



MINNECEUTICS

Indispensable News.

University of Minnesota Department of Pharmaceutics

Awards & Achievements

p. 12-13

Highlighting student and faculty
success in 2023-2024.

Internships & Competitions

p. 15

A glimpse into our students'
interactions with industry.

Milestones: Life Updates

p. 22-23

News from our current members
and alumni.

2023 Issue

Table of Contents

Click on any title to jump to the desired section.

Click on the home icon to return to Table of Contents.

<u>Greetings from the Department Head</u>	3
<u>Meet Our Faculty</u>	4
<u>Graduation Announcements</u>	5
<u>Commencement 2023</u>	6
<u>Welcome New Students</u>	7
<u>GPEN in Review</u>	8-9
<u>2023-2024 Fellowships & Grants</u>	10-11
<u>Awards & Achievements</u>	12-13
<u>U of M Outstanding Achievement Award</u>	14
<u>Internships & Competitions</u>	15
<u>Meetings & Conferences</u>	16
<u>Letter from the Director of Graduate Studies</u>	17
<u>Graduate Student Organization: Elected Members</u>	18
<u>Pharmaceutics Graduation Luncheon</u>	19-20
<u>Minneceutics Marriages & Minis</u>	21
<u>Milestones: Life updates from students, staff, and alumni</u>	22-23
<u>Pceuts at Play</u>	24
<u>Support Center</u>	25
<u>Faculty Newsroom: Faculty Profiles</u>	26-31
<u>Recent Publications</u>	31-35

A Message to Our Friends

Dear Friends,

We apologize for the delayed appearance of this year's newsletter.

Much has happened this past year. Professor Tim Wiedmann retired after 35 years of distinguished service to the Department of Pharmaceutics, the College of Pharmacy, and the University. Many of you will remember Tim for his years as Director of Graduate Studies. That role has been taken over by Professor Raj Suryanarayanan (Sury). Meanwhile, Professor Carolyn Fairbanks remains Associate Dean for Research and Professor Karunya Kandimalla is now Associate Dean for Graduate Studies for the College of Pharmacy.

In October 2022, we hosted the Graduate Pharmaceutics Education Network (GPEN) conference. This conference was delayed two years due to the COVID-19 pandemic. This international conference was run by our faculty, graduate students and staff. Kudos to all involved! Also, the 6th David Grant Symposium was held at the U of M, in June 2023, the first live conference since the COVID-19 pandemic.

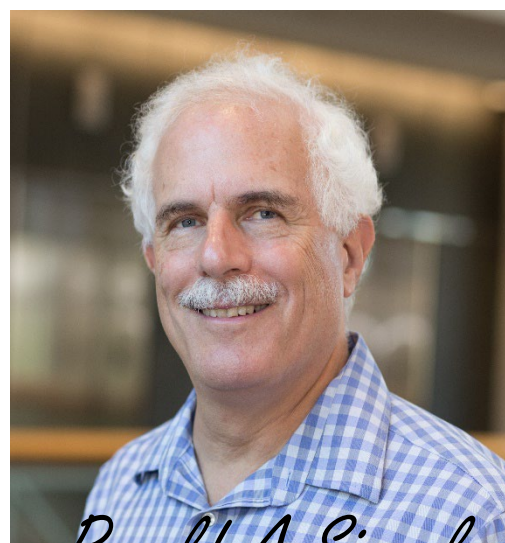
In August 2023, we celebrated alumnus Makarand (Mak) Jawadekar, who received the U of M Outstanding Achievement Award. Congratulations, Mak! To read more about the honor, see page 14.

The second ever College of Pharmacy Postdoctoral Appreciation Luncheon was held in September 2023, at which one of our own postdocs, Dr. Bhushan Munjal, gave a short talk titled, "Interplay of formulation components in pharmaceutical systems and its implications."

Doug Nelson, a graduate student in the Kandimalla lab, won the 2023 Three-Minute Thesis competition within the College of Pharmacy, taking home both the People's Choice Award and the Judge's Choice Award along with a \$1k travel grant. His presentation was titled, "Ironing out the causes of memory loss in Alzheimer's brain". To read more about the competition, see page 15.

We continue to invest in our spaces and technologies. Both of our conference rooms are now Zoom-room enabled to help fully transition our meeting spaces to wireless formats. We also transitioned to card access only for all of our lab spaces in the interest of enhanced safety. Finally, we renovated several of our lab spaces to better accommodate the growing needs of Dr. Kandimalla's lab group and to welcome Dr. Fairbanks' lab group back to Weaver-Densford Hall.

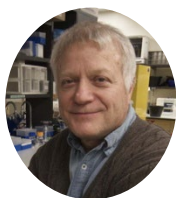
In closing, I invite you to explore our new support section on page 25, designed with outreach in mind. It provides resources for you to share updates about your professional journey, network with other alumni, and/or donate to support our students.



Ronald A. Siegel
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



Hongbo Pang, PhD

Assistant Professor,
Pharmaceutics



Ronald A. Siegel, ScD

Professor and Department Head,
Pharmaceutics



Changquan Calvin Sun, PhD

Professor and Associate
Department Head, Pharmaceutics



Raj Suryanarayanan, PhD

Professor, Peters Endowed Chair,
and Director of Graduate Studies,
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 Shalae, PhD, AbbVie

Rachael Sirianni, PhD, MS, MSE, University of
Texas Health Science Center at Houston

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



Degrees Earned in 2022-2023



Congratulations
to all our graduates



Rahul Lalge, PhD

Advisor: Professor Raj Suryanarayanan
Thesis: *Understanding Role of Excipients on the Physical Stability of Amorphous Pharmaceuticals through Time-Temperature Transformation*



Sneha Rathi, PhD

Advisor: Professor William Elmquist
Thesis: *Systemic and CNS Distributional Pharmacokinetics of Novel DNA Damage Response Inhibitors: Implications for the Treatment of Brain Tumors*



Gerrit Vreeman, PhD

Advisor: Professor Calvin Sun
Thesis: *In-Die Techniques to Characterize Powder Compression*



Arushi Agarwal, MS

Advisor: Professor Calvin Sun
Thesis: *Thermal and Microscopic Investigation of Unusual Phase Behaviors of Ephedrine Cyclamate*



Vedant Bhagali, MS

Advisor: Professor Calvin Sun
Thesis: *Predictive Modeling of Tabletability of Mixtures*



Wenqi (Kiki) Gai, MS

Advisor: Professor Raj Suryanarayanan
Thesis: *Study on the pH Shift of Tris HCL Buffer Under Subambient Conditions*



Nianwu Wang, MS

Advisor: Professor Hongbo Pang
Thesis: *Improving Nanomaterial Delivery into Mammalian Cells with Peptide Tools in the Bystander Manner*



Tianyi Xiang, MS

Advisor: Professor Calvin Sun
Thesis: *Worsened Punch Sticking by External Lubrication with Magnesium Stearate*



Jiaqi Zhao, MS

Advisor: Professor Hongbo Pang
Thesis: *Improving the Drug Delivery to Solid Tumor and Rheumatoid Arthritis through Peptide Targeting and EV Modulation*



Commencement



Students pictured (left to right):
Wenqi Gai
Jiaqi Zhou
Gerrit Vreeman
Arushi Agarwal
Vedant Bhagali
Rahul Lalge
Nianwu Wang
Tianyi Xiang





Welcome New Students!



Hae Chan Kim

PhD program
Advisor: Pang
Doctor of Pharmacy,
Massachusetts
College of Pharmacy
and Health Sciences



Mitch Kowalke

PhD program
Advisor: Pang
BS in Biomedical
Engineering, University
of Minnesota-Twin Cities



Ruisi Leng

PhD program
Advisor: Elmquist
MS in Integrated
Pharmaceutical
Sciences, University of
Michigan-Ann Arbor
BS in Pharmacy,
Southwest University



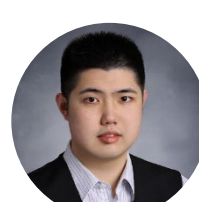
Marina Ruleva

PhD program
Advisors: Siegel &
Kandimalla
MS in Manufacturing
Systems,
University of Saint
Thomas
MS in Food Science and
Technology, Kaliningrad
Tehneskij Institut
Rybnoj Promyslenn
BS in Nutrition,
Kaliningrad Tehneskij
Institut Rybnoj
Promyslenn



Vaishnavi Veerareddy

PhD program
Advisor: Kandimalla
MS in Pharmaceutics,
University of Minnesota-
Twin Cities
MTech in Pharmaceutical
Technology, National
Institutes of
Pharmaceutical
Education and Research
Bachelor of Pharmacy,
Anurag Group
of Institutions



Nianwu Wang

PhD program
Advisor: Pang
MS in
Pharmaceutics,
University of
Minnesota-Twin
Cities
BS in Biomedical
Science, Southern
University of
Science and
Technology



Tianyi Xiang

PhD program
Advisor: Sun
MS in
Pharmaceutics,
University of
Minnesota-Twin
Cities
BS in Pharmacy,
Shenyang
Pharmaceutical
University



Zheng Xue

MS program
Advisor:
Kandimalla
BS in Biochemistry,
Iowa State
University

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



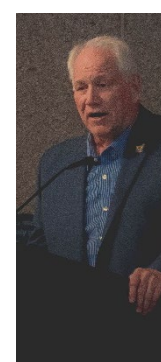
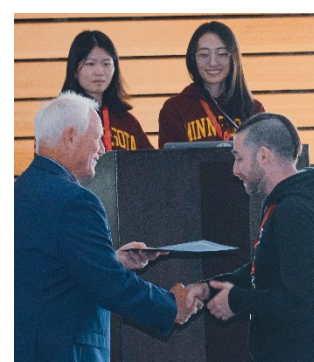
GPEN 2022 in Review

The 13th biennial GPEN conference was held Oct. 19-22, 2022 in Minneapolis, Minnesota.

