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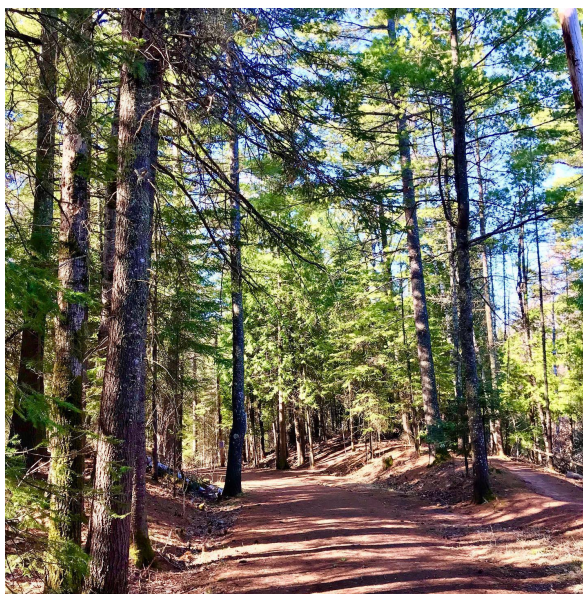
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## Covid Impact on our Department

One of the first questions many of us are asked is, "How did the UMD chemistry department deal with COVID-19?" We assume that our readership is wondering the same thing! How *are* we doing in the Department in the new world that we now live? The answer is similar to the one many of you might provide about your last six months: we are hanging in there, finding that each day presents a unique challenge, but also each day presents a new opportunity for growth and discovery. Overall, our Department is proud of our response to COVID. In the short-term, we remained focused on the education and well-being of our students, in addition to fostering our research enterprise. In the long term, we



discovered new ways to deliver an impactful education, run orientation programs, hold department meetings, and conduct research. We have realized upon reflection that this experience, though difficult, will positively impact the way we work in the department far into the future.



*Greetings Alumni and Friends!*

*It's my pleasure to write to you once again with updates on the UMD Chemistry & Biochemistry Department. We send this newsletter a little later than normal due to delays from the COVID19 pandemic. But we are happy to report that everyone is safe and sound, and adapting well to new ways of teaching, conducting research, and working. The process of retooling our work with COVID19 precautions has been a gradual uphill climb. The cover story of this year's Transitions (p.3-7) highlights some of the challenges we faced as a department, and the creative and effective ways in which we met them. We do face another challenging and in some ways uncertain academic year this coming fall. But due to the collective efforts of UMD faculty, staff, and students, we face the year with confidence, as well as a repertoire of new teaching techniques. We are optimistic that another great year is in store for UMD and the Department!*

*Since our last newsletter, we worked, taught, and conducted research for a full year in the new Heikkila Chemistry and Advanced Materials Science (HCAMS) building. The energy and enthusiasm surrounding this building saw us through an exceptional year. The large laboratory spaces, commons areas for students to study and the central conference room were all thoroughly utilized, bringing a new vibrancy and community to the Department. We also went through a highly successful external Departmental Review this last year. Reviewers were enthusiastic about the Department, its curriculum, facilities, resources, and people, and they passed on valuable feedback for growth into the next decade. Also, our Chemistry and Biochemistry clubs were particularly active this year (p.12-13) and we will miss this special class of graduating seniors, many of whom were a central part of these groups for many years.*

*As with every year, our faculty and students actively published their work. We again collectively published over 50 peer-reviewed research articles, with dozens of student coauthors (p.20-22). It was also a great year for grant funding as many of our faculty received new grants and/or had past grants renewed. Our faculty and staff were recognized with numerous college and university awards (p.8-9) including job promotions. And some of our faculty were elected to positions in national organizations or earned international awards.*

*This spring semester with COVID left many of us with a sad feeling because we were not able to meet in-person to honor our graduating seniors or to honor our student award winners in-person. But we did find other ways to honor their great accomplishments. We are optimistic and excited to watch their careers grow, as they take their skills acquired at UMD to adapt to our ever-changing world.*

*We greatly appreciate all of your support of the Department over the past year! On a weekly basis, I am amazed by your generosity of time, visits, gifts, and letters! Thank you for your support as we look forward to another dynamic year! Please stop by and visit us!*

*Warm Regards,*

Steven M. Berry

**Transitions - Fall 2020**

The Newsletter of the UMD Department of Chemistry and Biochemistry

*Editor:* Peyton Carlstrom

*Committee Members:* Steve Berry (Chair), Jennifer Bucsko, Brian Gute, Kate Kallevig, Jake Wainman

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## Cover Story, Cont.



### Spring Semester 2020 Courses

On Friday March 6<sup>th</sup>, when we parted ways for spring break, none of us expected to be where we are now. We heard fears of COVID transmission and were aware of some schools in larger cities conducting quarantines and cancellations. But none of us truly expected the immense impact the virus would have. In the middle of the week during spring break, the University of Minnesota system announced a ban on in-person instruction for two weeks to allow student travelers time to quarantine. Faculty were given a few days to prepare remote instruction for this 2-week quarantine time. Although, many of us suspected there was a good chance we might be apart for the rest of the semester, few of us embraced the notion. We held on to the hope that smaller lab courses and research might be able to resume after the few weeks of quarantines. As the days progressed, and after more guidelines from federal and state authorities, including the MN Governor's stay-at-home order, we soon learned that UMD would remain closed for the remainder of the semester. Our faculty and staff hurried to convert their last 5 semester weeks of labs and curriculum into an on-line or remote format!

