CHEM / BIOCHEM

Newsletter for Alumni and Friends — Spring 2021

From the Chair's Desk

Joe Aldstadt

As summer arrives, we hope our biannual newsletter finds you well. We're gradually beginning the transition back to "normal" operations after a tumultuous 15+ months. Suffice to say that through the hard work of our students, staff, and faculty we were able to "weather the storm" successfully. Everyone rose to meet the unique challenges of the pandemic and we are eagerly looking forward to returning to "normal" again.

In other news, the design phase for our New Building came to a close last month, and the "Request for Bid" was recently released. Construction is set to begin in the October/November time-frame with occupancy in late 2023/early 2024.

Doug Stafford

This past semester saw the retirement of Dr. Doug Stafford, who has been the Director of the Milwaukee Institute of Drug Discovery (MIDD) since its inception in 2010. Through Doug's pioneering efforts and exemplary leadership, MIDD blossomed into a thriving research center — the grants, awards, corporate partnerships, and license agreements that Doug secured have been significant factors in receiving and maintaining the University's R1 ranking. Doug served the Department in other capacities as well, including as a key member of the User Group for the design of our New Building. Doug will be sorely missed not only for his service to the Department but also for his wonderful wit & collegiality!

In closing, facing the trials and tribulations of the pandemic, we were still able to support our graduate students and technical operations in large part from the generous contributions of our alumni and friends. On behalf of the entire Department, I thank you!

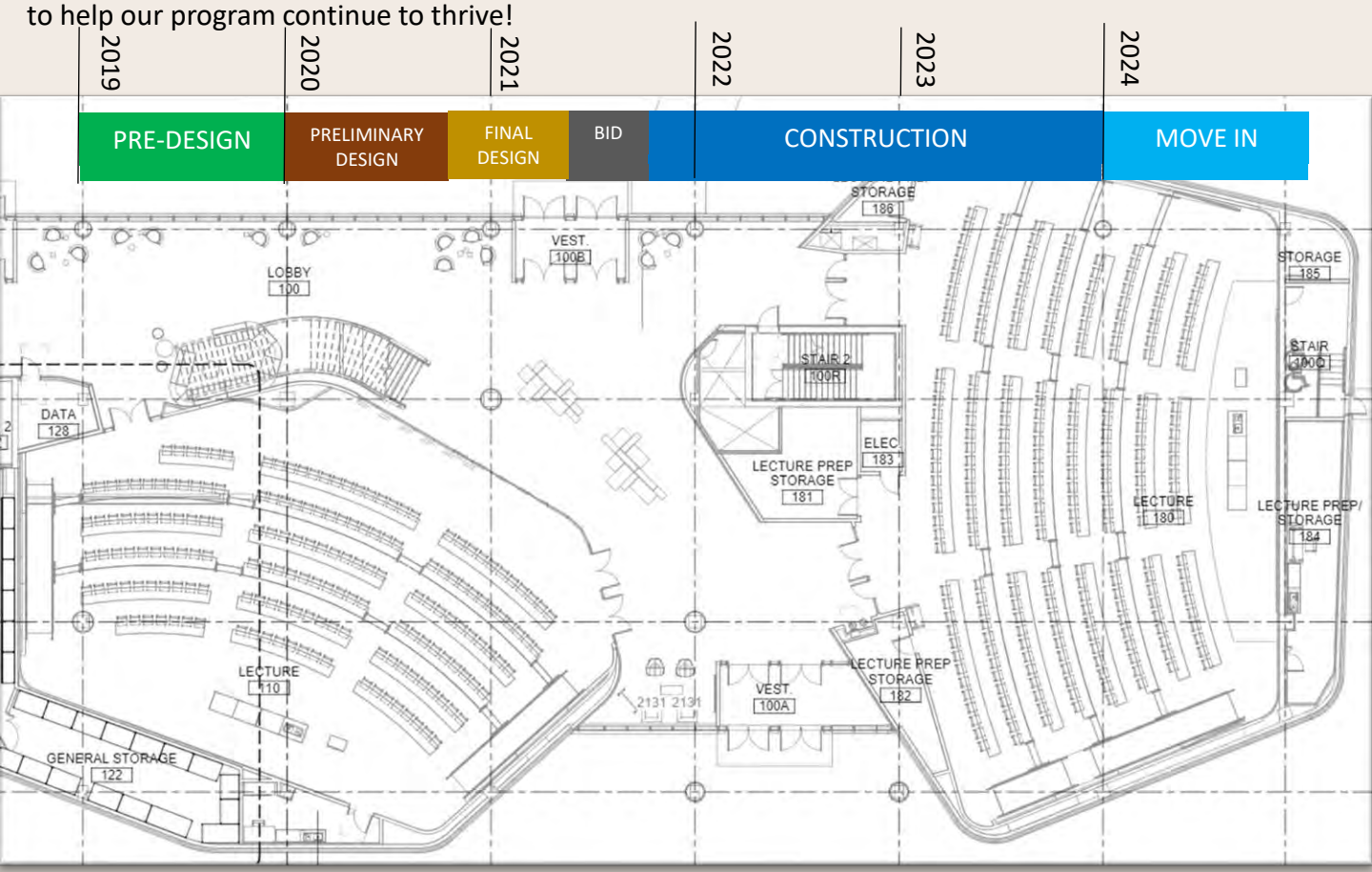
Sincerely.