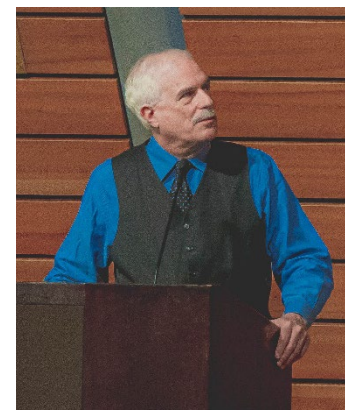


GPEN2022 was honored to welcome over 200 participants from over 48 universities and 25 industrial observers!

Faculty co-chairs: Drs. William Elmquist & Raj Suryanarayanan.
Original Student co-chairs: Surabhi Talele & Andrew Zhou paved the start of the conference pre-COVID19 pandemic.
Current Student co-chairs: Wenjuan Zhang & Tongzhen Xie gradually took on responsibilities after the GPEN board decided to postpone it to October 2022.



GPEN 2022 in Review



2023-2024 Fellowships & Grants



Awardee: Jinghan Li

Advisor: Dr. Raj Suryanarayanan

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.



Awardee: Vrishali Salian

Advisor: Dr. Karunya Kandimalla

Edward G. Rippie Fellowship

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



Awardee: Sichen Song

Advisor: Dr. Ronald Siegel

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: Lushan Wang

Advisor: Dr. Karunya Kandimalla

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.



2023-2024 Fellowships & Grants



Awardee: Zengtao Wang

Advisor: Dr. Karunya Kandimalla

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.



Awardee: Zijian Wang

Advisor: Dr. Changquan Calvin Sun

Edward G. Rippie Fellowship

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

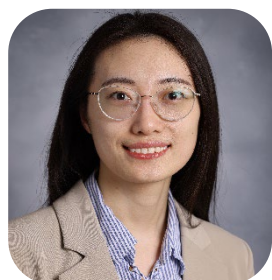


Awardee: Chaowang Zeng

Advisor: Dr. Raj Suryanarayanan

NIPTE-Rigaku Fellowship

The fellowship will be used to support the research project using cutting-edge diffractometric techniques from Rigaku. Chaowang's project studies the phase behavior characterization of mannitol frozen solution under different processing and excipient conditions.



Awardee: Wenjuan Zhang

Advisor: Dr. William Elmquist

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.

Ronald Sawchuk Fellowship

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

Ted Rowell Fellowship

This fellowship is 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



Katie M. James (*Office Supervisor & Graduate Program Coordinator*)

Meritorious Service Award: Civil Service/Bargaining Class 2022

The award recognizes employees who provide exceptional on-going service, go well beyond the norm on certain projects, or otherwise made valuable mission critical contributions. The award is Katie's second during her 12-years at the University of Minnesota as of December 2023.



Dr. Karunya Kandimalla

NEW ROLE: Professor

NEW ROLE: Associate Dean for Graduate Education in the College of Pharmacy

Dr. Kandimalla was promoted to Professor in the Department of Pharmaceutics. Dr. Kandimalla's expertise and research, which is sponsored by NIH, are focused on cellular trafficking and pharmacokinetics, with emphasis of macromolecular transport and metabolism at the blood-brain barrier. In collaboration with investigators at the Mayo Clinic (Rochester, MN), the Kandimalla Laboratory has been developing experimental methods and models to facilitate early diagnosis and treatment of Alzheimer's disease. The Kandimalla Lab is also focused on designing nanotheranostics and novel drug delivery systems to diagnose and treat brain diseases.



Lina Le (*graduate student*)

Twin Cities Fall 2023 TA Recognition Award

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



Oanh Nguyen

(*Research Project Specialist 1/Lab Manager*)

Meritorious Service Award: Professional and Administrative Class 2022

The award recognizes employees who provide exceptional on-going service, go well beyond the norm on certain projects, or otherwise made valuable mission critical contributions. The award coincided with Oanh's 30-year anniversary at the University of Minnesota, having started as a high school summer student intern.



Juhee Oh (*Postdoctoral Associate*)

ISSX Post-Doctoral Poster Award

Awarded at the International Society for the Study of Xenobiotics Annual Meeting 2023.

Juhee's poster was titled, "Method Development to Correct Tissue Concentrations for Residual Blood: Application to Drug Distribution in Brain Tumors".



Cristina Peterson (*Researcher 6 &*

Adjunct Assistant Professor in ECP)

2023 Fellow for the Journal of Pharmacology and Experimental Therapeutics

This is a one-year program for individuals with a relevant background to build important skills as a peer reviewer and editor.



Sneha Rathi (*graduate student*)

3 Minute Thesis: People's Choice Award 2022

Winning presentation titled, "A Bridge of Hope: Translating Brain Tumor Therapies from Lab to the Clinic!" Winners were gifted a College of Pharmacy travel grant.



Sichen Song (*graduate student*)

Doctoral Dissertation Research Recognition at the 2023 Genentech Graduate Student Symposium in Pharmaceutical Sciences.

Monthly Feature: Journal of Pharmaceutical Sciences. His first author article, "A Rheological

Approach for Predicting Physical Stability of Amorphous Solid Dispersions", was selected in recognition of being an outstanding early career scientist.



Dr. Changquan Calvin Sun

2022 Fellow of the American Association for the Advancement of Science (AAAS)

2023 Joined the Editorial Board of

CrystEngComm, a leading journal on crystal engineering published by RSC.



Awards & Achievements

Highlighting Success in 2023-2024



Dr. Raj Suryanarayanan

NEW ROLE: Director of Graduate Studies

Dr. Sury took on the role of Director of Graduate Studies this year.

The Raj Suryanarayanan (Sury) Dedicated Issue of JPharmSci® in recognition as one of the 'True Giants' in the pharmaceutical sciences. The January 2023 issue of the Journal of Pharmaceutical Sciences was dedicated in Sury's honor.



Surabhi Talele (*graduate student*)

Best Dissertation Award in Biological & Medical Sciences

Awarded by the University of Minnesota Graduate School in May 2023.



Joel Updyke (*graduate student*)

IPRIME Poster Award Winner

The Industrial Partnership for Research in Interfacial and Materials Engineering (IPRIME) awarded him for his research titled, "Sulfobutylether- β -cyclodextrin Hydrogel Microspheres Delivering TLR 7/8 Agonist for Transarterial Immunoembolization".



Vaishnavi Veerareddy & Zengtao Wang

(*graduate student co-authors*)

AAPS/PharmSci 360 2023 Best Abstract Award

The abstract was titled, "Gut Microbial Metabolites Effect Intracellular Accumulation of Alzheimer's Disease Amyloid Beta Peptides at the Blood-Brain Barrier Endothelium".



Zengtao Wang (*graduate student*)

Journal of Pharmacology and Experimental Therapeutics (JPET) Highlighted Trainee

The article that earned this selection is titled, "Deconvolution of Plasma Pharmacokinetics from Dynamic Heart Imaging Data Obtained by SPECT/CT Imaging".

Molecular Pharmacology Highlighted Trainee Author November 2023

The article that earned this selection was titled "Amyloid-Beta Proteins 40 and 42 Employ Distinct Molecular Pathways for Cell Entry and Intracellular Transit at the BBB Endothelium". Additionally, the visual abstract was selected to be the cover image for the November 2023 issue of Molecular Pharmacology.



Zengtao Wang (*continued*)

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

This accolade recognizes the excellence of your research poster presented at the 2023 AAPS PharmSci 360 meeting. The title of his research poster was "High-Density Lipoprotein Mimetic Peptide 4F Reduces Amyloid Beta Peptide Accumulation in the Blood-Brain Barrier Endothelium in Alzheimer's Disease".



