CHEM/BIOCHEM

Newsletter for Alumni and Friends

Spring 2016

From the Chair's Desk

Dr. Peter Geissinger, Chair

Dear Friends of the Department of Chemistry & Biochemistry,

Although we are already midway through the spring semester, I still would like to extend a belated welcome to our new graduate students, Lamia Badhin, Alejandro Boscoboinik, Victoria Fisher, Michael Kaul, Korshada Jahan, and Resham Rana. Some students shared short biographies in this issue.

They have hit the ground running and now are immersed in instruction, both as students taking introductory graduate courses and as teaching assistants. To assist our new teaching assistants with their new roles, they have been paired-up with mentors, who are experienced graduate students in our Department. This mentoring program is now in its fifth year and has been very successful. It speaks to the professionalism of our students that there are always sufficient volunteer mentors to support students in their first assignments as instructors. The Department would like to say a big THANK YOU to the current mentors, Sarah Oehm, Toufiqur Rahman, and Steve Reinhardt, and to all past (and future) mentors; their service is most appreciated.

Also, we welcome Dr. Shama Mirza as the new Director of the Shimadzu Laboratory for Applied Analytical Chemistry. Dr. Mirza comes to UWM from the Medical College of Wisconsin, where she investigated biomarkers for cancer. She will continue her research, which is supported by grants from the National Institutes of Health, at UWM in addition to the duties as lab director. She is a trained analytical chemist with specialization in mass spectrometry.

In this issue, we are featuring again an outstanding graduate student and an outstanding undergraduate student, Brett Beaupre and Elliot DiMilo, respectively. More details on their research can be found in this issue. And, we just learned that two of our students, Heli Fan and Matthew Hoag, were awarded a Graduate School Distinguished Graduate Student Fellowship. Congratulations to all of them!

We continue add programs and activities that support recruitment and retention of students. New this semester is supplemental instruction that is provided by Chemistry & Biochemistry students for all 100-level courses and 300-level courses. While attendance is voluntary, course instructors do monitor student progress carefully and encourage students who have difficulties to attend supplementation instruction. This service has been very well received and the special instructional space set aside for it was overcrowded at times. Thanks to Professor Murphy for organizing this service, to Kevin Blackburn for reconfiguring and renovating the space, and to our graduate student instructors Sandra Simon, Steven Reinhardt, Nazmul Hussain, Xavier Udad, Shalini Srinivasan, and Sarah Oehm for their dedication to helping our students.

To support area high-school teachers, our Department is in the process of establishing the UWM Science House. Led by Professor Blecking, this project aims to provide complete experimental classroom activities consisting of background materials, supplies and equipment, data analysis procedures, and assessment materials to teachers in regional high schools. The Science House space in our Department is not only the central repository for these modules, but also where training session for teachers will be held and the development and trailing of new modules will take place. This close engagement with high school science teachers will also serve student recruitment efforts.

Our departmental Student Awards Day will take place on Saturday, May 21st in the UWM Union starting at 9:30 a.m. Our Graduate Student Councilors Sarah Oehm, Nazmul Hussain, Mark Yerukhimovich, and Tyler Fenske have been working hard on the organization and fundraising for this event, which is open to the public. So if you are in the area on that day, please stop by to learn about the exciting research and scholarship that is currently being carried out in our Department. We would love see you at the event.

And, as always, we would like to express our gratitude for your donations to our Department. These support the professional development of our students. Your donations do make a difference!

Best Wishes,

Peter Geissinger

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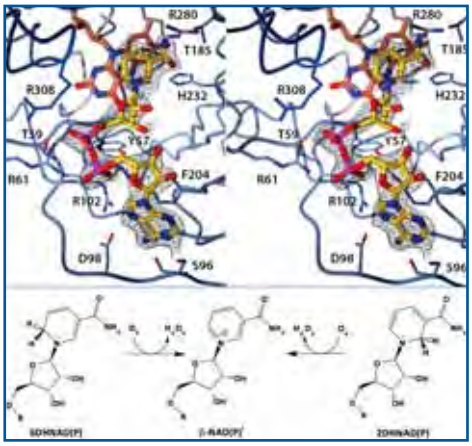
College of Letters & Science

Outstanding grad student: Brett Beaupre
Prepared by advisor Dr. Moran

I enthusiastically recommend Brett Beaupre for Outstanding Graduate Student.

