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Swenson Scholarship Programs Celebrate Twenty Years

This spring, we celebrated two decades of continuous scholarship support from the Swenson Family Foundation for our Chemistry and Biochemistry/Molecular Biology majors. Each year, thirty-two students receive a full-tuition scholarship which is renewable for up to four years. In addition, each summer, thirteen students are supported in our Summer Undergraduate Research Program (SURP). Through the Foundation, Jim (UMD Chemistry 1959) and Sue Swenson have generously given over \$6.0M to support 310 bright, hardworking, and motivated students.

The impact of this program is reflected in the achievements of the 270 Swenson Scholars who have graduated from the beginning of the program through Spring 2014. (See Table 1 on Page 2)

The greater campus community, including all of our faculty, is enormously grateful to Jim and Sue Swenson for their commitment to the Department's goals in teaching and research, their confidence in our efforts to educate students, and the transformative impact their scholarships have made on the lives of our graduates.



L to R: Chancellor Lendley Black, Susan Swenson, James Swenson, Chancellor Emerita Kathryn Martin, and SCSE Dean James Riehl.

Photo taken at the 2014 Annual Swenson Luncheon on April 15th, 2014.

Dear Friends and Alumni of UMD Chemistry and Biochemistry,

With this issue of *Transitions*, I bring warm greetings to all of you from the Chemistry and Biochemistry students, staff, and faculty. It has been another successful year and I hope you enjoy reading about the Department's activities and accomplishments. Our feature story recognizes the 20th anniversary of the Swenson Family Foundation Scholarship Program which was established by Jim (1959 UMD Chemistry) and Sue Swenson in 1994. We celebrate the tremendous impact of the Swenson Scholarships on the Scholars and the Department and express our deep gratitude to Jim and Sue.



Since we completed our Strategic Plan in May 2013, our efforts have been guided by our goals and objectives. Over the past year, the departmental committees have recommended several actions to advance the five goals that we developed last year. Some of these are described on p. 5.

I am pleased to describe the progress we have made on planning and securing funds for a new Chemical Sciences and Advanced Materials Building (p. 5). While ground breaking will depend on major funding from the Minnesota Legislature in the next few years, we have had many fruitful discussions leading to detailed descriptions of new teaching and research laboratories that will support modern, collaborative and interdisciplinary science, and meet the enrollment demands of incoming students.

2013-2014 brought several changes in the faculty (P. 3). We honor and thank Don Poe on the occasion of his retirement after 40 years of service to the department. Dean Jim Riehl stepped down from the SCSE deanship and will join the Department this fall. We successfully hired two new assistant professors who will start in August 2014: Alessandro Cembran in computational and physical chemistry and Kathryn Schreiner in analytical and limnological chemistry.

Last year, we inaugurated a new column called Looking Back... This year we focus on US-USSR/Russian Scientific Collaborations and the leadership role that Ron Caple played 40 years ago in initiating several fruitful scientific exchanges (p. 4).

The work we do is greatly enhanced by your generous support and we are extremely grateful to our alumni and friends. Your gifts allow us to provide more scholarships and awards to deserving students (p. 14-15), a first-class undergraduate research program (p.11), support for our instructional labs, and graduate student professional development.

We will continue to work hard at what we do best – educating our students, discovering new knowledge, and providing leadership to the campus and the community. We fondly remember all of our graduates and are proud to hear about your achievements and successes. Your visits are always welcome and we look forward to reminiscing with you and showing you what new things are happening in the department and at UMD. Please stay in touch.

Best wishes,

Bilin P. Jovan

Table 1: Swenson Scholar Graduates

Post-B.S. Position	Examples	Number	%
Graduate School	Chemistry, Biochemistry, Microbiology, Medicinal Chemistry, Water Resources, Geology, Neurobiology, Food Science, Philosophy	100	37%
Professional School	Medicine, Pharmacy, Optometry, Dentistry, Physician's Assistant, Physical Therapy, Law	85	32%
Employment in Field	Medtox, Mayo Clinic, Proex, Johnson and Johnson, 3M, Cline, Davis and Mann, Van Technologies, Fred Hutchinson Cancer Research Center, General Mills	63	23%
Other	Peace Corps, Americorp, teaching abroad	22	8%
Total		270	100%

Faculty & Staff Updates

Fond Farewells To:



Donald Poe, Professor, retired in May 2014 after forty years on the UMD faculty. Don grew up in a small town in southern Illinois and earned a B.S. in Chemistry from Southern Illinois University. He also completed an M.S. and Ph.D. in Chemistry at Iowa State University. He joined the UMD Department of Chemistry in 1974 as an Assistant Professor. Don has taught undergraduate and graduate level courses in analytical chemistry, introductory and general chemistry, and also taught in the UMD study abroad program in Poland. He served as Director of Graduate Studies in Chemistry and Biochemistry and as Director of the Trace Organic Analysis Laboratory in the Chemical Toxicology Research Center.