Lushan Wang (*graduate student*)

Teaching Assistant Recognition Award 2022-2023

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



Zijian Wang (*graduate student*)

2023 CIMSEPP IAB Spring Meeting Best Poster

Awarded by the Center for Integrated Material Science and Engineering of Pharmaceutical Products (CIMSEPP). Poster titled, "Predicting Tabletability of Mixtures from that of Individual Components".

2023 AAPS Best Abstract Award

Awarded for "Mechanism and Generality of the Tabletability Flip Phenomenon".

IPEC Graduate Student Award

The International Pharmaceutical Excipient Council of the Americas Foundation (IPEC) scholarship focuses on recent significant contributions to formulation science and technology through innovative research with excipients.

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. Four awards are given to the students of Indian heritage and two to other nationalities.



Tongzhen Xie (*graduate student*)

ASPET Travel Award

Awarded at the 2023 American Society for Pharmacology and Experimental Therapeutics (ASPET) Annual Meeting.



U of M Outstanding Achievement Award



Makarand Jawadekar

Dr. Makarand (Mak) Jawadekar was nominated by the College of Pharmacy and has been selected by the University All Honors Committee as the recipient of the Outstanding Achievement Award, which recognizes those alumni who have attained unusual distinction in their chosen fields or professions or in public service, and who have demonstrated outstanding achievement and leadership on a community, state, national, or international level. Mak graduated from the University of Minnesota with his Doctor of Philosophy Degree through the College of Pharmacy's Department of Pharmaceutics in 1982. He went on to establish himself as an industry leader and dedicated his professional career to furthering healthcare and pharmacy practice through research and leadership. Mak began his career at Pfizer immediately after graduating and went on to serve in numerous leadership roles, as well as contributing immensely to important formulary research efforts that have impacted millions of people throughout the world, including significant work on the Covid-19 vaccine. Mak has stayed actively engaged with the College of Pharmacy as a mentor and contributor to career pathway round tables. Mak's professional and volunteer career are indicative of University of Minnesota and College of Pharmacy Alums - committed, loyal and examples of excellence.

About the Award

The Outstanding Achievement Award is the University of Minnesota's highest award given to alumni. It is conferred upon former students of the University who have attained distinction in their chosen fields or professions or in public service, and who have demonstrated outstanding achievement and leadership on a community, state, national, or international level. Alumni who receive the award are chosen by the University's Board of Regents based upon prior approval of the All-University Honors Committee. <https://www.pharmacy.umn.edu/u-m-outstanding-achievement-award>



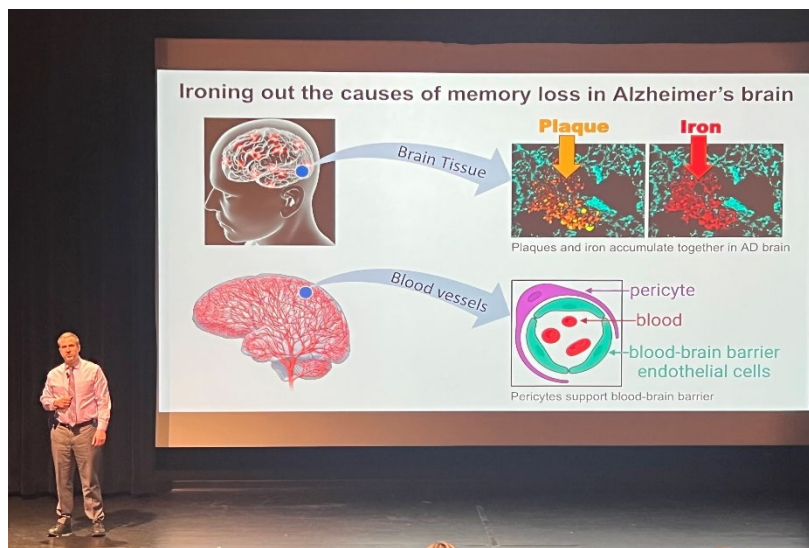
Internships & Competitions



Congratulations to Doug Nelson

(center) for winning the **Judges' Choice Award** and tying for the **People's Choice Award** at the 2023 College of Pharmacy 3-Minute Thesis Competition!

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. CoP 3MT winners go on to compete in the University-wide competition held every November and are invited to present their work at an upcoming Board of Regents meeting. To learn more, please visit: <https://grad.umn.edu/news-events/events-overview/2023-u-wide-three-minute-thesis-competition>



(Left to Right): Vineetha Guttha, Lushan Wang, Vaishnavi Veerareddy, Zijian Wang, Zekun Shao, Vikram Joshi, Tianyi Xiang, Sichen Song, Wenjuan Zhang, and Tongzhen Xie. All were participants in Boehringer Ingelheim's Emerging Scientist Talent (BEST) internship program. The goal is to expose future leaders in pharmaceuticals to industry.



Meetings & Conferences



CENTER FOR PHARMACEUTICAL PROCESING & RESEARCH, INDUSTRIAL ADVISORY BOARD MEETING (Oct 9-11, 2023)

Dr. Sury and the University of Minnesota hosted about 30 industrial scientists, faculty and students to share research findings and proposals for new research projects. Four new research projects were selected for funding by the Industrial Advisory Board. New research involves cell cryopreservation, CFD-DEM modeling of suspension mixing, polymer selection for amorphous solid dispersions, and spray freeze-drying of emerging therapies. To learn more about the CPPR or the event, please visit: <https://cppr.uconn.edu/2023/10/19/another-successful-cppr-research-conference/>



6th DAVID GRANT SYMPOSIUM (June 14-16, 2023)

Dr. Sun hosted the 6th David Grant Symposium, welcoming a full return to in-person conferences on campus. The 6th David Grant Symposium was held in honor of late Professor David J.W. Grant, a leader who helped to define the field of solid-state pharmaceuticals. Leading researchers, from both academia and industry, gathered to share their most cutting-edge research. <https://www.pharmacy.umn.edu/pharmaceutics/events/david-grant-symposium>.



From the Director of Graduate Studies

Dear UMN Pharmaceutics Community,

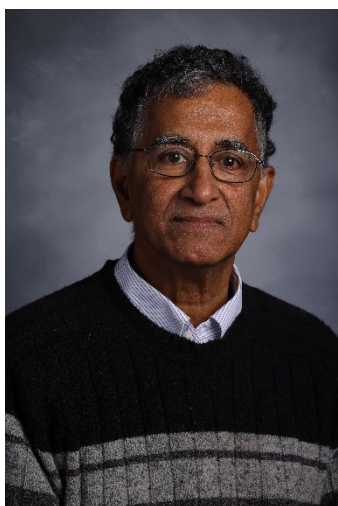
I took over as the Director of Graduate Studies after Professor Karunya Kandimalla took on the role of the Associate Dean of Graduate Education. It is noteworthy that the Associate Deans for Research (Dr. Carolyn Fairbanks) and Graduate Education in the College of Pharmacy are both from our department.

We had another year marked by excellent accomplishments of our graduate students and alumni. Three of our graduate students received the prestigious Doctoral Dissertation Fellowship from the U of M Graduate School. Dr. Surabhi Telele's (MS 2017, PhD 2022; mentor: Professor Bill Elmquist) thesis received the 2023 Best Dissertation Award in Biological Medical Sciences. Dr. Makarand (Mak) Jawadekar (PhD 1982; mentor: Professor Ed Rippie) was the recipient of the U of M Outstanding Achievement Award. The award recognizes alumni "who have attained unusual distinction in their chosen fields or professions or in public service, and who have demonstrated outstanding achievement and leadership on a community, state, national, or international level." You will see details of the other awards won by our students elsewhere in the newsletter.

In the fall of 2023, from a pool of excellent applicants, seven students were admitted into our PhD program and one into our MS program. In 2023, six PhD students and three MS students graduated from their programs. All the graduates have found career placement and some of the MS graduates are now pursuing a doctoral degree.

This fall, the College embarked on a new PharmD curriculum (called "MNspire"). While the role of teaching assistants in this new curriculum is still evolving, our graduate students continue to be actively involved in PharmD instruction.

As always, we are delighted to hear from you and keep us posted with news about you, your family and work.



