Molecules and Moles

Chemistry and Biochemistry Department Newsletter: 2024

NOTE FROM THE DEPARTMENT HEAD

Dear Alumni and Friends of the Chemistry and Biochemistry Department:

We hope our annual newsletter finds you well. Once again, it's time to reflect on the events in our department over the past year. 2024 was another year of remarkable achievements by our students, faculty, and staff. Our undergraduate and graduate programs continue to do very well. Our students have been highly successful in winning awards and securing internships in various industries and organizations. Riley Pope was awarded the Undergraduate Award in Environmental Chemistry by the American Chemical Society. Mary Fakunle won the Corteva AgriSciences DELTA (Developing Emerging Leaders & Talent in Agriculture) Symposium Award.

Our faculty also has an incredibly good year as well. Dr. Santimukul Santra and Dr. Tuhina Banerjee were awarded a grant of $591,497.00 by the United States Department of Agriculture (USDA). The four-year grant started in January 2025 and is the first grant the Chemistry and Biochemistry department is receiving from the USDA. Dr. Natasha DeVore was awarded the 2024 MSU Foundation Award for Excellence in Teaching. Dr. Cyren Rico won the same award but in the "Excellence in Research" category. Dr. Gary Meints got the James F. O'Brien Fellowship in Chemistry while Dr. Rico got the Roy D. Blunt Life Science Professorship. Helena Metzker was awarded a Teaching and Learning Fellowship by the MSU Faculty Center for Teaching and Learning. Dr. Tuhina Banerjee received the CNAS Faculty Excellence in Research Award while Dr. Matthew Siebert won the same award but in the teaching category.

Personnel movements and changes are always newsworthy, and last year was no exception. Michaela West joined our team as an Administrative Assistant. Welcome Michaela! Jessica Quin moved on to another department within MSU. Linda Allen retired after decades of stellar performance in our department as an Administrative Assistant. We wish her the best in her emeritus status.

IN THIS ISSUE:

Continued on Page 2

One of our former colleagues, Dr. Kathryn "Katye" Fichter, passed on in a tragic car crash. Katye was adored by her students, faculty, and staff. She left a lasting impact on the Chemistry and Biochemistry Department, and she will be fondly remembered by everyone whose lives she touched.

In closing, we thank our alumni and friends for their continued support and look forward to strengthening these relationships. We continue to be deeply grateful to all of you who have contributed so generously to our department over the years. Your contributions help us provide scholarships to students and improve our teaching and research facilities. I hope 2025 will be prosperous for you, both personally and professionally.

Adam Wanekaya
Head, Chemistry and Biochemistry Department
Missouri State University
Springfield, Missouri

WELCOME NEW FACULTY AND STAFF

Introducing Michaela West, Academic Administrative Assistant II

Michaela West joined the Department of Chemistry and Biochemistry in August 2024. She was born and raised in Joplin, Missouri, and graduated from Joplin High School. Michaela received her Bachelor of Fine Arts in Theatre Performance from Missouri Southern State University in May 2022, and worked as the Administrative Assistant for the Department of Performing Arts at MSSU for 2 years before moving to Springfield. She has loved getting to know all of the wonderful faculty, staff, and students at MSU and is eager to learn more and keep growing.

GENERAL ANNOUNCEMENTS

Jessica Quin
Moved to Computer Science in 2024

Linda Elvers
Retired in 2024

After many years of service, Erik Roberts has formally resigned from the Board of Advisors.

Emeritus Professor Eric Bosch Establishes New Scholarship

The "**Chemistry Scholarship**" was established by Dr. Eric Bosch, who retired in July 2023. The $2,000 scholarship will be awarded each academic year to one undergraduate or graduate student enrolled full-time at MSU seeking a degree in Chemistry or biochemistry. The recipient must meet Satisfactory Academic Progress and have demonstrated financial need. The student will hold the scholarship for one academic year. The scholarship may be renewed, but the student must reapply and be considered with all other applicants.

The Chemistry and Biochemistry department is grateful to Dr. Bosch for establishing this scholarship.

IN MEMORIAM

Dr. Kathryn "Katye" Fichter

February 10th, 1978 – April 7th, 2024

Dr. Katye Fichter was a beloved Assistant Professor of Chemistry at Missouri State. She earned a B.S. in Chemistry in 2004 and a Ph.D. in Chemistry/Biochemistry in 2008 from the University of Cincinnati, followed by a postdoctoral research position at Oregon Health and Science University. Katye joined Missouri State in 2012 as an Assistant Professor of Chemistry, and was adored by her students and fellow faculty. She received the CNAS Faculty Excellence in Teaching Award in 2014, and received a CNAS Student-Nominated Faculty Excellence Award in 2018. In 2018, she returned to her hometown of Cincinnati and accepted a research position at Cincinnati Children's Hospital in the Division of Experimental Hematology and Cancer Biology.

"I have always made a point to tell people that Katye was my favorite professor. Biochemistry became my favorite subdiscipline of Chemistry because of her classes. She was also a great mentor. The listening ear and advice she gave when I visited her office riddled with anxiety for the future always helped me feel relieved enough to press on. She wrote me a letter of recommendation when I applied to the Missouri State Highway Patrol to become a Toxicologist with the Crime Lab -- a job I still have (and love) five years later."

– Brennon Foster, Chemistry Alum ('17)

"I was Kayte's next-door office neighbor at Missouri State University. Kayte was an incredibly conscientious and kind soul, who was adored by the students. I used to love to hear the giggling that came from her office, and have fond memories of joining in."

