD 2012], and Brian Willis [PhD 2007]. Special presentations and reflections were given by Dr. K. Sandy Pang, Professor at University of Toronto, and Dr. Kenneth Thummel, Professor and Department Chair at the University of Washington, and reflections were shared by Dean Marilyn Speedie, Dr. Jayanth Panyam, Dr. William Elmquist, and many of the attendees.
Recent Publications


Recent Publications (cont.)


Recent Publications (cont.)


Recent Publications (cont.)


Symposiums

David J.W. Grant Symposium

The David Grant Symposium, held in honor of late Professor David J.W. Grant, a leader who helped to define the field of solid-state science, took place on June 22, 2016 at the University of Minnesota Twin Cities campus. It was attended by 74 active researchers and leaders in the field of pharmaceutical solid-state sciences. These leading researchers, from both academia and industry, gathered to share their most cutting edge research and exchange stimulating ideas. The symposium covered current topics that are of importance to different aspects of drug product development and clarified future directions in this field through a round table discussion.

Brain Barriers Research Center (BBRC) Symposium

The inaugural Brain Barriers Research Center (BBRC) Symposium took place on October 26, 2016 at the Commons Hotel in Minneapolis, Minnesota. It featured speakers from the University of Minnesota, Mayo Clinic Rochester, and University of Wisconsin-Madison and was attended by over 100 participants from a variety of research backgrounds. The objective of the symposium was to stimulate collaboration across various departments and institutions on issues related to brain barriers, especially the blood brain barrier, that interconnect both CNS drug delivery and CNS pathophysiology.

University of Minnesota College of Pharmacy Ranks Second in Nation

U.S. News and World Report Rankings Reflect Peer Assessments of the Program

The University of Minnesota College of Pharmacy ranked second in this year's U.S. News and World Report's ranking of pharmacy schools. The college moved up one spot from its third place ranking in 2012, the last time U.S. News ranked pharmacy schools. The rankings are based upon the results of peer assessment surveys sent to leaders in pharmacy schools across the country.

"We are extremely proud to be recognized as one of the very best pharmacy schools in the nation. This ranking reflects our exceptional work, dedication and high standards our students, faculty, and staff of the College of Pharmacy set for themselves and their colleagues," said Marilyn Speedie, dean. "Cutting-edge research by world-renown faculty enhances our excellent education program."

The University of Minnesota has the only college of pharmacy in the state of Minnesota, and offers its doctor of pharmacy (PharmD) program on both the Twin Cities and Duluth campuses. Faculty researchers in the college are known for their expertise in drug design, delivery, therapy, and policy. The college enrolls 640 doctor of pharmacy students in the four-year professional program and offers five graduate programs to 120 graduate students, along with several post-doctoral fellowships.

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