This rapid transition to on-line learning in the spring went better than might be hoped. The transition was facilitated by a number of fortuitous events, including the availability of new on-line instructional resources, as well as the previous work of a number of our own faculty on developing on-line curriculum. UMD just completed a three-year phased transition away from Moodle software to a new course management software system called Canvas. Most of us now enjoy using Canvas, and during the COVID restrictions on face-to-face instruction, we discovered that the program readily supports on-line coursework in a straight-forward and easy-to-learn manner. Canvas allows for not only the posting of lecture notes, weekly announcements, and weekly activities, a feature we were already using, but Canvas allows for the recording and posting of videos, including lectures and video announcements. Canvas also has a classroom chat feature for fostering student interactions and interaction with faculty through means other than email. In addition, Canvas allows for the remote administration of an on-line quiz or on-line exam, including sophisticated exam proctoring features that monitor student activity during the exam time. As faculty were discovering these features, they eagerly shared their discoveries with the whole department. We had many faculty volunteers host on-line meetings to train others on how to use the various features. In this way, we rapidly brought our courses to an on-line format.

Another resource that became mainstream for our teaching was Zoom, the remote videoconferencing software program. Some of us were aware of Zoom through participation in national meetings or service on national committees, but most had not used it before. Those of us who were familiar with the program volunteered to train colleagues on Zoom, and especially on how to use it for instruction. Through this platform, some of our colleagues continued with their normal lectures, holding live lectures at the normal class time, albeit remotely through Zoom. (See the feature on page 6 by Prashanth Poddutoori on how Zoom was used.) Others of us used Zoom for live office hours, where students could freely come and go during set blocks of time each week.

In addition to the convenient availability of the latest and greatest software to support our rapid transition to online learning, a number of our colleagues had already been thinking about providing students with alternative instructional formats. (...Cont'd page 4)

A normal occurrence in many of our classrooms is the phenomenon of flipped lectures. In a flipped classroom, the students are instructed to first watch the lecture through a pre-recorded video, before coming to class. The scheduled classroom time is then used for group work activities and problem solving. Most of our courses are not flipped entirely, rather some of our courses have anywhere from a few to a few dozen lectures in a flipped format. A faculty member might choose to pre-record particularly challenging concept for students to view over and over, and then devote classroom to answering questions and providing supplemental instruction. Or an instructor might want to break up the monotony of a lecture course by providing some different ways of learning. This spring, when we were forced to move on-line over the matter of a few days, for many, these flipped lectures ended up becoming the backbone of the course. Faculty had already developed polished content with which to engage students. And they were able to provide that for a few more days or weeks, and thereby buy additional time to develop the rest of the course into an on-line class.

While some faculty relied on their flipped content to engage students on short notice, others had been developing on-line coursework with plans to offer a fully on-line course. Prof. Paul Siders had already developed curriculum for an on-line version of our Aspects of Chemistry course. In addition, over the last year he had worked to develop a take-home lab kit for students in this non-major's course. Also, Romesh Lakhan had been planning for a year to teach a section of our General Chemistry 1 course, in the summer of 2020, in a fully on-line format. Therefore, the required transition to on-line teaching for his general chemistry course was smooth and rapid. (See the feature on page 6-7 by Romesh Lakhan.) Given the many ready transitions to an on-line format in the wake of COVID-19, we did have our fair share of difficulties. The main challenges, of course, surrounded the offering of our lab-based classes, and particularly those with upper level content. Fortunately, when we parted ways for spring break, students had already completed 8 weeks of in-person labs for all lab courses. Therefore, most lab instructors found ways to engage students on-line with the analysis of pre-recorded data and with the writing of lab reports. Some faculty used data from previous years for students to analyze. Other faculty found video demonstrations of chemistry experiments or tutorial videos provided by instrument manufacturers, and they asked students to make observations on the results. Faculty relied heavily on Zoom, Canvas and other software to facilitate this instruction.

## **Research Labs**

Not long after campus closed for COVID-19, UMD entered into a state referred to as “extended reduced operations” where all buildings were locked, and no one was allowed to work from campus. We were allowed to designate two of our lab support staff with special “essential employee” status. Both Greg Mielke and Randall Helander maintained instruments, filled the NMR with cryogenics, monitored freezers and refrigerators and checked on the general well-being of Department facilities while no one else was allowed to work on campus. In early June, many of our labs were allowed to resume limited research operations. The administration defined procedures for individual research labs to return to work by allowing each lab PI to submit what was referred to as a “Sunrise Plan.” The plans outlined for each lab how to safely conduct a specific research project on campus, utilizing physical distancing, PPE, and routine sanitization protocols. Each of these Sunrise Plans went through an approval process with the campus Environmental Health and Safety Office, as well as approvals by the Department Chair and the Dean. We additionally conducted contact tracing by requiring sign-in sheets on all facility doors. These plans allowed some graduate students and faculty to return to labs on a limited basis. The use of these plans will continue through the summer and into the fall semester. We were asked to work from home for all other duties whenever possible.