– Dr. Gautam Bhattacharyya, Associate Prof. of Chemistry & Biochemistry

Katye left a lasting impact on the Chemistry and Biochemistry Department and she will be fondly remembered by everyone whose lives she touched.

FACULTY / STAFF ACCOMPLISHMENTS

January 1 – December 31, 2024

Congratulations on these Fine Achievements!

Professor **Dr. Gary Meints** received the James F. O'Brien Fellowship in Chemistry.

(O'Brien) is a lovely person and well-respected professor across the board," Meints shared. "I hope to carry on his traditions, and this award is validation that I'm on the right track."

Associate Professor **Dr. Cyren Rico** was one of 2 CNAS professors to receive the Roy D. Blunt Life Science Professorship, a $4 million grant from the US Dept. of Education, CNAS for his work on understanding the ecological effects of nanomaterials, as well as his research on topics like isotopic techniques, ecological effects and food safety.

"I appreciate the effort of administration for this kind opportunity. This is a big boost for students' success in terms of training, publishing, and presenting at conferences." Dr. Rico said.

Professor **Dr. Santimukul Santra** received an NIH grant and ACS-PRF grant totaling $396,267.00 to further his research in nanosensor technology.

(above) Dr. Santra with students in his research lab.

Senior Instructor **Helena Metzker** was selected as 1 of the 4 FCTL Teaching & Learning Fellows and served a 2-semester term from Spring 24-Fall 24. Her fellowship focused on the use of technology for promoting active learning for students.

FACULTY / STAFF ACCOMPLISHMENTS – Continued

Assistant Professor **Dr. Natasha DeVore** was awarded the 2024 MSU Foundation Award for Excellence in Teaching.

Associate Professor **Dr. Cyren Rico** was awarded the 2024 MSU Foundation Award for Excellence in Research.

Professor **Dr. Santimukul Santra** and Assistant Professor **Dr. Tuhina Banerjee** championed a proposal entitled "Ultrasensitive Immunodetection of Foodborne Pathogens Using Smartphone-Based Lateral Flow Technology" which was recommended for funding in the amount of $591,497.00 by the United States Department of Agriculture (USDA). The four-year grant starts in January 2025 and is the first grant the Chemistry and Biochemistry department is receiving from the USDA.

FACULTY / STAFF ACCOMPLISHMENTS – Continued

Dr. Matthew Siebert receives the CNAS Faculty Excellence in Teaching Award for 2024!

Dr. Matt Siebert, associate professor of Chemistry and Biochemistry, analyzed student study habits and used those findings to make wholesale changes to his instructional approach in CHM 342 and 343, resulting in significant student gains in those courses. Dr. Siebert has mentored several undergraduate and graduate research projects and theses, and his students have presented at several state and regional conferences. As Chair of the University Premedical Committee, Dr. Siebert worked with 24 students in the past year.

Dr. Tuhina Banerjee receives the CNAS Faculty Excellence in Research Award for 2024!

Dr. Banerjee maintains one of the largest research groups in the Department of Chemistry and Biochemistry – both undergraduate and graduate students. The students are part of presentations and publications – local presentations at CNAS Research Day and EIDF along with many others. Dr. Banerjee received funding this past year from the National Science Foundation Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences (LEAPS-MPS) – nearly a quarter million dollars and National Institute of Health (NIH) R15-AREA grant (nearly a half million dollars).

INTELLECTUAL CONTRIBUTIONS

January 1 – December 31, 2024

Banerjee, Tuhina (Assistant Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Flint, Z., Grannemann, H., Baffour, K., Koti, N., Taylor, E., Grier, E., Sutton, C., Santra, S., Banerjee, T. (2024). Mechanistic Insights Behind the Self-Assembly of Amyloidogenic Proteins Under the Influence of Surface-Engineered Gold Nanoparticles.. ACS Chemical Neuroscience, 15(11), 2359-2371.

Journal Article, Academic Journal (Published)

Koti, N., Timalsena, T., Banerjee, T., Santra, S. Core-Tunable Dendritic Polymer: Folate-Guided Theranostic Nanoplatform for Drug Delivery Applications.

Journal Article, Professional Journal (Published)

Anderson, M., Dargatz, C., Banerjee, T., DeVore, N. (2024). Green, yellow, or cyan? Introduction of color change mutations into a green thermostable fluorescent protein and characterization during an introduction to biochemistry lab course.. Biochemistry and Molecular Biology Education, 52(5), 549-558.

Bosch, Eric (Emeritus)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Bosch, E., Unruh, D. K., Brooks, R. K., Krueger, H. R. J., Groeneman, R. H. (2024). Preference in the Type of Halogen Bonding Interactions within Co-crystals of Anthraquinone with a pair of Isosteric Perhalobenzenes. Crystals, 14, 325.

Journal Article, Professional Journal (Published)

Bosch, E., Bowling, N. P. (2024). Intra- and intermolecular C-H...F hydrogen bonds in the crystal structure of 1,2-bis(2-(2,3,4,5-Tetrafluorophenyl)ethynyl)benzene. To appear in Acta E: Crystallogrraphic Communications, 80.

Continued…

Journal Article, Professional Journal (Published)

Bosch, E., Bowling, N. P. (2024). Role of secondary interactions in the series of 2:1 halogen bonded cocrystals formed between 4-(N,N-dimethylamino)pyridine and ditopic halogen bond donors. Acta Crystallographica Section C, C80, 553-561

Journal Article, Professional Journal (Published)

Lang, L. B., Bowling, N. P., Bosch, E. (2024). Formation of planar pi-conjugated sheets in cocrystals of bis(iodoethynyl)pyridines and bipyrimidylalkynes: Cooperative C-H---N hydrogen bonds and sp-C-I---N halogen bonds. Crystal Growth and Design, 24(22), 9727-9734.