Don has published in the areas of electrochemistry and analytical separation science and has involved numerous undergraduate and graduate students in his research program on fundamental aspects of supercritical fluid chromatography.

Don has a research grant from the American Chemical Society which ends August 2015. He is looking forward to continuing his research activities and advising undergraduate and graduate research students for another year. He is also looking forward to transitioning to full time retirement.

Welcome To:



Eve Metto, Assistant Professor, joined the department in the Spring of 2014. She received her Bachelor's of Education with emphasis in Chemistry and Mathematics in 2001 from Egerton University in Njoro, Kenya, and a Ph.D. in Analytical Chemistry from Kansas State University in May 2013. Her research emphasis is in Microfluids, Separations Chemistry, and Capillary Electrophoresis. She joins us from Iowa City, Iowa where she was an online tutor to high school and college chemistry students. Eve teaches Analytical and General Chemistry courses.

Alessandro Cembran, Assistant Professor, will join the department in Fall 2014. He received his M.S. in Chemistry in 2000 and his Ph.D. in Computational Chemistry in 2004, both from the University of Bologna, Italy. He is currently at the University of Minnesota Twin Cities campus, where he is a Research Associate in the Department of Chemistry.

Kathryn Schreiner, Assistant Professor, will join the department and the Large Lakes Observatory in Fall 2014. She received her B.S. in Chemistry in 2006 and her M.S. in Earth Sciences in 2008, both from Purdue University, and her Ph.D. in Oceanography from Texas A&M University in 2013. She joins us after working as a Postdoctoral Fellow in the Department of Civil and Environmental Engineering at Northwestern University.



James P. Riehl, Professor, stepped down as Swenson CSE Dean at the end of June after serving with distinction for fourteen years. Jim is a member of the Chemistry and Biochemistry faculty and we look forward to having him as a colleague this fall. He will teach a graduate course in Group Theory, complete two books, and explore other opportunities in the Department.

Since Jim was appointed as the SCSE Dean in 2000, undergraduate enrollment grew 49%, graduate enrollment grew 110%, twelve new academic programs were added to the College, and the number of degrees awarded increased 85%. He holds a 3M McKnight Presidential Leadership Chair at the University of Minnesota and is a Full Professor in the Department.

Jim completed a B.S. in Chemistry at Villanova University and a Ph.D. in Physical Chemistry at Purdue University. Prior to coming to UMD, he was Chair of Chemistry at Michigan Technological University. His research areas include the study of the structure and reactions of chiral molecules using experimental and computational methods.

Congratulations To:



Peter Grundt, Assistant Professor, was tenured and promoted to Associate Professor in May 2014. Peter earned a Ph.D. in Chemistry from Universität - Gesamthochschule Duisberg, Germany in 1998. He came to UMD in 2007 after postdoctoral appointments at the University of Bristol, University of Bath, and the National Institute of Drug Abuse. Peter teaches organic chemistry courses and directs a research program in bioorganic, medicinal, and heterocyclic chemistry.

SCSE Academy of Science & Engineering

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. The annual induction ceremonies are held each year during fall semester. Our 2013 Academy inductee is... **Mr. Rik Tykwinski, Ph.D. Chemistry**

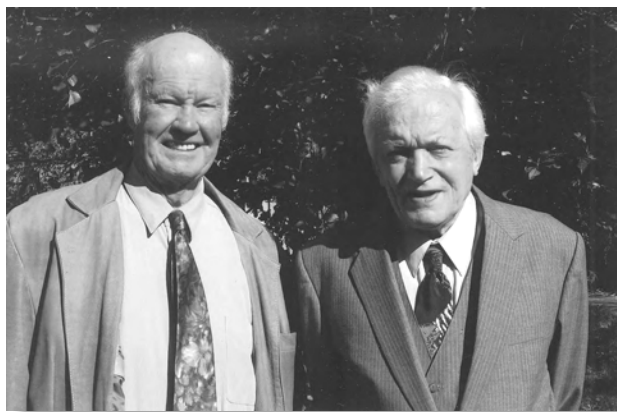
Rik started college at UMD in the mid-1980's and joined the research group of Professor Ron Caple as an undergraduate research student during his sophomore year. Rik graduated from UMD with a B.S. Chemistry degree in 1988 and received a Ph.D. in Organic Chemistry from the University of Utah in 1994. Following a post-doctoral appointment at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland, he accepted a faculty position at the University of Alberta. From 1997 to 2005, he rose through the faculty ranks to Professor of Chemistry.

