



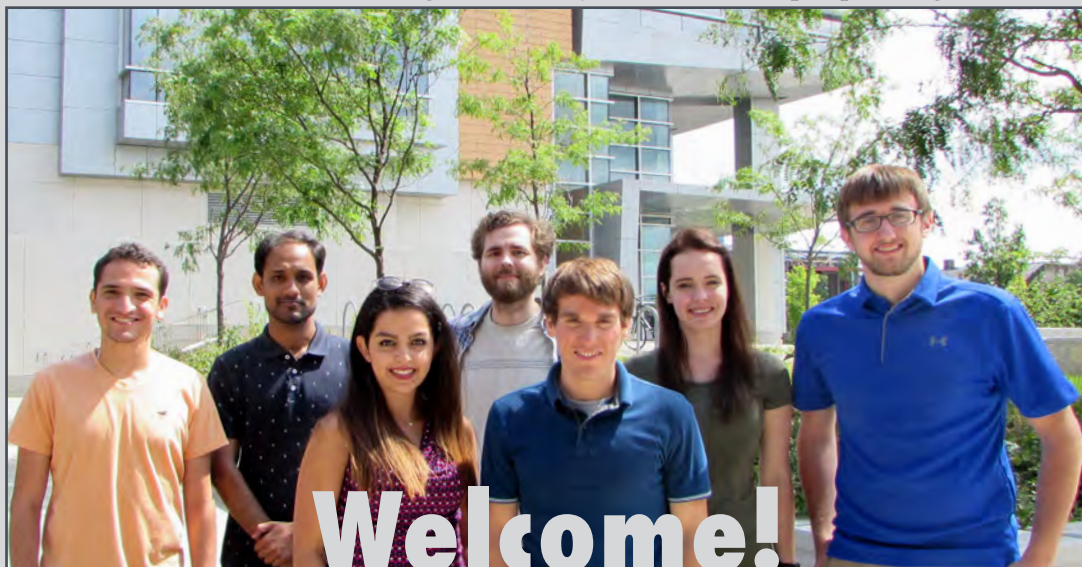
We would like to offer a warm welcome to our new graduate students of Fall 2018, who are from four different nations and pursuing four different concentrations of chemistry. During their first semester, the new students will rotate through different labs before choosing which research group they will join. They are also diving head first into coursework, research, and teaching laboratory sections. Keep up the good work!

Front Row (L-R):

*Sepideh Rezvanian (Organic),
Nicholas Lewandowski (Organic)*

Back Row (L-R):

*Leandro Inacio de Souza
(Analytical/Chemistry Education),
Nurul Setu (Bio-Organic),
Garrett Finn (Analytical),
Katryna Williams (Organic),
David Schreurs (Chemistry
Education)*



From the Chair's Desk



Joe Aldstadt

Dear Friends of the Department of Chemistry & Biochemistry,

We hope our biannual newsletter finds you well. We're having a busy semester and are looking forward to the holiday break!

We welcomed the new Dean of the College of Letters & Science this summer, Scott Gronert. Scott is also the newest addition to our faculty — see page 2 for more about him and his interesting research program in studying reaction mechanisms. We are also in the midst of recruiting for a tenure-track assistant professor in bio-inorganic chemistry. Things are looking up on the hiring front, and a sustained effort over the coming years will further strengthen the department.

We also are very excited that plans for our new building are moving forward at break-neck speed, as we are now ranked first on the Board of Regents' list of priorities for the UW System. We hope to smoothly navigate the remaining hurdles that will lead to including it in next year's state budget. See page 6 for more details.

We also welcomed seven new graduate students this fall, bringing our total number to 76, with five post-docs and two visiting faculty. Along with our 81 declared undergraduate majors, the department continues to thrive.

In closing, note that our Holiday Party will be held on Friday, December 14th in Greene Hall, so mark your calendar and we hope that you can attend.

