



MINNECEUTICS

Indispensable News.

University of Minnesota Department of Pharmaceutics



Milestones: Life Updates

p. 20-22

News from our current members and alumni.

New Murthy Fellowship

p. 11

Celebrating those who are gone by supporting students in their honor.

Outreach in Our

Community

p. 26

Students are making change happen on and off campus.

2024 Issue

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Curious about our history?

Explore our archived newsletters (1993 to current) at:
pharmacy.umn.edu/pharmaceutics/minneceutics-newsletter

A Message to Our Friends

Greetings Alumni & Friends,

This has been a year of big changes in the Department, in the College as well as in the University. After 40 years of distinguished service to the pharmaceuticals community as a scientist, educator and leader, Professor Ron Siegel has started his phased retirement. Ron joined our Department in 1998 and served as the Department Head until 2009. During this time, several new faculty were hired and they have played a big role in shaping us into a strong and vibrant Department. Ron again took on the role of the Department Head in 2020 until the start of his phased retirement. He is a scholar par excellence with expertise in numerous areas in drug delivery and related fields. This is reflected both in the quality of his papers and the research areas covered in his publications. His leadership style was characterized by his immense trust and respect for all his colleagues. He has played a key role in shaping our Department for which we are very grateful. Earlier this year, Ron and I “exchanged” our roles – I became the Department Head and Ron has kindly agreed to serve as the Director of Graduate Studies.

Recently, Lynda Welage stepped down from her role as the Dean of the College of Pharmacy. We thank Lynda for her leadership and her strong support to the Pharmaceuticals Department and the graduate program ([see page 15](#)). Professor Amy Pittenger, who was the Head of the Department of Pharmaceutical Care & Health Systems, is serving as the interim dean. Dr. Pittenger is recognized across the University for her leadership including her role as Chair of the Faculty Consultative Committee. Those of you attending the AAPS meeting will have the chance to meet Amy at the University of Minnesota reception. Finally, Dr. Rebecca Cunningham is the new President of the University of Minnesota. Dr. Cunningham is a physician-scientist, with a record of continuous federal research funding for more than 25 years as a principal investigator and is a member of the National Academy of Medicine.

The Department is delighted to welcome Dr. Ameya Kirtane as an Assistant Professor. Ameya came from Brigham and Women’s Hospital and Harvard Medical School (see the separate writeup about Ameya). I am confident that his research will take the department in new directions and to new heights. I am also delighted that Professor Calvin Sun was recognized as a Distinguished McKnight University Professor ([see page 10](#)). This is also a “first” for our Department.

Finally, I have some good news about a new fellowship and related initiatives in the department. The Dr. Kuchi S. Murthy and (the late) Dr. Swatantra Bharathi Murthy fellowship has been instituted, which will support graduate students in Pharmaceuticals ([see page 11](#)). We are also in the process of establishing the Ronald Siegel Fellowship and the William Elmquist Fellowship to honor our two senior and distinguished faculty. The alumni from Ron’s and Bill’s labs are taking a leadership role in setting up these fellowships. We will be providing more details at the AAPS alumni event.

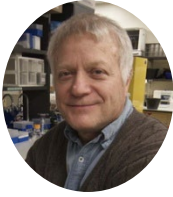
It is always a pleasure to hear from our alumni and friends. Therefore, please keep us posted. I am looking forward to meeting many of you in Salt Lake City later this month. Best wishes,



Raj Suryanarayanan
Department Head



Meet Our Faculty



William F. Elmquist, PharmD, PhD
Distinguished Professor, Pharmaceutics
Director, Brain Barriers Research Center



Carolyn A. Fairbanks, PhD
Professor, Pharmaceutics
Associate Dean for Research,
College of Pharmacy



Karunya K. Kandimalla, PhD
Professor, Pharmaceutics
Associate Dean for Graduate Education,
College of Pharmacy



Ameya Kirtane, PhD
Assistant Professor,
Pharmaceutics



Hongbo Pang, PhD
Assistant Professor,
Pharmaceutics



Ronald A. Siegel, ScD
Professor and Director of Graduate
Studies, Pharmaceutics



Changquan Calvin Sun, PhD
Distinguished McKnight University
Professor and Associate Department
Head, Pharmaceutics



Raj Suryanarayanan, PhD
Professor, Peters Endowed Chair,
and Department Head,
Pharmaceutics

Adjunct Faculty

Richard C. Brundage, PharmD, PhD,
Experimental & Clinical Pharmacology, U of M

Lester R. Drewes, PhD, Biomedical Sciences,
U of M Duluth

Virginia Ghafoor, PharmD, Fairview
Pharmacy Services

Brittany Hartwell, PhD, Biomedical
Engineering, U of M

David A. Largaespada, PhD, Pediatrics,
U of M

Val Lowe, MD, Mayo Clinic

Theresa Reineke, PhD, MS, Chemistry,
U of M

Jann N. Sarkaria, MD, Mayo Clinic

Ronald J. Sawchuk, PhD, Professor Emeritus

Evgenyi Shalaev, PhD, AbbVie

Rachael Sirianni, PhD, MS, MSE, University
of Massachusetts, Department of Neurological
Surgery, UMass Chan Medical School

Robert Thorne, PhD, Denali Therapeutics

Chun Wang, PhD, Biomedical Engineering,
U of M

Timothy Wiedmann, PhD, Professor Emeritus

Joseph A. Zasadzinski, PhD, Chemical
Engineering & Materials Science, U of M

Cheryl L. Zimmerman, RPh, PhD, Professor
Emeritus

Rui Zhang, PhD, Surgery, U of M



Degrees Earned in 2023-2024



Congratulations

to all our graduates

Sichen Song, PhD

Advisor: Professor Ronald Siegel
Thesis: *Crystallization Inhibition in High Drug Loaded Amorphous Solid Dispersions*



Lushan Wang, PhD

Advisor: Professor Karunya Kandimalla
Thesis: *Pathophysiological Mechanisms Underlying the Disruption of Blood-Brain Barrier Transport in Alzheimer's Disease and Metabolic Syndrome*



Tongzhen Xie, PhD

Advisor: Professor Carolyn Fairbanks
Thesis: *Elucidating the Mechanism of Maladaptive Spinal Plasticity and Therapeutic Solutions*



Muskan Mukesh Badola, MS

Advisor: Professor Karunya Kandimalla
Thesis: *Development of Targeted Nanovehicles to Deliver Biomolecules to Cerebrovascular Endothelium*



Pin-Syuan Huang, MS

Advisor: Professor Calvin Sun
Thesis: *Modifying Pharmaceutical Properties of Levofloxacin by Crystal Engineering*



Chaowang Zeng, MS

Advisor: Professor Raj Suryanarayanan
Thesis: *Effect of Cosolutes and Processing on Mannitol Phase Behavior in Frozen Solutions*



Zengtao Wang, PhD

Advisor: Professor Karunya Kandimalla
Thesis: *Anomalous A β Exposure and BBB Insulin Resistance Induce Cerebrovascular Dysfunction in Alzheimer's Disease*



Wenjuan Zhang, PhD

Advisor: Professor William Elmquist
Thesis: *Exploring the Exposure - Efficacy Relationship of Novel Treatment Strategies for Brain Tumors*



Vineetha Guttha, MS

Advisor: Professor Karunya Kandimalla
Thesis: *Molecular Mechanisms Driving the Cerebrovascular Accumulation of Dutch Mutant Amyloid Beta-Protein*



Vaishnavi Veerareddy, MS

Advisor: Professor Karunya Kandimalla
Thesis: *Gut Microbial Metabolite, Sodium Butyrate Regulates the Blood-Brain Barrier Transport and Intra-Endothelial Accumulation of Alzheimer's Disease Amyloid-Beta Peptides*



Commencement 2024



Back row (left to right): Chaowang Zeng, Ronald Siegel, Karunya Kandimalla
 Middle row (left to right): Lushan Wang, Pin-Syuan Huang, Sichen Song, Muskan Badola, Tongzhen Xie
 Front row (left to right): Vineetha Guttha, Vaishnavi Veerareddy, Sneha Rathi, William Elmquist, Wenjuan Zhang, Raj Suryanarayanan, Zengtao Wang, Carolyn Fairbanks



Muskan Badola



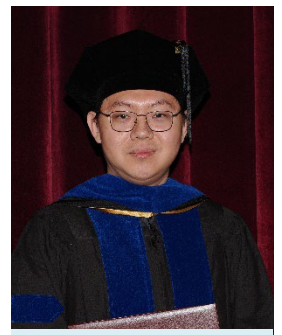
Vineetha Guttha



Pin-Syuan Huang



Sneha Rathi



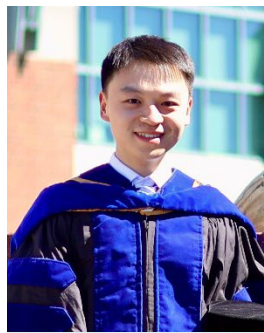
Sichen Song



Vaishnavi Veerareddy



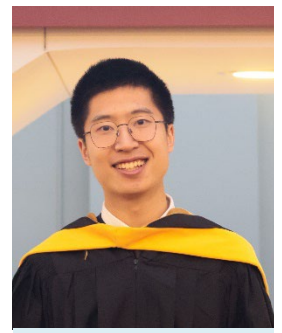
Lushan Wang



Zengtao Wang



Tongzhen Xie



Chaowang Zeng



Wenjuan Zhang



Wenqiu Zhang





Welcome New Students!



