

University of Milwaukee-Wisconsin

CHEM / BIOCHEM



Innovation
Takes Shape:
Chemistry Building in its
Final Stages of
Construction, Plans for
Old Chemistry Building
Unveiled
Pg. 15

Kahler Slater | CANNONDESIGN

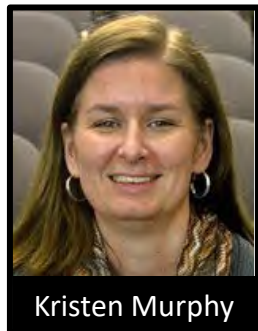
Fall 2023

CHEM / BIOCHEM

Newsletter for Alumni and Friends

Fall 2023

From the Chair's Desk



Kristen Murphy

Greetings to you all!

Another highly productive fall semester is coming to a close. It is such a joy to be part of this department and have the opportunity to work with so many talented people. There have been many exciting events and activities this past semester. We started with the Milwaukee Analytical Chemistry Conference that with the MIDD Conference and our Sosnovsky lecture series has become a cornerstone of our research conferences and an excellent opportunity to interact with industrial and academic partners and pillars in the field. We then held our first campus welcome event in coordination with the other Natural Science Department. We

invited all first-year students to this event, which included tours of key facilities and conversations with faculty, staff and students. We also welcomed to our Department family new graduate students and many new undergraduate students – with enrollment up compared to our previous fall.

This fall was a wonderful time to honor so many accomplishments by our faculty and staff. Distinguished Professor Emeritus Dave Petering joined Professor Emeritus Dennis Bennett (2022 awardee) earning the Ernest Spaghts Plaza Award. Professor Kristene Surerus earned the Faculty Distinguished University Service Award. Dr. Holger Foersterling, Director of our NMR Laboratory, earned the Academic Staff Outstanding Performance and Service Award. Professor Leggy Arnold was recognized as one of UWM's International Advocates.

We also wish Professor Joe Aldstadt farewell and best wishes on his next chapter as he retired at the end of summer. Joe has been so much more than just our Chair and colleague; he has been our friend. From his enthusiasm and unending energy for the undergraduate program (including mentoring so many undergraduate researchers) to his passion for his work and service to our department, he will be dearly missed.

The new building is almost complete! We are thrilled that we have a tentative construction completion date of mid-March with a start for move in coming at the conclusion of the spring semester. The activities surrounding the new building have only increased with the planning for new equipment purchases; moving, consolidation or removal of old; and planning for moving of research and teaching as well as the planning for the demolition of the old building. This could never have been accomplished without the current tireless team working on this: Leggy Arnold, Kevin Blackburn, and Nick Silvaggi. A special shout-out to Kevin for his immense effort on coordination the new equipment purchases.

As always, plans are underway for spring events championing the many accomplishments of the Department including the Annual Awards Day and Research Symposium (May 3rd and 4th). More details are regularly updated on our website. You are cordially invited to attend and hear more about the vibrant research and activities of the Department.

Thank you for being part of the Department family and your continued support of our mission!

All my best,

Welcome New Faculty & Staff



We are happy to announce that **Dr. Quint Owen** has joined UWM as Teaching Faculty for CHEM 100 in the Fall of 2023. Dr. Owen completed his PhD in the Spring of 2023 under Prof. Woehl's research group. Quint's research dealt with tracking nanoscale particles too small to be seen with standard confocal microscopy, and so he created microfluidic devices made of patterned metal layers on glass to confine these nanoparticles to very thin regions of observation via fluorescence. Dr. Owen is excited to begin working as a senior R&D chemist at Ellsworth Adhesives, here in Milwaukee this Spring. During his free-time, he enjoys being a loving father to his newborn daughter.

We are pleased to announce that **Dr. Omid Akbarzadeh Pivezhzani** has joined UWM Chemistry & Biochemistry as a Visiting Research Scholar/Teaching Staff in the summer of 2023. Dr. Omid holds a PhD in chemical engineering from the University Technology PERONAS, which he obtained in early 2017, and completed his postdoctoral research at the University of Malaya in Malaysia. He also has experience as a visiting researcher at Hokkaido University in Japan and Yancheng Institute of Technology in China, as well as an R&D and Technical Manager in the industry. His research expertise is in catalysis, where he aims to synthesize nanocatalysts that can transform greenhouse gases into green energy and value-added products, thereby contributing to the mitigation of global warming. He is eager to expand his knowledge and make a positive impact on science and society.



Dr. Shilpa Sharma has recently joined UWM as a postdoctoral fellow in Dr. Arjun Saha's lab. She obtained her graduate degree from the Indian Institute of Technology Delhi, India, with a focus on understanding the aggregation mechanism of Superoxide Dismutase 1 (SOD1) using computational and experimental methods. Currently, her work involves developing a computational framework to decipher protein-protein interactions relevant to various human diseases and creating inhibitor compounds to modulate these interactions. Shilpa is enthusiastic about the opportunities at UWM, where she looks forward to gaining new professional and personal experiences.



SAVE THE DATE

Mark your calendars for the Department's Annual Awards Day and Research Symposium. It will take place May 3rd and 4th of 2024. Learn more about our annual event here: <https://uwm.edu/chemistry/outreach/annual-research-symposium/>

Happy Retirement to Prof. Joseph Aldstadt



Prof. Joseph H. Aldstadt III retired from the Chemistry and Biochemistry Department at the end of the 2023 Spring semester after 25 years of service to the University. Before Prof. Aldstadt joined the Chemistry Department in 1998, he worked for Argonne National Laboratory for 5 years in Illinois.

Prof. Aldstadt had a passion for teaching and research where he mentored countless students. Prof. Aldstadt served as Department Chair from 2019 to 2023, guiding the department through the COVID-19 pandemic and the design and construction phases of the new Chemistry building. Joe's presence in the department will be missed.

Residing in Madison, Prof. Aldstadt's retirement plans include travel, backpacking and perhaps come consulting and/or volunteering.

2023 Welcome Picnic

Our annual Welcome Picnic was held on August 31st at Lake Park. After nearly 2 weeks of orientation and testing for our new graduate students, this gathering is a wonderful, if not necessary, respite for students, faculty, family, friends, and pets to gather, get to know one another, and relax before the chaos of the semester beings. We couldn't have asked for better weather and a better team to bring this event to fruition. Let's thank Kevin Blackburn, Neal Korfhage, and Prof. Silvaggi for taking on grilling duties, our graduate student council for planning the event, (Ethan Kowalczyk, Franca Ohikhuare, Justice Mallen, Michelle Meyer, Morteza Panahzadeh Khanmiri, Mujidat Shittu, Nazmul Hasan, Shampa Sharmin, Stephen Nkwocha, and Towheed Rahman) and everyone who brought food and/or attended!