Journal Article, Professional Journal (Published)

Holdaway, J., Bosch, E., Unruh, D. K., Groeneman, R. H. (2024). Supramolecular Catalysis of a Halogen-Bonded Co-crystal that undergoes a [2 + 2] Cycloaddition Reaction formed via Dry-Vortex Grinding. Crystal Growth & Design, 2024, 6101-6104..

Journal Article, Professional Journal (Published)

Andren, M., Bosch, E., Krueger, H., Groeneman, R. H. (2024). Achieving a series of solid-state [2 + 2] cycloaddition reactions involving 1,2-bis(2-pyridyl)ethylene within halogen-bonded co-crystals. CrystEngComm, 26(10), 1349-1352..

Journal Article, Professional Journal (Submitted)

Bosch, E., Speetzen, E., Bowling, N. P. (2024). Halogen bonded supramolecular parallelograms: From self-complementary iodoalkyne halogen bonded dimers to 1:1 and 2:2 iodoalkyne halogen bonded cocrystals. Crystal Growth and Design, 2024, 1674−1681

DeVore, Natasha M. (Assistant Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Anderson, M.R.; Padge`, C.M.; Ogbeifun, V.O.; DeVore, N.M. The Crystal Structure of Thermal Green Protein Q66E (TGP-E) and Yellow Thermostable Protein (YTP-E) E148D. SynBio 2024, 2, 298–310. https://doi.org/10.3390/synbio2030018

Journal Article, Academic Journal (Published)

Anderson, M., Dargatz, C., Banerjee, T., DeVore, N. (2024). Green, yellow, or cyan? Introduction of color change mutations into a green thermostable fluorescent protein and characterization during an introduction to biochemistry lab course.. Biochemistry and Molecular Biology Education, 52(5), 549-558.

Gerasimchuk, Nikolay N. (Distinguished Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. (2024). Finally: The X-ray crystal structure of the illusive unsubstituted iron(III) phthalocyanine μ-oxo(1) dimer. DFT-predicted Mössbauer quadrupole splitting and antiferromagnetic coupling constants for X-ray geometry.. *Journal of Porphyrins and Phthalocyanins., 2024*(28), 300-307.

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. (2024). Synthesis, Characterization and Antimicrobial Activity of Trimethylantimony(V) Biscyanoximates, a New Family of Antimicrobials.. *Molecules, 2024*(29), 5779.

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. (2024). Synthesis and characterization of Cu(II) complexes supported by a pyridylamide ligand.. *Journal of Molecular Structure, 1312*(Part 2), 138536.

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. (2024). Remarkable Structural Diversity of N-Pyrrolidine-cyanoxime and its Ni(II) Complexes.. *Crystal Growth & Design*(June 14, 2024).

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. (2024). Use of Unprecedented Intramolecular 1, 3-Dipolar Cycloaddition Reaction in meso-Nitrile Oxide-Containing BODIPYs as an Untraditional Pathway for the Preparation of Fused NIR Platforms.. *Chemistry European Journal, e202401210 (1 of 5)*.

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. (2024). Novel antimony-based antimicrobial drug targets membranes of Gram-positive and Gram-negative bacterial pathogens.. *Microbiology Spectrum, 12*(6), e0423423.

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. (2024). Li2MP2S6: A Family of 2D Non-van der Waals Layered Materials and Their Water, Ammonia, and Ion Intercalation Properties.. *Chemistry of Materials, 2024*(36 (8)), 3574-3587.

Journal Article, Academic Journal (Published)

Gerasimchuk, N. N. (2024). Co-crystallization of Isomers of Iron(II) Complex of a Tridentate Mixed Amine/Imine Ligand in one unit cell.. *Mendeleev Communications, Published by ELSEVIER B.V. on behalf of the N. D. Zelinsky Institute of Organic Chemistry of the Russian Academy of Sciences., 34*, 47-50.

Jahnke, Tamera (Full Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

West, N., Shavers, M., Smith, M., Namodi, J., Gordon, N., Jahnke, T. (2024). Black women as coxswains: Allyship outcomes for Black and White women in a PARC project developed by Black women in higher education.. *The Journal of Diversity in Higher Education.*

Rico, Cyren (Associate Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Wei, L., Ji, L., Rico, C., He, C., Shakoor, I., He, F., Fakunle, M., Lu, X., Hou, Y., Hong, J. (2024). Transcriptomics Reveals the Pathway for Increasing Brassica chinensis L. Yield under Foliar Application of Titanium Oxide Nanoparticles. *Journal of Agricultural and Food Chemistry, 72*, 18957-18970.

Journal Article, Academic Journal (Published)

Rico, C., Wagner, D., Ofoegbu, P., Kirwa, N., Clubb, P., Coates, K., Zenobio, J., Adeleye, A. (2024). Toxicity assessment of perfluorooctanesulfonic acid (PFOS) on a spontaneous plant, velvetleaf (Abutilon theophrasti), via metabolomics. *Elsevier, 907*, 13.

Santra, Santimukul (Assistant Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Koti, N., Timalsena, T., Kajal, K., Worsley, C., Worsley, A., Worlsey, P., Sutton, C., Banerjee, T., Santra, S. (2024). Core-Tunable Dendritic Polymer: A Folate-Guided Theranostic Nanoplatform for Drug Delivery Applications.. *ACS Omega, 9*, 30544-50588.