Muskan Badola
PhD program
Advisor: Kandimalla
*MS in Pharmaceutics,
University of Minnesota
-Twin Cities
*BPharm, Nirma University



Vineetha Guttha
PhD program
Advisor: Kandimalla
*MS in Pharmaceutics,
University of Minnesota
-Twin Cities
*BPharm, Chalapathi Institute
of Pharmaceutical Sciences

We look forward to
all the creative
solutions you will
discover on your
journey!



Pin-Syuan Huang
PhD program
Advisor: Sun
*MS in Pharmaceutics,
University of Minnesota-
Twin Cities
*BS in Pharmacy, Taipei
Medical College



Aran Kim
PhD program
Advisor: Elmquist
*BS in Pharmaceutical
Science, Purdue
University
*AS in Biology, Pierce
College



Riddhi Kini
PhD program
Advisor: Fairbanks
*MS in Pharmaceutics,
University of
Minnesota-Twin Cities
* BPharm, University of
Mumbai



Lyle Nyberg
PhD program
Advisor: Kandimalla
*BS in Mathematics,
Chemistry, and Biology,
Augsburg University



Prachi Shrivastav
PhD program
Advisor: Elmquist
*MS in Pharmaceutics,
National Institute of
Pharmaceutical Education
and Research (NIPER)
*BPharm, University of
Mumbai



Chi-Wei Huang
MS program
Advisor: Pang
(rotation)
*PharmD, National
Taiwan University



John Patani
MS program
Advisor: Sun
*BPharm, Manipal
College of
Pharmaceutical
Sciences



Zi Yin
MS program
Advisor: Sun
*BS in Pharmacy,
Zhejiang University

“Wherever the art of
medicine is loved,
there is also a love of
humanity.”
Hippocrates



2024-2025 Fellowships & Grants



Awardee: Vikram Joshi

Advisor: Dr. Changquan Calvin Sun

David J.W. Grant & Marilyn J. Grant Fellowship in Physical Pharmacy

This fellowship is awarded to students whose research is focused in Physical Pharmacy.



Awardee: Mitchell Kowalke

Advisor: Dr. Hongbo Pang

3M Fellow (2nd year)

The 3M Science and Technology Graduate Fellowship (3M Fellowship) provides a multi-year fellowship to exceptional, incoming PhD students in science and engineering and in the biomedical sciences.



Awardee: Lina Le

Advisor: Dr. William Elmquist

Edward G. Rippie Fellowship

This fellowship is awarded to students with a consistent and outstanding academic record in Pharmaceutics.

Ronald Sawchuk Fellowship

This fellowship is awarded to a graduate student whose research is focused in Pharmacokinetics.



Awardee: Doug Nelson

Advisor: Dr. Karunya Kandimalla

(INAUGURAL) Steven M. Wick Fellowship

This fellowship is awarded to a graduate student studying toward a PhD in Pharmaceutics.



Awardee: Zijian Wang

Advisor: Dr. Changquan Calvin Sun

David J.W. Grant & Marilyn J. Grant Fellowship in Physical Pharmacy

This fellowship is awarded to students whose research is focused in Physical Pharmacy.

Doctoral Dissertation Fellowship (DDF)

This fellowship gives the University's most accomplished PhD candidates an opportunity to devote full-time effort to an outstanding research project by providing time to finalize and write a dissertation during the fellowship year.

Rowell Graduate Fellowship

The Ted Rowell Graduate Fellowships are awarded to full-time College of Pharmacy PhD graduate students who are conducting research in basic pharmaceutical sciences with an emphasis in nutrition or drug delivery systems.



Awards & Achievements

Highlighting Success in 2023-2024



Amanda Hokanson (*administrative staff*)

2024 Excellence in Service Award, Pharmaceuticals

This award recognizes the extraordinary time and effort Amanda has dedicated to the department and its students. In the past nine years, Amanda has helped create, organize, and lead over 50 student engagement events to help students build a strong community.



Vikram Joshi (*graduate student*)

2023-2024 Teaching Assistant Recognition Award

This award recognizes outstanding performance of teaching assistants in the College of Pharmacy's PharmD program.



Lina Le (*graduate student*)

2023-2024 Teaching Assistant Recognition Award

This award recognizes outstanding performance of teaching assistants in the College of Pharmacy's PharmD program.



Jinghan Li (*graduate student*)

2024 NIPTE Outstanding Student Research Award

The National Institute for Pharmaceutical Technology & Education (NIPTE) presents this award to graduate students with outstanding scientific achievements in the areas of pharmaceutical science and technology. Jinghan also successfully defended his thesis "Role of Surfactants in the Stabilization of Protein Formulations".



Yiqin Li (*graduate student*)

2023-2024 Teaching Assistant Recognition Award

This award recognizes outstanding performance of teaching assistants in the College of Pharmacy's PharmD program.



Bhushan Munjal

(*postdoctoral associate*)

Cover Art on Front Cover of Molecular Pharmaceutics: 2024, 21, 10.

Cover art for the paper entitled "Excipient-Induced Lattice Disorder in Active Pharmaceutical Ingredient: Implications on Drug Product Continuous Manufacturing". View it at:

<https://pubs.acs.org/toc/mpohbp/21/10>



Sichen Song (*graduate student*)

Patrick DeLuca Emerging Researcher Award

Awarded by the International Pharmaceutical Excipients Council (IPEC) of the Americas Foundation for demonstrated interest in and dedication to the area of excipients in terms of published manuscripts and a research proposal in the area of excipient scientific/technological research.



Vaishnavi Veerareddy

(*graduate student*)

2024 Best Abstract Award & Travel Fellowship American Association of Pharmaceutical Scientists

Abstract title, "Amyloid Beta Peptides Inhibit Insulin Trafficking at the Blood-Brain-Barrier in Alzheimer's Disease Brain".

American Association of Indian Pharmaceutical Scientist (AAiPS) Graduate Student Award 2023

AAiPS presents six awards to graduate students in pharmaceutical sciences, regulatory affairs, and clinical research. Vaishnavi's research has been recognized for its excellence and her achievement will be celebrated at the AAiPS Annual Banquet in Salt Lake City, Utah.



Zijian Wang (*graduate student*)

2024 Best Abstract Award

American Association of Pharmaceutical Scientists

Abstract title, "Broad Applicability of a Model for Predicting Tabletability of Mixtures from Those of Individual Components".

2024 CIMSEPP IAB SLC Award

Awarded by the Center for Integrated Material Science and Engineering of Pharmaceutical Products (CIMSEPP) at the Industrial Advisory Board (IAB) May meeting for his contribution as a CIMSEPP Student Council Leader (SLC).

2024 American Association of Indian Pharmaceutical Scientist (AAiPS) Graduate Student Award

AAiPS presents six awards to graduate students in pharmaceutical sciences, regulatory affairs, and clinical research. Zijian's research has been recognized for its excellence and his achievement will be celebrated at the AAiPS Annual Banquet in Salt Lake City, Utah.



Tianyi Xiang (*graduate student*)

2024 American Association of Indian Pharmaceutical Scientist (AAiPS) Graduate Student Award

AAiPS presents six awards to graduate students in pharmaceutical sciences, regulatory affairs, and clinical research. Tianyi's research has been recognized for its excellence and his achievement will be celebrated at the AAiPS Annual Banquet in Salt Lake City, Utah.



Tongzhen Xie (*graduate student*)

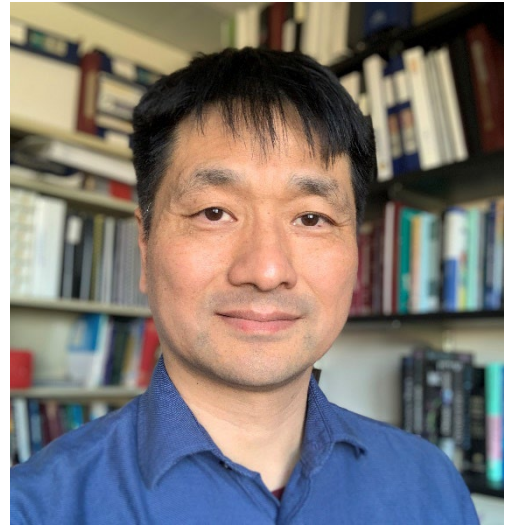
ASPET Travel Award

Awarded at the 2024 American Society for Pharmacology and Experimental Therapeutics (ASPET) Annual Meeting.