Sincerely,

New Letters & Science Dean Also New Chemistry Professor



Dr. Scott Gronert

Scott Gronert was born in Long Beach, California, and received a BS in Chemistry from the California State University at Long Beach. He did his PhD work with Dr. Andrew Streitwieser, Jr. at the University of California, Berkeley studying organolithium equilibria. Dr. Gronert did post-doctoral studies with Drs. Charles DePuy and Veronica Bierbaum at the University of Colorado. The work involved gas phase studies of organic reactions. He was a member of the faculty at San Francisco State University from 1990 until 2006. In 2007, he joined the faculty in the Chemistry Department at Virginia Commonwealth University and became Associate Dean of Research for the College of Humanities and Sciences in 2016. During his time at VCU, he received a Fulbright Scholarship to visit the University of Lille (France) and the 2016 Distinguished Research Award from the Virginia Section of the American Chemical Society. In 2018, Dr. Gronert moved to the University of Wisconsin – Milwaukee to become Dean of Letters and Science and Professor of Chemistry and Biochemistry. His current research interests focus on mass spectrometric studies of reaction mechanisms related to important metal-mediated catalytic processes. On November 2nd, Dean Gronert gave a talk at the weekly colloquium titled, "Ion Trap Reactors to the Rescue: A Tool to Solve Problems in Organic and Organometallic Chemistry."

Save the Date

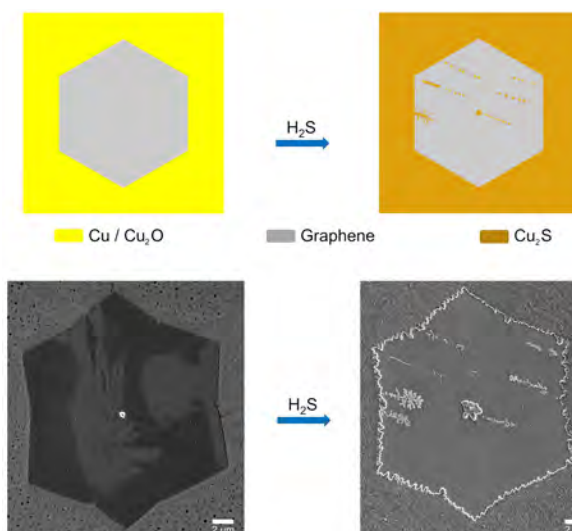
Milwaukee Analytical Chemistry Conference (MACC):
Mass Spec at Your Fingertips

Join us on **January 25th, 2019**, at the Kenwood Interdisciplinary Research Center for the first MACC hosted by the Chemistry & Biochemistry Department. The all day conference will be about mass spec and the applications to drug discovery and forensics. There will be guest talks, workshops, a poster session, and a job fair. If you are interested in attending, please register at bit.ly/Register-MACC.

In Situ Chemical Probing of Hole Defects and Cracks in Graphene at Room Temperature

Graphene is a two-dimensional carbon material with remarkable mechanical, electronic, thermal, optical, and optoelectronic properties. Chemical vapor deposition (CVD) has emerged as the most promising technique towards manufacturing of large area, high quality graphene. Characterization, understanding, and controlling of various structural defects in CVD-grown graphene are essential to realize its true potential for real-world applications. Although considerable research has been devoted to characterization of graphene grain boundaries, rather limited attention has been paid to fast probing of the distribution of nanoscale vacancy defects such as holes and cracks in large area CVD-grown graphene, despite such vacancy defects are well known to have significant effects on graphene's properties.

In a recent paper published in *Nanoscale*, Dr. Jian Chen and his graduate student Ali Altan reported a new method for in situ chemical probing of vacancy defects in CVD-grown graphene at room temperature. Their approach is based on a solid-gas phase reaction that occurs selectively in graphene vacancy defect regions such as holes and cracks. Their technique not only allows for fast probing of spatial distribution of vacancy defects in large area CVD-grown graphene samples, but also provides new insightful information on complex graphene cracking behaviors such as kinking, branching, and possibly ductile fracture. Their study also suggests that the copper grain and copper grain boundary play significant roles in formation and distribution of graphene vacancy defects. Altan and Chen's approach could be extended to probe vacancy defect in other 2D materials grown on a variety of metal substrates.