New Graduate Student Welcome

We are happy to welcome 11 new graduate students for this academic year. Wasiu Awoyera, Maya Fernando, Reuben Fortier, Sujan Kundu (not featured), Diane Meister, Najibehsadat Mirhosseinian (not featured), Kimberly Osborn, Madeline Rickert, Mubaraq Toriola (not featured), Aliu Waheed, and Tori Williamson. We're excited to have them join our Chemistry & Biochemistry Department and look forward to the contributions to the Department as well as research and discoveries they will make during their studies.



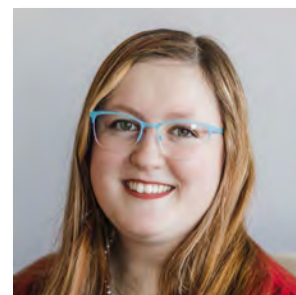
Maya Fernando received her BS in Biochemistry at Winona State University in Winona, Minnesota. In undergrad she worked on a project investigating metabolites of some tricyclic antidepressants, as well as developing a teaching lab for undergraduate biochemistry students. Maya is interested in organic synthesis and hopes to work on drug discovery research while at UWM. She is excited to meet new people and gain valuable knowledge and skills that she can use in her future career.

Reuben Fortier received a BS in Psychology from University of Wisconsin-Madison, a BS in Biochemistry and a B.A. in Computer Science at the University of Wisconsin-Milwaukee. He is interested in computational chemistry methodologies including virtual screening, molecular dynamics, and machine learning. Reuben has expertise in protein ligand docking, programming, Linux, databases, and systems integration. He will be developing and evaluating deep learning architectures to predict protein ligand binding interactions and guide drug discovery. Reuben is looking forward to working in the new chemistry building and collaborating with other research groups.



Kimberly Osborn received her BS in biochemistry from University of Wisconsin-Milwaukee in the spring of 2023. As a PhD student, she will continue the biochemistry research she began as an undergraduate. Kim will also be incorporating analytical chemistry and instrumentation techniques into her PhD project, which will involve metabolomics. She's excited to get started and has much to learn!

Tori Clare Williamson received her BS in Chemistry and Math at the University of Nebraska at Omaha. Tori has done research in the past for Chemical Education. She has explored the connections of math and chemistry as well as introducing instrumentation into lower-level chemistry labs. She would like to continue this research within the groups here at UWM. Tori looks forward to participating in Chemical Education research and better understand how teaching chemistry can be improved and built upon to further student success.

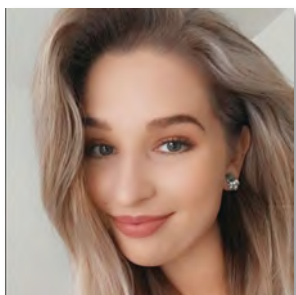


New Graduate Student Welcome



Aliu Waheed received his Certificate in Education (NCE) at the Federal College of Education in Oyo, Nigeria in Special Education/Chemistry and a B.Tech in Pure and Applied Chemistry at Ladoke Akintola University of Technology in Ogbomoso, Nigeria. Aliu will be working on Organic Synthesis and Characterization, Polymer Synthesis and Characterization, Nanomaterials Synthesis, Functional and Characterization, Sensor Fabrication and Characterization, Actuator fabrication and Characterization. He is looking forward to working at the MS laboratory.

Madeline Rickert received her BS in biochemistry at UWM. Her areas of interest and expertise are organic chemistry and biochemistry. Madeline will likely be working on projects involving organic synthesis in the field of medicinal chemistry. Overall, she is looking forward to being able to work towards her PhD in the lab spaces of the new chemistry building!



Diane Meister received her BS at Marian University. She double majored in chemistry and biology. Diane is very interested in medicinal chemistry, organic synthesis, and biochemistry and would like to be able to apply her knowledge of both chemistry and biology in research. While attending UWM, Diane will have the option of researching a variety of projects. This includes looking at the effects of manipulating drugs, investigating helicases of SARS-CoV-2 and West Nile virus, and bacterial breakdown of PFAS. Diane is looking forward to working on the manipulation of drugs to aid those who are living with neurodegenerative diseases and cancers.

Awoyera Wasiu Olaniyi received his B Sc. at Adekunle Ajasin University in Ondo, Akungba, Nigeria. Wasiu chose University of Wisconsin Milwaukee because of the outstanding records of the chemistry and biochemistry department, and my fascination with the school is due to the innovative research carried out by its faculty members, modern research facilities such as the analytical instrumentation lab. The opportunity to study at the UMW will enable Wasiu to work with the world's leading scientists who are dedicated to bridging knowledge gaps and solving real-life challenges coupled with the academic and professional success of alumni of UWM.



Undergraduate Student Spotlight

Molly Drosen is a senior undergraduate student majoring in biochemistry. Since December of 2022, Molly has been conducting research on the development of a mouse model in myalgic encephalomyelitis or chronic fatigue syndrome (ME/CFS). ME/CFS is a chronic inflammatory disease, which is characterized by severe muscle fatigue, pain, dizziness, and cognitive impairment. One of the cardinal symptoms of ME/CFS is post-exertional malaise (PEM), which is manifested by severe fatigue and pain immediately after treadmill exercise. However, the molecular mechanism of PEM is yet to be known. This research is conducted in collaboration with [Simmaron Research](#), a non-profit company with [research facilities located at the UWM Chemistry and Biochemistry building](#). Simmaron Research has been awarded an NIH grant to study the role of an early autophagy protein named ATG13 in the pathogenesis of PEM. Molly has been investigating if the metabolic impairment of ATG13 plays a critical role in the development of PEM in mice. As a part of her research objective, Molly has developed a transgenic mouse model in which the ATG13 gene is conditionally knocked out in the skeletal muscle tissue and as a result animals are showing PEM pathologies after treadmill exercise. For this purpose, Molly is conducting rt-PCR experiments to phenotype young mice for the



Molly Drosen is conducting rt-PCR experiments to phenotype mice.

absence of the ATG13 gene. Molly's groundbreaking research was accepted for the poster presentation at the annual meeting of the International Association of Chronic Fatigue Syndrome, which was held at Stony Brook University, NY in July of 2023. The goal of her research is to understand the molecular mechanism of ME/CFS.



Molly Drosen is conducting treadmill exercises with mice.

Molly is a very driven student and is making great progress in the development of a first-of-its-kind mouse model for ME/CFS. After conditionally knocking down the ATG13 gene, she evaluates mice on a treadmill followed by monitoring the post-exertional fatigue by recording muscle waves and open-field gross movement. Therefore, she is working in the AAALAC accredited UWM animal facility and strictly complies with all elements of the institutional program in the care and use of animals as described by the "Guide for the Care and Use of Laboratory Animals" (National Research Council).

"I took organic chemistry 1 and 2 with Professor Schwabacher, and I found it fascinating. The class sparked my interest in pharmacology", Ms. Drosen said. She is planning to attend Physician Assistant school next year and is looking forward to completing her research at UWM. "Working with animals has been an amazing experience as they are very similar to humans in many ways. Thus, I'm very grateful that Drs. Roy and Arnold enabled me to gain such an interesting and valuable research experience", Ms. Drosen concluded.