Since 2009, Prof. Tykwinski has held the prestigious position of Chair I for Organic Chemistry at the University of Erlangen-Nuremberg (Germany). Prof. Tykwinski has published over 150 journal articles, edited three books, and gave numerous invited lectures in many countries. He currently is the Associate Editor for the Journal of Physical Organic Chemistry. Prof.

Tykwinski's research focuses on the synthesis of polymeric molecules formed by repeating carbon-carbon triple bonds (polyynes), characterization of their electronic properties, and potential applications. His research group has made a significant progress toward the preparation of a linear carbon allotrope formed by *sp*-hybridized carbon atoms, so called carbyne. One needs to look no further than Nobel Prizes awarded in 1996 for carbon allotropes called buckminsterfullerene (C₆₀) and in 2010 for graphene to appreciate the impact of this research.



Looking Back...Forty Years of U.S. and USSR/Russian Scientific Collaborations



Professor Emeritus Ron Caple (L) and Dr. Villam Smit (R)

At the height of the Cold War between the US and USSR, the Academies of Sciences in both countries started an exchange program to foster scientific collaborations and to ease tensions. One of the first chemists to participate in this program was Professor Emeritus Ron Caple. He left Duluth in January 1974 with a briefcase full of reagents, starting materials, and NMR tubes to work on electrophilic addition reactions with a brilliant young Soviet chemist, Villam Smit, at the Zelinsky Institute of Organic Chemistry in Moscow.

The research that Villam and Ron pursued led to numerous publications, the last being published just a few years ago, and also many short term visits by Soviet/Russian chemists at UMD and by American chemistry faculty and students to the Zelinsky Institute and to Moscow State University. Ron was honored for

his extraordinary work in fostering international relationships by being named an Honorary Member of the Russian Academy of Sciences in 1994 and an Honorary Member at Moscow State University in 1996.

Ron's commitment to developing chemistry collaborations and attracting young people into the sciences led to several joint projects with chemists in developing countries such as Cuba, Vietnam and some of the former republics of the Soviet Union. Congratulations to Ron on his extraordinary achievements to nurture good chemistry and global understanding for nearly forty years.

Departmental Strategic Plan: One Year Later

Under **Goal 1 Undergraduate Education**, we have

- decided to develop a General Chemistry sequence for our majors followed the next year by an Organic Chemistry sequence for majors in order to emphasize knowledge synthesis, critical thinking, and active learning,
- analyzed and defined how our B.S. and B.A. majors and minors can be combined to meet UMD's baccalaureate requirements, and
- started to evaluate how we can improve written and oral communication skills within our majors in order to establish a more coordinated development of these skills across the curriculum.

To advance **Goal 2 Graduate Education**, we have

- more clearly defined and articulated our academic expectations for new graduate students,
- identified program milestones to achieve in order to successfully complete an M.S. degree,
- started to discuss meaningful assessment of our graduate students and the curriculum, and
- made progress in achieving a more balanced and diverse graduate student population (e.g. domestic/international; gender; UMD/non-UMD graduates).

A new committee was established to advance **Goal 3 Research and Scholarly Activities**. This Committee

- recommended a process for allocating indirect cost recovery funds associated with sponsored projects,
- discussed ways the department can recognize faculty and graduate student research achievement.

Actions taken within **Goal 4 Human and Physical Resources** include

- revision of the Department's Safety Training Program and completion of safety audits of fifteen research labs by the Safety Committee,
- the appointment of the Chemical Sciences and Advanced Materials Building Planning Committee to work on the CSAM pre-design document, and
- the allocation of instrument and equipment funds to upgrade the teaching labs and research resources.

The Department's outreach activities contribute to **Goal 5 Departmental Culture**

- Chem and Biochem Club Chemistry Shows for the public including shows at elementary schools,
- UMD Chemical Inquiry Workshop for high school chemistry teachers, and
- participation in UMD's first annual Science Day for 137 secondary students.

Chemical Sciences and Advanced Materials (CSAM) Building

The teaching and research activities of the Department are housed in two buildings with a 57 year gap between their constructions. The Chemistry (old Science) Building opened in 1948 and the Swenson Science Building opened in 2005. Readers of previous issues of *Transitions* know that in March 2012, the External Review Team urged the campus to replace the Chemistry Building with a new building with modern laboratories to house 21st century teaching and research activities and to accommodate a 40% growth in our course enrollments and majors since 2008.