U of M Distinguished McKnight University Professors Award 2024

The Distinguished McKnight University Professorship program honors and rewards our most distinguished and high-achieving mid-career faculty members who have recently achieved full professor status—especially those who have made significant advances in their careers at the University of Minnesota, whose work and reputation are identified with the University, and whose accomplishments have brought great renown and prestige to Minnesota. Recipients hold the title “Distinguished McKnight University Professor” for as long as they remain employed at the University of Minnesota. scholarswalk.umn.edu/university-awards/mcknight-distinguished-professors



Changquan Calvin Sun

We are delighted that Professor Sun has been awarded the Distinguished McKnight University Professorship. Please join us in congratulating him!

The grant associated with the Professorship consists of \$120,000 over five years to be used. Recipients' names appear on a Scholars Walk monument (Section A, Location 15). A total of 12 awards were given by the University in 2024. Professor Sun received this award based on his applied fundamental research that advances the science and technology required to develop and manufacture high-quality tablet products to promote the health and well-being of society. He has established a novel and comprehensive theoretical basis, transforming the field into a vibrant and active research area of pharmaceutical materials science and engineering. In his research, Professor Sun seeks to develop scientific links among solid-state structure, properties of the solid, processing, and tablet performance. In this space, he has made numerous critical scientific discoveries. By introducing new characterization tools and applying integrated crystal and particle engineering techniques, he has solved several long-standing problems in tablet manufacturing. Professor Sun is known for his transformative and systematic work leading to the efficient design of high-quality and low-cost medicines. His work is highly cited by peers scientists (H-index = 67 as of September 6, 2024, according to Google Scholar). Professor Sun is a leading scientist and opinion leader in the field of physical pharmacy. He is also an active mentor for the next generation of pharmacists and pharmaceutical scientists. This has included mentorship for of undergraduate, PharmD, graduate students, postdocs, and visiting scholars.



Announcing the Drs. Kuchi S. Murthy & Swatantra Bharathi Murthy Fellowship

The fellowship will be used to support graduate students in Pharmaceutics. Dr. Kuchi Murthy, a distinguished alumnus of our program, has established the fellowship in honor of his late wife, Dr. Swatantra Bharathi Murthy.



After obtaining his BPharm and Mpharm degrees from India, Dr. Murthy came to the University of Minnesota. He obtained his MS and PhD degrees from our graduate program under the mentorship of Dr. Edward Rippie.

Dr. Murthy has a distinguished professional record and has worked in several pharmaceutical companies including Parke-Davis, Pfizer, Sanofi-Aventis, Forest Labs and Valeant. Dr. Murthy's expertise is in the design and development of solid oral dosage forms, regulatory submissions, and process

validation. He has designed and developed commercial (marketed) solid oral dosage forms including scale-up and technology transfer to manufacturing sites and process validation. He has extensive experience with the Chemistry Manufacturing and Control (CMC) sections of Regulatory submissions (IND's and NDAs), as well as supplements and annual reports on drug products to FDA. Dr. Murthy holds several patents, including one for the stabilization of quinapril (Accupril), a significant commercial success. While working in the industry, Dr. Murthy maintained his scholarly activities by serving as a senior author in numerous scientific publications. Dr. Murthy is also a licensed pharmacist in NY and NJ and has worked part-time in retail pharmacy. He retired from the pharmaceutical industry in June 2011.

The Department of Pharmaceutics is immensely grateful to the Murthy family for this endowment through which they will be perpetually supporting our graduate students.

Dr. Swatantra Bharathi Murthy, affectionately referred to as Bharathi, was a retired psychiatrist and completed her residency at Detroit Psychiatric Institute. She practiced in a variety of settings including private practice, staff member in Saint Clare Hospital and in community mental health clinics in New Jersey. Dr. Bharathi Murthy passed away last year. Pharmacy runs strongly in the Murthy family. Their daughter Anita is a PharmD graduate from Rutgers and their granddaughter Mira is in the first year of the PharmD program at Rutgers.

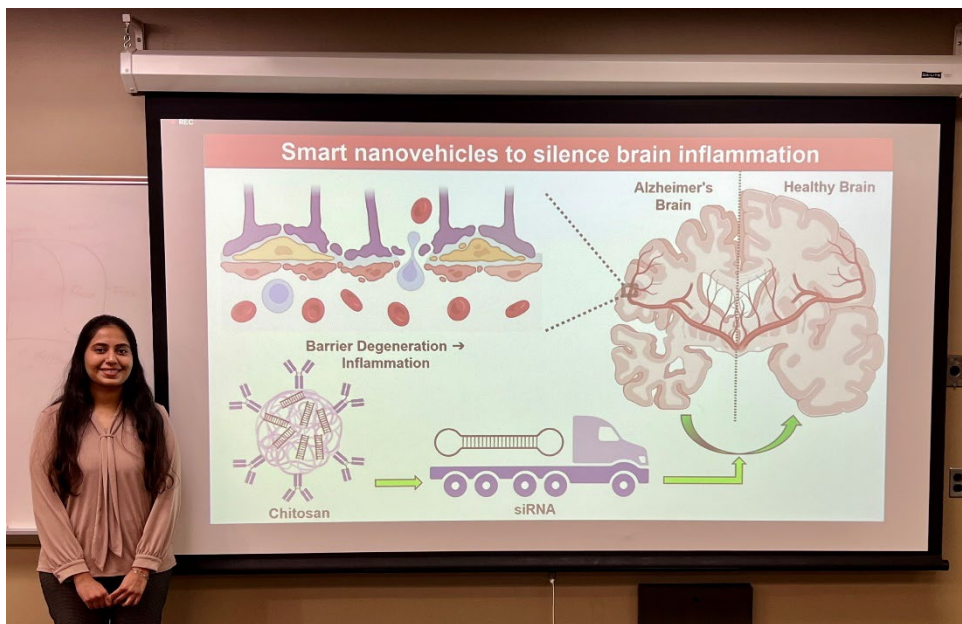


Internships & Competitions



Congratulations to Muskan Badola

(center) for winning the **Judges' Choice Award** at the 2024 College of Pharmacy 3-Minute Thesis Competition!



Muskan won a \$1,000 travel grant for her presentation titled, "Smart nanovehicles to silence brain inflammation".

Muskan will advance to represent the College of Pharmacy in the University of Minnesota competition on November 15, 2024.

CoP Master's and PhD students have three minutes to explain their research project concisely and effectively in language appropriate to a non-specialist audience. Contestants are allowed a single static PowerPoint slide.

The competition develops academic, presentation, and research communication skills and helps students learn to quickly explain their research to a non-specialist audience, leaving them wanting to know more.

For more details, please visit: grad.umn.edu/academic-career-support/three-minute-thesis



2024 Contestants:

Back row (L to R): Joe McPherson, Kostana Ligori, Noha Taher, Jigar Sethiya, Felix Ting, Yuhan Long, Tsung-Hua Shen. Front row (L to R): Vikram Joshi, Mary Raphael Daniel, Julia Lee, Muskan Badola, Xintian Lyu, Tuyet Lien Lam. Pictured with Dr. Karunya Kandimalla, Associate Dean of Graduate Education, College of Pharmacy.

Participants included students from the following departments:

- Medicinal Chemistry
- Experimental and Clinical Pharmacology
- Social and Administrative Pharmacy
- Pharmaceutics



2023 & 2024 Postdoc Appreciation Luncheon



*Thank you for
to all of our
postdocs, past
and present, for
all that you do
and the
contributions
you make!*

Faculty and staff from the College of Pharmacy gather annually for a luncheon to honor and celebrate postdoctoral associates and their important role in the College and University. This special tradition celebrates their invaluable contributions to the College's research mission.

In 2024, Dr. Aziz Ahmad (fifth from the left in the back row), a postdoctoral associate in Dr. Raj Suryanarayanan's lab, presented a talk titled, "Effect of formulation composition on the stability of trastuzumab against physical stresses".

In 2023, a fellow postdoctoral associate in Dr. Raj Suryanarayanan's lab, Dr. Bhushan Munjal, received the Third Place Travel Award for his short talk titled, "Interplay of formulation components in pharmaceutical systems and its implications".



Front Row, Left to Right: Qi Zhang, Zakia Belhadj, Prakashkumar Dobariya, Dariya Begum, Madhu, Thamina Akther, Subhankar Panda, Abdur Rahim, Girish Bisht, Muhammed Syafiq Bin Shahari, Pratip Kumar Dutta, Ricardo Rosas;
Back Row, Left to Right: Holly Korthas, Swetha Rao, **Gerrit Vreeman**, Robert Gruener, Qiang Liu, **Bhushan Munjal**, **Aziz Ahmad**, Kiran Bhilare, Gorakhnath Jachak, Sachin Sharma, Rayhan Biswas, Rahul Kardile, Ajit Jagtap, Samuel Offei, Jaehyeok Roh, Omar Al Yacoub, Benu George.