Journal Article, Academic Journal (Published)

Flint, Z., Grannemann, H., Baffour, K., Koti, N., Taylor, E., Grier, E., Sutton, C., Johnson, D., Dandawate, P., R. P., Santra, S., Banerjee, T. (2024). Mechanistic Insights Behind the Self-Assembly of Human Insulin Under the Influence of Surface-Engineered Gold Nanoparticles. *ACS Chemical Neuroscience, 15*(11).

Other Intellectual Contributions

Manuscript (Accepted)

Santra, S. (2024). *Core-Tunable Dendritic Polymer: A Folate-Guided Theranostic Nanoplatform for Drug Delivery Applications. (vol. 9, pp. 30544). ACS Omega.*

Manuscript (Accepted)

Santra, S. (2024). Mechanistic Insights Behind the Self-Assembly of Human Insulin Under the Influence of Surface-Engineered Gold Nanoparticles (vol. 15, pp. 2359). ACS Chem. Neurosci.

Siebert, Matthew (Associate Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Bakker, M. J., Siebert, M. R. (2024). Atomistic Details of Methyl Linoleate Pyrolysis: Direct Molecular Dynamics Simulation of Converting Biodiesel to Petroleum Products. *Energies*(17), 2433.

Wang, Fei (Associate Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Prasad, K., Upreti, D., Nabi, M. R. U., Oppong, R., Wang, F., Shinde, M., Hu, J., Wang, J. (2024). Synthesis, Crystal and electronic Structures, and Magnetic and Electrical Transport Properties of Bismuthides NdZn0.6Bi2 and (La0.5RE0.5)Zn0.6Bi2 (RE = Pr or Nd). *Inorganic Chemistry*, *63*, 20257-20265.

Yoshimatsu, Keiichi (Associate Professor)

Refereed Journal Articles

Journal Article, Academic Journal (Published)

Ellis, J. D., Iqbal, R., Yoshimatsu, K. (2024). Deep Q-Learning-Based Molecular Graph Generation for Chemical Structure Prediction From Infrared Spectra. *IEEE Transactions on Artificial Intelligence, 5*(2), 634-646.

Journal Article, Academic Journal (Published)

Saquer, N., Iqbal, R., Ellis, J. D., Yoshimatsu, K. (2024). Infrared spectra prediction using attention-based graph neural networks. *Digital Discovery*, *3*(3), 602-609.

STUDENT ACCOMPLISHMENTS

Riley Pope-Buss Receives ACS Undergraduate Research Award in Environmental Chemistry

(Pope in lab)

Missouri State University senior Riley Pope has been honored with the American Chemical Society (ACS) Undergraduate Research Award in Environmental Chemistry.

The award recognizes outstanding undergraduate students who have demonstrated excellence in environmental chemistry research. It is highly competitive, requiring a strong research background and a compelling application that aligns with the ACS's rigorous standards.

Pope has dedicated her academic career to environmental chemistry. Her research, conducted under the guidance of Dr. Cyren Rico, associate professor of chemistry at Missouri State, focuses on analyzing how environmental pollutants impact various plant species.

She studies the effects of pollutants on plant health, using advanced analytical techniques, such as ICMS (Ion Chromatography-Mass Spectrometry), LCMS (Liquid Chromatography-Mass Spectrometry) and NMR (Nuclear Magnetic Resonance).

Following her undergraduate studies, Pope is continuing her education through Missouri State's accelerated master's program in chemistry. She is considering pursuing a PhD in either geochemistry or water chemistry to further her expertise in environmental science.

Delta Corteva Agriscience Symposium, September 24-26, 2024 – Johnston, Iowa

(Mary at the Corteva Symposium)

"I had the opportunity to attend the Corteva DELTA symposium in Johnston, Iowa. The symposium was full of insightful discussions, exciting new developments and I was privileged to connect with so many brilliant and experienced minds at Corteva Agriscience.
Sharing my research was one of the highlights of the event for me, and I'm truly grateful for the opportunity to present to an audience with diverse backgrounds and exposure. Engaging these leaders provided me with feedback that will be instrumental as I continue my research."

-Mary Fakunle, Graduate Student

STUDENT ACCOMPLISHMENTS - continued

Outstanding Senior – Victoria Ogbeifun

"I have really appreciated my time in the chemistry department, and I am super glad to have been a chemistry major. I appreciate all the faculty and staff. Thank you for the outstanding senior award. I attribute my success during my undergraduate career to all my wonderful professors."

Congratulations, Victoria!

Midsouth Inorganic Chemists Association (MICA)

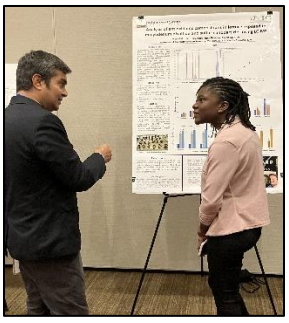
Fall 2024 Meeting – November 2nd, 2024 @ Arkansas Tech University in Russellville, AR

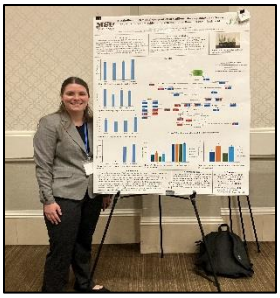
Dr. Nikolay Gerasimchuk and graduate student, Elaine Phan, were chosen to participate in the Fall 2024 MICA meeting held in Russellville, Arkansas.