For the past 15 months, the faculty and staff have been discussing laboratory needs and identifying facility priorities. Last August, we started working with an architectural and design firm on a detailed pre-design plan and in May 2014, we were very pleased that the Minnesota Legislature allocated \$1.5M to the campus to develop the final design documents. We are very excited about the rapid (head spinning) progress we have made in realizing a new building to be called the Chemical Sciences and Advanced Materials. The name of this building reflects the central role that the chemical sciences play and also a new interdisciplinary area of materials science and engineering. Watch for future news about CSAM.

Scientific Discovery

Our faculty continues to expand the boundaries of knowledge in both disciplinary and interdisciplinary areas resulting in a very successful and impressive year of publications, presentations, and grant awards. Our commitment to preparing the next generation of scientists, educators, and health care professionals for 21st century challenges is reflected, in part, by the growing number of undergraduate and graduate students working on research projects. In addition, the breadth of research in the department, the emergence of new collaborations, and the exciting applications that result from this research are indicators of a research-rich and highly productive department.

In 2013, research projects carried out by faculty and graduate and undergraduate students resulted in 49 articles published in refereed journals/proceedings, 35 papers presented at national/international meetings, 14 papers presented at regional meetings, 4 technical reports published, 1 comprehensive monograph, and 3 published book and article reviews. In addition, faculty members were active in their research areas serving as reviewers of articles for major journals and grant proposals for federal funding agencies.

Successful faculty research proposals in 2013-14 resulted in new external funding totaling over \$620,000. Funding was provided by grants from the National Science Foundation, Whiteside Institute for Clinical Research, Bighley Foundation, UM Committee on Pharmaceutical Development and a number of industrial corporations. The three year total for all external research funds was \$2.784 million.

Discovery Knows no Borders

Faculty members presented their research findings at several international conferences, received many invitations from scientists in other countries to present seminars, and maintained collaborations with colleagues all over the world.

Steve Berry: Presented a poster at the 15th International Conference in Bioinorganic Chemistry (ICBIC15) (Grenoble, France)

Elizabeth Minor: Presented a poster at the 26th International Meeting on Organic Geochemistry (IMOG) (Tenerife, Spain)

Victor Nemykin: Invited to speak at the EuCheMS Conference on Organometallic Chemistry (St. Andrew, Scotland)

Don Poe: Presented poster at the XXXVIth Symposium 'Chromatographic Methods of Investigating the Organic Compounds' (Katowice, Szcyrk, Poland)

Viktor Zhdankin: Presented a plenary lecture and taught a short course at the Universidad Nacional Autonoma de Mexico (Mexico City, Mexico)

Postdoctoral Fellows and Visiting Scientists

This academic year, the Department is hosting many fine postdoctoral fellows and visiting scientists from around the world. In addition to furthering their education, they provide scientific expertise in their research labs and mentor our undergraduate and graduate students.

Visiting professors: **Rodion Belosludov** (Japan), **Nicholas Jones** (USA), and **Dr. Mekhman Yusubov** (Russia)

Visiting research fellows: **Ekaterina Shevchenko** (Russia), **Yurii Zatsikha** (Ukraine)

Postdoctoral research associates: **Semen Dudkin** (Russia), **Eranda Maligaspe** (Sri Lanka) and **Akira Yoshimura** (Japan)

Research specialist: **Dmitrii Svitich** (Russia)

SCSE Welcomes a New Dean



Dr. Josh Hamilton joined the University of Minnesota Duluth as the new Dean of the Swenson College of Science and Engineering on June 16, 2014.

For more information go to <http://www.d.umn.edu/news/2014/June/20.html>.

Green Chemistry

CHEM 2901 – Principles of Green Chemistry, was offered for the first time during Spring 2014. Developed by Brian Gute as part of a Green Chemistry and Design education grant from the Minnesota Pollution Control Agency (MPCA), the course serves as an introduction to principles of toxicology and green chemistry. Green chemistry focuses on redesigning chemical processes, especially those with industrial applications, to create environmentally-benign, sustainable products. This is accomplished by designing reactions to use less costly starting materials, to maximize the conversion of reactants into desired products, to minimize or eliminate chemical waste, and to reduce or eliminate the use of organic solvents.