Graduate Student Spotlight

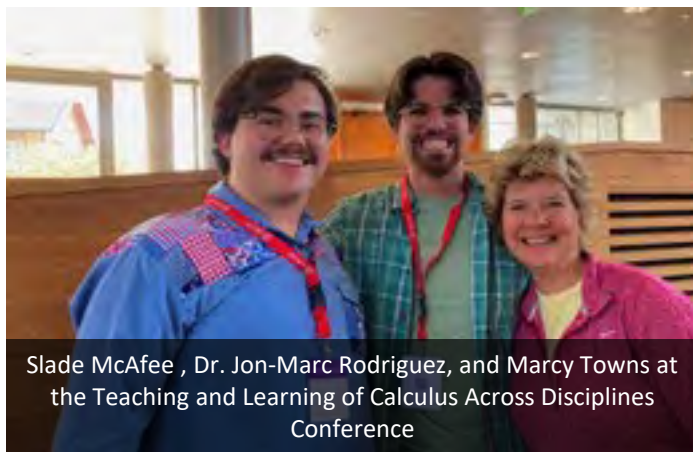


Slade McAfee at Graduate Seminar

Slade McAfee is a second-year chemistry education PhD student working under the supervision of Dr. Jon-Marc Rodriguez. Slade is interested in interdisciplinary work and seeks to keep that at the forefront of his research. His first project in graduate school focused on analyzing academic integrity statements in chemistry course syllabi. This work is currently under review as an article in the ACS journal, *Journal of Chemical Education* and he had the chance to present this work at the virtual X-DBER Conference last spring. Slade also attended the Research in Undergraduate Mathematics Education Conference in Omaha, Nebraska and will return this upcoming spring to present his own work. The project he is presenting focuses on mapping calculus skills and concepts to chemistry curriculum to outline the mathematics used in each chemistry course across the undergraduate

curriculum. Over the summer, he traveled to Bergen, Norway to attend The Teaching and Learning of Calculus Across Disciplines Conference. At this conference, he had the opportunity to interact with discipline-based education researchers across the world. This conference inspired an international collaboration that's purpose is to develop an intervention for calculus students utilizing kinetics as an applied science context for understanding derivatives and rates of change. Outside of mathematics, Slade is also interested in how students in science courses develop identities as scientists and has developed and submitted a proposal to the NSF Graduate Research Fellowship Program that seeks to quantitatively measure the development of students' science identity throughout the general chemistry sequence.

Slade hopes to become a chemistry professor after graduate school and continue conducting interdisciplinary research. The University of Wisconsin – Milwaukee has been a great place for him to develop the necessary skills to succeed.



Slade McAfee, Dr. Jon-Marc Rodriguez, and Marcy Towns at the Teaching and Learning of Calculus Across Disciplines Conference



Bergen, Norway (photo credit: Slade McAfee)

Support for Undergraduate Research Fellows (SURF)

The Department of Chemistry & Biochemistry continues the longstanding tradition of mentoring SURF students. The SURF program is made possible by the Office of Undergraduate Research and is designed to foster faculty-student research collaborations. Students have the opportunity to engage in thoughtful and progressively sophisticated work central to the overall research program of the principal investigator.



As a pre-veterinary student pursuing a degree in biology, **Mary Felli's** academic journey took a significant turn during the spring of 2023. Nurul, who served as the TA for Mary's organic chemistry lab, sparked her interest in the subject. This newfound passion opened doors for Mary, leading to a rewarding opportunity to volunteer in Dr. Peng's lab over the summer. Since the summer, Mary's involvement in Dr. Peng's lab has been a transformative experience. Mary also had the honor of receiving the SURF award this fall. This journey has not only deepened her comprehension of research and chemistry, but it has also equipped her with invaluable skills and knowledge that she

wholeheartedly believes will shape her future educational and career pursuits. Mary is sincerely grateful for the guidance and inspiration she's received, and her heartfelt aspiration is to continue contributing to the impactful work in Dr. Peng's lab for the entirety of her time at UWM.

Jatin Pandey is currently studying Neuroscience and Biology with a minor in chemistry and is a SURF student with Dr. Peng for the Summer and Fall of 2023. Jatin's research topic is combination therapies to induce synergistic effects between ROS generating agents and anti-cancer compounds. The goal is to determine the optimum concentration of both ROS enhancer and anticancer compounds to generate the maximum synergistic effect to kill the cancer cell. It is an innovative idea to generate ROS in cancer cells and make anticancer compounds more effective and diverse in cell lines that lack ROS.

Jatin is currently assisting Taufeeque in Dr. Peng's lab. Jatin's future plans are to pursue medicine and wants research to be the steppingstone for future goals.

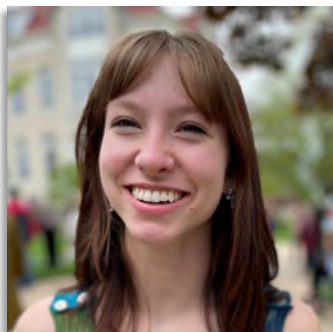


Grace Feucht is an undergraduate student studying biomedical science with a chemistry and biology minor with a certificate in forensic science and is a SURF student for Dr. Shama Mirza for the Fall of 2023. Prior to working with Dr. Mirza, Grace worked in the neuroscience department in Dr. James Moyer's lab about learning and memory. In Mirza's lab, Grace is working with graduate student Franca Ohikhuare on differential protein expression analysis in human glioblastoma using mass spectrometry-based proteomics. Grace currently has plans to go into forensic science, preferably toxicology or DNA analysis.

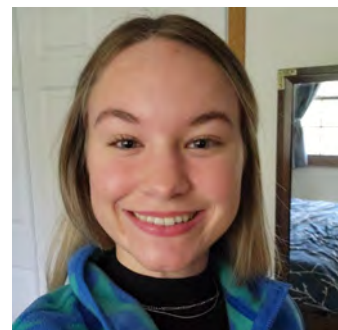
Julia Jakusza is studying biomedical sciences with an emphasis in Medical Laboratory Sciences and Pre-Med minoring in Spanish and Biology that has been a SURF student in Dr. Peng's lab since the Summer of 2023. Julia has been working with Nurul in the lab doing research for DNA cross-linking and organic synthesis. Julia plans on going to Graduate school before going to Medical school and hope to continue research with Dr. Peng for the rest of their time here.



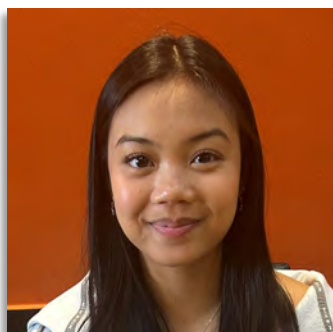
Support for Undergraduate Research Fellows (SURF)



Kali Quade is an undergraduate student pursuing a degree in Biochemistry. Her drug discovery research in the Arnold Group has piqued her interest because it mixes biology with chemistry, her two favorite subjects. Withing the lab, Kali is culturing mammalian cells and performs a viability assay to determine the toxicity of novel drug candidates synthesized by other members of the Arnold Group. Kali is also performing behavioral studies with mice to estimate if new drug candidates have any adverse CNS effects. Kali's is planning to continue her learning as a graduate student in the future.