Recent Undergraduate Spotlight: Madeline Dzikowski



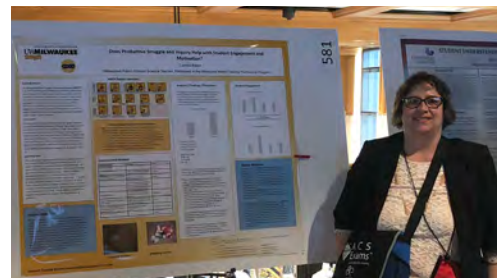
Madeline
Dzikowski

Madeline Dzikowski was a Biochemistry major and transfer student who graduated in Spring 2018. Madeline was very serious about her studies and maintained a near-perfect grade point average during the last two years of her undergraduate studies. Last spring, she began researching a novel drug target for glioblastoma in the Shimadzu Laboratory for Advanced and Applied Analytical Chemistry under the supervision of Dr. Shama Mirza.

Glioblastoma is the most aggressive form of brain tumor with overall survival less than fifteen months after diagnosis, even with multimodal therapy. The lab is studying the effects of inhibiting acid ceramidase, an enzyme thought to increase tumor proliferation and confer chemoresistance in glioblastoma tumors. By blocking that pathway, they hope to increase the sensitivity of glioblastoma tumors towards traditional therapies to increase patient survival rates. Madeline's research was focused on developing a liquid chromatography tandem-mass-spectrometry method for quantitative analysis of carmofur and its applications in pharmacokinetic studies. Carmofur is an acid ceramidase inhibitor, which has shown promising results against different *in vitro* glioblastoma cell lines. The goal of developing this method is to help facilitate the usage of this method for future pre-clinical works to examine the effects of carmofur *in vivo*. "Working in Dr. Mirza's laboratory has been invaluable," she said. "Putting together all the different pieces involved in experimental design has given me so many tools and skills for developing experiments. I feel so much gratitude for all the practical skills for my career that I've learned while researching at the Shimadzu Laboratory." Madeline presented her research at the annual UWM Undergraduate Research Symposium in April, 2018. This fall, Madeline enrolled in a medical biotechnology program at University of Illinois at Chicago to continue studying the applications of drug development in other cancers.

Supporting Science Teachers in Milwaukee Public Schools

The Milwaukee Master Teacher Partnership (MMTP), an NSF funded Robert Noyce Teacher Scholarship Program, entered its third year supporting 25 mathematics and science high-school teachers. The teachers work to increase their content and pedagogical knowledge through micro-credentialing. Participating teachers can present their work at regional and national conferences. Cynthia Blaser, a science teacher at MacDowell Montessori High School (image) traveled with Dr. Anja Blecking (MMTP co-PI) to the Biennial Conference on Chemical Education at the University of Notre Dame this summer to present her classroom research on student engagement and productive struggle.



As for our other program that supports MPS teachers, on October 9th, the M³ (M-Cubed) Initiative invited teachers of Advanced Placement Courses in the areas of English, mathematics, and science to connect with MATC and UWM faculty to discuss course expectations and share instructional material and teaching strategies. Teachers also had the opportunity to attend a variety of workshops, one of which discussed the important interdisciplinary concept of hydrogen bonding (presented by Erin Walsh of Riverside University High School and Dr. Anja Blecking). The next M³ event for all MPS high school science teachers is planned for February 19th, 2019.

2018 Spring Doctoral Degrees

Seyedali Banisadr "New Approaches to Multi-Functional Soft Material" (Chen Group)

Megan Josie Corby "Interactions of Viral and Cellular Helicases" (Frick Group)

Sarah Oehm "Molecular Recognition: Non-Proteogenic Amino Acids for Studies and Chemosensors for Recognition and Reporting Metal Ions" (Schwabacher Group)

Remembrance of George Sosnovsky

by Dr. David Petering

Professor Emeritus **George Sosnovsky**, our longtime colleague and friend, died on April 24, 2018, at the enviable age of 97. Growing up in Estonia, surviving WWII, receiving his PhD after the war in Austria, immigrating to the Australia outback to help the desert bloom, and wisely deciding that venture had little future, George moved to the U.S. to attend the Illinois Institute of Technology first as a post-doc and then transitioning to an Associate Professor of Chemistry. An itinerant for so long, he finally found his professional home in 1967 at the Chemistry & Biochemistry Department at UWM.