Elaine and Dr. Gerasimchuk presented oral talks on "Synthesis and characterization of G3 family of organoantimonials for biomedical studies" and "Crystallographic characterization of products of side reactions during syntheses of cyanoximes", respectively.

STUDENT ACCOMPLISHMENTS - continued

Master's Students Present at the Sustainable Nanotechnology Organization Conference (SNO)





The 13th Sustainable Nanotechnology Organization (SNO) Conference was held in Rhode Island from November 8th-10th of 2024, where over 150 people were invited to present. This conference focused on fundamental nano-scale processes related to sustainability and the environment and presents current state-of-the-art knowledge and an outlook on nano-enabled applications. The conference also showcased NanoPitch, where students must pitch a nano research topic in under 100 seconds. Dr. Cyren Rico, as well as Blessing Akinwande, Mary Fakunle, and Riley Pope-Buss – all from Dr. Rico's lab – were invited to present their research.

Rico presented on "Exposure of scallions (Allium fistulosum) to cerium oxide nanoparticles and perfluorooctanesulfonic acid" for the Fate, Transport and Exposure session of the conference. Rico also served as one of the co-chairs for the Poster Session and Reception.

Akinwande and Fakunle presented posters on "Analysis of Amino Acid Compositions in Lettuce Exposed to Molybdenum Disulfide and Sulfur Nanoparticles using LC-MS" and "Analysis of antioxidants compositions in lettuce exposed to molybdenum disulfide and sulfur nanoparticles using LC-MS," respectively. Pope-Buss presented a poster on "Metabolite and elemental composition of scallions (Allium fistulosum) after co-exposure to cerium oxide nanoparticles and perfluorooctanesulfonic acid".

This year, the conference featured a set of exciting plenaries and concurrent sessions covering a wide set of topics including fate, transport, toxicity, bioeconomy, climate actions, education, energy, environment, infrastructure, medicine, sensors, and nanoscale modeling. Along with other talks from prominent people in the profession, there was a tribute session for Professor Robert Hurt.

Additionally, recent MSU alumni, Preston Clubb, was attending the conference with UCLA, who gave Clubb an offer at last year's SNO conference. A former student of Dr. Rico's lab, Clubb was a 2023 recipient of the SNO grant and placed first at the 2023 SNO Nanopitch Competition.

The conference also recognizes outstanding students and their contributions to the field. Akinwande, Fakunle and Pope-Buss all received an SNO Student Award.

STUDENT ACCOMPLISHMENTS - continued

Symposium Winners 2024

Chemistry and Biochemistry

1st Place: Victoria Ogbeifun, Caitlin M. Padgett & Natasha DeVore
Protein Characterization and Crystak Structure of Yellow Thermostable Protein (YTP) Q66E E148D
Faculty Advisor: Dr. Natasha DeVore

2nd Place: Clayton Frazier, Santimukul Santra, Paris Yates, Elizabeth Bowie, Megan Liermann, David Johnson and Tuhina Banerjee
Membrane Fusion Interactions of Enveloped Viruses Using Magnetically-Labeled Liposomes
Faculty Advisor: Tuhina Banerjee

2024 -CNAS 3-Minute Theses Winner

Ethan Grier

30th Annual Graduate Einhellig Interdisciplinary Forum Winner

Outstanding Poster Presentations:
Preston Clubb, Iqra Shakoor, Carissa Sutton

American Chemical Society Officers 2024

President: Trishna Timalsena
Vice President: Rachel Helton
Secretary: Ainsley McCllelan
Treasurer: Thomas Banta
Social Media Coordinator: Brooke Winder

2024 SCHOLARSHIP AND AWARD WINNERS

Chemistry Dept. Scholarship Fund	Katie Poage
Chemistry Board of Adv. Summer Research Fellowship	Ye Sang, Trishna Timalsena, Rain Wolfe
Doris C. Lorz Scholarship	Chandler Cannell, Nick Williams
Dr. & Mrs. Vernon Thielmann Chem. Education and Chemistry Undergraduate Research Award	Katie Poage
Dr. Robert W. Martin Research Fellowship	No Applicants
Emil Lorz Memorial Scholarship	Alyssa Wilson, Alaina Worland
Eugene T. Scafe Memorial Scholarship	Renewal: Samantha Ball, Ben Coonrod, Maddie Ellis, Rachel Helton, Morgan Lewis, Riley Pope
Harriett H. Ford Memorial Scholarship	Sarah Catlett
Harthcock Chemistry Research Fellowship	Grace Atkins, Marck Dragoi
Louise & Roland Harthcock Scholarship	Thomas Banta
Robert Lloyd Ernst Summer Graduate Assistantship	Preston Clubb
Robert S. Christie Memorial Scholarship	Zach McCubbin, Elaine Phan, Trishna Timalsena
WEB & AOB Memorial Scholarship	Grace Atkins
William J. Husa Chemistry Scholarship	Olga Demicheva
Wyman & Sue Grindstaff Chem. Education Scholarship	N/A
Foundation for Immunotoxicology Award	Emilee Dees
ACS Organic Division Undergraduate Award	Reese Potter
ACS Undergraduate Award in Inorganic Chemistry	Abigail Teitelbaum
ACS Undergraduate Award in Analytical Chemistry	Benjamin Coonrod
Outstanding Organic Chemistry Student	Hunter Kimberlin-Poore
Outstanding Environmental Chemistry Student	Riley Pope
General Chemistry Achievement Award	Riley Cook, Nora Curry, Emilee Dees, Tim Hayes, Alaina Worland
Outstanding Physical Chemistry Student Award	Riley Pope
Outstanding Biochemistry Student Award	Emma Braun
Outstanding Inorganic Chemistry Student Award	Abigail Teitelbaum
Outstanding Student in Instrumental Analysis	Taryn Criblez
Outstanding Senior (Undergraduate Only)	Victoria Ogbeifun

GRADUATES 2024

Congratulations on your Graduation! We are so Proud of You!