Alexis Peterson is a senior majoring in Biomedical Sciences with a sub-major in Medical Laboratory Sciences. Alexis is also pursuing an Honors degree. She began her involvement in undergraduate research in 2022 under the guidance of Dr. Xiaohua Peng and Taufeeque Ali in the Biochemistry department. Her research was first focused on multiple nitrogen mustard prodrugs activated by reactive-oxygen species (ROS). These prodrugs were synthesized by Peng's lab to combat triple-negative breast cancer (TNBC) and are further being expanded upon. Alexis is currently beginning a new project involving cytotoxicity of various natural drugs on normal and cancer cell lines, and ROS' involvement in these cellular mechanisms. Alexis is debating pursuing a master's degree involving biochemistry but is also working towards becoming certified in medical



Amy Reyes is an undergraduate student majoring in biology and minoring in chemistry. She added the chemistry minor after taking an introductory course in organic chemistry. Recently, she finished a research internship with Prof. Paliwal, where she synthesized a plant-based sunscreen. That project introduced her to the world of drug discovery and brought her to the Arnold group. Amy is currently working with Profs. Arnold and Roy on developing new drug candidates for triple negative breast cancer. She is contemplating whether she wants to attend optometry school or pursue a PhD degree.

Taif Al-Dulaimi is an undergraduate student majoring in biochemistry. She is a pre- pharmacy student and hopes to attend pharmacy school in the future. Taif is very interested in chemistry and biology and how it is related to drug discovery and development. She is part of Dr. Arnold's research group and performing sensorimotor study with mice. Taif has been working together with graduate student Michelle Meyer and has become very independent to conduct these studies to evaluate new drug candidates synthesized by the other members of the Arnold Group. Taif received the best poster presentation price at the Milwaukee Analytical Chemistry Conference (MACC) in September this year.

Joseph Parlier, a sophomore in the Chemistry honors program, received a SURF award this past summer to study the protein truncated hemoglobin N, which helps the pathogen *Mycobacterium tuberculosis* evade the human immune system by converting toxic nitric oxide, generated by macrophages to destroy pathogens, into the relatively harmless nitrate. Mr. Parlier was mentored by graduate student Shabnam Marium of the Pacheco research group, and by the end of the summer, he had purified and characterized a novel variant of the protein.

Support for Undergraduate Research Fellows (SURF)

Riley Lueck is a senior chemistry major who has been involved in two projects with Dr. Dietz as a SURF student since the Summer of 2023. During the past summer, Riley worked to develop an experiment for the CHEM 221 course in which an ion selective electrode is used to measure the calcium content of dietary supplement tablets. This semester, he is assisting graduate student Chris Harris in applying so-called "distillable ionic liquids" to the determination of volatile organic compounds in water. The latter project aligns well with Riley's career goals, which involve working as a chemist for a company focused on environmental analysis and remediation.

Undergraduate Degrees Conferred Spring 2023

Biochemistry Majors

🎓 Reuben Fortier	🎓 Juan Garcia	🎓 Ahmad Masoud	🎓 Hermala Solomon
🎓 Kimberly Osborn	🎓 Grace Geiger	🎓 Afnan Khatib	🎓 Madeline Rickert
🎓 Payton Teduits	🎓 Molly Kiley	🎓 Daniel Janssen	

Chemistry Majors

🎓 Abdullah Rauf	🎓 Seth Krebs	🎓 Brenden Chasteen
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Chemistry Minors

🎓 Amira Hasan	🎓 Mckenna Anderson	🎓 Benjamin Cisneros	🎓 Meghan Jagdfeld
🎓 Amber Hammernik	🎓 Noah Bue	🎓 Vanessa Maciel	🎓 Jamison Trewyn
🎓 Marian Mercado	🎓 Laila Sabha	🎓 Noah Pison	🎓 Michaela Englund
🎓 Ariyaporn Akarasriwat	🎓 Noelani Vargas	🎓 Madisyn Neph	🎓 Dhivyashree Senthil Murugan
🎓 Nou Thao	🎓 Rutu Kumbhani	🎓 Fadesewa Adebola	🎓 Kaitlyn Rhyner
🎓 Jordyn Zalewski	🎓 Rania Al-Zubeidi	🎓 Emma Gingras	
🎓 Melissa Vang	🎓 Steven Schomisch		

Graduate Degrees Conferred in Spring 2023



DISSERTATION TITLE: Impact of the Pre-a Motif on Truncated Hemoglobin N Activity

Alex Drena completed his dissertation in the spring of 2023 under the supervision of Prof. Andy Pacheco. Alex's research focused on understanding the structure-function relationship of the protein truncated hemoglobin N, found in *Mycobacterium tuberculosis*. A series of kinetics studies highlighted the importance of a unique terminal motif during reduction of the heme cofactor. During his time at UWM, Alex volunteered for a number of events, such as the Wisconsin Science Olympiad, served on the graduate student council, and received

an award as a teaching assistant. Alex is currently a postdoctoral fellow at Northwestern University in the lab of Prof. Brian Hoffman, where he utilizes EPR and advanced EPR techniques to study metalloenzymes and their synthetic analogues

DISSERTATION TITLE: Utilizing Fluorescent Nanoscale Particles to Create a Map of the Electric Double Layer

Quintus Owen received his PhD degree in Physical Chemistry at UWM in Spring of 2023 as part of Prof. Jorg Woehl's research group. During his graduate studies, Quint's research dealt with tracking nanoscale particles too small to be seen with standard confocal microscopy, and so he created microfluidic devices made of patterned metal layers on glass to confine these nanoparticles to very thin regions of observation via fluorescence. By activating specifically placed electrodes, he was able to directly observe the effects of electric fields on nanoparticle movement and categorize how their movements matched (or didn't match) the established theories of Brownian Motion and the Electric Double Layer. His research found that when based within finite and limited systems in non-equilibrium states, the establishment of the Electric Double Layer occurs on timescales much longer than initially anticipated. Having served as a Teaching Assistant for many years, including earning the 2020 award for Outstanding Teaching Assistant, Quint has now joined the UWM Chemistry faculty as a Chem 100 instructor for the Fall semester. In the Spring, he is excited to begin working as a senior R&D chemist at Ellsworth Adhesives, here in Milwaukee. During his free-time, Quint enjoys being a loving father to his newborn daughter.