Brett has just completed his third year of graduate studies under my supervision. I count myself as exceedingly fortunate to have Brett in my research group as he is already a highly-accomplished scientist; attaining more measurable success in his first three years than most students manage throughout their degree. By far the most important metric in the sciences is the publication; Brett currently has five publications with three more in the works. His first three published articles have taken a decade old area of study and placed it squarely on its head. Brett discovered the true substrates for renalase, an enzyme wrongly touted to have direct influence on blood pressure. This answer had eluded many researchers (>120 articles), and his discovery was made more impressive by the fact that the substrates are complex molecules, difficult to prepare and rather unstable. His first research article was published in the prestigious *Journal of the American Chemical Society* as a Spotlight article that is highlighted by the journal in the same issue. In addition to his publications he has presented nine research posters at national and regional meetings, and I have presented his findings at the Enzymes Gordon Research Conference in July of 2014 and will again in 2016.



Brett has an unusual mix of qualities. His thought process is unstoppable, vibrant and rapid. This means that he quickly sorts a myriad of possibilities before deciding a path forward. When the path is selected he conducts the experiments in a careful manner and invariably produces data that is of publication quality, readily-analyzed and collected with the reader in mind – a rare quality indeed. His rapid survey of ideas is part of a generally-impressive intellectual capacity. As you may expect he has passed all departmental milestones in a timely fashion and expects to complete his comprehensive exam toward the end of his third year. As a graduate student he has maintained a near perfect GPA. For his departmental seminar, Brett gave an hour-long presentation on the topic of bacterial thymidylate synthase that was lauded as the best student presentation in recent years.

Brett's generally affable and eager nature has produced a renewed level of collaboration in my laboratory. All other members of my laboratory see Brett as a colleague and resource and together they accomplish more. He also sets an impressive work ethic standard, returning to the lab to work late, seeing experiments through to completion, placing science above most else.

2015 Fall Doctoral Degrees

Ryan Andrew Schmeling "Variable Pathlength Cavity Spectroscopy: Development of an Automated Prototype" – Advisor: Joseph Aldstadt

Kelly A Teske "Part 1. The Development of Non-Secosteroidal Vitamin D Receptor Modulators Part 2. The Development of a Universal GTPase Assay" – Advisor: Alexander Arnold

Hannah E Wagie "Porphyrin as a Spectroscopic Probe of Net Electric Fields in Heme Proteins" – Advisor: Peter Geissinger

2015 Fall Master's Degrees

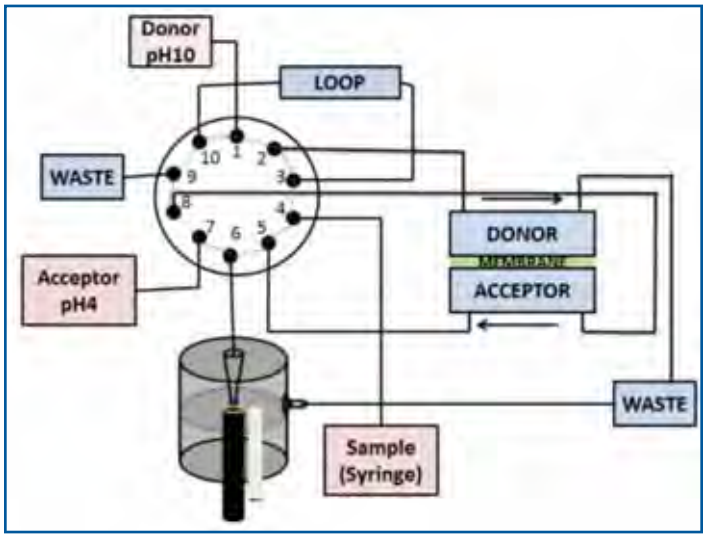
Zhe Cao "Encapsulation of Cationic Fluorescent Dyes and Photosensitizers Into the Nanoscopic Domains of Poly (Ethylene Glycol)-b- Poly (E-Carprolactone) Micelles" – Advisor: Gil Indig

Kaniz Fatema "Reaction of Zinc Proteome with Biological Important Metal Binding Ligands"
Advisor: David H. Petering

Outstanding Undergraduate Student – Elliot DiMilo
Prepared by Advisor Dr. Aldstadt

Elliot S. DiMilo is a senior chemistry major (with biochemistry emphasis). Elliot has excelled as a student and researcher. He has accrued a near perfect grade point average, been active in our Student Affiliates of the ACS (SAACS) chapter, and served several semesters as a Teaching Assistant (TA) in our General Chemistry curriculum. In his research efforts, Elliot has been studying analytical chemistry in Prof. Aldstadt's lab since June 2014. His research work has been supported by fellowships from the Office of Undergraduate Research (OUR), having successfully written proposals for a total of $10,000.