Joe

UNIVERSITY of WISCONSIN
UWMILWAUKEE
College of Letters & Science

New Chemistry Building

The design of our New Building is on-schedule and continuing to progress very well. On April 2nd, we concluded the Final Design process in preparation for the project to be 'sent out for bid'. Our "User Group" — Kristen Murphy, Nick Silvaggi, Kevin Blackburn, Douglas Stafford, and Joe Aldstadt — has spent many hours representing the Department in a series of monthly workshops that began in February 2018 that will continue through Summer 2021. The current schedule calls for construction to start in October/November 2021 and continue until project completion in late 2023. The images, above and below, were prepared by the architects at Cannon Design (Chicago) and Kahler Slater (Milwaukee) for the Final-Design Report — they depict a lecture hall, the lobby, and a view from inside the SW Quad of the green space and outdoor seating areas that are planned. We are very excited about the prospect of moving to such a state-of-the-art facility to help our program continue to thrive!



New Graduate Student Welcome

We are happy to welcome two new graduate students: Elizabeth Merkel and Bradley Dimock into our program starting Spring 2021.

Bradley also received his undergraduate degree from UWM. Bradley is looking forward to more hands-on experience in the lab and find where he can best utilize what he has learned. He is eager to further explore the world of science in Chemistry and do so in an environment that fosters and kindles experimentation and learning.

Bradley Dimock

Elizabeth Merkel

Elizabeth is a recent graduate of UWM (B.S., Chemistry, 2020) and is now a new student in the Dietz group. Because of Elizabeth's hard work, she was able to receive several scholarships throughout her undergraduate career.

Alumni Update

Tania Mutchie

While still preparing her final defense, Tania Mutchie accepted a position as Senior Process Chemist at Arrowhead Pharmaceuticals in Madison, WI (https://arrowheadpharma.com/). She will be developing new scaling methods for the manufacturing of small molecules for in-house scale-up campaigns.

Shahid

Former graduate student Shahid is now a postdoctoral fellowship at the National Institutes of Health in Bethesda, MD. He is working with Dr. Stewart Levine in the Laboratory of Asthma and Lung Inflammation.

Undergraduate Student Spotlight

Taylor Wilcox

Biochemistry major Taylor Wilcox is a currently a member of the Arnold research group. In her first year at UWM, Taylor started her laboratory research, which is focused on the development of new non-sedative treatments for neuropathic pain based on imidazodiazepines. She works with graduate student Amanda Nieman and together they have investigated the change of inflammation mediated by microglia in the presence of new compounds provided by the research group of Prof. Cook. Microglia are the immune cells of the central nervous system and are partially responsible for neuropathic pain. Their team effort resulted in a recent publication in *ACS Chemical Neuroscience* titled: "Targeting nitric oxide production in microglia with novel imidazodiazepines for non-sedative pain treatment". After Amanda was graduated in Fall 2019, Taylor has continued her work and found several new compounds with superior analgesic effects.

Taylor Wilcox

Taylor has maintained her research with support of the Office of Undergraduate Research, receiving the "Support for Undergraduate Research Fellow SURF" continuously since she started. She has also presented her work at virtual conferences, which were implemented virtually given COVID-19 restrictions. This year, she presented her work at the National Conference on Undergraduate Research, which has been organized annually by the Council on Undergraduate Research (CUR). CUR is an international organization with more than thirteen thousand members, which provides a focus on high-quality and collaborative undergraduate research, scholarly, and creative activity opportunities for faculty and students. Taylor also presented her research at UWM's 13th Undergraduate Research Symposium in Spring 2021, which virtually showcased 260 undergraduate research projects on campus. Taylor received the Outstanding Presentation Award together with 15 students from various UWM departments.

Taylor's career goal is to attend Medical School and complete a MD-PhD degree. She is a certified nurse assistant and is currently working as a Scribe in the Emergency Department at Aurora St. Luke's Medical Center. She also is the author of the patient welcoming letters for the Cardiothoracic Surgery Department at Froedtert Hospital and the Medical College of Wisconsin. Taylor is actively writing a case study to be published with Dr. Paul Linsky, Thoracic Surgeon at the Medical College of Wisconsin. The research work in the Department of Chemistry and Biochemistry at UWM complements her medical education. Taylor has also been part of the ski patrol at Sunburst Ski Resort and worked as a lifeguard at Beaver Dam YMCA. In addition, she assisted teachers in Máximo Nivel-Antigua Guatemala in Summer 2017, working with children to improve their hygienic habits and was part of the Summer program at the University or Glasgow in the UK to study functional anatomy and essential genetics. Taylor currently volunteers biweekly with Big Brother's Big Sister's-Metro Milwaukee.