There is growing recognition world-wide that businesses involved in manufacturing need to apply the concepts of green chemistry and green chemical engineering in their production processes. This course provides students with the basic knowledge and skills needed to begin addressing these real world issues. The green chemistry and green chemical engineering portion covers concepts related to establishing good atom economy in reactions, designing reactions and products to minimize waste, the role of catalysis in green chemistry, and alternative solvents including the use of supercritical fluids.

Additionally, the toxicology portion of the course focuses on hazard classification, route of exposure, fundamental toxicology testing and test design, case studies, and the dangers of environmental contamination. Combined, these skills will provide an invaluable foundation to students pursuing undergraduate or graduate research projects and seeking employment in the chemical industry.

UMD Chemistry & Biochemistry Club

Promoting a message that “science is fun” and that “everyone can do science”, the Chem and Biochem Club has grown in size, enthusiasm, and in the number of activities and events this year. Club members balanced a busy schedule of outreach programming, campus involvement, and social events.

Members planned, practiced, and presented very entertaining and educational chemistry shows at several elementary and secondary schools in Duluth and Superior in addition to a well attended on-campus show for elementary students. Club members also performed at the UMD Chinese Student Scholars Association’s Mid-Autumn Festival and the UMD Feast of Nations. During these programs, Club members often selected volunteers from the audience to help carry out experiments, all with a watchful eye on safety and responsibility (goggles and lab coats included).

Club members participated in the spring and fall Student Activities Fairs, Out Cold Week, UMD’s Relay for Life, and the Haunted Halls event during Halloween. Social activities such as ice skating, a hayride, and laser tag provided opportunities for members to meet other students, build friendships, and have fun. We are very proud of the Chem and Biochem Club for the effective and exciting outreach programs it produces and presents, the leadership opportunities it gives to our students, and the excitement about science it creates. Thank you for an exceptional year!



Science Day 2013



We participated in the first annual Bulldog Science Day on November 2, 2013. This program was fashioned after the successful Engineering Day program offered for over fifteen years by the Swenson College. 137 middle and high school students from area schools came to UMD to learn about careers in the sciences and academic programs in the Swenson College. Twenty-five of our junior and senior majors, advised by Associate Professor Anne Hinderliter, designed and presented five mini-lectures and demonstrations after which the 7-12 grade students carried out one of five hands-on lab activities. The presentations (Nylon Synthesis, Colored Flames, DNA Extraction, Elephant Toothpaste and Hydrogen Balloons) were a great success.

High School Chemistry Teacher Workshop

Responding to interest from regional high school chemistry teachers, the Department of Chemistry and Biochemistry developed a teacher workshop focusing on inquiry-based activities, more collaboration between teachers and UMD faculty, organic chemistry labs/techniques, and developing a knowledge base and skill set using various scientific instruments.

Faculty in the Department of Chemistry and Biochemistry (Brian Gute, Anne Hinderliter, and Romesh Lakhan) as well as Duluth East High School chemistry teacher Cynthia Grindy, developed a three-day workshop on the UMD campus for high school chemistry teachers.

Attendees began by synthesizing an organic molecule and then toured several research labs where teachers met with faculty and used some of the scientific instruments to examine their molecules. Afterwards, the teachers were guided through the process of making working models of the instruments to bring back to their classrooms. The cost of materials for the models was supported through the grants from the University of Minnesota Duluth, UMD Department of Chemistry and Biochemistry, the Lake Superior Section of the American Chemical Society, and local businesses. Throughout the workshop the teachers were guided to “reinvent” labs and activities to promote inquiry.

One of the attendees, Dr. Todd Benson, has already begun converting his High School Chemistry labs to the new inquiry format. “An amazing thing happened after we started the guided inquiry lab. The students started asking a lot of questions way beyond my guiding questions. Our lab took place over three days and their questions increased in complexity and application to many concepts related to our lab” –Dr. Todd Benson



UMD Graduate Student Attends Biophysical Society (BPS) Summer Course

Graduate student Shawn Helmueller participated in a highly selective eleven week summer course at the University of North Carolina (UNC) in Chapel Hill. The 2013 program was titled "Case Studies in the Physics of Life" and focused on selected topics in the field of biophysics. The course was directed by Profs. Barry Lentz (former President of the Biophysical Society) and Mike Jarstfer. Shawn attended classes, conducted analytical research in the laboratory of Prof. James Jorgenson, listened to and met several guest lecturers, and participated in several recreational and social activities. With Ph.D. student Dan Lunn, Shawn's summer project was to set up an Ultra High-Pressure Liquid Chromatography system to measure the column packing efficiency of columns being packed in the Jorgenson Lab. Shawn enhanced his knowledge of chromatography efficiency and resolution which is directly related to his current M.S. research project on Supercritical Fluid Chromatography in Prof. Don Poe's lab at UMD. At the end of the course, each student gave a 15 minute presentation on the results of their summer research project to faculty at UNC and staff from the Biophysical Society.