Graduate Degrees Conferred in Spring 2023



DISSERTATION TITLE: The Search for the Four-electron Reduced Intermediate in the Cytochrome c Nitrite Reductase (ccNIR) - Catalyzed Reduction of Nitrite

Victoria Mandella completed her dissertation in Bioinorganic Chemistry in the Spring of 2023 under the supervision of Professor Andy Pacheco. Victoria's research focused on studying the possible side products and putative intermediates formed during the ccNIR-catalyzed reduction of nitrite to ammonium in the presence of weak reductants. Before attending graduate school at UWM, Victoria received her BS in Chemistry at UWM in Spring 2017,

where she completed two years of undergraduate research under the supervision of Professor Mark Dietz. During this time, she received funding through SURF, leading to two publications. She is now working as an Analytical Development Scientist at Arrowhead Pharmaceuticals in Madison, WI. Victoria's duties include, but are not limited to method development, testing, and validation.

DISSERTATION TITLE: Part I Enantiospecific Total Synthesis of Unnatural Enantiomers of C-19 Methylated Sarpagine/Macroline/Ajmaline-Type Biologically Active Indole Alkaloids via the Pictet-Spengler Reaction/Dieckmann Cyclization Process. Part II Design, Synthesis, and Characterization of Novel Gamma-Aminobutyric Acid Type A (GABAA) Receptor Ligands for the Treatment of Neurological Disorders Including Epilepsy, Depression, anxiety, pain, and the synthesis of back up compounds for the clinically progressing KRM-II-81 for the treatment of pharmaco-resistant epilepsy and Dravet syndrome.



Kamal Prasad Prandey completed his PhD dissertation in organic chemistry under the supervision of distinguished Prof. James M. Cook in the Spring of 2023. Before joining UWM, he earned a bachelor's and master's degree in chemistry from the Tribhuvan University, Nepal. During his graduate studies at UWM, he worked in the enantiospecific total synthesis of unnatural indole alkaloids. Moreover, he designed and synthesized many imidazodiazepine type compounds. One of the compounds he made was found to be impressively fully potent in the therapy (Lamotrigine)-resistant seizure model, non-convulsive status epilepticus model, and more importantly with minimal or no-behavioral (side) effects in rodents even at high dose. From his research work, 12 articles (including 3 first authored articles) were published in various journals, and few more publications are anticipated. He participated and presented his research work in more than 10 conferences (including 3 ACS national conferences). Kamal received several awards to recognize his academic excellence and outstanding instructional skills including chemistry & biochemistry department outstanding teaching assistant award in 2018, UWM chancellor award from 2017 to 2021, UWM graduate student travel award in 2018 and 2022, and chemistry & biochemistry department TA mentorship travel award in 2022. He is currently working as a Senior Scientist in the research and development department at DuPont company.

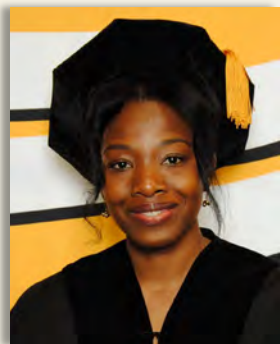
Graduate Degrees Conferred in Spring 2023

Thesis Title: Structure-Function Studies of Nitrate Reductase Enzymes

Nicholas Britt completed work for his MS degree in Inorganic Chemistry in May 2023 under the guidance of Dr. Jarett Wilcoxon. Nick's research focused on determining the structure and function of nitrate reductase enzymes Periplasmic Nitrate Reductase A (NapA) and Assimilatory Nitrate Reductase B (NarB), two molybdenum-based enzymes. Following graduation, Nick has continued to further his education by pursuing a PhD in Inorganic Chemistry at Northwestern University starting Fall 2023.



Graduate Degrees Conferred in Summer 2023



Dissertation Title: Implementation of reading interventions in introductory chemistry and its impact on Student Performance

Fatoumata Diawara (Fatou) proudly received her PhD in the summer of 2023. During her time at UWM, she engaged in impactful research in Chemical Education under the supervision of Dr. Anja Blecking.

Fatou's doctoral study investigated the impact of online pre-instruction reading assignments on student learning in introductory chemistry, as measured by student performance on a two-part final course examination. Fatou focused on

supporting students with lower reading abilities and designed reading interventions drawn from educational learning theories, instructional strategies, and delivery methods known to be effective for lower performers. Fatou's scholarly accomplishments emphasize her commitment to advancing educational practices and ensuring inclusivity within the learning environment. She is looking forward to starting a career in teaching in the near future, but for now, she is enjoying traveling and spending time with her family.

Calling All Alumni: Help Build Lasting Memories as Our New Chemistry Building Takes Shape



In an exciting development for UWM, plans have been unveiled to demolish the current Chemistry building on campus, paving the way for an expansive green space and much needed upgraded facilities for the soccer field. As we part with our iconic Chemistry building, we invite alumni to share their cherished memories of the old Chemistry building, reflecting on its rich history and the role it played in their collegiate experience.

As the old Chemistry building fades into the past, we invite alumni to join us in celebrating its legacy by sharing their favorite memories of this historic structure. Whether it be unforgettable experiments in your CHEM 102 lab or memorable encounters with professors, we want to hear your stories. Your reflections will serve as a testament to the Chemistry Department's progress throughout the years and a reminder of Department's roots.

To share your memories, please visit the following link: <https://uwm.edu/chemistry/share-your-memory/>. We encourage alumni to include any photographs they may have, adding a visual element to their stories.

Select memories and photographs will be featured in our upcoming Spring 2024 Newsletter,

preserving the legacy of the old Chemistry building for future generations to appreciate. By contributing your memories, you play an integral role in capturing the essence of this historical structure and its place in the Department's history. Please check back for dates of our Grand Opening Ceremony of the new Chemistry Building. The new Chemistry building will not only enhance the educational experience for our students but will embody the spirit of innovation, collaboration, and excellence that our alumni have instilled within our academic community.

Together, we will continue to shape the future of the UWM Chemistry & Biochemistry Department, nurturing the potential of each student and embracing the evolving needs of our community. We thank you for your unwavering support and look forward to welcoming you back to campus!

Share Your Memories of the
Old Chemistry Building in
the Link Below!

[https://uwm.edu/chemistry
/share-your-memory/](https://uwm.edu/chemistry/share-your-memory/)

Prof. Kristen Murphy Chosen as 2023 ACS Fellow



indicates a senior membership level, signifying that the individual has attained a particular status within the profession. For others, such as the American Physical Society, the designation indicates that the individual has been recognized by his or her peers for significant contributions to the science.

The ACS Fellows Program, however, uniquely recognizes a different standard of achievement and service. Specifically, the Fellow of the American Chemical Society (ACSF) designation is awarded to a member who, in some capacity, has made exceptional contributions to the science or profession and has provided excellent volunteer service to the ACS community.

On Monday, August 14th, **Prof. Kristen Murphy** was inducted into the 2023 class of American Chemical Society (ACS) Fellows. She was one of 42 in this class joining over 1300 total out of a total membership in the society of over 170,000 (American Chemical Society names ACS Fellows for 2023 - American Chemical Society). ACS is the largest professional society of scientists worldwide learning experiences. The ACS Fellows program was created in 2008 with the purpose to recognize and honor members of the American Chemical Society for their outstanding achievements in and contributions to the science **and** the profession and for their equally exemplary service to the Society.