Spring 2024

Master's Degree
Kristos Baffour
Tanner Rust
Hannah Thompson

Bachelor's Degree
Aaron Autry
Emma Braun
Jacob Churchman
Calysta Nichols
Victoria Ogbeifun
Joe Truong

Undergraduate Certificate
Daycyana Bond
Emma Braun
Kayla Collins
Emily Dunn
Kristen Knirr
Alexis Rapert

Summer 2024

Master's Degree
Alexander Babel
Iqra Shakoor
Carissa Sutton

Undergraduate Certificate
Kiley Garrett
Madison Lucas

Fall 2024

Master's Degree
Grace Atkins

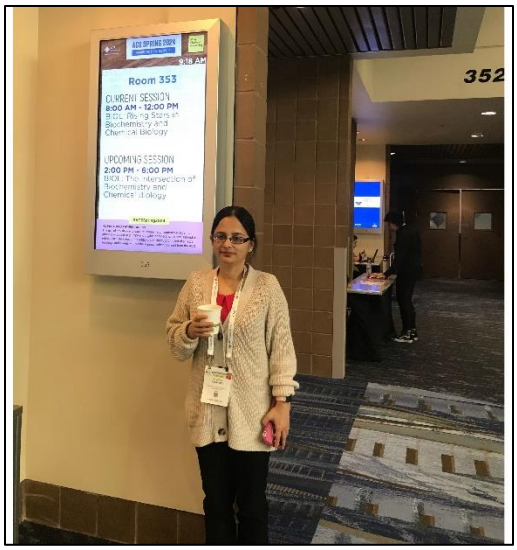
Bachelor's Degree
Andrew Murry
Andrew Pettenger
Riley Pope-Buss
Hannah Smith

Undergraduate Certificate
Emma Adams
Zoe Bouthillier
Sonika Gurung
Katie Helm
Greyson Yang

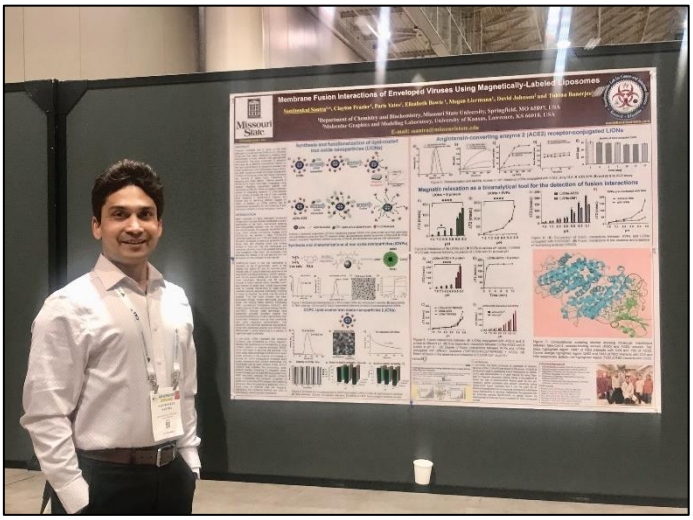
ACS NATIONAL MEETING - SPRING 2024

The National ACS Spring 2024 Meeting was held March 17-21, 2024, in New Orleans, Louisiana, at the New Orleans Ernest N. Morial Convention Center. The theme of this meeting was "Many Flavors of Chemistry" and included opportunities to engage in division-specific and general networking, diverse and forward-looking educational experiences, firsthand exposure to trending innovative services and products in the field, and intimate career advancement interactions. Drs. Tuhina Banerjee, Santimukul Santra, and Adam Wanekaya all attended and/or presented that the meeting.

Here are some photos from the event!



Dr. Banerjee



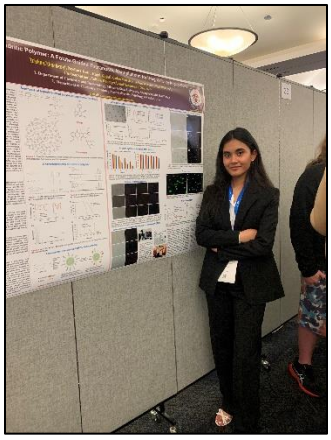
Dr. Santra

Dr. Santra, Dr. Banerjee and Dr. Wanekaya

ACS MIDWEST REGIONAL MEETING – FALL 2024

Numerous Chemistry Department students and faculty attended the 2024 ACS Joint Midwest Regional Meeting held October 13-15, 2024 in Omaha, Nebraska, at the Mike and Josie Harper Center. Hosts for the meeting were the Omaha Local Section of the ACS. This year's theme was "Chemistry for a Healthy Heartland" and provided MSU Chemistry Department's undergraduate and graduate students ample opportunity to present their research and make great contacts. The meeting featured plenary speakers, exciting technical sessions, special symposia, poster sessions, regional awards, social events, and a large vendor expo. In addition, there were special undergraduate programming, chemistry education workshops for high school teachers, and events sponsored by the local Younger Chemists Committees and the Minority Affairs Committees. It was a great opportunity for undergraduate and graduate students to present their research and get to know the Midwest and Great Lakes chemistry communities.

Here are some photos from the event!