Dr. Sosnovsky's career in organic chemistry flourished. He became a major contributor to the area of free radical chemistry, particularly applied to the role of free radical compounds in biological and medicinal chemistry. His research also helped build the foundation for the Milwaukee Institute for Drug Discovery. Besides his internationally recognized research, he co-founded the journal, *Synthesis*, and designed the current Chemistry building. His writing continued after he retired as he published new papers and books even in his 90's.

After he retired and without fanfare, George continued giving to the department. This time, it was through the endowed Sosnovsky Distinguished Lecture in Cancer Research, which annually brings the best researchers in the world to UWM, and the Sosnovsky Dissertation prize, created to honor and provide support to a top-rated doctoral student each year.

I call George one of the "Departmental Elders," along with Werner Brandt, Alex Hill, and Peter Kovacic. Together, they were hired to anchor the Department's conversion from an undergraduate teaching unit to an undergraduate-graduate research department. In turn, they began the process of populating the department with a cadre of outstanding assistant professors and the department we know today was borne. In the process, he helped develop the outstanding reputation of the Chemistry & Biochemistry Department.



Dr. Sosnovsky was a Spaight's Plaza Honoree in 2017.

Pictured with Chancellor Mark Mone and Dr. David Petering.

I think back about what made UWM's startling development into a top-tier research university possible. For us in Chemistry and Biochemistry, I have to credit the original UWM faculty from the UW-Extension and Milwaukee State Teachers College for understanding the need to hire senior leadership to transform the department into a powerful research-based program. They were willing to step out of their comfort zone to actually hire and put up with George and a few others who were professionally completely unlike themselves. At that point, it became the responsibility of these research-based faculty, the Elders, to forge the future. It has worked out remarkably well. Thank you, George, for your part!

A Year in Review: 2018 Faculty Publications & Achievements

Dr. Joseph Aldstadt

- Awarded Faculty of the Year at the UWM Chemistry & Biochemistry Research Symposium on May 22, 2018.
- Determination of Aromatic Arsines in Environmental Solids by Direct Thermal Desorption Gas Chromatography, *Analytical Letters*, [bit.ly/Aldstadt-AL](https://doi.org/10.1080/00036817.2018.1534444).

Dr. Alexander Arnold

- A High-Throughput Screening Assay for Pyruvate Carboxylase, *Anal. Biochem.*, [bit.ly/Arnold-AB](https://doi.org/10.1016/j.ab.2018.08.004).

Dr. Alexander Arnold and Dr. James Cook

- Design and Synthesis of Novel Deuterated Ligands

Functionally Selective for the Gamma-Aminobutyric Acid Type A Receptor (GABAAR) Alpha-6 Subtype with Improved Metabolic Stability and Enhanced Bioavailability, *J. Med. Chem.*, [bit.ly/Arnold-Cook](https://doi.org/10.1021/acs.jmedchem.8b00001).

Dr. Alexander Arnold, Dr. James Cook, and Dr. Douglas Stafford

- Clinical Drug Candidate MIDD0301 is a Novel Oral Asthma Treatment Combating Inflammation and Muscle Constriction in the Lung, *J. Allergy Clin. Immunol.*, [bit.ly/Novel-Asthma-Treatment](https://doi.org/10.1016/j.jaci.2018.08.004).

Dr. Alexander Arnold and Dr. Xiaohua Peng

- Discovery and Optimization of Novel Hydrogen Per-

oxide Activated Aromatic Nitrogen Mustard Derivatives as Highly Potent Anticancer Agents, *J. Med. Chem.*, bit.ly/Arnold-Peng.

Dr. Jian Chen

- *In Situ* Chemical Probing of Hole Defects and Cracks in Graphene at Room Temperature, *Nanoscale*, bit.ly/Chen-InSitu. (See page 2.)