Prof. Murphy was recognized through the Division of Chemical Education for “research that advances methods of quantifying the nature of testing chemistry as a form of assessing student learning and aligning curricular goals with measurable assessment tools and leadership of the ACS Examinations Institute and the rapid development of remote deliverable assessment tools in response to the emergency pivot to online courses required due to the pandemic.”

Although the Fellow designation has been adopted by many professional societies, the criteria for awarding this designation vary significantly from society to society. For some, such as the Royal Society of Chemistry, the Fellow designation

This is a once in a lifetime achievement so let's all congratulate Prof. Kristen Murphy.



Reference: [Program Announcement](#) in the January 19, 2009 issue of *C&EN*.)

Reference: [2023 ACS Fellows](#)



Professor Shama Mirza (Chemistry and Biochemistry) received a \$538,699 Major Research Instrumentation (MRI) grant from the National Science Foundation (NSF) for the acquisition of a high-throughput, high-resolution orbitrap mass spectrometer to enable multidisciplinary research and education in Southeast Wisconsin. The award is made to the University of Wisconsin-Milwaukee (UWM) to acquire a ThermoFisher Scientific Orbitrap Exploris 240-Mass Spectrometer (OE-MS). This new MS instrument enhances the core analytical infrastructure at UWM creating new research and

learning experiences. The OE-MS will have cross-cutting academic and commercial impacts in advancing a wide range of collaborative and translational research. This will be the new addition to the existing state-of-the-art mass spectrometry facility in the department of chemistry and biochemistry at UWM. It is centrally located in the Kenwood IRC building and available for research, teaching and core services for users as needed. "This is one of the most powerful analytical tools for compound characterization of wide array of analytes," Dr. Mirza said.

The OE-MS instrumentation will enable a diverse cadre of early-career and senior researchers at the UWM and regional universities to perform advanced proteomics, metabolomics, and high-resolution mass spectrometry analysis. The instrument will be used for the comprehensive characterization of small compounds like organic molecules and metabolites as well as large molecules like proteins, peptides and oligonucleotides with a high degree of precision and accuracy. Professors Mark McBride and Madhusudan Dey from biological sciences serve as Co-PIs on the grant for biological research projects. In addition, this instrument will advance the cross-disciplinary research pursued by scientific teams at the UWM and other local academic and industrial institutions in the fields of biochemistry, microbiology, neurochemistry, environmental chemistry, and biomaterial engineering to name a few. UWM's MS facility has a strong record of industrial collaborations, which will be expanded with this new addition.

Natural Science Welcome Event

On Friday, September 22nd, the Chemistry Department hosted a welcome event for all new and returning students in the Kenwood Interdisciplinary Research Center. Tables of various Natural Sciences were available for students to attend to discuss research opportunities, career opportunities, majoring within each natural science discipline, and much more!

Representatives from BioSci, Chemistry and Biochemistry, Conservation & Environmental Science, GeoSci, Math, Data Science, Physics, and Actuarial Science were all in attendance. Every discipline brought their own personality to their respective tables, each one more unique than the next. GeoSci filled their table with rocks as far as the eye could see while Chemistry adorned our section with posters of our amazing faculty and all our undergraduate course offerings.

Students could attend one of several rolling tours throughout the event hosted by BioSci, Physics, Chemistry, and GeoSci. The first started at the top of the event with a tour of the Biophysical Microspectroscopy Facility. After that, students could tour the Biological Sciences Greenhouse and the Biological Sciences Electron Microscope Laboratory. If that wasn't enough, the Advanced Analytical Chemistry Laboratory: the secret life of mass spectrometry equipment was available for a 45-minute tour! All the while, the Greene Gallery for minerals, fossils, and the interactive sandbox was open for the duration of the event!

When students weren't busy chatting up an advisor, professor, or picking out stickers at the BioSci table, they could walk over to the West end of KIRC to munch on Qdoba that was graciously catered by the Chemistry Department. There was no burrito bowl left uneaten.

While students mingled with faculty and ate their Qdoba, the event dwindled down. The students left with their many handouts and walked to their next class with haste, the excitement of the day's festivities left the atrium, and the tables were cleared. The Kenwood Atrium was soon as empty as it was when the Chemistry Department started setting up bright and early in the morning. As successful as the day went, the potential of what next year's event could be gives the Chemistry Department all the energy it needs to continue hosting wonderful events like this!

Welcome!

Natural Sciences Showcase: Calculating your place in STEM

Friday, September 22nd
10:30 am - 12:30 pm

Ask us about:

- Science Classes, Majors And Minors
- Career Options In The Sciences
- Science-Related Student Clubs
- Research Opportunities
- And anything else you want to know about our programs!

- » Biological Sciences & Microbiology
- » Chemistry & Biochemistry
- » Conservation & Environmental Science
- » Geosciences
- » Mathematical Sciences & Applied Math
- » Data Science
- » Physics & Astrophysics
- » Actuarial Science

Tours and lunch available!



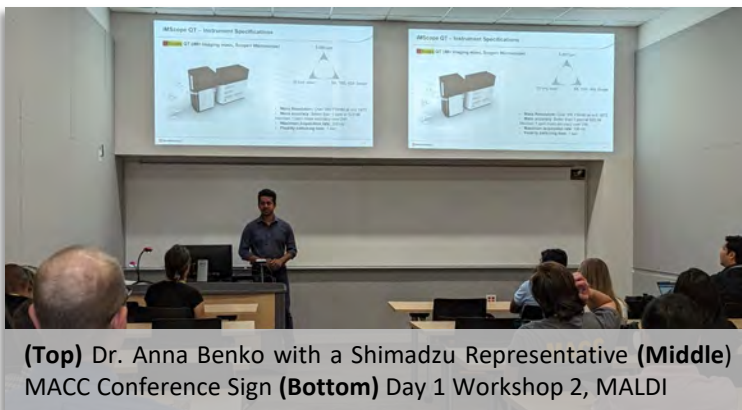
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MACC Conference

Our annual Milwaukee Analytical Chemistry Conference (MACC) was held on September 7th and 8th in the Kenwood IRC. The two-day event was jam packed with sponsored Workshops such as Proteomics provided by Thermo Fisher and MALDI provided by Shimadzu as well as a mixer and poster session, career fair and 3 featured lecturers including Tonya Zeczycki from the Brody School of Medicine, East Carolina University, Neil Kelleher from the Department of Chemistry at Northwestern University, and Daniel Wahl from Radiation Oncology, Michigan Medicine at the University of Michigan.

Day 1 saw workshops on Proteomics, MALDI, Meabolomics, and Lipidomis. After our several workshops, our first guest speaker, Tonya Zaczycki took to the stage with her presentation "A tale of two conformations: HDX-mass spectrometry and the drug discovery pipeline."

Day one closed out with dinner and mixer and a poster session of which SURF student Taif Al-Dulaimi was awarded "Best Poster".