Shawn and the other ten students from around the country lived in the UNC residence hall, studied, and worked hard gaining invaluable knowledge, research skills, and team building experiences. They also enjoyed barbecues, baseball games, a brewery tour, a ropes course, and a day at Willmington Beach. According to Shawn, "The best part of the summer course was the opportunity I was given to reach out and expand my professional network. "



Shawn Helmueller (back center) with the other Summer Course participants at the closing symposium on July 30th, 2013.

BMB Senior Selected to Emcee 2014 UM Foundation Holiday Dinner



Troy Hendrickson (UMD BS-Biochemistry & Molecular Biology Class of 2014) was selected as one of the student emcees at the UM Foundation President's Club Holiday Dinner. This annual event was held on December 11, 2013 and was hosted by UM President Eric Kaler to honor major donors to the University. This was the first time a non-Twin Cities student was tapped as one of the emcees.

Troy is a first generation college student who grew up in a close-knit family in Montevideo, MN. Based on his outstanding high school record, Troy was selected as a Swenson Scholar starting his freshman year at UMD. His graduation in Spring 2014 coincided with the 20th anniversary of the Swenson Family Foundation Scholarship Program (Cover story on p 1).

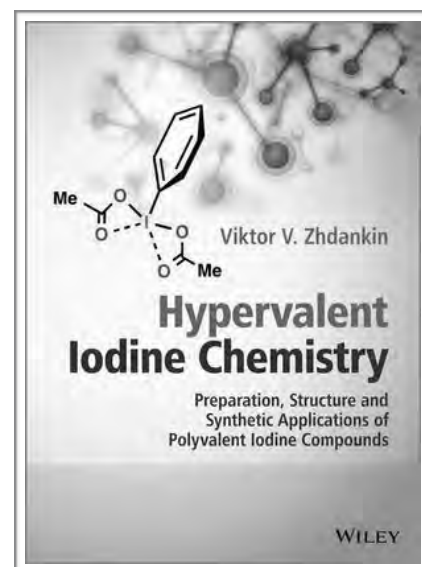
Over the past four years, Troy has excelled as a student, scientist, and leader. He started working in Prof. Anne Hinderliter's research lab as a freshman. His successful research proposals provided partial funding for four years of research on the binding properties of a protein (annexin) that regulates neurotransmitters. Troy presented his results at five national conferences and is also a co-author on three peer-reviewed publications.

Troy's success exemplifies the educational and personal values of Jim (UMD Chemistry, Class of 1959) and Sue Swenson: hard work, motivation, commitment to excellence, strong faculty mentoring, contributing to a respectful learning and research community, leadership, and giving back. We are very proud of Troy.

Congratulations to Viktor Zhdankin on the Publication of *Hypervalent Iodine Chemistry*

Prof. Viktor Zhdankin's comprehensive monograph on the preparation, properties, and synthetic applications of hypervalent iodine reagents was published by John Wiley & Sons in December 2013. *Hypervalent Iodine Chemistry* is a 480 page book that covers all the main aspects of the chemistry of organic and inorganic polyvalent iodine compounds including broad applications in chemistry research, medicine, and industry. It also serves as a complete reference to the early development of these compounds through the most recent discoveries.

Born in Ekaterinburg, Russian Federation, Viktor earned an M.S, Ph.D, and Doctor of Chemical Sciences at Moscow State University prior to a postdoctoral appointment at the University of Utah. He has published over 230 scientific papers from his research program focusing on synthetic and mechanistic organic chemistry of hypervalent main-group elements and organofluorine chemistry. In 2011, Viktor's extraordinary scientific contributions were recognized when he received the ACS National Award for Creative Research and Applications of Iodine Chemistry.



Honors Program

The departmental Honors Program provides an opportunity for outstanding Chemistry or BMB majors (3.25 or greater GPA) to enhance their ability to function as independent and competent research scientists. After a formal application and admission process, the students are guided towards choosing a mentor and beginning an undergraduate research program consisting of at least two semesters (or the equivalent). Currently, the program has about 13 members from each of the sophomore, junior and senior classes. The average GPA for the current honors students is 3.7.

The results of their research are presented during the Casmir Illenda Undergraduate Research Program at the annual spring Senior Symposium. Members of the Honors Program also participate in a spring luncheon where new members are introduced. Departmental honors graduates are recognized on their final grade transcripts with the notation "Distinction". Several members of our Program also actively participate in the all-campus "University Honors Program".

