CHEM/BIOCHEM

Newsletter for Alumni and Friends

Spring 2020

2019-2020 Award Recipients

Undergraduate

- Outstanding Performance in Introductory Chemistry - Jordyn Zalewski
- Outstanding Performance in Analytical Chemistry - Elizabeth Merkel
- Outstanding Performance in Biochemistry - Zachary Uttke
- Outstanding Performance in Inorganic Chemistry - Alexis Barner
- Outstanding Performance in Physical Chemistry (Vanselow Award) - Lexie Lanphere
- Outstanding Performance in Organic Chemistry (Kovacic Award) - David Deshpande
- Outstanding Junior (Chemistry Emeritus Award) - Miranda Senger
- Outstanding Senior - Matida Bojang

Graduate

- Outstanding Teaching Assistant: Discussion - Quintus Owen
- Outstanding Teaching Assistant: Laboratory - Shahnawaz Ali & Yeunus Mian
- Outstanding CSI Instructor (Gloria Macynski Award) - David Koltermann
- Excellence in Graduate Research (Sosnovsky Award) - Tania Mutchie & Nemanja Vuksanovic

Further information about the award recipients can be found on page five.

Joe Aldstadt

From The Chair's Desk

Over the past few months, we've seen our world turned upside-down in responding to the pandemic. I would like to express my sincere gratitude to our faculty, staff, and students for enduring such an ordeal and working so hard to successfully overcome the many obstacles that so suddenly appeared in our path. The Department had the monumental task of converting — in a two-week period — our entire curriculum (2500+ students in 30+ courses) to an on-line mode. Similar efforts to adapt to the "New Normal" in our research laboratories were also undertaken with remarkable success. For coordinating our teaching and research efforts, I thank Assistant Chair Prof. Kristen Murphy and Department Manager & Building Chair Mr. Kevin Blackburn, respectively.

We look forward to the eventual return to "in-person" teaching and research. While the curriculum will continue in an "on-line" mode for the Summer term, plans for the Fall semester are being finalized — a "hybrid" mode is likely, i.e., a combination of on-line and in-person formats.

Through your generous contributions over the years, we were able to provide stipends to support many of our graduate students this Summer term. On behalf of the Department, let me express our sincere gratitude to you for your strong support!

This semester, Professor Gil Indig decided to retire. We wish him well — and we'll miss his scholarship, leadership, and collegiality.

We hope that you stay well and continue to keep us abreast of your many accomplishments.

Sincerely,

Joe

UNIVERSITY of WISCONSIN
UWMILWAUKEE

College of Letters & Science


David Frick

Department COVID-19 Research Efforts

– Written by Laura L. Otto, UWM Media Services


Nicholas Silvaggi

In January 2020, as the first COVID-19 case landed in the United States, UWM chemistry professor David Frick and his students started investigating the virus behind it. They were studying the group of proteins in the virus that allows it to multiply inside a cell.

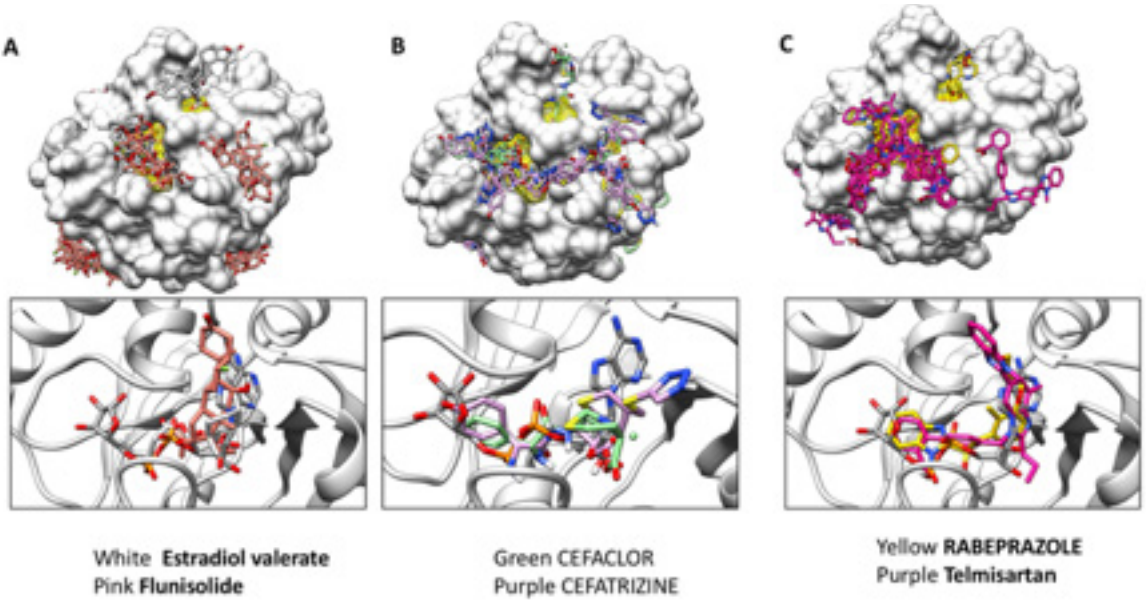
Now Frick, who has devoted most of his research to creating anti-viral drugs, has joined thousands of researchers who are exploring drug compounds with the potential to stop the pandemic. Several compounds that Frick developed six or seven years ago to test on other viruses are showing promise.