Elliot's research has focused on developing novel flow-injection (FI) instruments for chemical analysis. Elliot developed a method for study of the Maillard Reaction. The Maillard Reaction is a non-enzymatic series of reactions in which amino acids combine with sugars, and has medical implications such as hyperglycemia that leads to late diabetic complications. Elliot has been studying the early stages of the Maillard Reaction by using a benchtop 82 MHz proton Nuclear Magnetic Resonance (NMR) spectrometer interfaced to the FI system. Solutions of phenylalanine and methylglyoxal were used as model reactants. Elliot developed a novel method based on FI using a parallel-plate dialyzer (PPD) as a means to separate and preconcentrate the products of the reaction prior to the NMR measurement. Key milestones in his work were the development and optimization of the FI-PPD method and study of the kinetics of the Maillard Reaction by designing and conducting on-line monitoring experiments using the FI-NMR system. This project was challenging for an undergraduate student, involving the design, fabrication, and testing of the instrument as well as the subsequent method development work — but Elliot "rose to the occasion". Elliot has become adept in the interpretation of proton NMR spectra and we are presently compiling the results for publication. He has become increasingly independent and has provided insights in understanding our results and suggesting our next steps.



Elliot received the "Outstanding Junior Chemistry Major" award at our annual ceremony last April. Elliot will complete his Bachelor's studies this spring and is presently applying to graduate school for PhD studies in biochemical/medicinal chemistry.

Phi Beta Kappa Inductees

Congratulations to our Undergraduates inducted into Phi Betta Kappa!!!

Election to membership as a senior requires a minimum GPA of 3.6, while election as a junior requires a minimum GPA of 3.8. In addition, students selected for membership must have satisfied Phi Beta Kappa distribution requirements in language, mathematics, humanities, social and natural sciences.

From the Department of Chemistry and Biochemistry, the 2016 inductees are:

- Areej Jaber
- Matthew Michels
- Robert Miller
- Ahila Na
- Jon Rostas
- Dana Shannon
- Brandon Struck
- Talon Radke
- Michael Sportiello
- Marcus Jellen
- Christina Tersine

New and Noteworthy

Welcome Dr. Shama Mirza and our new graduate students: Lamia Tabassum Badhon, Alejandro Boscoboinik, Victoria Fisher, Khorshada Jahan, Michael Kaul, and Resham Rana. See some profiles on the next page.


Lamia Tabassum Badhon


Alejandro Boscoboinik


Victoria Fisher


Khorshada Jahan


Michael Kaul


Resham Rana

Congratulations to alumna, visiting lecturer, and Fall 2015 graduate, Hannah Wagie, on the birth of her baby boy, Arthur George born on January 8th, 2016.

Our Outstanding Undergraduate from the Fall 2015 edition, Kelsey Holbert, was named National Academic All-American Honor by CoSIDA, the highest academic honor possible in Division I women's soccer, and earned a spot on the Second Team Academic All-America squad. She is the second UW-Milwaukee women's soccer player named, joining Ginny Graczyk who was selected in 2006. She is also the 19th Milwaukee student-athlete to date to receive this honor across all sports. Great job!

Meet Shama Mirza, Director
Shimadzu Laboratory for Advanced and Applied Analytical Chemistry

Dr. Shama Mirza was an Assistant Professor at the Medical College of Wisconsin before joining UWM. She has been working on identifying biomarkers in glioblastoma, the most common and aggressive of the primary brain tumors, to evaluate long-term survivors, and for those with tumor recurrence to identify differential response to bevacizumab (anti-VEGF) therapy. These protein signatures aid in the prognosis of the disease, identify therapeutic response at early stages, and eventually to identify new therapeutic targets for individualized treatment.