The academic achievement and leadership skills of this group of students have made them excellent representatives of the best our program offers.



<https://www.facebook.com/UmdDepartmentOfChemistryAndBiochemistry>



Undergraduate Research Program

For more than sixty years, the Department of Chemistry and Biochemistry has been a recognized leader in delivering a strong program in undergraduate research. The impact of this program on the educational achievement of our students closely aligns with the UMD Strategic Plan: reinforce and enhance classroom learning, increase and improve experimental, analytical, and quantitative skills, engage students in the discovery of new knowledge and methods, develop collaborative and team building skills, and strengthen oral and written communication skills. We know that many of you participated in undergraduate research when you were a student at UMD and that what you learned as an undergraduate researcher were transferrable skills that have contributed to your professional lives and promoted lifelong learning.

The **UMD Undergraduate Research Opportunities Program (UROP)**, for example, offers competitive financial awards twice a year for undergraduate students to carry out research or participate in scholarly or creative projects in partnership with a faculty mentor. In 2013, 40 undergraduate students from our department were granted UROP awards. Because dissemination of their research is a vital element of discovery, students frequently present at regional and national conferences and/or the UMD Undergraduate Research and Artistry Showcase.



Our department offers a **Summer Undergraduate Research Program (SURP)**, which enables our undergraduates to conduct full-time research each summer while being engaged in social and developmental activities. SURP students are supported by the Swenson Family Foundation (SFF) Summer Research awards, UROP awards, and faculty research grants.

In the summer of 2013, 22 full-time SURP students (*pictured above*) were supported by these awards. They presented their research findings in the SURP Poster Symposium (August 9, 2013), which was attended by faculty, students, and UMD administrators. External interdisciplinary reviewers judged the poster presentations in order to select the top 3 Outstanding Poster Presentations. Each SURP student also earns a Merit Award for successfully completing the program.

In addition to the SURP and UROP programs, our undergraduates may register for research credits (Chem 3194: Undergraduate Research) during the year. At the end of each semester, the students complete a research paper summarizing their findings.

Graduating Seniors: 2013-2014



2013-2014

Josh Bruhn, BS-BMB
 John Caldwell, BS-Chem
 Emily Campion, BA-Chem
 Ana Damsgard, BS-BMB*
 Tong Ding, BS-BMB, BS-Chem*
 Brandon Edlund, BS-BMB*
 Brittany Ferrari, BS-Chem
 Jamie Fowlkes, BS-Chem
 Corey Geehan, BS-BMB*
 Stephanie Greengo, BS-Chem
 Troy Hendrickson, BS-BMB*
 Melissa Hill, BS-Chem, BS-CMB*
 Benjamin Horn, BS-BMB
 Justen Ingvalson, BS-Chem
 Bryan Jensen, BS-BMB
 Melissa Just, BS-BMB
 Jonathan Kummer, BS-BMB
 Kristina Larson, BS-BMB*
 Erin Machacek, BS-BMB

Katchen Malecha, BS-BMB, BS-CMB,
 BA-Chem
 Leland McMillen, BS-Chem
 Kelsey Melgaard, BS-BMB, BS-CMB
 Brittney Miilu, BS-BMB
 Alissa Munger, BS-BMB
 Stephany Nelson, BS-Chem
 Sara O'Dowd, BS-BMB
 Bryant Pearson, BS-BMB
 Kameron Perkins, BS-BMB
 Aren Peterson, BS-Chem
 Jordan Peterson, BS-Chem
 Logan Pirkel, BS-BMB, BS-Chem*
 Paige Pluemer, BS-Chem
 Vlad Popescu, BS-BMB, BS-Chem*
 Hannah Rhoda, BS-Chem
 Amy Roesch, BA-Biochem
 Zachary Roggow, BS-BMB*
 Conor Ronayne, BS-BMB*
 Charles Rood, BS-BMB

Annah Rueger, BA-Biochem
 Bryan Sather, BS-Chem
 Alexandra Sauer, BS-BMB, BS-CMB*
 Lauren Scott, BS-Biol, BS-BMB*
 Nicole Shantz, BS-BMB*
 Charles Sieberg, BS-BMB*
 Min Sohn, BS-BMB*
 Shawn Stafki, BA-Chem
 Katelyn Starkey, BS-BMB
 Tyler Stevens, BS-BMB*
 James Strasburg, BS-Chem
 Anthony Sylvester, BS-Chem
 Christopher Tappe
 Brittnie Tatsak, BS-BMB
 Chang Thao, BS-BMB
 Dakota Tidd, BS-Chem
 Emmalee Toldo, BS-BMB*
 Marie Vestal, BS-Chem
 Patricia Westergren, BS-Chem