He began by comparing the replication proteins in SARS-CoV-2, the virus that causes COVID-19, to those in the virus that caused the less-severe SARS outbreak in 2003. He and his lab colleagues identified the protein that was most distinct from its earlier cousin, and the protein most similar. Frick then started testing hundreds of druglike compounds – some of which he developed – to see if any interfere with the proteins they isolated.


Wilfred Tysoe

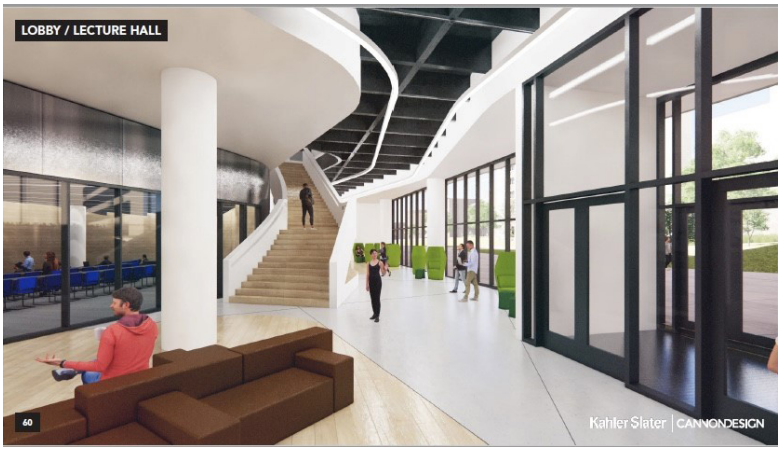
The protein most similar is called a helicase. Many viruses need helicases to read instructions encoded in genes. Frick has often applied his expertise to develop "helicase blockers," compounds that can stop a virus from accessing its cellular "command center." For this research, he is relying on help from Wilfred Tysoe, distinguished professor of chemistry, and Nicholas Silvaggi, associate professor of chemistry. Tysoe's lab members are using computer models to simulate how compounds interact with the COVID-19 proteins on the molecular level. Silvaggi's lab is mapping the proteins' atomic structure using X-rays.