7th David Grant Symposium

Mark your calendars: June 18-20, 2025

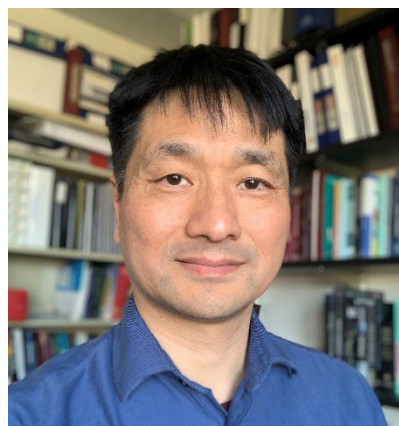


Curious about the upcoming meeting?

The David Grant Symposium covers a variety of topics including crystallization of pharmaceuticals, structure-properties of pharmaceuticals, amorphous pharmaceuticals and dissolution, and trends in solids development.

The symposium is held in honor of the late Dr. David Grant, a Professor and William and Mildred Peters Endowed Chair. Dr. Grant was globally recognized for his expertise and contributions in several areas, most notably in the field of pharmaceutical materials science. His research enabled pharmaceutical companies to make safe and effective drug products with reproducible and predictable performance.

“We are very proud that, in just a few short years, the David Grant Symposium has become the premier conference for solid-state pharmaceuticals,” said Professor Changquan Calvin Sun, the conference’s program chair.



Need an invite? Please contact:
sunx0053@umn.edu
612-624-3722



Farewell from Dean Welage



Dear alumni and friends,

"Change is the only constant." - Heraclitus

Perhaps the ancient Greek philosopher had the beginning of a new academic year in mind when he penned this thought. Change is always afoot, but especially so this time of year - a change in the seasons, a change in the faces we see on campus, a change from our busy summer schedules to a wholly different kind of busy in our classrooms, labs, and communities.

The start of this particular academic year also brings a transition of leadership for our community. While the decision to step down as Dean was incredibly difficult, I know our community is in the good and more than capable hands of Dr. Amy Pittenger, who will serve as Interim Dean for the next year while the Office of the Provost conducts a national search for a permanent Dean. You will hear more about that process as the search gets underway.

You've likely heard me say, at one event or another, that in my role as Dean I felt my responsibility was to make dreams come true. That work would not have been possible without the bold dreams of many in our community and the collaboration of many students, faculty, staff, alumni, donors, and partners along the way. Working with all of you to accomplish so many important things has brought me some of my greatest moments of joy. I hope to stay connected with you in my role as a faculty member, where I will do what I can to support and cheer for the continued growth and success of our top-ranked programs.

It has been an incredible honor to serve as the Dean of this esteemed institution for the past seven years. I hope you'll rise up to meet Dr. Pittenger with the support you have so graciously given me. Thank you so much for all you do to support our students and the mission of our medical laboratory science, occupational therapy, and pharmacy programs.

With tremendous gratitude,

Lynda S. Welage, PharmD, FCCP
Dean

The Pharmacy Record - Summer 2024

Please join us in congratulating former Dean Lynda Welage, who received the prestigious Harold R. Popp Award at the Minnesota Pharmacists Association Annual Meeting on Thursday, October 10, 2024.

Sponsored by the Minnesota Pharmacists Association, the Harold R. Popp Award was established by MPhA in 1969 in honor of the late Senator Harold R. Popp to recognize one pharmacist annually for outstanding services to the profession of pharmacy. This is the highest honor bestowed by the association.

Congratulations Dean Welage!

-Office of Professional & Clinical Affairs





You are cordially invited

Minnesota Alumni Reception

Monday, October 21, 2024
5:30 to 6:30 PM
Hyatt Regency Salt Lake City | Wasatch Room

Come join us! We'd love to see you there!

AAPS PharmSci 360
Salt Lake City, Utah | October 20-23, 2024
conference registration is not required to attend this reception

2024-2025 Graduate Student Representatives



Zheng Xue
Second Year
MS Student



Yiqin Li
Third Year
PhD Student



Pharmacy Graduate Student Association

Supporting graduate students from the College of Pharmacy



Mission: The Pharmacy Graduate Student Association (PGSA) represents and supports graduate students in the College of Pharmacy at the University of Minnesota. We foster professional development, mentorship, and community through networking, information sessions, and social events.

This program evolved from the Buddy Program, which was originally developed and lead by the Pharmaceutics Department, to be offered College-wide as the PGSA in 2024.

Leadership team:

Vrishali Salian- President (Pharmaceutics)

Ehfazul Haque- Treasurer (Medicinal Chemistry)

Muskan Badola- Program Coordinator (Pharmaceutics)

Amanda Hokanson- Administrative Support (Pharmaceutics)

Vineetha Guttha- Vice President (Pharmaceutics)

Vaishnavi Veerareddy- Secretary (Pharmaceutics)

Zheng Xue- Event Coordinator (Pharmaceutics)



From the Director of Graduate Studies

Dear UMN Pharmaceutics Community,

In what might look like a “shakeup,” Raj Suryanaryanan (Sury) and I have switched roles in the Department of Pharmaceutics. Sury is now Department Head and I am Director of Graduate Studies (DGS). The reason for the switch is that I have entered phased retirement with reduced commitment, and the DGS position involves less administrative work. That said, we should congratulate and thank Professor Sury for his outstanding work as DGS. I anticipate that he will also excel as Department Head!

This year one of our students, Zijian Wang (Calvin Sun, mentor), was awarded the prestigious Doctoral Dissertation Fellowship (DDF) provided by the Graduate School. Within the Department, we selected winners of the David and Marilyn Grant Fellowship, the Ronald J. Sawchuk Fellowship, and the Edward Rippie Fellowship for the 2024-2025 academic year. In addition, we inaugurated the Steven Wick Fellowship in honor of a distinguished alumnus (PhD, 1998) who, unfortunately, passed away in 2021. Presentation was made by Steve’s wife, Karen, and their long-time friend, Diann Boonstra. Finally, our Office Supervisor and Graduate Program Coordinator, Katie James, received an Above and Beyond award from the College of Pharmacy in recognition of her outstanding work in the program and Amanda Hokanson, Executive Office and Administrative Specialist, received special recognition from the Pharmaceutics Department for providing excellent service.

This year we recruited seven new PhD students, with four of those graduating from the master’s program and entering the doctoral program, and three new master’s students. We also conferred five PhDs and five master’s degrees. As always, we had a 100% placement of our doctoral graduates either in industry or as postdocs.

As Professor Sury wrote last year, we are in the midst of a change in the professional PharmD curriculum to a new model called “MNSpire”. This change has meant a small reduction in TA needs in the professional program, but fortunately the College of Pharmacy has kept its commitment to the departments, and we are able to use the remaining TA lines to aid in the teaching of our first year Modules courses. Also in the works is a Bachelor of Science in Pharmaceutical Sciences (BSPS) program, which we anticipate will provide work for TAs in the future.

Finally, a significant event this year was the unionization of all graduate students at UMN. Student stipends and working conditions going forward will be determined by negotiation between the University of Minnesota and the UMN Graduate Labor Union.

I look forward to meeting with those attending the Minnesota Alumni Reception at AAPS in October. Please keep in touch with us regarding your professional, personal, and family news.

Warm regards,

Ronald A Siegel, ScD, FAIMBE, FAAPS, FCRS
Professor of Pharmaceutics and Biomedical Engineering
Director of Graduate Studies, Pharmaceutics
University of Minnesota



Ronald A. Siegel



Welcome Ameya Kirtane

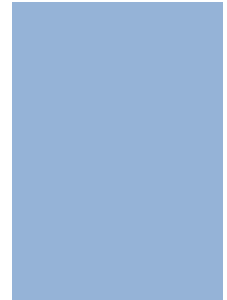
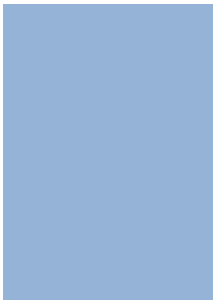
Celebrating our newest faculty member



The Department is delighted to welcome Ameya Kirtane to its faculty. As many of you know, Ameya joined the Pharmaceutics Department in 2010 to pursue his PhD under the mentorship of Professor Jayanth Panyam. During his PhD program, Ameya developed nanoparticles to target chemotherapies to solid tumors. Specifically, he showed that degrading fibrin, an extracellular matrix protein in tumors, improves the chemotherapeutic efficacy of nanoparticles. He received the Doctoral Dissertation Fellowship, which recognizes highly accomplished PhD students, and the AAPS Graduate Student Award. Ameya also won the Best Dissertation Award in Biological and Medical Sciences, an annual University-wide award reserved for only one recent PhD graduate.