Graduate Student Spotlight

Elizabeth Merkel

Chemistry: It's just what the doctor ordered!

Elizabeth Merkel

While many students know from a very early age that they are meant to study the sciences, others take a more roundabout path. So, it is with Elizabeth (Beth) Merkel, a recent graduate of UWM (B.S., Chemistry, 2020) and now, a new graduate (M.S.) student in the Dietz group. As a child, Beth dreamed of combining a career as a firefighter with a role as the nation's first female President. During her time as a UWM undergraduate, however, these dreams eventually gave way to life as an "academic nomad" and a series of majors, including American Sign Language Interpretation, Political Science, Biomedical Engineering, and Communications, among others. "I found each of these as interesting as the last", says Beth, but her lack of focus made college a considerable challenge. The difficulties of her first few years at UWM led her to resurrect another childhood dream — to pursue a career as a physician. Beth believes that: "Health and wellness can be more than just treating a physiological ailment". It can also be ensuring equal access to various healthcare resources and the agency for others to self-advocate. For others, it may look like financial assistance, access to healthy food and clean water, quality education, or a safe environment to live and work in. I want this level of equality for others and cannot picture myself entering any other field besides medicine to accomplish this." With renewed focus on this long-time dream, Beth will soon begin the arduous process of applying to medical school. In the meantime, in addition to working as a pharmacy technician and volunteering at a crisis center, she has begun research to develop novel, environmentally benign solvents that can be used in the removal of toxic organics (e.g., azo dyes) from wastewater.

Mark L. Dietz

Graduate Degrees Conferred in the 2020-2021 Academic Year

Master of Science

- **Garrett Finn:** "Novel Approaches to the Determination of Toxic Metals in Industrial Waste and Soil Extracts"
  Major Professor: Professor Joe Aldstadt

Doctor of Philosophy

- **Nemanja Vuksanovic:** "Structural and Functional Characterization of L-Enduracididine Biosynthetic Enzymes"
  Major Professor: Nick Silvaggi

- **Shahid:** "A Mechanistic Investigation of Cytochrome c Nitire Reductose Catalyzed Reduction of Nitrile to Ammonia: The Search for Catalytic Intermediates"
  Major Professor*:* Andy Pacheco
- **Elliot S. Di Milo:** "Determination of the Metabolism, Distribution, and Concentration of Calcitroic Acid"
  Major Professor: Leggy Arnold
- **Tania Mutchie:** "Part I: Development of Small-Molecule-Based Probes for the Vitamin D receptor Part II: Development of a Scalable Manufacturing Process for Orcein Dye"
  Major Processor: Leggy Arnold

Every year the UWM Graduate School selects recipients of fellowships in the following areas:

- **Distinguished Dissertation Fellows (DDF)** recognizes "…exceptional scholarly achievements and recognition relative to expectations in the field of study and exceptional potential contribution of new knowledge."
- **Distinguished Graduate Student Fellows (DGSF)** recognizes "…strong academic achievement or exceptional potential, demonstrated leadership potential, and research goals."
- **R1 Distinguished Dissertation Fellows (R1 DDF)** is "…intended to reinforce UWM's R1 status by supporting exceptional PhD students who plan to finish and defend their dissertations and complete all the requirements for the PhD degree during the 2019-20 award year."
- **Graduate Student Excellence Fellows (GSEF)** was "… established in 2015 by the Dean of the Graduate School, Marija Gajdardziska Josifovska, as a philanthropic effort to provide advanced degree students the support they need to pursue their research endeavors, complete their studies, and share discoveries with others in their fields."

2019-20 Fellowship Recipients
Daniel Knutson - R1 Distinguished Dissertation Fellows (R1 DDF)
Nicolas Zahn - Distinguished Graduate Student Fellows (DGSF)
Nemanja Vuksanovic - Graduate Student Excellence Fellows (GSEF)

2020-21 Fellowship Recipients
Tania Mutchie - Graduate Student Excellence Fellows (GSEF)
Shadiqur Roni - Graduate Student Excellence Fellows (GSEF)

Congratulations to **Vilashini Rajaratnam** on receiving the *Distinguished Graduate Student Fellowship award* and to **Nicholas Zahn** for receiving the *Distinguished Dissertation Fellowship award for 2021-2022*. These awards reflect the endless hours and the discipline they have spent focusing on their research.

2021-22 Distinguished Dissertation Fellowship award

Nicholas Zahn

Vilashini Rajaratnam, Chemistry PhD Major Professor: Shama Mirza
Vilashini received the award for her dissertation abstract titled "*Pharmacology Properties of ARN 14988, an Acid Ceramidase Inhibitor, and its Potential as Chemotherapeutic Agent for Glioblastoma*".

Vilashini Rajaratnam

2021-22 Distinguished Graduate Student Fellowship award

Nicolas Zahn, Chemistry PhD; Major Professor Leggy Arnold
Nick received the award for his research focused on the "*Development of New Treatments for Asthma and Neuropathic Pain*".

2021 Awards Day and Symposium

The 2021 Research Symposium was held virtually (again) due to COVID-19.