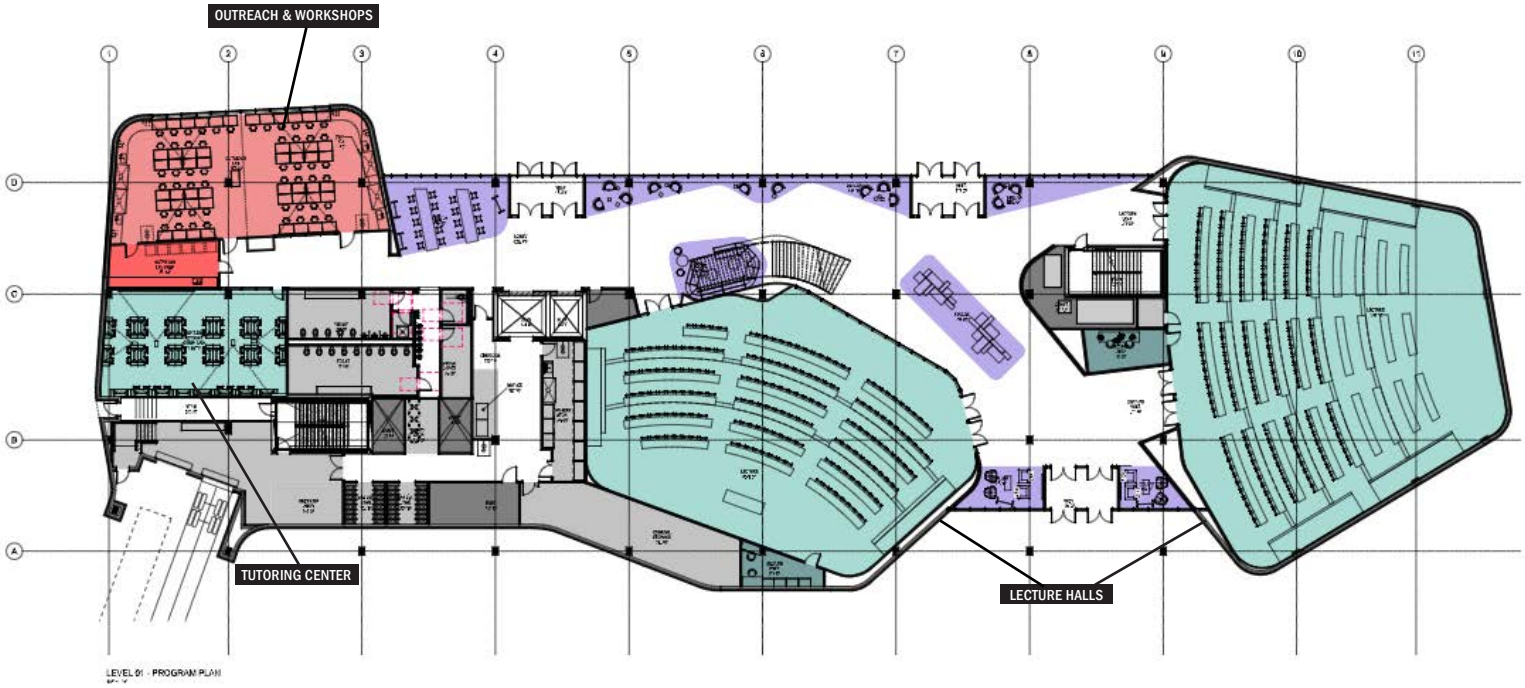
"This work began years ago when we were testing our compounds on the hepatitis C virus," Frick says. "Whether any existing drugs will work, however, really just depends on how they fit the structure of the COVID-19 proteins."



New Building Update

The design of our New Building is continuing to progress very well. Our "User Group" — Kristen Murphy, Nick Silvaggi, Doug Stafford, Kevin Blackburn, and Joe Aldstadt — have spent many hours representing the Department in a series of monthly workshops that began in February 2018 and will continue into the Fall 2020 semester. The schedule calls for the design to be finalized in October and then put out for bid by the end of the calendar year, with construction underway by this time next year. The images below were prepared by the architects at Cannon Design (Chicago) and Kahler Slater (Milwaukee) — they depict the first floor lobby, an aerial view along Kenwood Boulevard, and a schematic disgram of the ground floor.

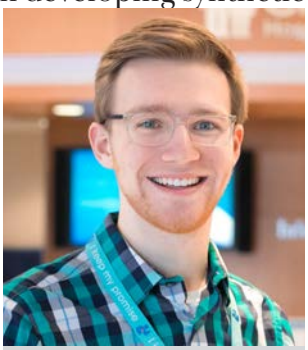




Senior Excellence in Research Awards: Ryan Majinski Under the Supervision of Prof. M. Mahmun Hossain

M. Mahmun Hossain and Ryan Majinski

Since 2016, Ryan Majinski has been studying in Professor Mahmun Hossain's laboratory where he has been developing synthetic routes to (+)-Elacomine, a natural anticancer agent. At the recent Office of Undergraduate Research's Annual Research Symposiu, Ryan describes his award-winning research at: bit.ly/2ASx6hX



Ryan Majinski

Ryan Majinski is working in an organic chemistry laboratory under his mentor Mahmun Hossain, developing a precursor molecule to many modern medicines.