Raj
Suryanarayanan, PhD
Director of
Graduate Studies



Graduate Student Organizations



Chair
Chenxu Li
Experimental & Clinical
Pharmacology



Chair-Elect
Jiayan (Lina) Le
Pharmaceutics



Treasurer
Zijian Wang
Pharmaceutics



Secretary
Tiffany Chang
Experimental & Clinical
Pharmacology



Web Coordinator
Pin-Syuan Huang
Pharmaceutics



Student Outreach
Vineetha Guttha
Pharmaceutics



Jiayan (Lina) Le
Pharmaceutics
Graduate
Student
Representative



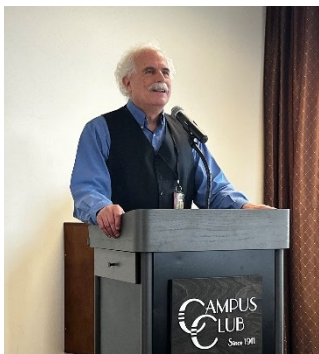
Tianyi Xiang
Pharmaceutics
Graduate
Student
Representative

**AAPS UMN Student
Chapter Officers**

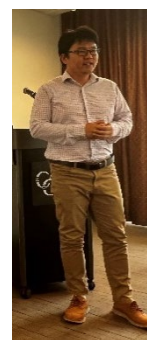
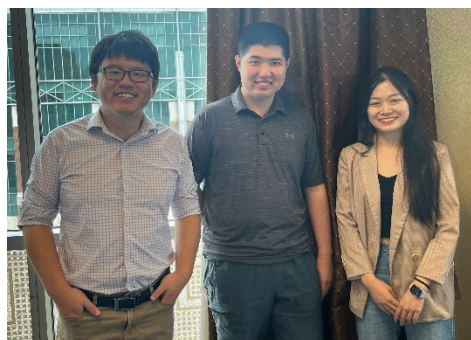
Elected 2023-2024



Pharmaceutics Graduation Luncheon



Graduates celebrating with their advisers, families, and peers. Graduates shown (back row, L to R): Rahul Lalge, Sneha Rath, Wenqiu Zhang, Wenqi (Kiki) Gai, Tianyi Xiang, Vedant Bhagali, Gerrit Vreeman, Arushi Agarwal. Nianwu Wang and Jiaqi Zhao pictured bottom left with Dr. Pang.



Pharmaceutics Graduation Luncheon



Minneceutics Marriages & Minis

Celebrating new beginnings



Congratulations to Lushan Wang and Liang Zhu (above) engaged on September 8, 2023.



Congratulations to Sichen Song and Wenjuan Zhang (above) married on August 10, 2023



Congratulations to Dr. Elmquist on the birth of his granddaughter, **Tove**, born in June 2023 to Dane and Karen.



Congratulations to Joanna Peng and her husband on the birth of their daughter, **Emily**, born in May 2022.



Congratulations to Mak Jawadekar on the the birth of his grandson, **Liam**, born in July 2023 to Neal and Kerri. Shown with his sister, **Olivia**, who is 2.5 years old.



Milestones

Life updates from students, staff, and alumni

Alekha Dash, a 1990 PhD graduate from Dr. Raj Sury's lab, received a foundation grant to start a PhD program in Pharmaceutical Sciences at Creighton University School of Pharmacy and Health Professions. He also received a grant from the state of Nebraska (LB692) for the purchase a Rigaku SmartLab powder x-ray diffraction instrument for Creighton.

Amanda Hokanson, Executive Office & Administrative Specialist for Pharmaceutics, graduated with an MS in Training and Human Resource Development (TRHRD) from the University of Wisconsin at Stout. She also planned several meetings held on campus this year: CIMSEPP (May), the 6th David Grant Symposium (June), CPPR IAB (Oct), and the first-ever Pharmaceutics Graduate Student Appreciation Event (May). She continues to plan and lead student engagement events off campus to help students explore Minnesota. She also had wonderful adventures in Las Vegas and Bermuda on her travels in 2023 and returned safely from each. Amanda celebrated eight years with Pharmaceutics on December 7, 2023. She also designed the newsletter this year. Please reach out if you like it or want to include something new in the next issue!

Katie M. James, Office Supervisor and Graduate Program Coordinator for Pharmaceutics, was admitted into the University of Minnesota-Duluth's Master of Education program for Fall 2023. She also currently serves on the College of Pharmacy's Diversity, Equity, Inclusion, and Accessibility Committee representing the College's graduate programs and attended NAGAP's 2023 Graduate Enrollment Management Summit in New York City, April 2023. In summer 2023, Katie's family welcomed home a new member of their family: Kiki, a retired racing greyhound.

Makarand Jawadekar, a 1982 graduate from Dr. Ed Rippie's lab, attended the FIFA FOOTBALL World Cup at the Invitation of the Royal Family of Qatar in November 2022 in DohaQatar, along with the US Secretary of State Anthony Blinken, Former Secretary of State Mike Pompeo, and the Indiana Attorney General Todd Rokita. He was also invited to the "Tennis Hall of Fame" in July 2023 for attending the Annual ATP Tournament there, along with Patrick & John McEnroe.

Oanh Nguyen, a researcher in and lab manager for Dr. Carolyn Fairbanks' labs, traveled to NYC in June with her three teenage sons (Charlie, Vincent and Morgan) where her sons fulfilled their lifelong dream of visiting the Nintendo Store. Additionally, Oanh's husband (Peter) and youngest son (Jack) rode their tandem bike along the Northern Pacific Bridge No. 9 this summer. Their favorite route takes them along the U of M Transitway onto the Greenway Bike Trail over the Mississippi River on the Stone Arch Bridge. If you ever spot them, give them a wave!

Joanna Peng, a 2002 PhD graduate from Dr. Ronald Sawchuk's lab, has been a consultant for the past seven years and has her own consulting company supporting clinical pharmacology, modeling and simulation, and translational science.

Purnanand Sarma, a 1993 PhD graduate from Dr. David Grant's lab, received the prestigious Lifetime Achievement Award from TiE Global, a nonprofit organization devoted to entrepreneurs in all industries, at all stages, from incubation, throughout the entrepreneurial lifecycle. With a global reach and a local focus, the heart of TiE efforts lies in its five foundational programs: Mentoring, Networking, Education, Funding, and Incubation. <https://indianewengland.com/2020/12/serial-entrepreneur-purnanand-sarma-to-receive-tie-boston-lifetime-achievement-award/> Sarma currently serves as the President and Chief Executive Officer of Immunome, Inc., a biopharmaceutical company utilizing a proprietary human memory B cell platform to discover and develop first-in-class antibody therapeutics, with a focus on oncology and infectious diseases including COVID-19.

Sichen Song, a graduate student in Dr. Ronald Siegel's lab, presented his recent work, "Stabilization of Amorphous Solid Dispersion above the Overlap Concentration (c^*): Delay of the First Nucleation Event" twice: (1) 2023 Genentech Graduate Student Symposium in Pharmaceutical Science; (2) The 6th David Grant Symposium. To read Sichen's article in the Journal of Pharmaceutical Sciences, please visit: [https://www.jpharmsci.org/article/S0022-3549\(23\)00384-2/fulltext](https://www.jpharmsci.org/article/S0022-3549(23)00384-2/fulltext)



Milestones

Life updates from students, staff, and alumni

Joel Updyke, a graduate student in Dr. Jayanth Panyam's and Dr. Ronald Siegel's labs, attended the American Association for Cancer Research (AACR) conference in Orlando to present a poster on his thesis research titled, "Sulfobutylether-B-Cyclodextrin Hydrogel Microspheres Delivering TLR 7/8 Agonist for Transarterial Immunoembolization". This spring semester, Joel interned with ProMed Pharma, LLC and presented a poster related to his internship at the Controlled Release Society (CRS) conference in Las Vegas titled, "Preparation and Testing of Rate Controlling Coatings on Cylindrical Drug Reservoirs via Dip Coating". On a personal note, Joel took his family on a much needed vacation to Disney World and Universal Studios this past summer.

Lushan Wang, a graduate student in Dr. Karunya Kandimalla's lab, continues to work on her thesis research, which is focused on uncovering the pathophysiological mechanisms contributing to blood-brain barrier dysfunction in Alzheimer's disease and metabolic syndrome. She plans to graduate in the coming year. Over the past year, she has published two research papers as a first author and contributed as a co-author to two additional manuscripts. She also presented a poster titled "Amyloid-beta Peptides and Endothelial Insulin Resistance Synergistically Inhibit Glucose Transport at the Blood-Brain Barrier in Alzheimer's Disease" at the Gordon Research Conference (GRC)-Barriers of CNS in New London, NH, in 2021. In 2022, she presented another poster titled "Sex Difference of Glucose Transport in an Alzheimer's Disease Transgenic Mouse Model" at the AAPS annual meeting in Boston, MA. This work was also recognized with an invitation to deliver a podium presentation at the GPEN biannual meeting in Minneapolis, MN in 2022. In the summer of 2022, she joined the clinical pharmacology department at Johnson & Johnson as an intern. During her internship, she focused on assessing the accuracy of tau PET as a surrogate marker for Alzheimer's disease using linear-mixed effects models.

Zengtao Wang, a graduate student Dr. Karunya Kandimalla's lab, completed a six month internship in the Department of Clinical Pharmacology and Pharmacometrics at Biogen. His projects included quantitative disease progression modeling of Parkinson's disease (PD) and pharmacokinetics pharmacodynamics modeling of an anti-sense oligonucleotide (ASO) for PD treatment.