Awards Presented:

- Outstanding Performance in Introductory Chemistry: **Reuben Fortier**
- Outstanding Performance in Analytical Chemistry: **Chelsey Lecus**
- Outstanding Performance in Biochemistry: **Gabrielle Haskins**
- Outstanding Performance in Inorganic Chemistry: **Aliece Novitski**
- Peter Kovacic Scholarship for Outstanding Performance in Organic Chemistry: **Alexis Hope Stauffacher**
- Vanselow Award for Outstanding Performance In Physical Chemistry: **Elizabeth Merkel**
- Chemistry Emeritus Award, Outstanding Junior: **Bruce Yang**
- Outstanding Senior: **Nicole Carlson**
- Teaching Assistant Award – Discussion: **Alexander Drena**
- Teaching Assistant Award – Lab: **Elizabeth Merkel**
- Gloria Moczynski Teaching Assistant Award-CSI: **David Schreurs**
- Sosnovsky Award for Excellence in Graduate Research – **Md. Rashid Roni**

Poster Awards:

- 1st Place – **Sepideh Rezvanian**
- 2nd Place – **Alexander Vincent**
- Honorable Mention – **Robert Bavisotto**, **Ethan Kub**, **Trevor Melkonian**

Students who presented their research included:

- **Nicholas Hopper** – "Methyl Pyruvate Hydrogenation on Pd(111); ReactionKinetics from First-Principles"
- **Robert Bavisotto** – "Effects of Terminus on Tribochemical Reactions of Midchain Length Carboxylic Acids on Copper"
- **Gabrielle Grimes** – "Investigation of student understanding of acid-base chemistry in undergraduate analytical chemistry"
- **Allison Tomczyk** – "Exploring Modifications to Scale-Themed Instruction in General Chemistry II: Determining Content Area and Scale Concepts Targets"
- **Fatoumata Diawara** – "Are we meeting students' needs? Matching the difficulty level of chemistry text with student reading comprehension abilities"
- **Ethan Kub** – "Development of an LC-MS Method to Quantify Ceramide Levels and test Combination Therapies on Glioblastoma Cancer Cells"
- **Mohammad Mohiminul Islam** – "Development and validation of LC-MS/MS method for quantitative bioanalysis of carmofur in rat plasma"
- **Vilashini Rajaratnam** – "Shake Flask Lipophilicity Assay, PAMPA and RED Plasma-Protein Binding Assay of ARN14988, an acid ceramidase inhibitor, a potential drug for glioblastoma" & "LC-MS/MS Method Development and Validation for Quantification of ARN14988, an acid ceramidase inhibitor, in rat model"
- **Alex Drena** – "Studying the Pre-A Motif of Truncated Hemoglobin N"
- **Shahama Alam** – "Probing the mechanism of the enzyme Cytochrome *c* Nitrite reductase (CcNiR): studies of the wild type and its variants"
- **Trevor Melkonian** – "Structural and Functional Characterization of PlInd4, a PLP-Dependent L-Arginine Oxidase from the marine bacterium *Pseudoalteromonas luteoviolacea*"
- **Jonathan Mielke** – "Elp3 and tRNA: Towards Understanding a New Role in Wobble Uridine Modifications"
- **Victoria Mandella** – "The Search For Intermediates in the Cytochrome *C* Nitrite Reductase Catalyzed Reduction of Nitrite"
- **David Schreurs** – "Search for the Optimal Measurement of Student Ability"
- **Md Yeunus Mian** – "Design and Synthesis of Anti-schistosomal Drug with decreased sedation"
- **Khorshada Jahan** – "A convenient approach to synthesize regioselective C-2 alkylation of Protected Gramine"
- **Taukir Ahmed** – "Large scale synthesis of a benzodiazepine which positively modulates the GABA®A in type 3 medulloblastoma cancer cells"
- **Muhammad Asad Uz Zaman** – "In-vivo efficacy study of Phenylboronic Acid Nitrogen Mustards as antitumor agents for Triple-Negative Breast Cancer"
- **Jawad bin Belayat** – "Development of a novel, small-molecule brain-penetrant histone deacetylase inhibitor that enhances spatial memory formation in mice"
- **Kamal Pandey** – "The Total Synthesis of Unnatural Enantiomers of biologically active C – 19 Methyl Substituted Macroline, Sarpagine, And Ajmaline Indole Alkaloids"
- **Sepideh Rezvanian** – "Synthesis of Chiral Imidazodiazepines as a-Subtype Selective GABA(A) R Modulators to Treat Schizophrenia and Depression"
- **Alex Vincent** – "6-nitroquinolone Derivatives and their H-Bonding Properties: Binding β-Sheets and Dimerization Imaging"
- Taylor Wilcox – "Development of new treatments for neuropathic pain based on imidazodiazepines"
- Michelle Meyer – "Cell Viability, Motor Performance, and Behavioral Assessments of New Drug Candidates"
- **Eron Saxon** – "Synthesis of a Phenyl Boronic Acid Nitrogen Mustard Analog"
- **Trevor Hagemann** – "Oxidized Arginine Derivatives"
- **Nicolas Zahn** – "Nebulized MIDD0301 Reduces Airway Hyperresponsiveness and Bronchoconstriction in Murine Models"
- **S. Rashid Roni** – "Metabolism and drug disposition of clinical asthma compound MIDD0301 in mice"
- **Daniel Webb** – "Synthesis of MIDD0301 Phase II Metabolites and Application of Amino Acid N-Carboxy Anhydrides to Generate New MIDD0301 Analogs"