After graduation, Ameya moved to Boston to conduct postdoctoral training with Professors Bob Langer and Gio Traverso at the Massachusetts Institute of Technology (MIT). At MIT, Ameya worked with the Bill and Melinda Gates Foundation to design technologies for the developing world. To tackle the challenge of poor patient adherence, Ameya designed an orally delivered sustained release system that is ingested as a capsule but unfolds upon reaching the stomach. The device is retained in the stomach for several weeks, where it releases the drug. In another project, Ameya designed pediatric drug delivery systems inspired by molecular gastronomy (the art of altering food texture to accentuate taste). His team converted food oils into gels that ranged in consistencies from protein drinks to yogurts. Both systems are in various phases of human testing. Many popular news outlets including The Guardian, The Boston Globe, and NPR have covered this work. The Boston Globe STAT Magazine named Ameya a STAT Wunderkind, an annual recognition given to only about 30 young scientists worldwide. Most recently, Ameya served as an Instructor at Brigham and Women's Hospital and Harvard Medical School.

At Minnesota, Ameya's lab aspires to convene scientists with different backgrounds to make fundamental discoveries and build drug delivery technologies. Specifically, his lab will study cell and tissue-based barriers to the uptake of nanomedicine, and design materials and devices to overcome these barriers. To achieve this goal, one arm of research will focus on high throughput assays to understand cell-nanoparticle interactions. A second thrust in his lab will be to design materials and technologies that overcome mucosal barriers to the uptake of nanoparticles. Ameya is looking forward to new collaborative opportunities and to establishing his connections with the extended UMN Pharmaceutics family. Please feel free to reach out to him at kirta001@umn.edu.



Milestones

Life updates from students, staff, and alumni

Aziz Ahmad, a Postdoctoral Associate in Dr. Raj Sury's lab, gave an oral presentation titled, "Effect of formulation composition on the stability of Trastuzumab against different physical stresses" during the 2024 Industrial Partnership for Research in Interfacial and Materials Engineering (IPRIME) annual meeting.

Muskan Badola, a graduate student in Dr. Karunya Kandimalla's lab, will present a poster titled, "Development of targeted nanovehicles to deliver biomolecules to cerebrovascular endothelium" at the American Association of Pharmaceutical Scientists (AAPS)/PharmSci 360 this October 2024 in Salt Lake City, Utah. She now also serves as the Program Coordinator of the Pharmacy Graduate Student Association, formerly the Buddy Program.

Joan Cheng, a graduate student in Dr. Karunya Kandimalla's lab, will present a poster titled, "Intracellular Trafficking of Cationic Bicelles and siRNA Cargo in an In Vitro BBB Model" at the American Association of Pharmaceutical Scientists (AAPS)/PharmSci 360 this October 2024 in Salt Lake City, Utah.

Alekha Dash, a 1990 PhD graduate from Dr. Raj Sury's lab, won the 2024 Creighton University Research Award. Alekha is currently a Professor, Department of Pharmacy Sciences, Associate Dean for Research, Gilbert F. Taffe, Jr. Endowed Chair at the Creighton University School of Pharmacy & Health Professions.

William H. Frey II, a former adjunct faculty member, currently works as a Senior Research Investigator in the Neuroscience Research Center at the HealthPartners Institute. He recently started IntrepiCyte, LLC to facilitate the development of noninvasive intranasal delivery of anti-inflammatory stem cells, immune cells, and genetically-engineered cells to the CNS to treat Alzheimer's, Parkinson's, Huntington's disease, stroke, neonatal cerebral ischemia, glioblastoma, and other disorders. The IntrepiCyte team is helping companies who have therapeutic cells deliver and target their cells to the brain. Clinical trials demonstrating safety have been published in recent years and Phase 2 trials are being developed. If you would like a summary or should this be of interest to you, please contact Dr. Frey or visit: www.intrepicyte.com.

William also recalls, with great fondness and gratitude, the work conducted with Professor Rahman and many graduate students and postdoctoral fellows from the UMN Department of Pharmaceutics related to the intranasal delivery of NGF, insulin, IGF-1, and other therapeutic peptides and molecules.

Marie Gaumet, a Postdoctoral Associate from Dr. Ronald Siegel's lab, is now the Managing Director of the Swiss Association of Pharmaceutical Professionals (SwAPP) and is currently completing her Executive MBA at the University of Lausanne, Switzerland.

Vineetha Guttha, a graduate student in Dr. Karunya Kandimalla's lab, presented a poster titled, "Effect of Vasculotropic Dutch amyloid beta 40 on blood brain barrier (BBB) endothelial trafficking and signaling" at the 2024 Pharmaceutics Graduate Student Research Meeting (PGSRM). She will also present the same poster at the 2024 American Association of Pharmaceutical Scientists (AAPS)/PharmSci 360 this October 2024 in Salt Lake City, Utah. Her 2023 AAPS presented poster was titled, "Transdermal permeability assay of LK467, a selective potent agonist of the melanocortin 1 receptor demonstrating the efficacy of topical application". She now also serves as the Vice President of the Pharmaceutics Graduate Student Association, formerly the Buddy Program.

Takehisa Hanawa, a 2006 Visiting Scientist in Dr. Ronald Siegel's lab group, currently works as a Professor at the Tokyo University of Science. His wife, Tomoko, is a Professor at the Kyorin University School of Medicine. Dr. Jee Eun Lee, who was a member of Dr. Siegel's lab at the same time as Takehisa, visited the couple in Tokyo at the end of March; the first visit in nearly twenty years! The group had a very enriching reunion.

Amanda Hokanson, Executive Office & Administrative Specialist for Pharmaceutics, was recognized for her efforts in creating and leading student engagement events with a surprise award for Excellence in Service, given to her at the first seminar session of Fall 2024. As always, she continues to have fun taking students kayaking on the St. Croix River, to watch the aerobatic pilots at the Osceola Wheels & Wings, for some scary fun times at the Halloween attraction "Dead End Hayride"! She also designed the newsletter this year "Where's Waldo?" style and challenges you to be the first to email her with how many times she appears in it. Otherwise, please reach out if you like this issue or want to include something new in the next one. Finally, she hopes to see you at the next David Grant Symposium, CIMSEPP meeting, and/or CPPR meeting.



Milestones

Life updates from students, staff, and alumni

Katie M. James, Office Supervisor and Graduate Program Coordinator for Pharmaceutics, continues to serve on the College of Pharmacy's Committee for Diversity, Equity, Inclusion, and Accessibility representing the College's graduate programs. In July 2024, Katie completed the Office for Equity and Diversity's Equity Certificate Hosted Online (ECHO) certificate program and updated training in order to continue to serve as a Mental Health Advocate. In August 2024, she received the College of Pharmacy Above & Beyond award. Katie will be attending the Minnesota Alumni Reception on Monday, October 21, 2024 at the AAPS PharmSci 360 Annual Meeting in Salt Lake City for the first time and is looking forward to seeing past and current students, faculty, and staff there! You can also find a photo of Katie at the Minnesota Renaissance Festival during the Highland Fling themed weekend, wearing her maternal grandfather's Clan MacRae tartan sash and Balmoral bonnet with the clan crest in the Pceuts at Play section ([see page 27](#)).

Mak Jawadekar, a 1982 PhD graduate from Dr. Ed Rippie's lab, was recently honored as the Senior Advisor to the Saudi Royal Private Office by the Saudi Prince in Dubai, United Arab Emirates in January 2024.

Janice Kearns (Laramy), a 2018 graduate from Dr. William Elmquist's lab, is currently working as a Clinical Pharmacologist at Sanofi in Massachusetts. She recently married and has changed her last name.

Raj Khankari, a 1993 PhD graduate from Dr. David Grant's lab, gave remarks as the Alumni Honored Guest at the College of Pharmacy's 2024 MS/PhD Celebration.

Viddhi Khanna, a 2016 MS and 2019 PhD graduate from Dr. Jayanth Panyam's lab, moved with her family to Vancouver late last year and joined a company called Zymeworks as a Scientist, In Vivo Biology, ADC Technologies.

Sibo Liu, a 2019 MS graduate from Dr. Changquan Calvin Sun's lab, is currently completing a PhD in Health Economics / Health Service Research at Duke-NUS Medical School in Singapore. He says the weather is hot so he misses Minnesota and hopes there will be an opportunity to visit again soon.

Jee Eun Lee, a 2008 PhD graduate from Dr. Ronald Siegel's lab group, completed her industry career in Korea, returned to the US, and is currently a consultant at Aretevollo. She stopped by Tokyo in March to visit prior lab alumnus Takehisa Hanawa, surprising him with a visit after nearly twenty years apart!