Timothy Wiedmann, Professor Emeritus, officially retired as of June 2023 and is travelling and enjoying time with his family. Per his parting message to the department, "I want to express my thanks for your thoughtful (timely) gift and kind words of congratulations. Retirement is definitely a major milestone in one's life, which for me is a time of introspection, and thus no need for a party. I encourage all of you, as your time for retirement, graduation, transition, etc. occurs, to take the time to consider how the knowledge, skill, friendships, colleagues, and experiences you have gained in the past can be used in the future for the betterment of your family, friends, and society. PS: I will retain my UMN email, which can be freely used if there is anything that I can do to help."

Zheng Yang, a 1997 PhD graduate from Dr. Ronald Sawchuk's lab, moved to Alnylam Pharmaceuticals in September 2022 after nearly 25 years at Bristol Myers Squibb (BMS). He and his wife, Xueqing Chen, relocated to the Boston area at the end of August in 2023 and Xueqing, who is also an alumna of the department (2000 PhD graduate from Dr. Yueh-Erh Rahman's lab), transferred to the BMS Cambridge site.

Chaowang Zeng, a graduate student in Dr. Raj Sury's lab, presented his research at the 2023 NIPTE Research Conference in Washington D.C.

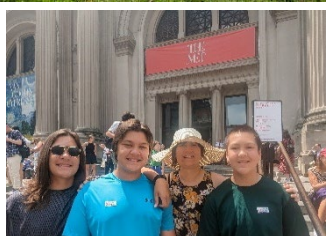
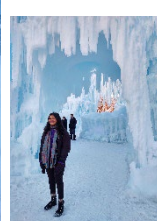
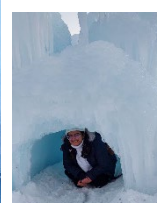
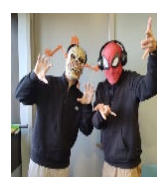
Tong Zhu, a 2002 PhD graduate from Dr. Ronald Sawchuk's lab, worked for 20 years as a Clinical Pharmacologist at various global pharmaceutical companies with increasing responsibilities before deciding to step outside her comfort zone. In her new role as Vice President, Primary Focus Lead of Mitochondria at Astellas Pharma reporting to the Chief Strategy Officer of the company, Tong is responsible for creating and executing strategies in the company's Research, Development, Manufacturing, and Commercialization divisions of a portfolio targeting mitochondria-related diseases.



Pceuts at Play



ADVENTURES & MEMORIES 2023



pharmacy.umn.edu/pharmaceutics



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 (polisk042@umn.edu | 612-626-8975).

Existing fellowships include:

Smita and Aleka Dash Pharmaceuticals Alumni Fellowship

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

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.

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. Remmel & Cheryl L. Zimmerman Fellowship

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

Want more updates?

Join our alumni email group: <https://groups.google.com/a/umn.edu/forum/#!forum/pceut-alumni>



LinkedIn: <https://www.linkedin.com/company/pharmaceutics-umn/>



Facebook: <https://www.facebook.com/pharmaceuticsumn/>



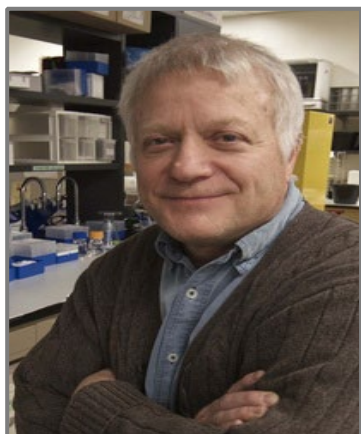
Twitter: <https://twitter.com/pceutsUMN>



Faculty Newsroom

Activities and Updates

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.

Invited presentations:

"Preclinical Translational Studies on CNS Penetration of Drugs: The Example of Brain Tumors." Globalization of Pharmaceutics Education, University of Minnesota, Minneapolis, Minnesota, October 2022.

"Marker Molecules to Measure BBB Permeability/Perfusion in and Around Brain Tumors." Society of Neuro-oncology, Tampa, Florida, November 2022.

"Overview of Pharmacokinetics." Mayo Clinic Neuro-oncology Group, January 2023.

"The Black Hole of Brain Tumors: Bending Light Thirty Years Later" Department of Pharmaceutics, University of Minnesota, February 2023.

"Delivery of Radiosensitizers to Primary and Metastatic Tumors in the Brain." University of Nebraska Medical Center, Omaha, Nebraska, February 2023.

"The Ins and Outs of Clearance – General Considerations." Mayo Clinic Neuro-oncology Group, April 2023.

"WSD0628 – A Potent ATM Inhibitor." DNA Damage Repair Consortium, National Brain Tumor Association, May 2023.

"Mechanisms and Models of Hepatic and Renal Clearances." Mayo Clinic Neuro-oncology Group, July 2023.

"Drug Distribution: The Forgotten Stepchild of ADME." Mayo Clinic Neuro-oncology Group, October 2023.

"Marker Molecules to Measure BBB Permeability in and around Brain Tumors." AAPS Annual Meeting, Orlando, FL, October 2023.

"Intratumoral Pharmacokinetics to Inform Study Design and Interpretation in Neuro-oncology." Annual Meeting of the Society for Neuro-oncology, Vancouver, BC, Canada, November 2023.



Professor Carolyn Fairbanks



Dr. Fairbanks continues 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 of Graduate Education through June of 2023.

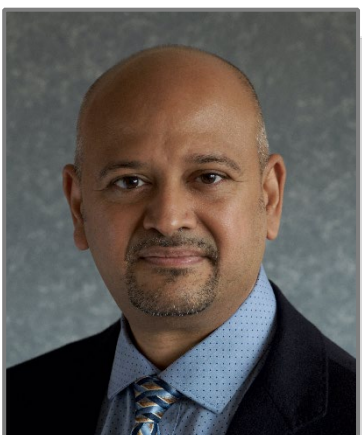
In 2023, Dr. Fairbanks served as elected Chair of the Division of Neuropharmacology for the American Society of Pharmacology and Experimental Therapeutics (ASPET). She also joined the Associate Editorship of the Journal of Pharmacology and Experimental Therapeutics (JPET). She is also a regular member of the Neurosensory of Pain and Itch (NPI) study section for NIH. Dr. Fairbanks' team remains laser-focused to develop 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 of 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

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

Professor Karunya Kandimalla



Dr. Karunya Kandimalla's lab continues to focus on developing experimental methods and models to elucidate macromolecular transport at the blood-brain-barrier (BBB). In collaboration with Dr. Ling Li (Experimental and Clinical Pharmacology, UMN), the Kandimalla Lab has been investigating the efficacy of HDL mimetics as potential therapeutic agents for Alzheimer's disease (AD). With Drs. Val Lowe, Ronald Petersen, and David Knopman (Mayo Clinic, Rochester, MN), the Kandimalla Lab has been investigating insulin trafficking deficiencies at the BBB in AD patients and elderly individuals. With Dr. Krishna Kalari (Mayo Clinic, Rochester, MN), they are developing 'omics' approaches to investigate pathophysiological mechanisms contributing to BBB dysfunction in AD and cerebrovascular disease. In addition, the Kandimalla Lab has been developing novel drug delivery systems to administer via transdermal (pain), nasal (epilepsy), or otic (otitis media) routes, was interviewed by Allen Saakyan of the YouTube series "Simulation" on the connections

between metabolic syndrome, including cardiovascular diseases and diabetes, and Alzheimer's disease. You can view the interview at z.umn.edu/Simulation367.



Professor Hongbo Pang



The Pang lab experienced some personnel changes this year:

- Shilpi Singh joined the lab in September as a postdoctoral associate
- Yiqin Li joined the lab in August as a PhD student
- Dr. Yushuang Wei left the lab in August to join the Chinese Academy of Science in Shenzhen, China
- Dr. Mahadi Hasan left the lab in December last year to join a university in Japan

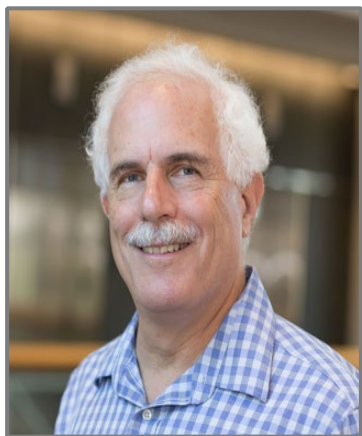
Invited presentations:

- Dr. Pang attended and presented at the annual meeting of American Peptide Society, Whistler BC, Canada.
- Dr. Pang and Dr. Xian Wu attended and presented at GRC-drug carrier conference, West Dover, Vermont.
- Dr. Pang and Dr. Hong Guo attend the AACR-JCA joint meeting, Hawaii
- Students Yuexuan Li, Nianwu Wang and Jiaqi Zhao presented their work at the AACR annual meeting & GPEN 2022.
- Dr. Pang gave talks within UMN (MCC cellular mechanism, pharmacology, UMII) and beyond (Songshan Lake Material Lab).