Dr. James Cook

- Was an Organization Committee Member for the International Conference and Exhibition On Pharmaceuticals & Drug Delivery Systems in Valencia, Spain, August 2-4, 2018.
- Attaining in vivo selectivity of positive modulation of Alpha-3-Beta-Gamma-2 GABAA receptors in rats: A hard task!, *Eur. Neuropsychopharmacol.*, bit.ly/Cook-EN.
- Different Benzodiazepines Bind with Distinct Binding Modes to GABA A Receptors, *ACS Chem. Biol.*, bit.ly/Cook-ACS.
- Improved Synthesis of Anxiolytic, Anticonvulsant, and Antinociceptive Alpha-2/Alpha-3-GABA(A)-ergic Receptor Subtype Selective Ligands as Promising Agents to Treat Anxiety, Epilepsy, and Neuropathic Pain, *Synthesis*, bit.ly/Cook-Synthesis.
- Unprecedented Stereocontrol in the Synthesis of 1,2,3-Trisubstituted Tetrahydro-Beta-carbolines through an Asymmetric Pictet-Spengler Reaction towards Sarpagine-Type Indole Alkaloids, *Eur. J. Org. Chem.*, bit.ly/Cook-EJOC.

Dr. Mark Dietz

- Determination of Extractant Solubility in Ionic Liquids by Thermogravimetric Analysis, *Solvent Extr. Ion Exch.*, bit.ly/Dietz-SEIE.
- Solvent Water Content as a Factor in the Design of Metal Ion Extraction Systems Employing Ionic Liquids, *Solvent Extr. Ion Exch.*, bit.ly/Dietz-Solvent.

Dr. David Frick

- Role of the Conserved DECH-box Cysteine in Coupling Hepatitis C Virus Helicase-catalyzed ATP hydrolysis to RNA Unwinding, *Biochemistry*, bit.ly/Frick-Biochem.

Dr. Scott Gronert

- Imidazolidin-4-Ones via (3+2) Cycloadditions of Aza-Oxyallyl Cations onto (E)-N-Arylideneanilines, *Tetrahedron Lett.*, bit.ly/Gronert-TL.

Dr. M. Mahmud Hossain

- A Concise Synthesis of Potential COX Inhibitor BRL-37959 and Analogs Involving Bismuth(III) Catalyzed Friedel-Crafts Acylation, *Chem. Biodiversity*, bit.ly/Hossain-CB.
- Palladium(0)-Catalyzed Rearrangement of Allyl Enol Ethers to Form Chiral Quaternary Carbon Centers

via Asymmetric Allylic Alkylation, *Tetrahedron Lett.*, bit.ly/Hossain-TL.

Dr. Shama Mirza

- Served as a Session Chair for the oral session, "Imaging: Biomedical Applications" at the 66th ASMS conference on Mass Spectrometry and Allied Topics' held in San Diego, California, June 3-7, 2018.
- Characterization of RPE Melanin and Degraded Synthetic Melanin Using Mass Spectrometry and In Vitro Biochemical Diagnostics, *Photochem. Photobiol.*, bit.ly/Mirza-Photochem.
- Identification of Radiation Responsive Genes and Transcriptome Profiling via Complete RNA Sequencing in a Stable Radioresistant U87 Glioblastoma Model, *Oncotarget*, bit.ly/Mirza-Oncotarget.

Dr. Kristen Murphy

- Beliefs about Learning and Enacted Instructional Practices: An Investigation in Postsecondary Chemistry Education, *J. Res. Sci. Teach.*, bit.ly/Murphy-Beliefs.
- Historical Analysis of the Inorganic Chemistry Curriculum Using ACS Examinations as Artifacts, *J. Chem. Educ.*, bit.ly/Murphy-JCE.

Dr. Xiaohua Peng

- Design, Synthesis, and Characterization of Binaphthalene Precursors as Photo-Activated DNA Interstrand Cross-Linkers, *J. Org. Chem.*, bit.ly/Peng-Design.
- Substituents Have a Large Effect on Photochemical Generation of Benzyl Cations and DNA Cross-Linking, *Chem. Eur. J.*, bit.ly/Peng-CEJ.

Dr. Alan Schwabacher and Dr. Nicholas Silvaggi

- *Streptomyces Wadayamensis* MppP is a PLP-Dependent Oxidase, Not an Oxygenase, *Biochemistry*, bit.ly/Schwabacher-Silvaggi.

Dr. Nicholas Silvaggi

- RitR is an Archetype for a Novel Family of Redox Sensors in the Streptococci That Has Evolved From Two-Component Response Regulators and Is Required for Pneumococcal Colonization, *PLoS Pathog.*, bit.ly/Silvaggi-RitR.