(Top) Dr. Anna Benko with a Shimadzu Representative (Middle) MACC Conference Sign (Bottom) Day 1 Workshop 2, MALDI

Day two started early at 8 am with breakfast sponsored by A.O. Smith followed by our second featured lecturer, Neil Kelleher and his presentation "Label-free imaging of proteoforms in human tissues using individual ion MS." Research presentations and lunch followed Neil's lecture. The latter half of day two was filled with a career fair with presentations from Abbott, Accelerated Analytical Laboratories, and Sterling as well as interviews and advice from our very own guest lecturer Daniel Wahl. After Daniel Wahl was finished at the career fair portion of the day, he presented his lecture "Metabolomic approaches to measure and target altered metabolism in brain cancer."

2023 ACS Project SEED

The ACS Project SEED (“Summer Experiences for the Economically Disadvantaged”) is an over 50-year-old national program offered nationally by the American Chemical Society (ACS), that has provided 8-10 weeklong authentic summer research experiences and summer camps to more than 11,000 high school students in 40 U.S. states and territories.

Each year, the program supports 350+ students with research opportunities with qualified mentors in both academia and industry, as well as providing a virtual summer camp to students focusing on college readiness and professional development, lab preparedness, and exposure to chemistry-related career paths.

Currently, UW-Milwaukee is the only ACS Project SEED site in Wisconsin, offering paid 8-week mentored research experiences for high school students. In 2022, UWM was able to invite five high school students (freshman to senior level) and the number increased to eight summer interns in 2023.



2023 ACS Project SEED students with Prof. Blecking



ACS CEO Al Horvath visiting students working with graduate student Ethan Kowalczyk, and Dr. Alexander Arnold's group. (From left to right: Aliyah B. graduate student Ethan Kowalczyk, Al Horvath, Dr. Arnold, Maya A.

Between June and August, students worked full time in UW-Milwaukee laboratories, with real scientists serving as their mentors. They learned about careers in chemistry and chemistry-related disciplines while engaging in hands-on research experiences. A program requirement is that all research projects must be related to chemistry but can be interdisciplinary in nature. At UW-Milwaukee, ACS SEED Project participants had the opportunity to work with faculty mentors from a variety of disciplines, e.g., Freshwater Sciences, Chemistry and Biochemistry, Biological Sciences, and Physics.

Participating faculty and graduate student mentors from the Chemistry and Biochemistry Department were Dr. Nick Silvaggi, Dr. Alexander Arnold, Ethan Kowalczyk, Collins Agyemang Acheampong, Nazmul Md. Hasan, and Justice Mallen.

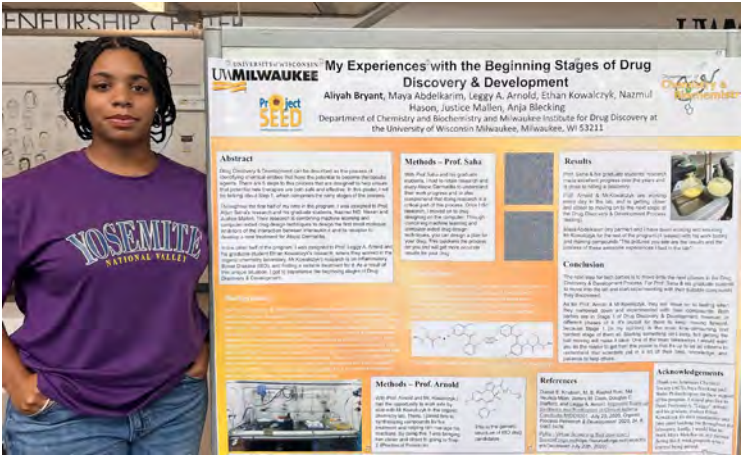
The research internship allowed students, after they completed a safety training, to be actively involved in regular, day-to day research activities, work alongside with their mentors in labs, attend meetings in their research groups, engage in scientific discussion and problem-solving exercises, and safely manage equipment.

Students worked with their research mentors Mondays through Thursdays and engaged in STEM skill building activities outside of the lab every Friday under the guidance of program coordinator Dr. Anja Blecking.

2023 ACS Project SEED (cont.)

The program concluded with a poster presentation in the Lubar Entrepreneurship Center on August 11, 2023, to which family, friends, and mentors were invited. This celebration, other program activities, and student support were sponsored by Bader Philanthropies, Milwaukee. Thanks to generous continued support from Bader Philanthropies, we look forward to hosting ACS Project SEED during summer 2024 for the third consecutive year. We are very thankful for their support and generosity!

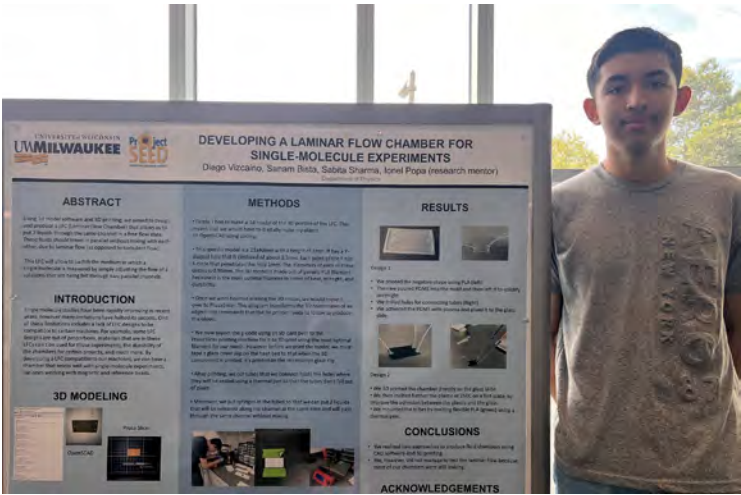
As another highlight during the program, the CEO of the American Chemical Society, Al Horvath, stopped at UWM for a short visit in July to see the ACS Project SEED program in action. He visited students in Dr. Arnold's and Dr. Silvaggi's laboratories.



Aliyah B. presenting “My Experiences with the Beginning Stages of Drug Discovery & Development”



L&S Natural Science Associate Dean Daad Saafarini listening to Natalie T's poster presentation



Diego V. presenting “Developing a Laminar Flow Chamber for Single-Molecule Experiments”



Prof. Silvaggi amongst other attendees at the poster presentation

- Three faculty, staff, and emeritus of the Chemistry Department were honored at the Annual Fall Awards Ceremony held on October 25th. Each honoree has and continues to make valuable contributions to UWM and our community and are nominated by their peers, colleagues, and students. **Distinguished Professor Dave Petering** was awarded the 2023 Ernest Spaights Plaza Award which is one of the highest honors at UWM and honors individuals who have made significant contributions to the growth of the university. **Professor Kristene Surerus** was selected for the Faculty Distinguished University Service Award. This award recognizes faculty members who have outstanding community service including committee service, curriculum development, mentoring, and sustained service. **F. Holger Foersterling** received the Academic Staff Outstanding Performance & Service Award. With this award, Holger Foersterling demonstrated initiative, innovation, and dedication to the job as well as service to the community in capacities that will enhance the university. Let's all congratulate Dr. Petering, Dr. Surerus, and Dr. Foersterling!