Pantherics Inc. Graduate Fellowship

Nicholas Zahn

Pantherics Incorporated donated $19,000 to fund the "Pantherics Incorporated Fellowship" during the Spring 2021 semester. The Fellowship provides one semester of support for an advanced PhD student engaged in original, translational drug discovery research in the Department. The Fellowship was awarded to Nicolas Zahn, a 4th year PhD student working in the lab of Professor Alexander Arnold. Nick's thesis research work is focused on characterizing the safety and efficacy of novel anti-inflammatory drug compounds for use in asthma and other immune disorders.

Pantherics is on the forefront of developing novel drugs based on targeting GABA(A) receptors in the lung and other peripheral organs. The company's lead product is an oral medication for symptom control in persistent asthma and is based on technology discovered at UWM and licensed from the UW-Milwaukee Research Foundation and Columbia University. Douglas Stafford, Pantherics CEO and former MIDD Director said, "We are pleased to support graduate education in the Department of Chemistry and Biochemistry and impactful MIDD research. Nick's work will generate key knowledge on new chemical entities to treat immune-inflammatory disorders." Nick Zahn further commented, "I am honored to receive the Pantherics Fellowship support, which gives me the ability to contribute to developing an important new class of drugs."

Undergraduate researcher targets drug-resistant bacteria

Drug-resistant bacteria are a growing threat to the health of the world. Larsen Birdsong hasn't been graduated yet, but he's helping tackle the problem.

Larson, who is majoring in Chemistry and Biochemistry, is an undergraduate researcher in Professor Alan Schwabacher's lab. He's focused on synthesizing a chemical compound that will target aspects of drug-resistant bacteria to knock out their defenses and make them treatable by antibiotics.

Larsen presented his research at the virtual Undergraduate Research Symposium in April. Larsen felt that it was a great experience to culminate his years of research experience at the university. Please click on the following link to read an article describing his work that appeared recently. https://issuu.com/uw-milwaukee/docs/2021_june_in_focus/9

View Larsen's presentation at the following link: https://bit.ly/3yLNhGZ

New Director of the Milwaukee Institute for Drug Discovery (MIDD)

Dr. Alexander (Leggy) Arnold

Professor Leggy Arnold, recently accepted the position of MIDD Director. He was one of three "cluster hires" in 2009 – along with Profs. Nick Silvaggi and Xiaohua Peng – to support the research area of drug discovery and development on campus. As a founding member of the MIDD, Leggy has been working closely with former MIDD Director Doug Stafford to create an exceptional infrastructure to support researchers at UWM. The new vision for the MIDD includes the coordination of UWM centers affiliated with drug discovery such as the Shimadzu Laboratory for Advanced and Applied Analytical Chemistry, the High-Throughput Screening Laboratory, the Biotechnology Facility, and the Medicinal Chemistry Facility. The new Chemistry Building will house a Kilogram-Scale Laboratory, a Toxicology Center and a Metabolomics Facility to further complement the drug discovery and development pipeline accelerated by the MIDD. Leggy stated, "In the coming months, we will identify the most promising drug discovery projects on campus and help researchers to acquire crucial data for successful grant applications, support the formation of startup companies, and attract third party support from pharmaceutical companies." In the past decade, the MIDD helped to secure more than 20 million dollars for research and was involved in the formation of startup companies such as Pantherics and Estrigenix. The MIDD will also continue working very closely with the UWM Research Foundation to protect intellectual property created at UWM. The mission aligns well with the 2030 Vision for UWM that committed to conduct top tier research by: a) expanding collaborative and interdisciplinary scholarship and graduate programs; b) supporting entrepreneurship, design thinking, and data science; and c) strengthening sustaining partnerships with community, industry and other academic institutions.

Kate Jiannacopoulos

New Undergraduate Coordinator

We are pleased to announce that Kate Jiannacopoulos has joined the Department as our Undergraduate Coordinator. The UGC position is of course crucial to our mission, and we are eager for Kate to thrive.

Kate is a UWM alumna and has extensive administrative experience in the academic and private sectors — in particular, she worked for several years in our Center for Math & Science Education Research.

Mass Spectrometry Facility (Anna Benko)

Spring has officially arrived in Milwaukee with the warm weather, first flower blooms and fresh hope for all of us to be able to come back to the old "normal" as we knew it. Last year took quite a toll on all of us. The UWM Mass Spectrometry Facility was no exception. We were fortunate to be able to support critical UWM research including projects focused on gaining a better understanding of COVID-19.