## **Graduation and Awards Ceremonies**

The Department was faced with the task of determining what to do with the external seminar program, our annual awards ceremony, and graduation ceremony. (...Cont'd page 5)



We made the difficult choice of cancelling the seminar program simply because speakers couldn't travel, and many were scrambling themselves to adapt to the situation. We decided our graduate student seminar speakers would present their research later in the summer by Zoom as part of their thesis defense. For our annual Departmental Awards ceremony, we couldn't accommodate the large number of participants on Zoom, and we certainly couldn't meet on campus as normal. Instead we delivered the awards individually to each student award winner by email as well as through daily public announcements. For student graduation, the campus offered a virtual graduation ceremony where each student's name was read. This was not live, but the recorded ceremony meant that it could be viewed at any time. Our department additionally honored the graduating Chemistry and Biochemistry majors by recording a video montage and communicating a public message acknowledging each graduating student.

### **Summer Undergraduate Research Program**

To facilitate our annual departmental summer undergraduate research program in light of COVID restrictions, we moved the start date of the program back by two weeks and made plans for on-line research projects. In late February, students had already identified research mentors and were planning to start normal research projects. With the on-set of campus closures, faculty proposed new research projects which could be completed online or with computational chemistry software. Students chose new projects and began the annual Summer Undergraduate Research Program (SURP) with a Zoom orientation led by the SURP committee chair, Dr. Kathryn Schreiner. Students took part in team-building exercises with weekly Monday afternoon Zoom meetings. These meetings included discussions on career development, science, ethics, and literature reviews. After the Fourth of July weekend, some students were allowed to visit campus for select research projects if they so desired and if the project benefitted from it. All in all, the faculty and students involved in the summer research program deserve high commendations for confidently facing an unknown summer, and turning it into to what ended up being a relatively normal SURP program, with the exception of no summer picnics and a little less on-campus research.

### **Summer Courses**

UMD decided early in April that the best way to plan for summer courses was to offer them on-line. Over the summer the department typically offers general chemistry 1 and 2 and the corresponding labs, organic chemistry 1 and 2 and the labs, quantitative analysis and lab, and the single semester biochemistry course. The department faculty discussed how to best teach these courses in an on-line format. Left with little other choice, faculty did the best they could with the situation. Lectures and labs were prerecorded and posted on Canvas. Homework, quizzes and exams were all conducted through the internet. And although some office hours were held live on zoom, most of the course content was accessible to students at a time and location of their choosing.

Some benefits arose from the situation. Students greatly appreciated the opportunity to complete a college course during a summer when there were limited work and recreational opportunities. Also, we enjoyed course enrollments for all of our summer courses that were significantly higher than average. Lastly, because faculty had some time to plan their summer courses, they invested more time in recording high quality videos, experimenting with new delivery methods, and developing on-line practice problem sets. All of these activities added to the wealth of information developed in the department on alternative modes of instruction. We now face an uncertain fall semester albeit with more confidence, ready to face whatever we might encounter for the necessary teaching modalities. In conclusion, we rapidly transitioned to on-line teaching, research, and service as much as was possible during the COVID pandemic. We gave ourselves permission to teach on-line lab classes that were not perfect. We came up with a plan for summer course offerings and resumed bench-research. We picked up some new techniques and skills for delivering on-line curriculum, and we are excited to begin the fall semester with a new repertoire of instructional methodologies. (...Cont'd page 6)

## Dr. Prashanth Poddutoori adapts the Inorganic Chemistry lecture course to an on-line format.



Although the online transition was unexpected, it was a notable experience. Dr. Poddutoori taught two courses, General Chemistry and Descriptive Inorganic Chemistry, in the spring semester. Both were larger-sized classes with an enrollment of ~60 students. Dr. Poddutoori's lectures were delivered live through Zoom. In the beginning, it was a bit unclear about the transition to on-line and how it would go. Much to Dr. Poddutoori's surprise, the students were very enthusiastic and understanding, and the transition was smooth with minimal disruption. There was some concern in the student community, but that was overshadowed by their excitement of virtual learning from their living rooms. The live classrooms provided a great place for students to catch up with each other, introduce their pets, family members, friends, etc. One of the most important aspects was that the students were in their natural environments, i.e. in the home with family; they were in their comfort zone. This seemed to enhance their faculties to learn the subject and to participate actively in the learning process. They asked free-flowing questions, participated in lively discussions, and displayed their problem-solving skills in a rewarding manner.

Another interesting perk is that student attendance was very high. The first few lectures had an unheard-of 100% student attendance. Dr. Poddutoori used his iPad as a whiteboard to lecture the course. This was transmitted live during the Zoom lectures. This format not only proved an effective way of lecturing but also provided a one-click resource as the lectures were recorded and posted on the Canvas page for any students experiencing network issues during the live-feeds. In addition, virtual office hours were utilized just as productively as regular office hours. Overall the semester went very well despite the chaos created by the COVID-19. After living through the spring semester, Dr. Poddutoori found the online instructional mode to not only be a fun way to teach, but also an effective alternative option.