- Prof. Alexander (Leggy) Arnold** was among this year's recognized UWM's International Advocates. During the second International Advocate Award Ceremony at UWM, Prof Arnold received a Certificate of Recognition from the Center of International Education. The certificate is in recognition of efforts as an outstanding advocate for international students at UWM. Dr. Arnold played a pivotal role in guiding international students through crucial decisions in their academic path. His expertise in course selection and the enrollment process as well as degree planning help international students to navigate the UWM chemistry graduate program.
- Prof. Xiahua Peng** and **Prof. Arnold** were awarded a \$60,000 Catalyst Grant.
- UWM Chemistry Department alum **Aaron Roerdink** (PhD Analytical Chemistry '04) was recently appointed the Associate Dean of Learning Enrichment and Associate Professor-in-Residence of Chemistry at Central College in Pella, Iowa. After completing his PhD with the Chemistry Department, he eventually became a professor of Chemistry at Heidelberg University where he served as Chair.

- Graduate Student **Ethan Kowalczyk** was awarded the Greater Milwaukee Foundation James and Dorothy Shaw Fellowship summing up to \$32,000 over four years. The Shaw Fellowship is for select doctoral students in a Shaw Scientist discipline – molecular biology, neurobiology, biochemistry, or other similar discipline with a focus on medical and healthcare-related research.
- Distinguished Professor of Chemistry **Wilfred Tysoe** was recently named to the editorial board of the new journal *RSC Mechanochemistry*. As the first journal dedicated to the field of mechanochemistry, *RSC Mechanochemistry* will focus on the publication of innovative research that advances the fundamental understanding and application of the use of mechanical force for driving and controlling chemical reactions and materials transformations in the gas, liquid, and solid states.
- We congratulate **Prof. Xiaohua Peng** on receiving a National Institutes of Health award for \$461,998.00. Dr. Peng's research will be focusing on the development of novel ROS-activated anticancer prodrugs with improved tumor specificity and drug like property. They will also develop novel combination strategies of using selected pro-oxidants with ROS-activated prodrugs to achieve synergistic and durable antitumor effects while minimizing unwanted side-effects. Dr. Peng's group has already developed a H₂O₂-activated anticancer prodrug that showed in vivo efficacy and selectivity. Her group has demonstrated that vitamin C further enhanced the anticancer effect of the H₂O₂-activated prodrug by selectively intensifying H₂O₂ accumulation in cancer cells.

Holiday Gathering



2023 Chemistry & Biochemistry holiday gathering in the Lubar Entrepreneurship Center



Donor Profile

Dr. Dave Krenzke earned his BS in Chemistry from UWM in 1968 when the Chemistry Department was in Lapham Hall. Shortly after graduation, he got married to his wife Mary and was fortunate to find a job with Sinclair Oil in Chicago working in a specialized area of catalysis. Five years and two daughters later, his family moved back to Milwaukee, where he pursued his PhD at UWM, graduating in 1977. His work in Chemistry has brought him and his family to Russia, France, and California where he now resides.

During his senior year as an undergrad at UWM, he took a graduate level catalysis course and found working with Dr. George Keulks and Dr. Keith Hall interesting. Staying connected with Dr. Keulks and the enticement of working with him again encouraged him to continue his graduate

studies at UWM. During his graduate studies at UWM, he was asked to join exchange research groups in Russia and France lead by Dr. Keulks and Dr. Hall, respectively. Both of these research opportunities lead to a long successful career in catalysis research.



Dr. Dave Krenzke, UWM graduation 1968



Dr. Dave Krenzke

Dave and his wife Mary have generously supported the George Keulks Memorial Chemistry Fellowship for many years to honor Dr. Keulks' for his years of tireless service to Chemistry, the Graduate School and UWM, and the impact he had on Dave's career. Dave and Mary also hope this Fellowship affords other students the opportunities he had. They remember how financially challenging it was going back to school, especially as young parents, and any assistance students can receive is very beneficial. Maija Lee, a recipient of the Keulks Fellowship, states, "Being able to really focus on my studies all semester long will make a great impact on my education and help shape me into a professional. I cannot express enough how much

gratitude I have towards those who make this possible, it really makes a huge difference."

The George Keulks Memorial Chemistry Fellowship was created from many generous memorial donations to honor Dr. Keulks, Distinguished Emeritus Professor of Chemistry and former Graduate School Dean who helped build up the Chemistry PhD program and the Graduate School until he passed away in 1997. It widely supports undergraduate and graduate students pursuing a career in Chemistry. Another one of last year's recipients of the Keulks Fellowship, Allison Tomczyk, says "This award motivates me to continue to strive and reach my professional goals. Graduate school is challenging, and it is easy to feel discouraged along the way. Your support for my education and personal goals will not be forgotten."

Let's all thank Dr. Dave Krenzke and Mary for their generous support over the years and the impact they have had on our past and future students.

New Chemistry Building – In Final Stages

The new Chemistry building is a milestone project for UWM - and the first new all-academic building on the East Side campus since the KIRC in 2015 and Lubar Hall in 1995. The Chemistry building is scheduled for completion in early 2024 with a quick move-in and transition of Chemistry courses anticipated in summer 2024. We are looking forward to the new facilities which will be the new home to undergraduate and graduate studies, research, industry partnerships and community outreach. Campus will be announcing the grand opening and open house in the summer of 2024, and we look forward to the start of a new chapter for UWM. We are very thankful for the new facility and the new equipment that we have been able to get as part of this project, but we also recognize that it is the people that make the difference. We are looking forward to the new chapter and are very thankful for all of our donors who make impacting student pathways with their generous donations.



Dr. Arnold in his new research lab.



Chemistry lobby, lecture hall and staircase to the second level.

Friends of Chemistry

Your contributions enhance the educational experience of our students and strengthen the research and development of our faculty and staff. Please join us in thanking our friends. The gifts that were received from May 2023 through November 2023 were:

Chemistry General Fund

- Daniel & Janet Brophy
- PPG Industries match for Jennifer Kloss
- Dr. Meilin Huang
- Mr. Michael J. Martin
- Dr. Gene A. Hiegel
- Mr. Richard P. Bowman
- Mrs. Barbara Ann Regent
- Jay & Theresa Wrobel

Chemistry Scholarship Fund

- Dr. Lynn C. Moscinski
- Mr. Carl E. Wolff

Durward C. Layde Memorial Scholarship Fund

- Margaret Layde

George Keulks Memorial Fund

- Mr. Lixun Zhang

MIDD Support Fund

- Steve Weitman

For more information on becoming a Friend of Chemistry and Biochemistry, please see the pledge form on the back, visit our website www.uwm.edu/chemistry/give, or contact Leslie Horn at lahorn@uwm.edu.



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