Manish Mishra, a former Postdoctoral Research Associate in Dr. Changquan Calvin Sun's lab, recently secured a Scientist position in the Division of Physical and Materials Chemistry at CSIR-National Chemical Laboratory, Government of India, starting in November 2023. His research interests include crystal engineering, mechanical behavior, ionic liquids, and carbon capture. You can learn more about his research group by visiting academic.ncl.res.in/mk.mishra/dr.-mkm

Bhushan Munjal, a Postdoctoral Research Associate in Dr. Raj Suryanarayanan's lab, was first author on a number of papers including: 1. Munjal B, DeBoyace K, Cao F, Krzyzaniak JF, Arora KK, Suryanarayanan R. Excipient-Induced Lattice Disorder in Active Pharmaceutical Ingredient: Implications on Drug Product Continuous Manufacturing. *Molecular Pharmaceutics*. 2024, 21, 10, 5150–5158. 2. Li J, Munjal B, Zeng C, Suryanarayanan R. Dual Functionality of Poloxamer 188 in Freeze-Dried Protein Formulations: A Stabilizer in Frozen Solutions and a Bulking Agent in Lyophiles. *Molecular pharmaceutics*. 2024 Mar 29; 21(5):2555-64.

Doug Nelson, a graduate student in Dr. Karunya Kandimalla's lab, published a paper in March 2024 in the *Journal of Alzheimer's Disease* supplemental issue "Omics Approaches in Alzheimer's Disease Research" titled, "Pericyte Control of Gene Expression in the Blood-Brain Barrier Endothelium: Implications for Alzheimer's Disease." His presentation at conferences this year are: *"Influence of Gut Microbiota on Intestinal Drug Transporters, Enzymes and other Endogenous Factors Affecting Oral Drug Bioavailability" at the Globalization of Pharmaceutics Education Network (GPEN) in Copenhagen, Denmark, July 2024 *"Gut Microbiota Influence on Oral Bioavailability: Implications for Precision Medicine" rapidfire at the 2024 American Association of Pharmaceutical Scientists (AAPS) upcoming meeting on October 22 in Salt Lake City, Utah.



Milestones

Life updates from students, staff, and alumni

Oanh Nguyen, a Researcher in and Lab Manager for Dr. Carolyn Fairbanks' lab, took an exciting trip with her whole family this year and wanted to share the highlights: (1) Kayaking in Lake Superior among the caves at Apostle Islands. (2) Glass bottom boat shipwreck tour of Lake Superior. (3) Viewing Niagara Falls from the Canadian side. (4) Swimming in the Atlantic Ocean from the coast of Rhode Island. (5) Hiking along the "Cliff Walk" of Newport in Rhode Island. (6) Visiting the Battleground of Gettysburg in Pennsylvania. (7) Touring the National US Air Force Museum

Sneha Rathi, a 2023 PhD graduate from Dr. William Elmquist's lab, was selected as a Highlighted Trainee Author for August 2024 by the Journal of Pharmacology and Experimental Therapeutics (JPET). Sneha currently works as a Senior Clinical Pharmacologist at AbbVie in the Bay Area of San Francisco, California. Despite California's bountiful sunshine, Sneha says she misses her Minnesota family and hopes to meet many of you again soon! Upon her graduation, she also celebrated with a solo trip to Thailand in December.

Vrishali Salian, a graduate student in Dr. Karunya Kandimalla's lab, interned with Johnson and Johnson Innovative Medicine in the Clinical Pharmacology and Pharmacometrics department with Dr. Weirong Wang's group and was mentored by Dr. Vivaswath Ayyar. The internship period was from May 2023- December 2023. She has also taken on the role of President of the Pharmacy Graduate Student Association (PGSA), formerly the Buddy Program.

She will also be presenting several posters at various conferences this year, as per the details below.

1. "Regulation of VCAM-1 Expression by the Gut Microbial Metabolite Butyrate: Insights into Molecular Mechanisms" at the American Association of Pharmaceutical Scientists (AAPS)/PharmSci 360 this October 2024 in Salt Lake City, Utah.
2. "Interplay Between Amyloid-Beta Pathology and Cerebrovascular Inflammation in Alzheimer's Disease" rapid-fire talk at the American Association of Pharmaceutical Scientists (AAPS)/PharmSci 360 this October 2024 in Salt Lake City, Utah.
3. "Generating data-driven insights from the Alzheimer's Disease Neuroimaging Initiative (ADNI): Towards establishing a QSP model of Alzheimer's disease" at American Conference on Pharmacometrics (ACOP) in Phoenix Arizona, which exhibits part of her Johnson & Johnson internship research.

Vaishnavi Veerareddy, a graduate student in Dr. Karunya Kandimalla's lab, will present a poster titled, "Amyloid Beta Peptides Inhibit Insulin Trafficking at the Blood-Brain-Barrier in Alzheimer's disease Brain" at the American Association of Pharmaceutical Scientists (AAPS)/PharmSci 360 this October 2024 in Salt Lake City, Utah. She now also serves as the Secretary of the Pharmacy Graduate Student Association, formerly the Buddy Program.

Lushan Wang, a 2024 PhD graduate from Dr. Karunya Kandimalla's lab, is currently working as a Postdoctoral Fellow at Johnson & Johnson Innovative Medicine.

Zengtao Wang, a 2024 PhD graduate from Dr. Karunya Kandimalla's lab, joined Eli Lilly and Company as an Advisor-Pharmacometrician after he graduated this past May.

Tongzhen Xie, a 2024 PhD graduate from Dr. Carolyn Fairbanks' lab, gave oral presentations at Research Day 2024 (Minneapolis, MN), ASPET Daily Datablitz (Arlington, VA), and UMN Pain Day (Minneapolis, MN).

Yuanyuan Xie, a 2008 PhD graduate from Dr. Timothy Wiedmann's lab, joined Fosum Pharma, one of the top 10 big pharma companies in China, as their Executive General Manager of International Regulatory Affairs in the Established Medicines Manufacturing & Supply Division earlier this year.

Zheng Xue, a graduate in Dr. Karunya Kandimalla's lab, presented a poster titled, "A PBPK Model for Amyloid-Beta Antibody and Peptide Target Engagement" at the 2024 Pharmaceutics Graduate Student Research Meeting. He will also present a poster titled, "Disruptions in Glucose and Amyloid-Beta Transport in Mouse Models Manifesting Metabolic Syndrome" at the American Association of Pharmaceutical Scientists (AAPS)/PharmSci 360 this October 2024 in Salt Lake City, Utah. Zheng is also currently serving as an Event Organizer for the Buddy Program/Pharmacy Graduate Student Association (PGSA) and was elected as the 2024-2025 Pharmaceutics Student Representative.

Chaowang Zeng, a 2024 MS graduate student from Dr. Raj Sury's lab, joined the Department of Pharmaceutical Sciences at the University of Maryland, Baltimore (UMB) to pursue his PhD degree. Prior to his August graduation, Chaowang attended the International Society of Lyophilization – Freeze Drying (ISLFD) Midwest Chapter Conference and presented a poster on his thesis project titled, "Effect of processing and cosolutes on mannitol phase behavior in frozen solutions". He was later nominated by the National Institution for Pharmaceutical Technology and Education (NIPTe) as a 2023 NIPTe Rigaku Research Scholar for that same research. He also completed a three-month internship in the Pharmaceutical Research & Development (PhRD) department at Pfizer in Andover. His projects involved freeze-drying (lyophilization) of partially crystalline protein formulations and focused on addressing the gap in the use of mannitol.



Travel Time

Pharmaceutics members exploring the world



Mak Jawadekar with the Prince of Saudi Arabia (L) and his PA, Rashid Khan (R). Mak was named Senior Advisor to Prince Mohammed bin Salman Al Saud.



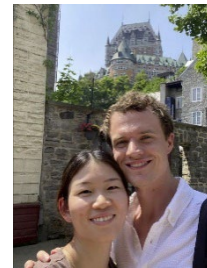
Takehisa Hanawa, Jee Eun Lee, Tomoko Hanawa at 20 year surprise visit at Tokyo 2024.



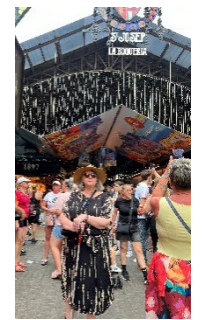
Sneha Rathi in Thailand.



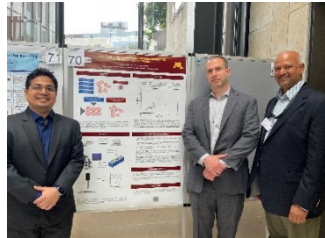
Dr. Raj Khankari (1993 alum) with Raj Sury & Ron Siegel at the University of Minnesota Twin Cities campus.



Tongzhen Xie in Kawasaki, Japan and Quebec City, Canada.



(L to R): Tianyi Xiang, Vaishnavi Veerareddy, Vineetha Guttha, Zheng Xue, and Zijian Wang at the 2024 Pharmaceutics Graduate Student Research Meeting (PGSRM) in Iowa.



Vikram Joshi, Doug Nelson, and Dr. Karunya Kandimalla at GPEN in Copenhagen, Denmark.



Cheryl Zimmerman touring Spain.