Publications:

In 2022, our works have been published a number of high impact journals, including ACS Nano for synergistic cell entry (first author: Yushuang Wei), Advanced Science (first author: Xian Wu), Advanced Therapeutics (first author: Xian Wu), and Molecular Pharmaceutics (co-first authors: Yuexuan Li and Nianwu Wang). Additional works are under review.

Professor Ronald A. Siegel



Dr. Ronald A. Siegel continues to direct the Biomaterials and Pharmaceutical Materials (BPM) program for Industrial Partners for Research in Interfacial and Materials Engineering (IPRIME), an industrial/academic consortium at the University of Minnesota.

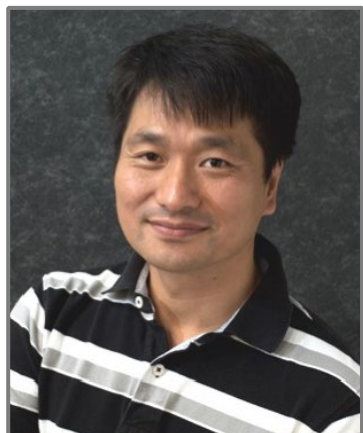
Dr. Siegel presented invited talks at the David Grant Symposium (UMN), the Controlled Release Society (Las Vegas), and the Pharma Crystallization Summit (Newark, NJ).

Dr. Siegel received a grant of \$25,000 from the NSF-funded Center for Integrated Material Science and Engineering of Pharmaceutical Products (CIMSEPP). The project title is "Efficient Development of High Drug Loaded Tablets Containing Amorphous Solid Dispersions."

Two of Prof. Siegel's publications in *Journal of Pharmaceutical Sciences* were named monthly featured articles.



Professor Changquan Calvin Sun



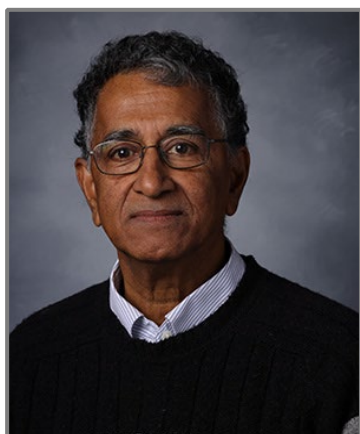
Professor Sun received a grant from the NSF for establishing an IUCRC (Phase I, 2022-2027), Center for Integrated Material Science and Engineering for Pharmaceutical Products (CIMSEPP). This center supports research selected by the center industry advisor board, currently consisting of 13 company members. Learn more about CIMSEPP at <https://www.cimsepp.org/>

Invited presentations

1. November 30, 2022, Punch sticking - mechanism, kinetics, and strategies to overcome it, IPPH, Purdue University, West Lafayette, IN
2. November 16, 2022, Beyond size specifications – Variability in bulk powder properties of micro-sized API by different particle engineering methods, Merck, Rahway, NJ
3. October 18, 2023, Tablet Compression, USP General Chapters – Open House, Rockville, MD
4. October 6, 2023, Solving Punch Sticking Problems during Tablet Manufacturing Through Crystal Engineering of APIs, Pharma Crystallization Summit, Princeton, NJ
5. October 2, 2023, Advanced Topics in Powder Compaction, BASF, TarryTown, NY
6. October 2, 2023, Fundamental and Practical Aspects of Powder Compaction, BASF Distinguished Lecture Series, TarryTown, NY
7. September 20, 2023, Determining Important Physical Properties of Drugs by Compaction Simulation, Keynote, 5th Styl'One User Meeting, MedelPharm, Lyon, France
8. July 17, 2023, Engineering Approaches for Enabling Direct Compression Tablet Formulation, Tianjin University of Technology, Tianjin, China
9. July 16, 2023, Attaining Superior Properties of Active Pharmaceutical Ingredients through Spherical Cocrystallization: A Powerful Crystal Engineering Technique, 19 th National Conference on Crystal Growth (CCCG-19), Tianjin, China
10. July 14, 2023, Particle and Crystal Engineering Solutions For Common Problems During Tablet Manufacturing, Shenyang Pharmaceutical University, Shenyang, China
11. July 13, 2023, Solving Punch Sticking Problems through Crystal and Particle Engineering, Tianjin University, Tianjin, China
12. July 11, 2023, Solving Punch Sticking Problems through Crystal and Particle Engineering, School of Pharmacy, Jinan University, Guangzhou, China
13. July 10, 2023, Developing Quality Tablets through Materials Science and Engineering, XtalPi, Shenzhen, China
14. June 30, 2023, Overcoming Punch Sticking and CU Problems During Tablet Manufacturing through Particle and Crystal Engineering, Zhejiang University, Hangzhou, China
15. June 27, 2023, Integrated Materials Science and Engineering to Enable Efficient Development of Pharmaceutical Tablets, Hubei University of Chinese Medicines, Wuhan, China
16. June 26, 2023, Enabling Efficient Development of Pharmaceutical Tablets by Integrated Materials Science and Engineering, Hubei University of Chinese Medicines, Wuhan, China
17. June 5, 2023, Overcoming punch sticking and CU problems during tablet manufacturing through particle and crystal engineering, Merck, Rahwy, NJ
18. April 28, 2023, Crystal and particle engineering to enable direct compression tablet formulation, Mirati Therapeutics, San Diego, CA
19. April 28, 2023, Punch sticking - mechanism, kinetics, and mitigation, Mirati Therapeutics, San Diego, CA
20. April 18, 2023, Efficient Development of Pharmaceutical Tablets through Integrated Materials Science and Engineering, 3M-MDRCBB lecture.



Professor Raj Suryanarayanan



Dr. Sury recently published a book chapter:

D. Heger, R. Govindarajan, E. Lu, S. Ewing, A Lay-Fortenbery, X. Yuan, L. Vesely, E. Munson, L. Gatlin, B. Hancock, R. Suryanarayanan, E. Shalae, "Beyond pH: Acid/Base Relationships in Frozen and Freeze-Dried Pharmaceuticals", In Principles and Practices of Lyophilization in Product Development and Manufacturing, F. Jameel (ed.), Springer, Switzerland, 2023.

Invited presentations

Symposium session: Innovation Based on Non-Traditional Platforms at the AAPS National Biotechnology Conference, Philadelphia, PA, April 24, 2023.

At the conference session: The Physics of Freezing and Freeze-drying at the Freeze-drying of Pharmaceuticals and Biologicals Conference, Breckenridge, CO, August 2, 2023.

As part of the webinar series, "The New Frontier of Amorphous Solid Dispersions", organized by BASF Pharma, May 11, 2023.

Webinar organized by ATS Life Sciences, August 30, 2023.

College of Pharmacy, Dongguk University, South Korea, November 13, 2023.

Dr. David J.W. Grant Symposium, University of MN, Minneapolis, June 14, 2023.

Howard University College of Pharmacy in collaboration with AMCP and FDA, Washington, DC, April 5, 2023).



Recent Publications

Publications: Dr. William Elmquist

Ji, J., Dragojevic, S., Callaghan, C. M., Smith, E. J., Talele, S., Zhang, W., Connors, M. A., Mladek, A. C., Hu, Z., Bakken, K. K., Sarkaria, P. P., Carlson, B. L., Burgenske, D. M., Decker, P. A., Rashid, M. A., Jang, M. H., Gupta, S. K., Eckel-Passow, J. E., Elmquist, W. F., Sarkaria, J. N. (2024). Differential distribution of the DNA-PKcs inhibitor peposertib selectively radiosensitizes patient-derived melanoma brain metastasis xenografts. *Molecular cancer therapeutics*. doi: 10.1158/1535-7163.MCT-23-0552

Zhang, W., Vaubel, R. A., Oh, J. H., Mladek, A. C., Talele, S., Zhang, W., Waller, K. L., Burgenske, D.M., Sarkaria, J. N., Elmquist, W. F. (2024). Delivery versus Potency in Treating Brain Tumors: BI-907828, a MDM2-p53 Antagonist with Limited BBB Penetration but Significant In Vivo Efficacy in Glioblastoma. *Molecular cancer therapeutics*, 23(1), 47-55. doi: 10.1158/1535-7163.MCT-23-0217