Dr. Mirza is an expert in mass spectrometry, and has developed numerous novel approaches to improve the analysis of different classes of compounds from small organic species to very large proteins. Her research focuses on developing novel mass spectrometry-based technologies for the comprehensive characterization of cellular proteome to better understand protein functions and interactions under normal and disease states. Such understanding requires high-throughput technologies that allows running various experiments in parallel. She develops such technologies to gain insight into the biological processes that would otherwise not be achieved using traditional biochemical methods. She has published more than 30 peer-reviewed journal articles on applications and technology development aspects in the field.

Faculty Grants

Widlansky, M. (P.I.), Arnold, A. and Hill, B. (Co-investigators) "Endothelial function in human diabetes: role of mitochondrial fission proteins," sponsored by NIHLB, $1,931,914.

J.M. Cook (P.I.) "Development of New Drugs for Asthma by Targerting GABA (A) Receptors in the Lung (C. Emala, PI), NIH, UWM-subcontract, $200,808 (2016-2020)

Victoria Fisher (Master's Student):

Where are you from: Menasha, WI
Previous Degree: Bachelor in Chemistry from the University of Wisconsin-Platteville
Why you chose UWM's graduate program: The faculty and the environment the department provide to help advance in my career.
Hobbies: I am an avid half-marathon runner and enjoy reading, knitting and tea.
Plans after graduation or dream job: After graduation I hope to become a Professor at a community college or technical school.

Alejandro Boscoboinik (PhD Student):

Where are you from: Argentina
Why you chose UWM's Graduate program: The UWM is a prestigious institution for which I keep my highest respect and admiration. I am a person whose motivation is to help others and promote educational feedback in communities. This is why I have chosen UWM Graduate program as a way to cope with challenges that allow me to grow academically, socially and personally as a part of a community.
Research interests: Surface chemistry, ultra-high-vacuum surface-science techniques, catalyst preparation techniques, model-catalyst research, heterogeneous catalysis, Monte Carlo simulations and density functional theory analysis applied to surface sciences
Plans after graduation or dream job: After I graduate, I plan to continue with my academic preparation to help develop a better understanding of elemental surface chemical processes.

Lamia Badhon (PhD Student):

Where are you from: Bangladesh
Why you chose UWM's Graduate program: I came to know about this campus from my husband as he is also a graduate student here. I have explored research work of the faculty members and found it interesting as well as flourishing.
Research interests: Biochemistry
Plans after graduation or dream job: University-based research and teaching

Alumna Update: Kelly Teske

Hello from Connecticut,

In November, I began working as a post-doctoral fellow in the School of Pharmacy at the University of Connecticut (UConn) under the direction of Dr. Kyle Hadden. I am currently developing posaconazole analogues as hedgehog (Hh) pathway inhibitors with potential as anti-cancer chemotherapeutics. Dysregulation of the Hh signaling has been linked to different human cancers such as medulloblastoma and basal cell carcinoma. In addition, I am investigating the epigenetic mechanism by which alpha-thalassemia/mental retardation, X-linked (ATRX) syndrome, a human congenital disorder that causes severe intellectual disabilities, functions in order to develop new chemothereapies.

When not at work, I spend much of my time exploring the east coast. I live in a relatively small town, but it is very close to several major cities including Boston and New York City. There are a lot of great wineries in Connecticut and many fun outdoor activities to do such as biking, hiking and cross country skiing. The UConn, itself, is tucked away in rural Storrs, Connecticut, where you can see cows grazing on the rolling hills around campus. You can even get ice cream and cheese that has been made from the milk provided by these cows at the local Dairy Bar! Don't worry though, Wisconsin still has the best dairy in my opinion…cheese curds, fried or fresh, aren't even a thing here! Other than a few things lacking compared to the great city of Milwaukee, Connecticut has been an amazing new adventure thus far.

Your fellow UWM Panther,
Kelly A. Teske, PhD

Length of Service Honorees

On Wednesday, April 20, 2016, UWM held its annual Length of Service Awards Ceremony in the Ballroom of the UWM Union. Several members of the Department of Chemistry & Biochemistry were honored.