Doug Nelson, Dr. William Elmquist, and Vikram Joshi at GPEN 2024 in Copenhagen, Denmark.



(L) to (R): Charlie (17), Oanh Nguyen, Jack (13), Morgan (15), Peter, Vincent (17). Herbster, Wisconsin on Lake Superior's southern shore.



Dr. Karunya Kandimalla at the CRCNS annual PI meeting in New York.



Celebrations

Birthdays & Babies



Sichen Song, Wenjuan Zhang, and Zhi-Ang Song (Yuanyuan)



Xian Wu and Qifan (Tong Tong)



Gautham Gampa & Elmquist



Juhee Oh, Lina Le, Elmquist, Wenjuan Zhang, Ruisi Leng, and Jann Sakaria



Yu Si, Wenjuan Zhang, Zhi Ang, Sichen Song



Vamika Munjal born August 2024



Jessica Griffith, Elmquist & Surabhi Talele



Friends, family, students, and mentees traveled to Minnesota to celebrate Dr. William Elmquist's 70th birthday on the University of Minnesota campus. "Wherever you may wander, there's no place like home."



Pharmaceutics Annual Picnic

Good food, great company!



Community Outreach

Celebrating student investment in our communities



Vrishali Salian, a PhD student in Dr. Karunya Kandimalla’s lab, has served as the Secretary at the Chateau Student Housing Co-Op in Dinkytown (Minneapolis, MN) and as a member of the co-op’s Finance and Operations Committee since 2019. In her role, she wrote a grant to secure funding through the University of Minnesota’s “Good Neighbor Fund”. This grant, in collaboration with the Marcy Holmes Neighborhood Association, allowed the Chateau co-op to commission a five-story mural on the side of its building (photos below). Vrishali was involved in every step of the process, from writing the grant and selecting the artist to finalizing the design and organizing community paint events where the Dinkytown community could participate. The mural was officially unveiled on August 27, 2024 at a celebration that invited the entire Dinkytown area, and it was even featured in the Minnesota Daily! Explore the article: <https://mndaily.com/285070/arts-entertainment/a-new-mural-graces-side-of-dinkytowns-tallest-building/>

“The mural is part of an ongoing effort to revitalize the space between the Chateau and the neighboring Fourth Street Co-op, said Gunnar Carlson, the community engagement manager of Riverton, the company that oversees both properties. The mural, designed and painted by muralist Jacqui Rosenbush in collaboration with the board of the Chateau, is based on the results of a community survey conducted by Chateau board members.”



“A University alumna herself, Jacqui Rosenbush said she was inspired by the ‘seasonality’ of students coming and going from the area as they progress through their collegiate careers. In contrast to the lively trees painted in the mural’s background, the branches the birds are perched atop of are barren to represent Minnesota’s winters.”



Pceuts at Play



Support Center

Keeping our department strong



Hello friends! We hope that you've enjoyed our newsletter and its glimpse into our Department's culture and performance. If you'd like to help support our students so that they and their research can thrive, please consider contributing to one of our fellowships. For donation options or further information, please contact our Chief Development Officer: Amy Polski Larson (polsk042@umn.edu | 612-626-8975). Existing fellowships include:

Smita and Aleka Dash

Pharmaceutics Alumni Fellowship

This fellowship is awarded to a graduate student studying towards a degree in Pharmaceutics.

William F. Elmquist Fellowship

This fellowship is awarded to a graduate student whose research is focused in Biopharmaceutics.

David J.W. Grant & Marilyn J. Grant Fellowship in Physical Pharmacy

This fellowship is awarded to students whose research is focused in Physical Pharmacy.

Edward G. Rippie Fellowship

This fellowship is awarded to students with a consistent and outstanding academic record in Pharmaceutics.

Ronald Sawchuk Fellowship

This fellowship is awarded to a graduate student whose research is focused in Pharmacokinetics.

Ronald A. Siegel Fellowship

This fellowship is awarded to a graduate student who is studying toward a degree in Pharmaceutics.

Raj Suryanarayanan

Fellowship in Pharmaceutics

This fellowship is awarded to a graduate student who is in good academic standing with exceptional potential in their field.

Steven M. Wick Fellowship

This fellowship is awarded to a graduate student studying toward a PhD in Pharmaceutics.

Rory P. Rimmel &

Cheryl L. Zimmerman Fellowship

This fellowship is awarded to students that have chosen a thesis advisor whose research encompasses Drug Metabolism or Pharmacokinetics.

Learn more at z.umn.edu/cop-pceuts-fellowships

Doug Nelson receiving the inaugural Steven M. Wick Fellowship in Pharmaceutics from donors Karen Wick and Diann Boonstra. Pictured with Ronald Siegel, Director of Graduate Studies in Pharmaceutics.



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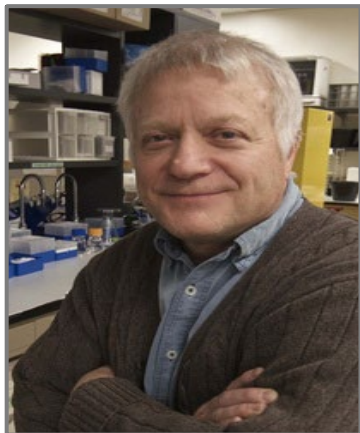
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Faculty Newsroom



Professor William Elmquist

Dr. Elmquist's group is busy working on novel therapies to treat brain tumors- both primary, such as glioblastoma, and metastatic, for instance from lung and skin cancers, in the brain. He maintains a robust collaboration with the Mayo Clinic. The work is funded by the NIH and, recently, the National Brain Tumor Society. Dr. Elmquist is proud of his group and the work they do to fight these terrible diseases.



Professor Carolyn Fairbanks

Dr. Fairbanks continues to serve as the Associate Dean for Research for the College of Pharmacy. She served as the elected Chair of the Council of Research Associate Deans for the University of Minnesota through last year. She also served as Associate Dean for Graduate Education through June of 2023. In 2023, Dr. Fairbanks served as elected Chair of the Division of Neuropharmacology for the American Society of Pharmacology and Experimental Therapeutics (ASPET). She also joined the Associate Editorship of the Journal of Pharmacology and Experimental Therapeutics (JPET) and is a regular member of the Neurosensory of Pain and Itch (NPI) study section for NIH. Dr. Fairbanks' team remains laser-focused on the

development of non-opioid agents that serve as analgesics independently of, and as co-adjuvants to, opioids to reduce both opioid dose requirements and addiction. They are currently supported by Department of Defense to develop agmatine-based therapeutics for the treatment of chronic pain. Their partners in this endeavor include the Institute of Therapeutics Discovery and Development and Robert Schumacher and the Center for Translational Medicine.

Invited Presentations

1. *Accelerating Pharmacology Research and Education Through Synergism*. **Department of Pharmacology, Indiana University, Indianapolis** (January 25, 2023).
2. *Gene Therapeutic Targets Elucidate Analgesic Mechanisms*. **Kaua'i Pain Conference** (March 2, 2023).
3. *Spinal Analgesic Combinations: Mechanistic Studies*. **Kaua'i Pain Conference** (March 3, 2023).
4. *Alleviating Pain and Eliminating Addiction*. **Best of the BioMidWest Conference, Chicago Illinois** (May 9, 2023).
5. *Novel Analgesic and Anti-Addiction Therapeutics*. **Department of Pharmaceutical Sciences, University of Michigan** (December 4, 2023).





Professor Karunya Kandimalla

The Kandimalla Lab is advancing research into the complexities of the blood-brain barrier (BBB) and its role in Alzheimer's disease (AD). In collaboration with researchers from the Mayo Clinic and the University of Minnesota, the lab focuses on identifying pathological mechanisms disrupting insulin trafficking and signaling at the BBB, both critical factors contributing to cognitive decline in AD and type-2 diabetes. Their collaborative efforts include cutting-edge 'omics' approaches to uncover the pathophysiology of cerebrovascular dysfunction and the use of induced pluripotent stem cell-derived in vitro models to investigate cellular interactions within the neurovascular unit. Additionally, the lab is pioneering cationic lipid bicelles for targeted siRNA delivery to BBB endothelial cells, aiming to regulate inflammatory pathways

involved in neurodegeneration and exploring the gut-brain axis in collaboration with microbiome experts, investigating how gut microbiota influence cerebrovascular dysfunction and neuropathological changes in the AD brain. The Kandimalla Lab has been awarded a Collaborative Research in Computational Neuroscience (CRCNS) program grant for their project titled "Deep Learning to Discover Neurovascular Disruptions in Alzheimer's Disease." In collaboration with the Mayo Clinic, New York University, and the University of Navarra, Spain, this grant supports the development of advanced deep-learning techniques to identify and resolve pathological changes in neurovascular unit that contribute to cognitive decline in Alzheimer's disease. Established by the NIH, NSF, and other international agencies, this grant program fosters interdisciplinary research that integrates neuroscience with data science, artificial intelligence, and mathematics to drive innovative discoveries.