Since the Hossain Laboratory Group has developed a synthetic route that serves as the first steps in forming biologically active compounds, Majinski is using his final year to research the synthesis of all-carbon quaternary stereocenter-containing compounds, a type of molecule that includes four different carbon functional groups in close proximity, allowing for numerous pharmaceutical applications.

“A lot of modern medicines, along with some natural products, contain this basic structure, but it’s hard to make synthetically," Majinski said. The goal is to fine tune and test the reaction to increase the yield, eliminate unwanted materials and remove impurities. The end product could eventually be used to make new blood thinners, painkillers and some anti-cancer agents.

M. Mahmun Hossain

Majinski was interested in medical research and was eager to start looking into opportunities as soon as he came onto campus freshman year. “When I found Dr. Hossain’s project information on the Office of Undergraduate Research website, I was really fascinated with all the implications down the line in terms of future medicine.”

Majinski was also able to further develop his interests in medicine in his choice of major. “The biomedical sciences major helps prepare medical lab scientists, the professionals who do all the standard testing for disease diagnosis,” Majinski said.

He eventually plans to become a pediatrician, and his experience as a biomedical sciences major will lend itself well to this future role, he said. He is also able to help other students get involved in medically related opportunities as president of the American Medical Student Association at UWM.

He was drawn to UWM by the cutting edge research and the location. His campus visit with a “phenomenal” tour guide convinced him this was the place for him. “It just seemed like they really cared about their students. This was right after UWM became an R1 research institution, and I knew there would be plenty of opportunities to get involved.

“I am excited about my future in research and medicine both at UWM and beyond.”

2019-2020 Award Recipients

Undergraduate

Outstanding Performance in Introductory Chemistry

Jordyn Zalewski is most deserving of this award showing her excellent level of knowledge in Chemistry 102 and 104, both with Dr. Carlson. Ms. Zalewski is a student in the College of Health Sciences and intends to major in Kinesiology.

Outstanding Performance in Analytical Chemistry

Elizabeth Merkel receives the award for outstanding performance in her Analytical coursework and research. A senior chemistry/pre-med major, Beth has consistently been a top performer in our analytical chemistry courses. In addition, as part of Prof. Dietz's group, she has been working to develop new chromatographic materials for metal ion separations of interest in nuclear medicine. Following graduation later this year, she plans to attend medical school.

Outstanding Performance in Biochemistry

Zachary Uttke is the recipient of the this award for outstanding performance in his Biochemistry coursework and his dedication and achievement in research. Zach performed research in both the Silvaggi (Chemistry) and de la Cova (Biological Sciences) laboratories, investigating enzymes of secondary metabolism from Pseudoalteromonas luteoviolacea and cellular communication in Caenorhabditis elegans, respectively.

Outstanding Performance in Physical Chemistry (Vanselow Award)

Lexie Lanphere performed exceptionally well in both the Physical Chemistry lectures and the laboratory, and was the best student in Chem 562, the second semester Physical Chemistry course. She really excelled in the laboratory where she was invariably very well prepared and was the person that other students would seek out for advice when the TA was not available.

Outstanding Performance in Inorganic Chemistry

Alexis Barner stood out as an exceptional student in Professor Wilcoxen's Introduction to Inorganic Chemistry course. Alexis is a bright student whose insightful questions and hard work in the course earned her the top grade and exemplifies the qualities of an outstanding student with a promising future a head of her.

Outstanding Performance in Organic Chemistry (Kovacic Award)

David Deshpande was one of the top ranking students in Professor Chen's Organic Chemistry II (CHEM 345) class in the Spring 2020 semester. Dr. Chen noted that David often asked insightful questions, and some of them were beyond the typical Organic Chemistry textbook level.

Outstanding Junior (Chemistry Emeritus Award)

Miranda Senger has accomplished much in her junior year by completing CHEM 501, 560, 602, 603 and 604 this academic year at a high level of achievement. Ms. Senger is a student in the College of Letters and Science, majoring in Biochemistry.