Dr. Wilfred Tysoe

- Adsorption and Structure of Chiral Epoxides on Pd(111): Propylene Oxide and Glycidol, *J. Phys. Chem.*, bit.ly/Tysoe-JPC.
- Easy Alloying on Flat Carbides, *Nat. Catal.*, bit.ly/Tysoe-Carbides.
- Effect of Coverage on Catalytic Selectivity and Activity on Metallic and Alloy Catalysts; Vinyl Acetate Monomer Synthesis, *Top. Catal.*, bit.ly/Tysoe-Effect.

Funding for New Building Approved by UWS Regents

by Dr. Douglas Stafford

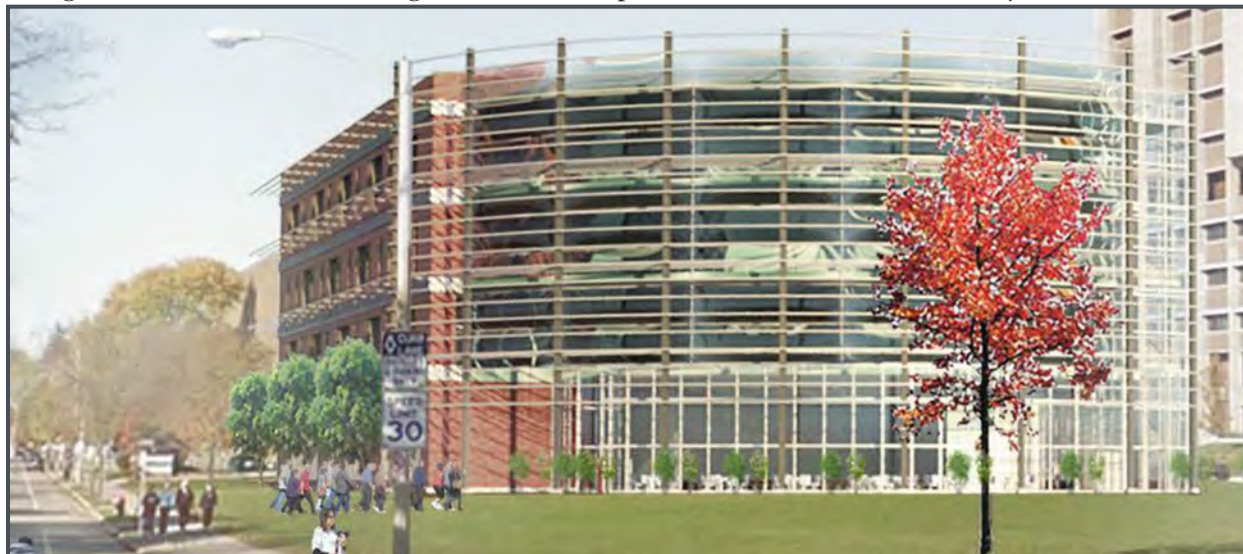
On August 23, 2018, the Board of Regents approved the UW System's capital budget recommendations for 2019-21, which largely focus on renovation, repair, and replacement of aging or obsolete facilities. Included in the recommendation is a new building to house UWM's Department of Chemistry & Biochemistry, with state-of-the-art instructional and research laboratories. The new facility would replace the current 46-year-old, 150,000-square-foot chemistry building at 3210 N. Cramer Street. UWM officials stated that the new chemistry building was UWS's top priority in the upcoming UW System budget, following a recently-completed study that "solidly documented" the need for a new building.

Initial planning calls for a new 130,000-square-foot building that would include:

- Modern instructional laboratories to support and expand offerings for core curricula across all STEM and health science related majors. New labs are intended to position UW-Milwaukee as the "go to" place for the best and brightest regional high school students.
- Modern research laboratories to support and expand research across chemistry specialties. The new facilities would support an expanded graduate program with more graduate students and post-docs participating in faculty-led research.
- A modern outreach facility to broaden relationships between UWM and the local primary and secondary education community. Developing these relationships further positions UWM to recruit the best students possible.
- Specially designed facilities for tutoring, mentoring, and informal learning.