Järvinen, J., Montaser, A. B., Adla, S. K., Leppänen, J., Lehtonen, M., Vellonen, K. S., Laitinen, T., Jalkanen, A., Elmquist, W. F., Timonen, J., Huttunen, K. M., Rautio, J. (2024). Altering distribution profile of palbociclib by its prodrugs. *European journal of pharmaceutical sciences : official journal of the European Federation for Pharmaceutical Sciences*, 192, 106637. doi: 10.1016/j.ejps.2023.106637

Riviere-Cazaux, C., Rajani, K., Rahman, M., Oh, J., Brown, D. A., White, J. F., Himes, B. T., Jusue-Torres, I., Rodriguez, M., Warrington, A. E., Kizilbash, S. H., Elmquist, W. F., Burns, T. C. (2023). Methodological and analytical considerations for intra-operative microdialysis. *Fluids and barriers of the CNS*, 20(1), 94. PubMed Central ID Number: PMC10729367 doi: 10.1186/s12987-023-00497-2

Zhang, W., Oh, J. H., Zhang, W., Rath, S., Larson, J. D., Wechsler-Reya, R. J., Sirianni, R. W., Elmquist, W. F. (2023). Central Nervous System Distribution of Panobinostat in Preclinical Models to Guide Dosing for Pediatric Brain Tumors. *The Journal of pharmacology and experimental therapeutics*, 387(3), 315-327. PubMed Central ID Number: PMC10658912 doi: 10.1124/jpet.123.001826

Zhang, W., Oh, J. H., Zhang, W., Rath, S., Le, J., Talele, S., Sarkaria, J. N., Elmquist, W. F. (2023). How Much is Enough? Impact of Efflux Transporters on Drug delivery Leading to Efficacy in the Treatment of Brain Tumors. *Pharmaceutical research*, 40(11), 2731-2746. doi: 10.1007/s11095-023-03574-1

Riviere-Cazaux, C., Carlstrom, L. P., Rajani, K., Munoz-Casabella, A., Rahman, M., Gharibi-Loron, A., Brown, D. A., Miller, K. J., White, J. J., Himes, B. T., Jusue-Torres, I., Ikram, S., Ransom, S. C., Hirte, R., Oh, J. H., Elmquist, W. F., Sarkaria, J. N., Vaubel, R. A., Rodriguez, M., Warrington, A. E., Kizilbash, S. H., Burns, T. C. (2023). Blood-brain barrier disruption defines the extracellular metabolome of live human high-grade gliomas. *Communications biology*, 6(1), 653. PubMed Central ID Number: PMC10281947 doi: 10.1038/s42003-023-05035-2

Conage-Pough, J. E., Stopka, S. A., Oh, J. H., Mladek, A. C., Burgenske, D. M., Regan, M. S., Baquer, G., Decker, P. A., Carlson, B. L., Bakken, K. K., Zhang, J., Liu, L., Sun, C., Mu, Z., Zhong, W., Tran, N. L., Elmquist, W. F., Agar NYR, Sarkaria, J. N., White, F. M. (2023). WSD-0922, a novel brain-penetrant inhibitor of epidermal growth factor receptor, promotes survival in glioblastoma mouse models. *Neuro-oncology advances*, 5(1), vdad066. PubMed Central ID Number: PMC10263119 doi: 10.1093/noajnl/vdad066

Power, E. A., Rechberger, J. S., Zhang, L., Oh, J. H., Anderson, J. B., Nesvick, C. L., Ge, J., Hinchcliffe, E. H., Elmquist, W. F., Daniels, D. J. (2023). Overcoming translational barriers in H3K27-altered diffuse midline glioma: Increasing the drug-tumor residence time. *Neuro-oncology advances*, 5(1), vdad033. PubMed Central ID Number: PMC10148679 doi: 10.1093/noajnl/vdad033



Recent Publications (continued)

Publications: Dr. Carolyn Fairbanks

Clements, B. M., Peterson, C. D., Kitto, K. F., Caye, L. D., Wilcox, G. L., Fairbanks, C. A. (2023). Biodistribution of Agmatine to Brain and Spinal Cord after Systemic Delivery. *The Journal of pharmacology and experimental therapeutics*, 387(3), 328-336. PubMed Central ID Number: PMC10658908 doi: 10.1124/jpet.123.001828

Fairbanks, C. A., Peterson, C. D. (2023). The opioid receptor: emergence through millennia of pharmaceutical sciences. *Frontiers in pain research (Lausanne, Switzerland)*, 4, 960389. PubMed Central ID Number: PMC10646403 doi: 10.3389/fpain.2023.960389

Gore, R., Esmail, T., Pflepsen, K., de Marron Fernandez Velasco, E., Kitto, K. F., Riedl, M. S., Karlen, A., Mclvor, R. S., Honda, C. N., Fairbanks, C. A., Vulchanova, L. (2023). AAV-mediated gene transfer to colon-innervating primary afferent neurons. *Frontiers in pain research (Lausanne, Switzerland)*, 4, 1225246. PubMed Central ID Number: PMC10436501 doi: 10.3389/fpain.2023.1225246

Peterson, C. D., Waataja, J. J., Kitto, K. F., Erb, S., Verma, H., Schuster, D. J., Churchill, C. C., Riedl, M. S., Belur, L. R., Wolf, D. A., Mclvor, R. S., Vulchanova, L., Wilcox, G. L., Fairbanks, C. A. (2023). Long-term reversal of chronic pain behavior in rodents through elevation of spinal agmatine. *Molecular therapy : the journal of the American Society of Gene Therapy*. doi: 10.1016/j.ymthe.2023.01.022

Publications: Dr. Karunya Kandimalla

Smith, K., Rickles, N., Kiousi, C., Burkhardt, C., Betharia, S., Fernandez, J., Fan, J., Tolman, J., Howard, M. L., Kandimalla, K., others (2023). ALFP Debate: Pharmacy Practice Needs Pharmacy Schools to Drive Innovation in the Profession. *American Journal of Pharmaceutical Education*, 87(8), 100143.

Wang, Z., Sharda, N., Omtri, R. S., Li, L., Kandimalla, K. K. (2023). Amyloid-Beta Peptides 40 and 42 Employ Distinct Molecular Pathways for Cell Entry and Intracellular Transit at the Blood-Brain Barrier Endothelium. *Molecular pharmacology*, 104(5), 203-213. PubMed Central ID Number: PMC10586509 doi: 10.1124/molpharm.123.000670

Cheng, J., Wang, L., Guttha, V., Haugstad, G., Kandimalla, K. K. (2023). Delivery of RNA to the Blood-Brain Barrier Endothelium Using Cationic Bicelles. *Pharmaceutics*, 15(8). PubMed Central ID Number: PMC10459289 doi: 10.3390/pharmaceutics15082086

Wang, Z., Wang, L., Ebbini, M., Curran, G. L., Min, P. H., Siegel, R. A., Lowe, V. J., Kandimalla, K. K. (2023). Deconvolution of Plasma Pharmacokinetics from Dynamic Heart Imaging Data Obtained by Single Positron Emission Computed Tomography/Computed Tomography Imaging. *The Journal of pharmacology and experimental therapeutics*, 386(1), 102-110. PubMed Central ID Number: PMC10289239 doi: 10.1124/jpet.122.001545



Recent Publications (continued)

Publications: Dr. Hongbo Pang

Guo H*, Wu X*, Zhao J, Li YX, Zhou Y, Pang HB. Improving the delivery and therapeutic outcomes of rheumatoid arthritis treatment by peptide functionalization. *Submitted*.

Wei Y, Wu X, Li YX, Pang HB. Proteomic profiling of nanomaterial-cell interface reveals novel regulators of macropinocytosis. *Under external review, Nature Communications*.

Guo H, Guan J, Xian Wu, Wei Y, Zhou Y, Li F, Pang HB. Peptide-guided delivery improves the therapeutic efficacy and safety of glucocorticoid drugs for treating acute lung injury. *Molecular Therapy*. 2023 Jan 6; S1525-0016(23)00003-5. doi: 10.1016/j.ymthe.2023.01.003.

Publications: Dr. Ronald Siegel

S. Song, R.A. Siegel, M.A. Sánchez, M.C. Calderer, and D. Henao, "Experiments, modelling, and simulations for a gel bonded to a rigid substrate," *J Elasticity*, 153, 651-679 (2022) DOI: 10.1007/s10659-022-09911-6

S. Song, C. Wang, B. Zhang, C.C. Sun, T.P. Lodge, and R.A. Siegel, "A rheological approach for predicting physical stability of amorphous solid dispersions," *J Pharm Sci*, 112, 204-212 (2023) DOI: 10.1016/j.xphs.2022.08.028

K.M.H. Jain and R.A. Siegel, "Predetermination of burst times of elastoplastic osmotic capsules," *J Control Rel*, 357, 422-431 (2023) DOI: 10.1016/j.jconrel.2023.03.029

Z. Wang, L. Wang, M. Ebbini, G.L. Curran, C.J. Vernon, P.H. Min, R.A. Siegel, V.J. Lowe, and K.K. Kandimalla, "Deconvolution of plasma pharmacokinetics from dynamic heart imaging data obtained by SPECT/CT imaging," *J Pharmacol Exp Therapeut* 386, 102-110 (2023) DOI: 10.1124/jpet.122.0011545.