## COVID-19 has forced educators to change how chemistry is taught. How do you teach a lab-based course online? Where will students learn lab skills?



*Instructor Lakhan as seen in one of his on-line lecture videos on fuels and thermochemistry.*

Lakhan began the journey to creating a fully online General Chemistry 1 course in the fall of 2019. The goal was to have a course available for the summer of 2020 to support non-traditional students who could not access classes in the traditional in-person lecture format. Some of the challenges were 1) creating an experience where students felt connected to each other and their instructor, 2) developing a lab experience where students could safely do labs at home, and 3) conducting online exams. Even while teaching a full course load, Lakhan began creating short lecture videos and building the online course in October of 2019. The college supported Lakhan by providing grant funding to hire two chemistry students to edit closed-captions for the more than 65 lecture videos. One of the videos went viral with over 1.2k views!

Lakhan also received support from UMD's Center for Excellence in Teaching and Learning (CETL), the Media Hub, and the Office of Information Technology in working on this project.

In March of 2020 COVID restrictions forced all classes to be taught remotely. Instructor Lakhan wasn't fully finished with his online course, but he quickly incorporated what he had built so far to provide a robust online experience for his General Chemistry students. (...Cont'd page 7)

This summer, instructor Lakhan taught UMD's first (on purpose) fully online General Chemistry 1 course. The course enjoyed a very large enrollment, with 36 students.

Many were from MN, but some completed the course from as far away as North Dakota, Wisconsin, Nebraska, Illinois, and Oklahoma. At the end of the semester students were surveyed on their experience with online instruction. Their responses were overwhelmingly positive with one student sharing: "The weekly check-in's were a great idea because it allowed us to measure our learning to find gaps in our knowledge. Also, being able to connect with other students was good to be able to have some social interaction. The skeletal notes combined with the lecture videos were also great and engaging. Professor Lakhan is one of the most engaging lecturers I've ever had even when compared to in-person classes."

This fall, instructor Lakhan has partnered with Professor Cembran to further fine-tune the course modality and provide exceptional fully online General Chemistry instruction to a class of over 230 students. As we experience a continuation of COVID restrictions to in-person instruction, instructor Lakhan's efforts are paying off for our students.

# Faculty & Staff Updates

## Congratulations:



**Jennifer Bucsko**, was promoted to Office and Administrative Supervisor.



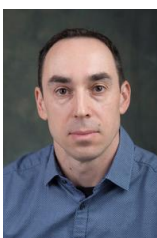
**Dr. Anne Hinderliter**, was elected to chair of UMD Faculty Senate.



**Dr. Robert Carlson**, was the recipient of the 2020 President's Award for Outstanding Service.



**Dr. Melissa Maurer-Jones**, was the recipient of the SCSE Young Teacher Award.



**Dr. Alessandro Cembran**, was the recipient of the SCSE Young Teacher Award. Congratulations to Dr. Cembran as he was promoted to Associate Professor with Indefinite Tenure!



**Dr. Joseph Johnson**, was recognized as the Pharmacy Program Teacher of the Semester, Fall 2019.



**Brian Gute**, celebrated for 20 years of service to UMD.



**Dr. Paul Kiprof**, celebrated six years of service as the DGS (Director of Graduate Studies).



**Dr. Ahmed Heikal**, was the recipient of UMN-GIA award for research.



**Dr. Sangeeta Merredy**, was recognized for an Excellence in Program Assessment Award.



## Faculty & Staff Updates cont.



**Dr. Venkatram Merredy**, was the recipient of UMN-GIA Award for research.



**Dr. Erin Sheets**, was promoted to full professor.



**Dr. Prashanth Poddutoori**, was the recipient of UMN-GIA award for research.



**Dr. Kathryn Schreiner**, was promoted to associate professor with indefinite tenure. Dr. Schreiner was also promoted to the new DGS!



**Dr. Viktor Zhdankin**, was the recipient of the Markovnikov Medal for outstanding achievements in organic chemistry, Moscow State University, Russia.

### Welcome:



**Peyton Carlstrom**, is our newest staff member. Peyton joined the department in March 2020 as the principle office and administrative specialist. She enjoys hiking on all the trails around Duluth and being in the outdoors.

### Fair-well wishes:



**Dawna Carlberg**, departed our department after 10 years of service and joined facilities management as their customer service supervisor. We wish you the best Dawna and know you will continue to do great things at UMD.

## Biophysical Society Annual Meeting:

### Students Win Awards

Three students, Cody P. Aplin ('20 Chemistry MS student), Julie A. Beenken ('20 Biochemistry BS student), and Taryn M. Kay ('20 Physics MS student), from the Ahmed Heikal/Erin Sheets research group presented their research at the 2020 Annual Meeting of the Biophysical Society (BPS) in San Diego, which was held February 15-19, 2020. All three were recognized with BPS Travel Awards to help defray some of the costs. Julie competed in the undergraduate research poster competition, and Cody and Taryn competed in the Student Research Achievement Award poster competition. All three posters were well received in the regular poster sessions. Taryn's abstract was also selected for a flash talk at the Biological Fluorescence subgroup, during which she did an outstanding job. In addition to these scientific presentations, Prof. Sheets participated in many meetings and events in her role as Secretary of the Biophysical Society.