The project would be funded from \$129.5 million in taxpayer borrowing and represents a major commitment to chemistry and STEM education at UWM. To understand the scale of chemistry operations at UWM, consider the breadth of whom we serve and what we offer. Enrollment in undergraduate classes is about 5,000 per academic year. In the last ten years, 450 undergraduate degrees, over 40 Master's, and over 90 PhD degrees in chemistry disciplines were awarded. Currently, there are 81 Chemistry & Biochemistry Department declared majors. We offer nearly 50 lecture and seminar courses including about 85 lab sections per semester. Beyond the classroom, every semester, approximately 60 hours per week of extensive walk-in tutoring is offered and about 2,000 students attend the Chemistry Supplemental Instruction (CSI) program.

The funding request will be submitted to the Wisconsin Department of Administration for consideration as part of the governor's executive budget, which is expected to be released in early 2019.



Building concept along Kenwood Boulevard developed by UWM's School of Architecture & Urban Planning and Department of Chemistry & Biochemistry

2018 Support for Undergraduate Research Fellows (SURF)

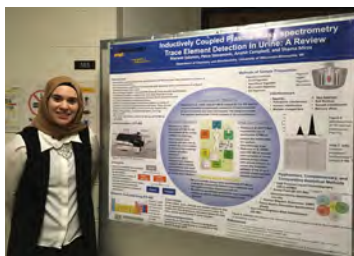
Seventeen undergraduate students participated in the 2018 SURF program. SURF is funded by the Office of Undergraduate Research (OUR). Faculty nominate undergraduate students to work in their research labs. The students are paid an hourly wage and for their research costs. The program is mutually beneficial. Faculty and their group members act as research mentors, and the undergraduate students have an opportunity to leave a distinct mark on professional research. For many, their results will be part of future publications. This experience culminates with the student presenting their work to the department and to the school at large. As an additional part of the program, SURF participants visit a local chemistry company to learn more about what a professional chemist does.



Visiting Eurofins SF Analytical

This year, the students worked in the research laboratories of the Aldstadt, Arnold, Dietz, Hossain, Mirza, Pacheco, Silvaggi, Schwabacher, or Woehl group. Besides their research, they visited Eurofins SF Analytical. The company is a full-service testing laboratory located in New Berlin, WI.

Manager David Riggs and chemist Tomas Garrett gave a tour of the facilities and provided information about Eurofins. As for the SURF poster awards, Marwat Salamin, who worked with Dr. Mirza's group, won first place. The title of her poster was: "Inductively Coupled Plasma-Mass Spectrometry Trace Elements Detection in Urine: A Review."

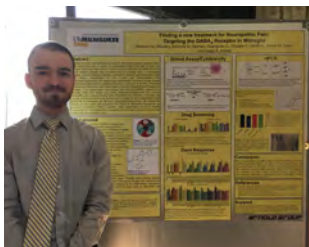


1st: Marwat Salamin

See all the students' posters at bit.ly/2018SURF.



2nd: Kristen Meyer and Hilda Ramirez



3rd: Brandon Mikulsky

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. (Gifts were received from March 2018 to October 2018.)

General Chemistry Fund

- Dow Chemical Company Foundation (matching gift for Shirley Weber McLean)
- Dr. Steven Chmielewski and Mrs. Melanie Chmielewski
- Mr. Michael J. Martin
- Mr. Michael J. McLaughlin
- Mrs. Johanna Vanselow
- Dr. Xiao Yun Xu

Chemistry Scholarship Fund

- Dr. Lynn C. Moscinski
- Mr. Timothy P. Obukowicz

George Keulks Memorial Chemistry Fellowship Fund

- Honeywell International Charity Matching (matching gift for Suheil Abdo)
- Mr. James W. Espy

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 Christina McCaffery at 414-229-4963 or email her at cmmakal@uwm.edu.

Seeking Alumni News

We'd love to hear your story and about your accomplishments. Please email Goldie Gibbs, the Undergraduate Coordinator, at chem-undergradcoord@uwm.edu with your success stories and photos.

Please send in any news that you would like to share for the next edition of our newsletter by **February 15, 2019**.



College of Letters & Science

Department of Chemistry and Biochemistry

P.O. Box 413

Milwaukee, WI 53201-0413



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University of Wisconsin-Milwaukee
Attn: Christina Makal McCaffery
P.O. Box 413
Milwaukee, WI 53201-0413