Unfortunately, at the same time, we had to significantly reduce the user load to ensure safe operation for our users. Our unique, state-of-the-art analytical chemistry research facilities (focused on mass spectrometry), used substantially for undergraduate research and undergraduate instruction (as well as a platform for graduate research, publication, and collaboration,) was no longer able to allow in-person research for undergraduate students. As UWM operations are gearing towards the full on-campus experience, the Mass Spectrometry Facility is getting ready to support full operation as well. Our instruments are ready to perform challenging analyses to identify unknown substances in complex mixtures (such as environmental or biological samples) or quantify known substances in these samples. The lab has always been equipped with a suite of instruments - Liquid Chromatography Triple Quadrupole Mass Spectrometry (LC-MS/MS), Liquid Chromatography Single Quadrupole Mass Spectrometry (LC-MS), Liquid Chromatography Ion-trap and Time-of-flight Mass Spectrometry (LC-IT-TOF) with high resolution capabilities, Gas Chromatography Mass Spectrometry (GC-MS), Ultra Performance Liquid Chromatography (UPLC), High Performance Liquid Chromatography (HPLC), Inductively Coupled Plasma Mass Spectrometry (ICP-MS), Matrix-Assisted Laser Desorption/Ionization Mass Spectrometry (TOF/TOF) with imaging capabilities. Each analytical system is designed to perform unique types of analysis (e.g., heavy metal contamination in fish or lake water, pesticides in soil and foods, drug concentrations in blood, presence of cancer-related substances in tissues, and many other applications). Moreover, we are happy to announce that we added three new, exciting members to our already large equipment family.

We have successfully installed the new Shimadzu LC-MS/MS (model 8060) instrument that provides significantly improved sensitivity for low- level quantitation of impurities. Currently the LC-MS (8060) is mainly utilized for analysis of polyfluoroalkyl substances (PFAS) at parts per trillion levels, an extremely challenging, environmental analysis.

Shimadzu LC-MS 8060

The Shimadzu Ion Chromatograph (IC) has been installed to support the routine analysis of anions to complement the capabilities of ICP-MS.

The LCMS 9030 Quadrupole-Time of Flight (QTOF) instrument represents a brand-new capability within our instrument suite. The system is onsite and will be available to our users once training and instruction are completed.

Shimadzu LC-MS 2020

Shimadzu LC-MS 8040

Mass Spectrometry Facility (Ann Benko)

With recent enhancements, both undergraduate and graduate students will continue to gain hands-on experience operating the state-of-the-art analytical instrument systems, understand how complex research questions can be answered though analytical chemistry, and learn how to transform voluminous raw data into useful results. These skills are a cornerstone of UWM's Chemistry curriculum and highly sought by future employers.

Shimadzu LCMS IT-TOF

Shimadzu MALDI 7090

Shimadzu 9030 QTOF

In addition to internal UWM users, the Mass Spectrometry Facility supports research performed by other academic and industrial users. Depending upon the collaborator's need, we perform a full analysis service and provide the training for users to use the laboratory resources independently. If you have a research project that requires analytical support, please let us know – we will be happy to help! For any requests about capabilities, please reach out to us Anna Benko, Laboratory Manager, at abenko@uwm.edu or 414-229-5265 and Shama Mirza, Director and Associate Professor of Chemistry & Biochemistry, at mirza@uwm.edu or 414-229-3658.

Dr. Anna Benko

Anna has managed the Mass Spectrometry Facility since 2017. She is a UWM Chemistry Department Alumna, holds a PhD in organic chemistry, and has over 10 years of experience managing an industrial analytical chemistry laboratory (including new instrument acquisition and validation, method development, tech transfer, work-flow management, and budgeting). Anna is responsible for day-to-day operations and maintaining high levels of system operability, including work-flow management, routine maintenance, troubleshooting, and data acquisition and interpretation. She provides instruction in instrument operation and supports the research of facilities users.

Dr. Shama Mirza

Shama has 20 years of mass spectrometry experience including a PhD in Analytical Chemistry/Mass Spectrometry. She has extensive experience in various MS technologies for analyzing analytes, ranging from small molecules like organic compounds and metabolites to large compounds like proteins, peptides and oligonucleotides. In addition to her own research lab, in the MS facility she directs projects and programs, evaluates new technologies, develop ideas for new research projects, supervises hiring, training and goal setting. Shama teaches undergraduate, graduate, and postgraduate students, offering courses and workshops including lectures on theoretical aspects of MS and labs with hands-on training on the MS instruments. She also serves as PI, Co-PI and consultant in several national and internationally funded grants.

NMR Facility (Frank Foersterling)


Dr. Frank (Holger) Foersterling

The UWM Nuclear Magnetic Resonance facility serves about 50 graduate and undergraduate students from the Departments of Chemistry and Biochemistry, Biological Sciences, and Mechanical Engineering. All users receive training to operate the spectrometers independently and will gain hands on experience in operating-state-of-the-art high field spectrometers. In addition, students learn analysis of complex multidimensional spectra, and become familiar with automated and semi-automated spectral assignment and structural generation from their NMR data.