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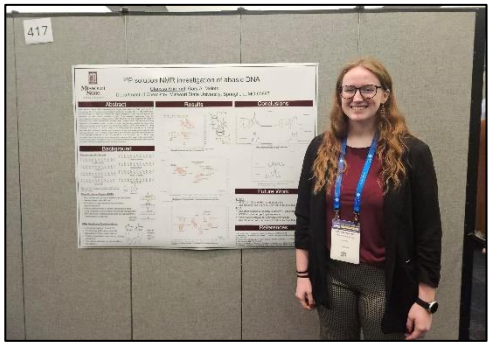
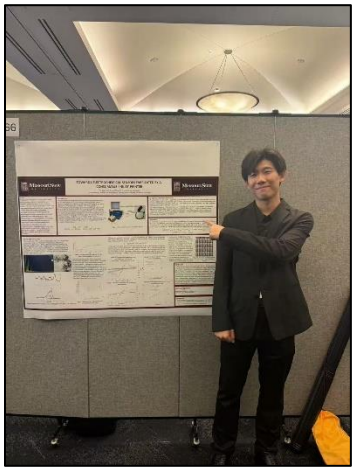


Clarissa Krimmel

Elaine Phan



Ye Sang

Dr. Gary Meints

Kristos Baffour

INSPIRING FUTURE CHEMISTS: A PARTNERSHIP IN RESEARCH

Chemistry and Biochemistry Professor Dr. Cyren Rico has partnered for the third year with Willard High School chemistry teacher and MSU alumnus Mr. Kameron Coates through the American Association of Chemistry Teachers (AACT) where students have the chance to work in a research lab under Dr. Rico and his team's mentorship. This year they are continuing a project they started a couple of years ago analyzing heavy metal contamination levels in Lake Springfield by collecting sunfish and largemouth bass samples collected in November. High school students gain experience working with instruments they normally wouldn't have the chance to use in a normal high school environment such as the ICP-MS, and microwave digestion. Dr. Rico and his research team are dedicated to inspiring and motivating local high school students to see the value in chemistry research in hopes students choose to pursue chemistry as a career. Dr. Rico and Kameron's students meet on one Saturday a month in the research lab where students gain first-hand experience working in an academic setting.

Dr. Rico (left) and WHS students Andrew Yates, Theodora Osborne & Andrew Cooper.

Dr. Rico (right) discussing the principles and safety protocols for microwave sample digestion and dilution for ICP-MS analysis.

DR. G'S GLOBAL ADVENTURES

Giving a lecture at the University of Free State, Bloemfontein.

Where in the world is Dr. G?

Dr. Nikolay Gerasimchuk, fondly known as "Dr. G," has been on quite an adventure around the globe! In 2024, he proudly represented the Department of Chemistry and Biochemistry at various international conferences and connected with students from different corners of the world.

In February, Dr. G traveled to South America and gave lectures to the Chemistry Department at the University of Montevideo in Montevideo, Uruguay. He spoke about his ongoing research, as well as gave a presentation on "Teaching of Inorganic Chemistry at Missouri State." Dr. G also established a relationship with professors Leopoldo Suescun and Natali Alvarez – two local crystallographers – whose students were sent to Dr. G's lab for collaborative work over the summer.

From March to June, Dr. G spent time in South Africa, where he was invited to the University of Free State in Bloemfontein, SAR. During his time at UFS, he conducted a total of six lectures for students and faculty in the Chemistry Department, with one of them including demonstrations, and worked with/supervised several students working on collaborative research projects and published several papers, including one titled "Crystallography Reports."


Delivering his keynote address at the VI LACA Meeting in Montevideo, Uruguay.

By June, Dr. G was invited to present a talk at the 2024 South Africa Inorganic Chemistry Conference, which was held June 2nd-6th in Kwazulu-Natal, South Africa. The conference provides a platform for local as well as international researchers, including emerging and young career chemists, technologists, and entrepreneurs to showcase their research and familiarize themselves with the latest advances and trends in the disciplines of both inorganic and physical chemistry. Dr. G's lecture was titled "Structural Chemistry of Cyanoximes."

In September, Dr. G returned to Montevideo, Uruguay, where he was invited to be a keynote speaker at the VI Latin American Crystallographic Association (LACA) Meeting, which brought together participants from 32 countries. He delivered his keynote address, "Current Status of Pt-based 1D Solids," where he focused on the historical development and future directions of inorganic and materials chemistry. Dr. G also highlighted Missouri State's contributions to the field and discussed how the university has positioned itself as a hub for advanced crystallographic research. He carried out the dissemination of his lab's research results and advances in the field of application of Pt-based coordination compounds. Dr. G also reunited with Prof. Suescun and Prof. Alvarez, who will be traveling to Missouri State to work in Dr. G's research lab in 2025.

From Uruguay, to South Africa, and back to the United States, we are incredibly proud of Dr. Gerasimchuk for representing the MSU Department of Chemistry and Biochemistry so well across the globe!

DR. G's GLOBAL ADVENTURES – CONTINUED

With professors Leopoldo Suescun and Natali Alvarez at the University of Montevideo.

Presenting at SACI 2024 Conference in Kwazulu-Natal, South Africa.

Having dinner with students from Botswana and Namibia.

With conference organizers of SACI 2024, Dr. Thishana Singh & Ms. Laila Smith.

Giving a lecture to students at the University of Montevideo.