*Left to Right: Cody Aplin, Dr. Sheets, Julie Beenken and Taryn Kay*

*\*Undergraduate authors are italicized*

1. Taryn M. Kay, *Christin Libal*, Cody P. Aplin, Arnold J. Boersma, Erin D. Sheets, and Ahmed A. Heikal, "Single-molecule studies of hetero-FRET biosensors to environmental ionic strength using different modalities of fluorescence correlation spectroscopy."
2. *Julie A. Beenken*, *Emmanuel Tetteh-Jada*, Cody P. Aplin, Taryn M. Kay, Arnold J. Boersma, Ahmed A. Heikal, and Erin D. Sheets, "Comparative photophysical studies of mCerulean3 and mTurquoise2.1 as FRET donors."
3. Cody P. Aplin, Robert C. Miller, Taryn M. Kay, Alessandro Cembran, Arnold J. Boersma, Ahmed A. Heikal, and Erin D. Sheets, "Investigating novel hetero-FRET biosensors for environmental ionic strength using experimental and theoretical approaches."

## Dr. Viktor Zhdankin Receives the Markovnikov Medal



*Dr. Zhdankin awarded Markovnikov Medal*

Professor Viktor Zhdankin was awarded with a prestigious Markovnikov Medal for Outstanding Achievements in Organic Chemistry in 2019. This award was established in Russia to celebrate the famous Russian chemist Vladimir Markovnikov, who was a professor at Moscow University during 1875-1893. All organic chemistry students know Markovnikov's rule, which predicts the regioselectivity of electrophilic addition reactions.

The Markovnikov Medal is an annual award presented at the International Markovnikov Conferences organized by Moscow State University every January in Moscow. The award recipient's travel expenses are covered by the conference organizers and the awardee presents an invited lecture on the first day of the conference followed by the award ceremony and banquet.

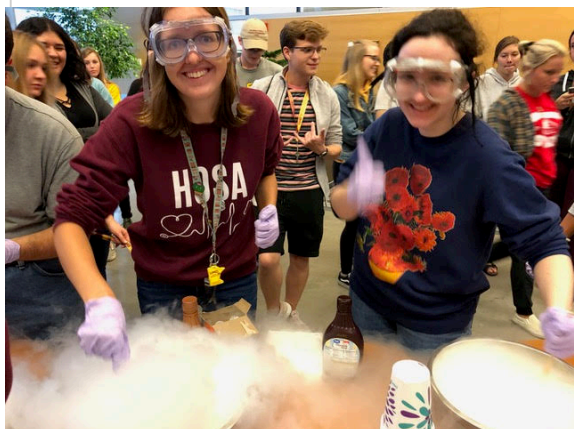
In his award lecture "Iodine and Life," Dr. Zhdankin presented research results of his UMD students along with a general overview of iodine chemistry and its applications. Zhdankin's research students at UMD work on the preparation and study of new organic compounds of iodine in high oxidation states known as "hypervalent iodine reagents." These compounds find wide application in organic synthesis and the pharmaceutical industry as the reagents for selective transformation of organic molecules. Dr. Zhdankin has published more than 300 highly cited research papers (h-index 55), given over a hundred research presentations in many countries, and authored *Hypervalent Iodine Chemistry* published by John Wiley & Sons, Ltd in 2014. He also co-authored a general introductory textbook on Organic Chemistry with Prof. Peter Grundt.



*Markovnikov Medal*



## Student Organizations



Chemistry and Biochemistry Club makes liquid nitrogen ice cream for new members.

Beyond classwork and research opportunities, the Chemistry and Biochemistry majors at UMD have the opportunity to participate in three different student organizations, each with their own focus.

These clubs include:

*The Chemistry and Biochemistry Club*, whose focus is science outreach and community development among students. Faculty Advisors: Dr. Jake Wainman and Romesh Lakhan. Student Chair: Grant Jackson.

*The Society for Chemists and Biochemists*, whose focus is professional development. Faculty Advisors: Dr. Erin Sheets and Dr. Melissa Maurer-Jones. Student Chair: Jenna Swenson.

*PeerUp*, a college-wide group whose focus is supporting the success of students from underrepresented populations in STEM fields. Faculty Advisors: Dr. Anne Hinderliter and Romesh Lakhan. Student Chairs: Selena Math and Jeffrey McVay.

While each of these groups does have focused events related to their own individual goals, it is possible for a student to participate in all three. In fact, recognizing the fact that any professional chemist and biochemist could benefit from the skills gained by events put on by all three groups, the student leadership worked together to ensure that joining all three groups would not only be possible – it was encouraged! During the 2019-2020 Academic Year, these groups succeeded in their respective missions. The Chemistry and Biochemistry Club hosted a Science Outreach Day at Congdon Elementary, where hundreds of children could interact with a variety of science demonstrations. The Chemistry and Biochemistry club students invited many other STEM-focused clubs, so the children (and their parents) could not only enjoy freezing flowers in liquid nitrogen, but they could also walk a few tables over and pet hissing cockroaches with the Biology club, interact with a robot with the Computer Science club, and play with electromagnets with the Physics club.