Our newest instrument is the recently acquired Bruker Avance III HD™ 500 MHz spectrometer. It is equipped with a Prodigy™ cryoprobe for increased sensitivity and throughput, and a sample changer to allow for automated and remote operation. This instrument allows students to perform most state-of-the-art, high-resolution NMR experiments, including linear and non-linear two-dimensional correlation experiments (HSQC, COSY, HMBC, ADEQUATE), diffusion experiments, variable temperature measurements, and many of the non-routine nuclei such as ^{15}N, ^{29}Si, and ^{11}B. Additionally, the 300 MHz spectrometer is available for routine experiments, and an Oxford Pulsar 60 MHz spectrometer is available in the teaching labs. In addition, several processing workstations are available in the lab for off-line processing and analysis.

Besides users from the UWM campus, the NMR facility also supports academic and industrial users from the wider community. Requests for access and fee schedules should be directed to the facility director, Dr. Frank H. Foersterling at holger@uwm.edu or 414-229-5035. Dr. Foersterling has been managing the NMR facility since 1998. He has a PhD in Chemistry and an extended background in the application of NMR to chemical and biochemical problems. He oversees scheduling, maintaining the instruments, training new users, and providing research support to research groups using the instruments. He also teaches a graduate class every Fall semester on the theoretical and practical applications of NMR spectroscopy. This class consists of both a lecture and a lab portion, during which students gain hands on experience in operation of the spectrometers and data analysis. In addition, he instructs students in advanced data acquisition and analysis techniques.

Scientific Glass Shop (Neal Korfhage)

Mr. Neal Korfhage

I'm the Scientific Glassblower in the Department of Chemistry & Biochemistry. My father, Jack Korfhage, began teaching me scientific glassblowing in his home shop when I was fifteen years old. I went on to technical training for glassblowing and worked for Aldrich Chemical, (now Millipore Sigma) after technical school. I worked for eleven years in their Glass Shop with seven other glassblowers. I've been working at UWM in the Department of Chemistry & Biochemistry for over thirteen years. I'm a member of the American Scientific Glassblower Society (ASGS) and serve as a committee member of the Allen Brown Seminar at the annual ASGS Symposium, where I present advanced glassblowing techniques to seminar participants.

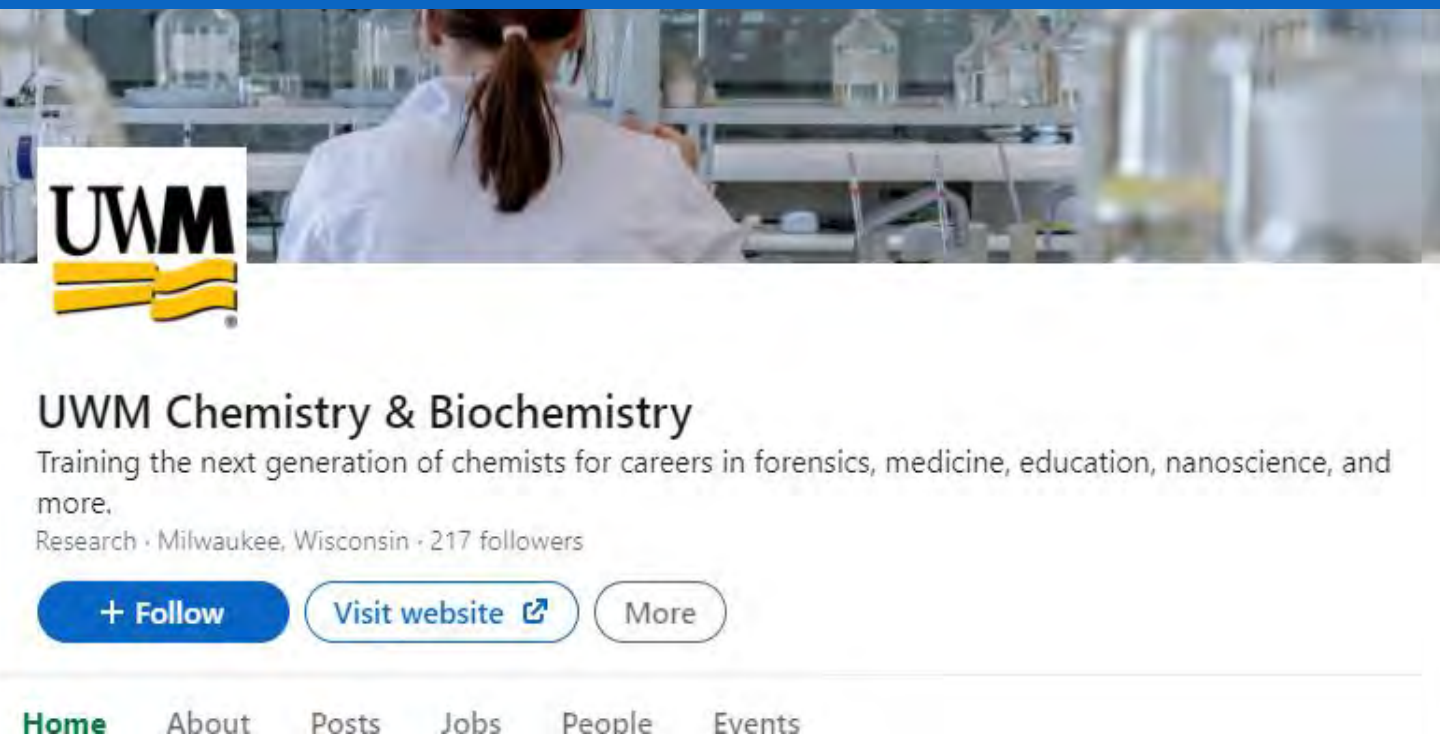
I make and repair glassware for scientific research at UWM that supports R1 research in Chemistry, Biochemistry, Engineering, and Physics. I work primarily with borosilicate (Pyrex) glass, but also with fused quartz, and I specialize in high-vacuum systems and distillation.