10 years:	Gloria Freschl, Farida Hossain, and Neal Korfhage
15 years:	Vincent Maberry
20 years:	Alan Schwabacher
25 years:	Tom Sorensen
30 years:	Elise Nicks
45 years:	David Petering


Gloria Freschl


Farida Hossain


Neal Korfhage


Vincent Maberry


Alan Schwabacher


Tom Sorensen


Elise Nicks


David Petering

Friends of Chemistry

Your contributions enhance the educational experience of our students and strengthens the research and development of our faculty and staff. Please join us in thanking our friends (gifts from 10/2015 to 3/2016):

General Chemistry Fund

- Dr. Rosemary E. Schreoter
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- Westrock Foundation (matching gift for Kevin Ellis)
- Mrs. Shirley Weber McLean
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- Eli Lilly and Company Foundation, Inc. (matching gift for Michael Martin)
- Benevity Community Impact Fund (matching gift for Tabby Lei in honor of E. Alexander Hill)
- Cybergrants (Boeing gift matching program for John Patrick Kinlen)
- Mr. Michael J. McLaughlin

Chemistry Scholarships/Fellowships/Awards

- Mr. Carl E. Wolff
- Dr. Xiaoyun R. Xu

Durward C. Layde Memorial Scholarship Fund

- Mrs. Mary Elizabeth Krueger (in memory of Mary Layde)

Polyquinanes and Medicinal Chemistry Fund

- Takeda California, Inc. (matching gift for Chunrong Ma)

George Keulks Memorial Chemistry Fellowship Fund

- Honeywell Int'l Charity (matching gift for Suheil Abdo)

Become a Friend of Chemistry and Biochemistry. See the pledge form on the back, visit our website, or contact Christina McCaffery at (414) 229-4963 or cmmakal@uwm.edu.

Spotlight on CHM 690: "Scientist Career Transitions"

During the Fall & Spring semesters – Chemistry 690: "Scientist Career Transitions" – is being offered to upper-level students in the natural sciences. The course, now in its fourth semester, was developed in 2014 by Dr. Douglas Stafford, Director, Milwaukee Institute for Drug Discovery, as part of a larger UW-System Incentive Grant.

The course is designed to offer students a unique perspective of the scientific workplace as they contemplate transition to employment in science-oriented industrial careers. The course seeks to develop "translational skills" to transition from academic learning to initial employment, job success, and career advancement. Topics covered during the one-semester, one-credit course include business and personal ethics, matrix organizations, human resources principles/regulations, conflict resolution, intellectual property, regulations, human subjects research, research strategy and decision making, contracts, and project management. Each class period includes discussion of industry events, with a focus on biomedical topics, reported in the press that day to connect course topics with events in real-time. According to Dr. Peter Geissinger, Department Chair, "Chem 690 is a great opportunity for students to better understand how chemists work and succeed in industry. The course emphasizes the importance of communication skills, ethics, and participation in cross-disciplinary teams."

Dr. Petering brings Zebrafish research to high schools around Wisconsin

Distinguished Professor, David Petering, is teaching more than UWM students – he's brought Zebrafish who have been exposed to pollutants and a hands-on learning experience to high school students across Wisconsin including Waukesha, Racine and Pardeeville. Most recently, Hamilton High School in Milwaukee as well as Seymour Community High School, just west of Green Bay. The mission is to provide high school science students with a replica of a research environment. Students were able to examine effects of environmental agents like nicotine and ethanol on animal development and health. Students then present their findings at the annual Student Research Conference in the UWM Student Union. This year's annual conference was held on April 19th, 2016.

Dr. Petering started this precollege education program, now called WInSTEP (WI Inquiry-based Scientist-Teacher Education Partnership) 20 year ago at UWM. The National Institute of Health Science Education Partnership Award Program has given over $3 million to fund this program. This past year (2014-2015), there were a total of 27 schools, 35 teachers and 2,822 students who participated. Additionally, over the past 5 years, the program has been implemented in 53 schools, including 14 MPS high schools, and has reached over 8,800 students.

Dr. David Petering says "UWM is a research university. When we use the term research university, you don't want to sort of separate out and say but here's the research and here's the teaching. The two go absolutely together with one another. The whole goal is to expand the frontiers of knowledge, or, you could say, the frontiers of teaching."

A YouTube video featuring the story, can be seen at this link: *https://youtu.be/fDocPbAvIrg*

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