Invited talks: Keynote speaker, "Deciphering Cerebrovascular Contributions to Alzheimer's Disease: A Systems Pharmacology Approach", 16th Annual BICB Research Symposium. Jan 11, 2024.

"Systems Pharmacology Approaches to Investigate Neurovascular Unit Integrity and Function". National Institute of Pharmaceutical Education and Research, Hyderabad, TN, India. March 12, 2004

"Signaling and Trafficking Disruptions at the Blood-Brain Barrier in Alzheimer's Disease and Metabolic Syndrome". NIA/NIH Workshop: Blood-Brain Barrier Transport in Aging and Alzheimer's Disease, April 24-25 2024.



Professor Ameya Kirtane

The Kirtane Lab seeks to identify cell- and tissue-based barriers to the uptake of nanomedicine, and design technologies to overcome these barriers. To achieve this goal, one arm of their research will design and execute high throughput assays to understand cell-nanoparticle interactions in vitro. Another arm of their research will evaluate the uptake of nanoparticles at mucosal interfaces in vivo, and design materials and technologies to overcome these barriers.

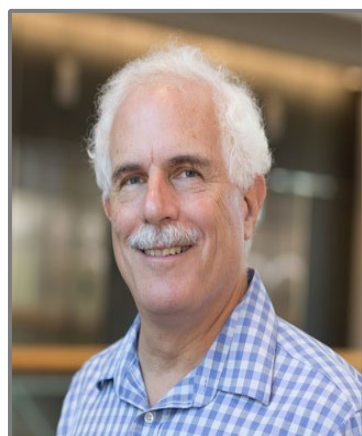
Professor Kirtane is also excited to welcome his first Researcher 5, Dr. Nilesh Ambhore, to the lab this November.





Professor Hongbo Pang

The Pang Lab experienced some personnel changes this year: Dr. Xiangxiang Hu (postdoc), Mitch Kowalke and Nianwu Wang (PhD students) joined the group in August 2023. Academic activities: Dr. Pang attended and presented at the Controlled Release Society Annual Meeting (2023, Las Vegas), AACR Annual Meeting (2024, San Diego), CSHL Asia Meeting-Chemical Biology (2024, Suzhou, China), and Chinese Peptide International Symposium (2024, Hong Kong). Dr. Pang was also invited to present scientific talks at multiple Universities and research institutes, including Zhejiang University, Chinese University of Hong Kong, National Center of Nanoscience and Technology, Peking University Medical Center, Wuhan University, Huazhong University of Science and Technology, and Chinese Academy of Sciences.

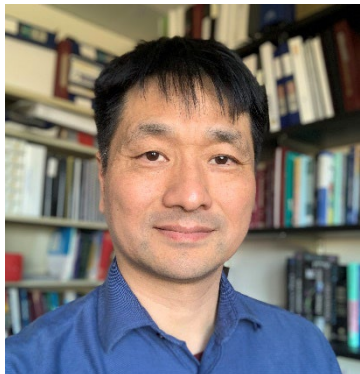


Professor Ronald A. Siegel

Dr. Siegel has initiated phased retirement, and will work part-time for three years prior to full retirement. He has stepped down as Department Head but has taken on the responsibility of Director of Graduate Studies.

Dr. Siegel presented a seminar at the University of Toronto titled "Adventures in Supersaturation" in April 2024. Also in April, Dr. Siegel and Pharmaceutics PhD alumnus Robert Schultz (Solliervo, Inc.) presented an Industrial Grand Rounds in the Biomedical Engineering department, covering their work using benzodiazepine prodrugs and converting enzymes to prevent or stop seizure emergencies and to sedate patients in the Emergency Department of hospitals.





Professor Changquan Calvin Sun

Research Summary

The Sun lab's research focuses on manufacturing science of solid dosage forms, such as tablets and capsules. Formulation and process development is achieved by a clear scientific understanding of powders, including their flow and compaction properties. In this way, design replaces trial and error, and improved quality results.

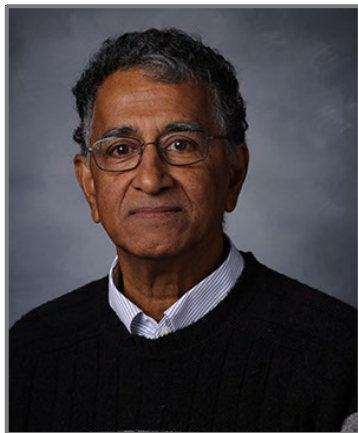
We rely on three levels of control to attain the desired powder properties for successful manufacturing: (1) study and specification of the physico-mechanical properties of drugs; (2) incorporation of appropriate excipients for optimum

mechanical properties; and (3) optimization of processes such as mixing, granulation, and compaction, based on a mechanistic understanding.

Invited Presentations

1. August 20, **2024**, Flexible pharmaceutical crystals – behaviors and structural insights, Lattice Dynamics: Characterization & Applications, Fall 2024 ACS National Meeting, Denver, Colorado
2. July 1, **2024**, Frontiers in Powder Tabletability Research, National Industrial Pharmacy Conference, Shenyang, China
3. June 18, **2024**, Recent Breakthroughs in Powder Tabletability Research, Huazhong University of Science and Technology, Wuhan, Hubei, China
4. June 18, **2024**, Recent Breakthroughs in Powder Tabletability Research, Hubei University of Chinese Medicines, Wuhan, Hubei, China
5. March 6, **2024**, Advanced topics in Pharmaceutical Materials Science and Engineering, Biogen, Boston, MA (virtual)
6. March 5, **2024**, Cocrystallization – A versatile tool for improving pharmaceutical properties of drugs, University of Texas at Austin, TX (virtual)
7. February 29, 2024, Punch sticking in tablet manufacturing: characterization, mechanism, and engineering solutions, PHAD Academy, Novartis, (virtual)
8. February 22, **2024**, Trends in Pharmaceutical Materials Science and Engineering Research, Eli Lilly, IN
9. February 22, **2024**, A Platform to enable direct compression continuous manufacturing of peptides and large molecules, Eli Lilly, IN
10. December 21, **2023**, Plasticity of Pharmaceutical Solids Quantified by Nanoindentation – Implication on Tabletability, 7th International Indentation Workshop (IIW7), University of Hyderabad, India
11. December 17, **2023**, Mechanical Properties Of Amorphous Solids Investigated By Nanoindentation, 3rd Conference on Nanomechanics for Pharmaceutical Applications (NPA), Lemon Tree, Gachibowli, Hyderabad, India
12. November 28, **2023**, API Coprocessing – Benefits and Strategies, Pfizer Global Crystallization meeting, Pfizer (virtual)
13. October 31, **2023**, Punch Sticking – Mechanism, Kinetics, and Mitigation through Crystal and Particle Engineering, Pharmaceutical Sciences and Experimental Therapeutics, College of Pharmacy, University of Iowa





Professor Raj Suryanarayanan

The Sury lab's work in the area of pharmaceutical material science continues with emphasis in the following areas: (i) role of excipients in continuous manufacturing of drug products, (ii) using time-temperature-transformation to understand drug crystallization in amorphous solid dispersions and (iii) using solid state NMR to probe state and phase transition in frozen systems. Our work in the area of protein pharmaceutical has focused on: (i) identifying multifunctional excipients for use in freeze-dried pharmaceuticals, (ii) challenges associated with the characterization of biosimilars and (iii) identifying excipients to be used for the frozen storage of proteins.

Dr. Sury presented the plenary Lecture at the International Society of Lyophilization – Freeze Drying, Midwest Chapter Annual Meeting, Northlake, IL, April, 2024.

He gave invited presentations at:

- Freeze-Drying of Pharmaceuticals and Biologicals Conference in Breckenridge (CO).
- 15th International Symposium on the Properties of Water, Purdue University, West Lafayette, IN.
- Workshop entitled, "Advances in Drug Delivery Technologies for Bioavailability Enhancement", Ascendia Pharma, NJ.
- Inaugural Michael Pikal Symposium, University of Connecticut, Storrs, CT.
- *12th Conference on Broadband Dielectric Spectroscopy and its Applications* was held in Lisbon, Portugal.
- College of Pharmacy at the Dongguk University, South Korea
- GlaxoSmithKline



Recent Publications

Publications: Dr. William Elmquist

Rathi S, Mladek AC, Oh JH, Dragojevic S, Burgenske DM, Zhang W, Talele S, Zhang W, Bakken KK, Carlson BL, Connors MA, He L, Hu Z, Sarkaria JN, Elmquist WF. **Factors influencing the Central Nervous System (CNS) distribution of the ATR inhibitor elimusertib (BAY1895344): Implications for the treatment of CNS Tumors.** *J Pharmacol Exp Ther.* 2024 Sep 16;JPET-AR-2023-002002. doi: 10.1124/jpet.123.002002. Epub ahead of print. PMID: 39284626.

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