K.M.H. Jain, H.H. Hou, and R.A. Siegel, "An artificial gut/absorption simulator: Simultaneous evaluation of desupersaturation and absorption from ketoconazole supersaturated solutions," *J Pharm Sci*, 112, 2217-2222 (2023) DOI: 10.1016/j.xphs.2022.09.017.

Publications: Dr. Changquan Calvin Sun

N. Kumari, P. Roy, S. Roy, C. Wang, S. Das, N. Pandey, S. K. Mondal, A. Bose, C.C. Sun* and A. Ghosh*, Development of direct compression Acetazolamide tablet with improved bioavailability in healthy human volunteers enabled by cocrystallization with p-Aminobenzoic acid, *Int. J. Pharm.*, 652:123793 (2024), <https://doi.org/10.1016/j.ijpharm.2024.123793>

N. Pandey, N. Kumari, P. Roy, S.K. Mondal, A. Thakur*, C.C. Sun* and A. Ghosh*, Tuning caco-2 permeability by cocrystallization: insights from molecular dynamics simulation, *Int. J. Pharm.*, 650: 123666 (2024), <https://doi.org/10.1016/j.ijpharm.2023.123666>

T. Xiang and C.C. Sun*, Worsened punch sticking by external lubrication with magnesium stearate, *Int. J. Pharm.*, 649:123636 (2023), DOI: 10.1016/j.ijpharm.2023.123636

F. Osei-Yeboah and C.C. Sun*. Effect of Drug Loading and Relative Humidity on the Mechanical Properties and Tableting Performance of Celecoxib–PVP/VA 64 Amorphous Solid Dispersions, *Int. J. Pharm.* 644:123337 (2023)



Recent Publications

Publications: Dr. Changquan Calvin Sun (continued)

- Z. Wang, C. Wang, D. Bahl, and C.C. Sun*, The ubiquity of the tabletability flip phenomenon, *Int. J. Pharm.*, 643:123262 (2023)
- H. Guo, S. Liu, C.C. Sun*, Modulating pharmaceutical properties of berberine chloride through cocrystallization with benzendiol isomers, *Pharm. Res.*, (2023), <https://doi.org/10.1007/s11095-023-03533-w>
- S. Paul, Y. Guo, C. Wang, J. Dun, C.C. Sun*, Enabling direct compression tablet formulation of celecoxib by simultaneously eliminating punch sticking, improving manufacturability, and enhancing dissolution through co-processing with a mesoporous carrier, *Int. J. Pharm.*, 641:123041 (2023)
- C.A. Gunawardana, A. Kong, D. Wanapun, D. Blackwood, C.T. Powell, J. F. Krzyzaniak, M. Thomas, J.E. Kresevic, and C.C. Sun*, Understanding the role of magnesium stearate in lowering punch sticking propensity of drugs during compression, *Int. J. Pharm.*, 640:123016 (2023)
- Y. Tsume,* L. Ashworth, M. Bermejo, J. Cheng, V. Cicale, J. Dressman, K. Fushimi, I. Gonzalez-Alvarez, Y. Guo, C. Jankovsky, X. Lu, K. Matsui, S. Patel, N. Sanderson, C.C. Sun, N.K. Thakral, M. Yamane, L. Zöller, Harmonizing biopredictive methodologies through Product Quality Research Institute (PQRI) Consortium Part I: Biopredictive dissolution of ibuprofen and dipyridamole tablets, *AAPS J.*, (2023)
- W.M. Awad, D.W. Davies, D. Kitagawa, J.M. Halabi, M.B. Al-Handawi, I. Tahir, F. Tong, G. Campillo-Alvarado, A.G. Shtukenberg, T. Alkhidir, Y. Hagiwara, M. Almehairbi, L. Lan, S. Hasebe, D.P. Karothu, S. Mohamed,* H. Koshima,* S. Kobatake,* Y. Diao,* R. Chandrasekar,* H. Zhang,* C.C. Sun,* C. Bardeen,* R.O. Al-Kaysi,* B. Khar,* P. Naumov*, Mechanical Properties and Peculiarities of Molecular Crystals, *Chem. Soc. Rev.*, 52:3098-3169 (2023),
- R.N. Elsergany, G. Vreeman, and C.C. Sun*. An approach for predicting true density of powders based on in-die compression data, *Int. J. Pharm.*, 635: 122694 (2023)
- M. Goldenberg *, G. Vreeman, D.J. Sun, M. Moffit, M. Li, M. Zernik, S. Ahuja, Y. Kim, D. Semin, and C.C. Sun*. A material-sparing simplified buoyancy method for determining the true density of solids, *Int. J. Pharm.*, 635:122694, (2023)
- S. Chatteraj and C.C. Sun*. Structural origin of anisotropic thermal expansion of molecular crystals and implication on the density rule probed with four ROY polymorphs, *Crystals*, 13:270 (2023)
- C.C. Sun* and R.N. Davé, Crystal and particle engineering – an indispensable tool for developing and manufacturing quality pharmaceutical products, *Pharm. Res.*, editorial, 39:3041–3045, (2023)
- C.A. Gunawardana, A. Kong, D. Blackwood, C.T. Powell, J. F. Krzyzaniak, M. Thomas, C.C. Sun*, Quantifying magnesium stearate surface coverage of tablets and crystals using SEM-EDS, *Int. J. Pharm.*, 630:122422, (2023)
- P. Chakravarty, A. Dash, E. Shalaev, C.C. Sun, G.G.Z. Zhang, S. Thakral*, Professor Raj Suryanarayanan: Scientist, Educator, Mentor, Family Man and Giant in Pharmaceutical Research, *J. Pharm. Sci.*, 112:2-7 (2023), editorial
- S. Song, C. Wang, B. Zhang, C.C. Sun, T.P. Lodge, and R.A. Siegel*, A rheological approach for predicting physical stability of amorphous solid dispersions, *J. Pharm. Sci.*, 112:204-212 (2023)
- C. Wang and C.C. Sun*. A critical examination of three-point bending for determining Young's modulus, *Int. J. Pharm.*, 629:122409, (2022)



Recent Publications

Publications: Dr. Raj Suryanarayanan

J. Sonje, C.F. Chisholm, R. Suryanarayanan, Frozen storage of proteins: Use of mannitol to generate a homogenous freeze-concentrate. *Int J Pharm*, 121995 (2023).

S. Thakral, J. Sonje, B. Munjal, B. Bhatnagar, R. Suryanarayanan, Mannitol as an excipient for lyophilized injectable formulations. *J Pharm Sci*, 112(1), 19-35 (2023).

R. Lalge, N.S.K. Kumar, R. Suryanarayanan, Implications of Drug-Polymer Interactions on Time-Temperature-Transformation: A Tool to Assess the Crystallization Propensity in Amorphous Solid Dispersions. *Mol Pharm*, 20(3), 1806-1817 (2023).

B. Munjal, K. DeBoyace, F. Cao, J.F. Krzyzaniak, K. K. Arora, R. Suryanarayanan, Drug phase transformation and water redistribution during continuous tablet manufacturing: A case study of carbamazepine dihydrate. *Mol Pharm*, 20(3), 3427-3437 (2023).

J. Sonje, S. Thakral, S. Kruege, R. Suryanarayanan,, Enabling Efficient Design of Biological Formulations Through Advanced Characterization. *Pharm Res*, 40 1459-1477 (2023).

R. Lalge, N.S.K. Kumar, R. Suryanarayanan, Understanding the effect of nucleation in amorphous solid dispersions through time-temperature transformation. *Mol Pharm*, 20(8), 4196-4209 (2023).

J. Li, J. Sonje, R. Suryanarayanan, Role of poloxamer 188 in preventing ice-surface-induced protein destabilization during freeze-thawing. *Mol Pharm*, 20(9), 4587-4906 (2023).

Y. Du, J. Li, W. Xu, A. Cote, A. Lay-Fortenbery, R. Suryanarayanan, Y. Su, Solid-State NMR spectroscopy to probe state and phase transitions in frozen solutions. *Mol Pharm*, 20(12), 6380-6390 (2023).

A. Ukidve, K. B. Rembert, R. Vanipenta, P. Dorion, P. Lafarguette, T. McCoy, A. Saluja, R. Suryanarayanan, S. Patke (2023). Succinate Buffer in Biologics Products: Real-world Formulation Considerations, Processing Risks and Mitigation Strategies. *J Pharm Sci*, 112(1), 138-147 (2023).