Meanwhile, the Society for Chemists and Biochemists invited an external seminar speaker, Dr. Catherine Murphy of the Chemistry Department at the University of Illinois. Dr. Murphy is an expert in the use of nanoparticles as sensors in a variety of applications spanning biology and environmental science. Not only did Dr. Murphy give a fascinating, well-attended seminar, but she also met with the Society of Chemists and Biochemists over lunch. There, she discussed her career in a more informal setting with the students, getting to know them more personally and offering words of encouragement for our students. PeerUp, the newest of the three groups, saw a great deal of success in building up a structured set of programming targeting the needs of students from underrepresented groups. The student leaders built up these resources with an eye toward sustaining the program beyond their time at UMD, ultimately resulting in a website filled with resources for programming for both mentors and mentees. In addition, this group volunteered at SCSE's Science and Engineering Day, serving as the tour guides during the outreach event focused on high school students. As the face of SCSE, PeerUp guides showed the high school students that folks from all backgrounds could continue their studies in STEM. (...Cont'd page 13)





In the Spring, the COVID-19 pandemic challenged all three groups. All three groups took stock of what was important, cancelling major in-person events for the sake of everyone's health. While these outcomes were unfortunate, it was necessary. The student leadership in these organizations have thoughtfully handed over the reins to new leaders for the upcoming academic year, and this transition has been centered on achieving each group's goals under the restrictions of a pandemic. Connections between students and faculty will still be fostered, just maybe over Zoom instead of in person. Their efforts will be focused on the most crucial aspect of student organizations to support student success: Informal connections made with others, opportunities to share fears and stories and triumphs, and building community. Remotely, these student organizations will continue to serve Chemistry and Biochemistry students in meaningful ways; it'll just look and feel a little different.

## SCSE Academy of Science & Engineering



*Dr. Cary Scheiderer*

The Academy of Science and Engineering was established in 2002 to recognize alumni and special friends of the Swenson College of Science and Engineering who have distinguished themselves through their participation, commitment, and leadership in their chosen professions. Our 2019 inductee to the Academy is Dr. Cary Scheiderer.

Dr. Scheiderer attended UMD beginning in 1995 and pursued a BS degree in Biochemistry and Molecular Biology. She worked with Emeritus Professor Paul Anderson and performed summer undergraduate research in summers of 1997 and 1998 on an NSF grant. She published a paper on her work in the *Journal of Biological Chemistry*, entitled “Muscle as a Primary Site of Urea Cycle Enzyme Activity in an Alkaline Lake-Adapted Tilapia.” This paper was published the same year she graduated from UMD, in 1999. Dr. Scheiderer then attended the University of Alabama at Birmingham to pursue her Ph.D. in Neurobiology. She was supported by a prestigious NIH Predoctoral National Research Service

Award, and graduated in 2004, with a thesis entitled “Novel Hippocampal Plasticity Induced by Acetylcholine and Norepinephrine.” Dr. Scheiderer also worked with the Peace Corps in Burkina Faso, West Africa, and worked under an NIH post-doctoral fellowship. Dr. Scheiderer is currently a Review Officer at the Patient-Centered Outcomes Research Institute (PCORI), where she is responsible for organizing and managing the review of applications submitted for funding. In this position, she works with scientists, patients, and other healthcare stakeholders to help PCORI identify applications with the strongest potential to help patients, caregivers, clinicians, policy makers, and other healthcare system stakeholders make informed decisions to improve patient outcomes. Before joining PCORI, she held policy analyst positions at the National Institutes of Health in the Office of the Director. She worked on initiatives related to bioethics, protection of participants in research, compensation for research-related injury, financial conflict of interest, IRB review, research misconduct, and the future of the biomedical workforce. Dr. Scheiderer also worked as a Senior Policy and Research Analyst with the Presidential Commission for the Study of Bioethical Issues where she led a report on privacy issues surrounding whole genome sequencing.

Dr. Scheiderer visited campus last October and shared career advice with our students and faculty in a talk entitled “The Making of a Career.” She was inducted into the SCSE academy in a College organized banquet and event.

## Leadership in Professional Organizations

Multiple members of the Chemistry and Biochemistry Department are active in leadership positions for international scientific organizations, and serve in editorial positions for various scientific publications.

Dr. Viktor Zhdankin has been a member of the scientific advisory board of the World Iodine Association (WIA) since July of 2019. WIA is an international nonprofit organization established by 10 large chemical and medical companies. The main mission of the WIA is to develop, support and promote the use of iodine and its derivatives in both existing and novel uses and to provide information about the purposes, uses and applications of iodine and its derivatives. Last spring, Dr. Zhdankin was heavily involved in organizing the WIA's conference on industrial applications of iodine in Bangkok, Thailand, and was scheduled to deliver a lecture entitled "Iodine and Life". Unfortunately, it was cancelled due to the pandemic. Now, jointly with the WIA, Dr. Zhdankin is organizing the 7th International Conference on Hypervalent Iodine Chemistry to be tentatively held in Moscow, Russia, June 27 through July 1, 2021. In addition to organizing conferences and delivering lectures, Dr. Zhdankin also reviews new applications of iodine in chemistry and industry for the WIA Board of Directors. When asked what he likes about serving in this position, Dr. Zhdankin replied, "I learned a lot about the importance of iodine in different areas of our life during meetings of the Board. Also, preparing scientific programs of conferences is important for my professional development. Travel to the conferences and establishing new contacts is also important." Dr. Zhdankin is hopeful that in the future UMD students will be able to attend international conferences organized by the WIA. More information about the WIA is found at <https://www.worldiodineassociation.com>.