Outstanding Senior

Matida Bojang is most deserving of this award with her completion of her senior year by completing CHEM 221, 501 and 602 with excellent performance. Ms. Bojang has previously received the Outstanding performance in Organic Chemistry (2019), thus showing the continued high achievement of her trajectory. Ms. Bojang is a Biochemistry major planning to attend medical school following the completion of her degree.

Graduate

Outstanding Teaching Assistant: Discussion - Quintus Owen

Quintus Owen taught the discussion sections of Chem 561 and Chem 562 in AY19-20. He was simply outstanding as a TA, communicated very well with the students taking the class, graded homework assignments promptly, and had even taught a few lectures for Prof. Woehl in his absence. He had shown initiative and put in extra work during the COVID-crisis this semester to make the transition to remote teaching as seamless and painless as possible for the students.

Outstanding Teaching Assistant: Laboratory - Shahnawaz Ali & Yeunus Mian

Shahnawaz Ali graded for Chem 345 and taught Chem 344 lab during the AY19-20. He did an outstanding job in both activities. He was liked by his students, and they highly admired his teaching. Additionally, during the TA meeting, he was always very active and made important suggestions to improve the lab teaching.

Md Yeunus Mian has been TA for CHEM 344 for several years, including AY19-20. He not only is an excellent TA in CHEM 344 but also an excellent grader for CHEM 343/345. He always did his TA job very professionally and in a timely fashion.

Outstanding CSI Instructor (Gloria Macynski Award) - David Koltermann

David Koltermann was a CSI instructor for CHEM 104 and 105 for AY19-20. He was always very willing to jump in where needed and really serve the students. In F19, there were fewer attendees at his 105 sessions, so he proposed moving students into 2 sessions instead of 3 and running a "102-refresher" for 104 students. This was really well-received and appreciated by students.

Excellence in Graduate Research (Sosnovsky Award) - Tania Mutchie & Nemanja Vuksanovic

Tania Mutchie and **Nemanja Vuksanovic** are exemplary students who have been highly productive in research — with 10 peer-reviewed articles and 8 presentations at regional and national conferences between them. In addition to their excellent work at the bench, Neno and Tania have also excelled in teaching, mentoring, and service to the Department.

First steps towards a PharmD/PhD degree in Collaboration with Concordia University School of Pharmacy


Douglas Stafford

An agreement has been reached with Concordia University that will allow PharmD students to continue their education at UWM and work toward receiving the PhD degree. UWM offers our undergraduates all of the prerequisite coursework necessary to apply to professional pharmacy schools such as Concordia University in Mequon, Wisconsin. We have now come full circle and are offering students at Concordia a focus on pharmaceutical research offered by the Department of Chemistry and Biochemistry. Dr. Stafford, director of the Milwaukee Institute for Drug Discovery, spearheaded this exciting collaboration that will bring our institutions closer together and broadens the educational opportunities for students in the area of Drug Discovery and Development.

Department in the News

- Kristen Murphy, Director of the ACS Exams Institute, was interviewed by C&E News about how the Institute is handling the pandemic. See: bit.ly/2MP4YhU
- Jim Cook and doctoral student Daniel Knutson are featured in an article on WUWM radio. See: bit.ly/37mxvF9
- Mahmun Hossain and undergraduate student Ryan Majinski are featured in an article in the UWM Report. See: bit.ly/2MYqWip
- The MIDD was featured in a UWM Research article. See: bit.ly/2UBO5LU

Graduate Degrees Conferred in the 2019-2020 Academic Year

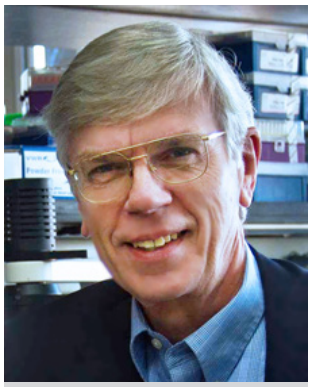
Master of Science

- **Shawn C. Salske** — "Speciation, Transport, and Fate of Heavy Metals in Soils from a Civil War Battlefield: Development of a Novel MAE-GF-AAS Method"
  Major Professor: Joe Aldstadt
- **Anahit M. Campbell** — "Characterization of DNA Interstrand Cross-Linking Agents by Liquid Chromatography-Mass Spectrometry"
  Major Professor: Xiaohua Peng
- **Malati Thapa** — "Development of a Novel Sequential Injection-Proton NMR Method for Determining Cathinones in Forensic Samples"
  Major Professor: Joe Aldstadt