2024 ALUMNI SPOTLIGHT

TYLER CRAFT (BS 2015, Missouri State University; PharmD 2019, UMKC)

Born and raised in St. James, MO I began my expedition at Missouri State University (MSU) after graduating high school in 2011. I've always enjoyed athleticism and working out from a very young age, so naturally my initial aspirations were in the realm of Athletic Training and/or Physical Therapy. I started the fall semester of my freshman year at Missouri State as an Exercise Science major. It was during that first semester that it dawned on me I was destined for something more. In hindsight, I learned a lot about myself that semester, and looking back, I can see that the General Chemistry course I was enrolled in provided me with a sense of structure, stability, integrity, and belonging that made it feel like home. I developed an innate curiosity to learn more about Chemistry and within 3 months of starting college, I switched my major to a Bachelor of Science in Chemistry and never looked back!

My exposure and experiences with chemistry prior to MSU were minimal, and as a result, I was never too fond of chemistry in high school. I started my freshman year with a sense of fear for what was to come. For me, the challenges of that first semester of General Chemistry became a defining point in my career that paved the way for accomplishments larger than I ever thought I was capable of. In comparison to my other courses that semester, chemistry was the only subject that challenged me in a way that would prepare me for a difficult road ahead; it was exciting, and I knew I wanted to be a part of that crowd. As I progressed throughout the program, I found myself integrated into the family of the Chemistry Department with an endless amount of support from professors, mentors, and students. I feel it a privilege to have been a member of the Department of Chemistry in my time at MSU and I cannot express enough gratitude for the support system it provided me. Most importantly, my chemistry studies developed a fierce sense of independence, accountability, and ability to self-teach/learn that I would not be where I am today.

I graduated from MSU in 2015 with a Bachelor of Science in Chemistry. Following graduation, I pursued a Doctorate in Pharmacy (PharmD) at the University of Missouri-Kansas City (UMKC) in Kansas City, MO. After successful completion of Pharmacy School at UMKC in 2019 I then traveled to Branson, MO, and completed a year-long Post-Graduate Year 1 (PGY1) Residency at Cox Health Hospital. Upon completion of Residency training in 2020 I then accepted a position as the Clinical Pharmacy Coordinator at Phelps Health in Rolla, MO; a relatively small, rural hospital back home. In the summer of 2021, I achieved extra credentialing and the designation of a Board-certified Pharmacotherapy Specialist (BCPS). I am currently in my 5th year as the Clinical Coordinator at Phelps Health.

2024 ALUMNI SPOTLIGHT - continued

In terms of Pharmacy school and the current position I hold as the Clinical Pharmacy Coordinator, I believe my Chemistry degree set me up exceedingly well for both. Pharmacy school came with its own difficulties and struggles, however, the didactics I was confronted with in Pharmacy school oftentimes paled in comparison to the intellectual challenges that were a catalyst to grow my mind and expand my skillset in my time as a Chemistry major. The analytical skills and objective writing skills afforded to me in the numerous Chemistry labs are invaluable skills that I feel I excel in, and I still use on a day-to-day basis in my current position. My current position requires a lot of analytics, mathematics, policy/procedure drafting, and objective proposals all of which I owe credit to my time as a Chemistry major at MSU. In my time as a pharmacist, I have rediscovered my fondness for mathematics and complex pharmacokinetic derivations which I credit my background in Chemistry for developing. Though I don't make use of many of the fundamental Chemistry concepts in my day-to-day work, I see a direct correlation between my current skillset and that which was instilled in me through my undergraduate studies.

I am immensely thankful for the opportunities that being a Chemistry major at MSU has afforded me, and I still brag about being a part of the Department of Chemistry at MSU to this day! Speaking from experience, I can assure you that a Bachelor of Science in Chemistry will bid you well in your future career choice (I can personally attest to this in the Healthcare field). I'm proud to call myself an Alumni of the MSU Chemistry Department and hold many great memories of my time there and the people who supported me.

2024 ALUMNI SPOTLIGHT - continued

LISA BLUE, Ph.D. (BS 2002, Missouri State University; PhD 2010, University of Kentucky)

As a first-generation college student, I've learned that there is no single path to success, which is fortunate since I took a circuitous route! My journey began as a biology major, aiming for medical school until a summer chemistry course sparked a new direction under Dr. Richard Biagioni's guidance. Chemistry challenged me unlike any subject before, but I also found beauty in its elegance: understanding a few logical concepts enabled me to reason through almost any problem. This shift led to research with Dr. Ralph Sheets and internships with Kraft Heinz, Dayco Products, and City Utilities of Springfield as I considered the professional possibilities this new major could offer.

After earning BS and MS degrees in chemistry at Missouri State University and a PhD in inorganic chemistry at the University of Kentucky, I pursued an engineering post-doc at Washington University in St. Louis, collaborating with leading scientists at the Stanford Linear Accelerator (SLAC) and École Polytechnique Fédérale de Lausanne (EPFL). Following a brief tenure in the industry as Director of Research & Development at Covalent Research Technologies, I returned to academia, driven by a strong commitment to sharing my enthusiasm for chemistry with students.

At Eastern Kentucky University, I became fascinated with generative artificial intelligence (GenAI) and its transformative impact on education. Now, as the Director of Artificial Intelligence Strategies, I oversee the ethical and responsible integration of AI across campus, leading the development of innovative policies and enhancing university operations through this advanced technology.

Reflecting on my journey, I realize that my chemistry degrees were not solely about preparing for a single career path, but about cultivating tenacity, resilience, critical thinking, and effective communication. These skills prepared me for a career I once could not have envisioned, enabling me to engage globally in GenAI training and consultation.

GIVING

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Thank you!

Be sure to check us out on social media and see all the cool and fun things happening in the department!

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