Dr. Erin Sheets has been the secretary of the Biophysical Society (BPS) since July of 2019 and has been a member since 1993. The BPS is the international society for scientists working at the nexus of the physical and life sciences. In addition to promoting biophysics, the BPS supports the next generation of biophysicists. As secretary of the BPS, much of Dr. Sheets' work focuses on supporting members by providing scientific and professional development opportunities. For example, Dr. Sheets has been active in coordinating creative program outreach by member-service related committees as well as helping guide the future direction of the BPS. Dr. Sheets is a very enthusiastic supporter of the BPS, stating, "I've enjoyed all of the roles that I have played to date in BPS. However, serving as Secretary has been among the most fulfilling work of my career because we are doing impactful work on behalf of our members by supporting their research excellence and professional development. We have worked really hard to support our members, and I am particularly proud of our efforts to make the Society a supportive community for all members through our diversity, equity, and inclusion programming and community building." There are many opportunities for UMD students to be active in the BPS. Dr. Sheets said, "We welcome undergraduate and graduate students as members in BPS. In fact, Profs. Alessandro Cembran, Anne Hinderliter, Ahmed Heikal, and I routinely have our undergraduate and graduate student team members present their work at our annual meeting. Our students regularly participate in poster competitions about their research and are recognized with society travel awards. The meeting is a great way to introduce our students to the biophysical community, and a way to begin to develop their professional networks. In addition to presenting their research, students can also take advantage of a variety of professional development activities at the meeting and year-round." Dr. Sheets encourages membership in the Biophysical Society. More information can be found at <https://www.biophysics.org/>.

Others in the department serve on Journal editorial boards. Dr. Elizabeth Minor serves as an editorial board member for the publication *Organic Geochemistry*. She also serves on the board of advisors for National Ocean Sciences Accelerator Mass Spectrometry Advisory and Planning Board. Dr. Kathryn Schreiner is the review editor for the journal *Frontiers in Environmental Science*. Dr. Zhdankin serves as the editor-in-chief, the scientific editor, and a control board member of *ARKIVOC*, or the *Online Journal of Organic Chemistry*. He is also an editorial board member for *Current Organic Synthesis* and *Mendeleev Communications*.



## Graduating Seniors: 2019-2020

Amber Anderson, Chemistry  
Katarina Andersen, Biochemistry & Chemistry\*  
Andreas Aristidou, Chemistry  
Michael Badger, Biochemistry & Chemistry  
Claire Baetzold, Biochemistry\*  
Anna Bastyr, Biochemistry & Chemistry\*  
Julie Beenken, Chemistry\*  
Hannah Bischel, Biochemistry  
Matthew Otto Bohn, Chemistry  
Zachary Clark, Biochemistry & Chemistry  
Austin Cox, Biochemistry\*  
Thomas Cramer, Chemistry  
Samantha Dahl, Biochemistry  
Mark DeLong, Biochemistry & Chemistry\*  
Alexis Doucette, Biochemistry & Chemistry\*  
David Eaton, Chemistry  
Jackson Ellenbecker, Biochemistry  
Amber Escobedo, Biochemistry  
Austin Evenson, Biochemistry  
Jennifer Fournier, Biochemistry & Chemistry\*  
Nicole Franklin, Chemistry  
Jonah Fuls, Biochemistry  
Cassandra Hamm, Biochemistry & Chemistry\*  
Bennett Hanson, Biochemistry & Chemistry  
Emily Hanson, Biochemistry  
Jens Huseby, Biochemistry\*  
Mark Iwen, Biochemistry  
Grant Jackson, Biochemistry\*  
Emmanuel Tetteh-Jada, Biochemistry & Chemistry\*  
Marissa Jensen, Chemistry\*  
Kevin Johnson, Biochemistry\*  
Cameron Kurisko, Biochemistry  
Anna Mork, Biochemistry\*  
Nathan Mukai, Biochemistry\*  
Benjamin Nelson, Biochemistry  
Eleanore Nelson, Biochemistry & Chemistry  
Samuel Nelson, Biochemistry\*  
Mark Iwen, Biochemistry  
Grant Jackson, Biochemistry\*  
Emmanuel Tetteh-Jada, Biochemistry & Chemistry\*  
Marissa Jensen, Chemistry\*  
Kevin Johnson, Biochemistry\*  
Cameron Kurisko, Biochemistry  
Roselynd Lin, Chemistry\*  
Tyler Liska, Biochemistry\*  
Isabella Maki, Biochemistry & Chemistry\*  
Salena Math, Chemistry  
Ana Mattson, Biochemistry  
Madelyn Moore, Biochemistry  
Erik Morey, Biochemistry  
Anna Mork, Biochemistry\*  
Nathan Mukai, Biochemistry\*  
Benjamin Nelson, Biochemistry  
Eleanore Nelson, Biochemistry & Chemistry  
Samuel Nelson, Biochemistry\*  
Claudia Ramjattan, Chemistry  
Alexandria Reed, Biochemistry  
Jeremiah Riendeau, Biochemistry  
Erin Scofield, Biochemistry  
Natalya Seppanen, Biochemistry  
Ryan Sherden, Biochemistry\*  
Seth Shingledecker, Biochemistry  
Brenden Stay, Biochemistry & Chemistry  
Sophia Stupak, Chemistry  
Zoe Suiter, Biochemistry & Chemistry\*  
Matthew Sunderman, Chemistry  
Jenna Swenson, Biochemistry & Chemistry\*  
Jeffery Symens, Chemistry  
Ries Trenary, Chemistry  
Emma Wallow, Chemistry  
Katelin Warner, Biochemistry & Chemistry  
Logan Woock, Chemistry