Doctor of Philosophy

- **Md Mahbbat Ali** — "Probing The Early Steps In The Cataytic Reduction of Nitrite To Ammonia Catalyzed By Cytochrome c Nitrite Reductase"
  Major Professor: Andy Pacheco
- **Afsana A. Mahim** — "Intracellular Zinc Trafficking: An Interplay of Proteome, Metallothionein and Glutathione"
  Major Professor: David H. Petering
- **Eric Lund** — "Zinc Proteomics: Interactions of Zn2+, and Metal-binding Ligands with Zn-binding Sites in the Proteome"
  Major Professor: David H. Petering
- **Dustin R. Olson** — "Chemical Self-Assembly Strategies Toward the Design of Molecular Electronic Circuits"
  Major Professor: Wilfred Tysoe
- **Atreyei Ray** — "The Curious Case of NAD-Cleaving Nudix Hydrolases"
  Major Professor: David Frick
- **Xavier S. Udad** — "Controlling and Manipulating Microscopic Particles In Solution By Using Various Electric Field Geometries"
  Major Professor: Jorg Woehl
- **Md Mizzanoor Rahaman** — "Part 1. A Concise Asymmetric Synthesis of Microtobule Inhibitor, Tryprostatin B; Part II. Synthesis and Biological Assessment of Histone Deacetylase Inhibitors. Part III. Acid Catalyzed Reactions of Aromatic Ketones with Ethyl Diazoacetate"
  Major Professor: Md Mahmun Hossain
- **Amanda Nieman** — "Targeting the y-Aminobutyric Acid A Receptor (GABAA R) to Alleviate Inflammation for Asthma and Neuropathic Pain"
  Major Professor: Alexander Arnold

Distinguished Professor David Petering receives a $270,000 NIH Award


David Petering

Distinguished Professor David Petering received $270,000 for the 5th year of funding of his Science Education Partnership Award Program (SEPA) grant entitled "Empowering Preservice Teachers and Students With Environmental Health Research".

The grant is funded through the National Institutes of Health (NIH). This year represents the *25th year* of funding for Dr. Petering's precollege education program! Currently, he and Craig Berg, Director of the Milwaukee Collaborative Science and Mathematics Teacher Education Program of the School of Education at UWM, are co-principal investigators. They are joined by Ms. Renee Hesselbach, program coordinator, and scientists Drs. Michael Carvan, Henry Tomasiewicz, and Daniel Weber from the School of Freshwater Sciences, and Dr. Michael Pickart of Concordia University. Together, they provide intensive support for teachers throughout the year.

The project trains pre-service science teachers at UWM so that they will be able to implement authentic, intensive experiences in experimental science and science communication with middle and high school students. Pre-service teachers gain experience in classrooms of master teachers who regularly offer students opportunities to conduct research through the SEPA program. Yearly activities culminate in April with a Student Research Conference held at UWM where about 600 students attend and present posters and papers describing their research. Participation in the program during the first four years of this grant period included 79 pre-service teachers, 31 in-service teachers and 29 schools in the city of Milwaukee, the metropolitan area, and the state for a total of more than 7,000 students.

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 December 2019 to May 2020.

Chemistry General Fund

- Mr. Frederick Hinz
- Dow Chemical Company Foundation, Match for Shirley McLean
- Advanced Chemical Systems, Inc.
- Bank of America Charitable Gift, Credit for Jay Wrobel
- Daniel and Janet Brophey
- Fidelity Charitable, Credit for Steven and Melanie Chmielewski
- Dr. William F. Gutknecht
- Dr. Gene A. Hiegel
- Dr. Paul and Mrs. Jo Ann Hankwitz
- Dr. Steven Mark Socol
- Mr. Thomas G. Kottke

Chemistry Scholarship Fund

- Dr. Steven Socol
- Dr. Gene A. Hiegel
- Mr. John Patrick Kinlen
- Boeing Gift Matching Program, Match for John Patrick Kinlen

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

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