Fun fact: the largest project I've ever worked on (at Aldrich) was almost 100 liters in volume. It was a unique project for the Aldrich chemists to do a complex reaction in one vessel without transferring materials to other containers. It took a two-person team working together to build the massive unit. We also wore heat-reflective suits and masks to keep the heat exposure to a minimum. My favorite thing about working at the UWM Chemistry & Biochemistry Department is collaborating with a diverse variety of exciting people and projects.

In addition to supporting R1- level research at UWM, the Scientific Glass Shop also provides consultation for glassblowing services (repairs or make new) and receives projects from other universities and from industrial collaborations. Orders can be shipped to our facility or dropped off and picked up in person. If you have any scientific glassblowing needs, please feel free to contact me: Neal Korfhage, Scientific Glassblower, University of Wisconsin – Milwaukee, Department of Chemistry & Biochemistry, 3210 N. Cramer Street Milwaukee, WI. 53211. My office phone is 414-229-5224 and my email is korfhage@uwm.edu

Example of a custom creation by Neal, this is a 'falling film distillation head'

From the Communications Committee



We have established the UWM Chemistry & Biochemistry LinkedIn site to enable you to receive updates on your LinkedIn feed and get real-time information about important Department events. If you already have a LinkedIn account, just click "Follow" and join us!

We also created a platform to enable current and former graduate students to stay in contact. The UWM Chemistry Graduate Program at LinkedIn has over 141 UWM Chemistry & Biochemistry graduate student members so far. In the news feed, we often see open chemistry position advertised by your former colleagues, accomplishments and publications, and invitation to conferences and workshops. Thus, don't hesitate to join this group!

We also have included new webpages to our official UWM Department website. If you want to have quick access to new department publications, then check out our Research page. Do you want to see photos from previous Research Symposiums or want to know more about our current graduate students? Thus, our department webpage is providing the information you need to stay connected, contact friends and experts, as well as to make donations. We will continue to host scientists from all over the world to present their work each Friday at 3 pm, be sure to also check out our calendar.

Faculty In the News

In rankings by Stanford University, six current and former faculty members in our Department are listed as among the top 2% of researchers in their respective fields based upon citation frequency.

- Scott Gronert (Professor of Chemistry and Biochemistry and Dean of the College of Letters & Science)
- Mark Dietz (Professor of Chemistry and Biochemistry)
- David Petering (Distinguished Professor Emeritus of Chemistry and Biochemistry)
- Wilfred T. Tysoe (Distinguished Professor of Chemistry and Biochemistry)
- Carolyn Aita (Distinguished Professor Emerita of Chemistry and Biochemistry)
- George Sosnovsky (Professor Emeritus of Chemistry and Biochemistry)

Sterling Steps Up Recruitment Following Acquisition

For the 19th Annual UWM Chemistry Symposium held in April, Sterling Pharma Solutions partnered with UWM as an event sponsor and provided employees to serve as panel judges.

Sterling, a Wisconsin-based pharmaceutical employer, made presentations to current students and highlighted local career opportunities available to them at its nearby facility in Germantown, which was acquired from Alcami in September of 2020.

Across a network of four facilities in the UK and the US, Sterling provides a range of small molecule and antibody drug conjugate (ADC) development and manufacturing services to customers around the globe. The Germantown location develops and manufactures Active Pharmaceutical Ingredients (API) to support all phases of the clinical development cycle with a unique specialization in highly potent APIs (HPAPIs).

The Sterling organization is built upon a strong foundation of culture and values; that focus the team on delivering an unrivaled experience to customers, while taking care of each other. These values are based on collaboration, trust and open communication: "Be Caring, Be Reliable, Be Willing and Be Transparent".

The Germantown facility has experienced significant growth in recent years and has equally ambitious plans for the future, so it is the perfect time to join the team!

Sterling Germantown is currently seeking highly motivated graduates for the following positions:

- Analytical and Chemical Research & Development Scientists
- Analytical Chemists – Quality Control
- Production Chemists – Manufacturing
- Chemical Engineers

Please visit www.sterlingpharmasolutions.com/careers and apply today!

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