\* With Distinction (Departmental or University Honors)





## Graduating Masters Students: 2019-2020

The Master of Science in Chemistry degree program at UMD provides an excellent opportunity to acquire and develop advanced technical expertise and problem-solving skills expected of today's chemical and biochemical professionals. Coursework is designed to provide a firm fundamental basis for student going into a variety of chemical specialities in both professional and academic settings. Following is a list of students who are completing their Master's degree over the 2019-2020 academic year:



Cody Aplin, Advisor: Erin Sheets  
Victoria Fringer, Advisor: Melissa Maurer-Jones  
Peter Jones, Advisor: Alessandro Cembran  
Greeshma Kumpati, Advisor: Venkatram Merredy  
Jeffrey McVay, Jr., Advisor: Steven Berry  
Kim Ngo, Advisor: Viktor Zhdankin  
Jack Norman, Advisor: Venkatram Merredy  
Madelyn Petersen, Advisor: Kathryn Schreiner  
Kassidy Rodriguez, Advisor: Joseph Johnson

## Student Awards

Our department is fortunate to be able to recognize our outstanding and deserving students. Former students, faculty, and friends of the department established some of these awards; others are from organizations in the field. Award details can be viewed at <http://scse.d.umn.edu/about/departments-and-programs/chemistry-biochemistry-department/scholarships-awards>.

### Achievement in Organic Chemistry (ACS) Award

Mark DeLong

### Achievement in Inorganic Chemistry (ACS) Award

Rowan Simonet

### Achievement in Physical Chemistry (ACS) Award

Julie Beenken

### Achievement in Environmental Chemistry (ACS) Award

Jenna Swanson

### Achievement in Organic Chemistry (Dept) Award

Mark DeLong

### Peterson Memorial Scholarship

Thi Ta

### Lake Superior Section of ACS Outstanding Senior

Grant Jackson, Emmanuel Tetteh-Jada

### The American Institute of Chemists Outstanding Senior

Jenna Swenson

### F.B. Moore Academic and Leadership Award

Jenna Swenson

### General Chemistry Award for Excellence

Mitchell Kottke, Emily Rahrick, Julia Rowles, Joseph Sauer, Zachary Sexe, Natalie Watson

### Warren F. Davis Award for Excellence in Biochemistry

Katelyn France, Amber McRae, James Terry, Nicholas Zosel, Jaise Skinner

### Catherine E. Cox Scholarship for Chemistry & Biochemistry

Tara Tesch

### James H. Maguire Scholarship

Sam Himes, Sebastian Laureano, John McClay, Michaela Sanger, Shannon King

### Undergraduate Analytical Chemistry Award

Grace Bishop

### Undergraduate Biochemistry Award

Julie Beenken

### Robert Bayer Memorial Scholarship

Belainesh Adams, Brooke Newman

### Larry C. Thompson Inorganic Chemistry Award

Noah Holzer

### James C. Nichol Scholarship

Mark DeLong

### Dr. Nathan and Elaine Ballou Scholarship

Gabriella Brinkley, Raven Buckman, Kari Olson, Sarah Vind, Alexis Ward

### Departmental Honors

Anna Bastyr, Mark DeLong, Grant Jackson, Roselynd Lin, Zoe Suiter, Jenna Swenson, Emmanuel Tetteh-Jada, Madeline Zamzow

**Departmental Outstanding Service Award**

Alexis Doucette

**Ballou Scholarship Honoring John C. Cothran**Gabriella Brinkley, Raven Buckman, Kari Olson, Sarah  
vind, Alexis Ward**Chemistry and Biochemistry Outstanding**

Teaching Assistant

Michael Badger, Brad Johnson

**2019/2020 GRADUATE AWARDEES:****SCSE Outstanding Graduate Teaching**

Assistant

Cody Aplin, Victoria Fringer, Jeffry McVay Jr.

**Dept. Outstanding Graduate Teaching Assistant**

Peter Jones, Tanner Schumacher

**CAMPUS AWARDEES:****University Honors**Katie Andersen, Anna Bastyr, Cassandra Hamm,  
Isabella Maki, Anna Mork, Jenna Swenson, Madeline  
Zamzow, Emilie Ziebarth

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