* *With Distinction (Departmental Honors)*

Post Graduation Plans:

Attending Graduate School = 14
 Attending Professional School = 22
 Seeking/Secured Employment = 14
 Undecided = 5

Masters of Science in Chemistry Program Graduates: 2013-2014

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 students going into a variety of chemical specialties in both professional and academic settings. Following is a list of students who have completed their Master's degree over the past year:

2013-2014

John Alfveby
Evan Anderson
Nathan Erickson
Brandy Forsman
Arjun Kafle
Brent Kastern
Balabhadra Khatiwada
Steven Koski
Bogdana Krivogorsky
Ryan Mahling
Garrett Stoddard
Michael Swenson
Michael Williams

Post-graduation Plans

Seeking employment in chemical industry, with future plans to attend a Ph.D. Program.
University of Minnesota Twin Cities, Chemistry Ph.D. program.
University of Kansas, Chemistry Ph.D. program.
Working for the Environmental Protection Agency in Duluth, MN.
University of Utah, Computational Chemistry Ph.D. program.
University of North Dakota, Chemistry Ph.D. program.
Seeking employment in a chemistry or biochemical lab in Minnesota.
Seeking employment as an instructor or in a field related to environmental chemistry.
Will graduate Fall 2014.
University of Iowa, Biochemistry Ph.D. program.
Seeking employment in Chemistry in the Twin Cities area.
Working for Boreal Natives doing wetland and stream restoration.
Plans to get his Ph.D. in Integrated Biosciences.



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://www.d.umn.edu/chem/undergraduates/awards.html> and <http://www.d.umn.edu/chem/graduates/awards.html>

UNDERGRADUATE AWARDS:

Swenson Family Foundation Scholarships for Academic Excellence

2013/14: Carter Duncan, Melody Grafton, Alexis Houle, Dillon McCann, Wyatt Miller, Cyrina Ostgard, Matthew Terhaar

Achievement in Organic Chemistry (ACS) Award

2013/14: Melissa Hill, Conor Ronayne

Achievement in Inorganic Chemistry (ACS) Award

2013/14: Paul Yager

Achievement in Organic (POLYED) Award

2013/14: Hillary Heiling

HyperCube Scholar Award

2013/14: Kevin Hughes

Peterson Memorial Scholarship

2013/14: Mackenzie Liebl

Lake Superior Section of ACS Outstanding Senior

2013/14: Melissa Hill, Kristina Larson

The American Institute of Chemists Outstanding Senior

2013/14: Tong Ding

F. B. Moore Academic and Leadership Award

2013/14: Tong Ding, Hannah Rhoda

CRC Freshman Award for Excellence in General Chemistry

2013/14: Ann Hunt, Melissa Johnson, Su Yeon Kim, Cyrina Ostgard

Warren F. Davis Award for Excellence in Biochemistry

2013/14: Dakota Lundstrom, Katherine McMahon

Catherine E. Cox Scholarship for Chemistry & Biochemistry

2013/14: Michelle Botts, Skyler Hubbard, Kathryn Peterson, Kaelt Simpson

James H. Maguire Scholarship

2013/14: Hillary Heiling, Holly Israelson, Mathew Kayser, Justine Schramel

Undergraduate Analytical Chemistry Award

2013/14: Kevin Hughes

Robert Bayer Memorial Scholarship

2013/14: Alexander Carlberg, Alexander King

Norm and Joan Gill Scholarship

2013/14: Scott Vonbank

Larry C. Thompson Inorganic Chemistry Award

2013/14: Logan Pirkl, Hannah Rhoda

James C. Nichol Scholarship

2013/14: Mathew Kayser, Chad Reuter

Casmir Ilenda Award for Outstanding Undergraduate Research

2013/14: Corey Geehan, Chang Thao, Paul Yager

Dr. Nathan and Elaine Ballou Scholarship

2013/14: Jonathan Fuchs, Justine Olson, Katelyn Schneider

Departmental Honors

2013/14: Ana Damsgard, Tong Ding, Brandon Edlund, Corey Geehan, Troy Hendrickson, Melissa Hill, Kristina Larson, Logan Pirkl, Vlad Popescu, Zachary Roggow, Conor Ronayne, Alexandra Sauer, Lauren Scott, Nicole Shantz, Charles Sieberg, Min Sohn, Tyler Stevens, Emmalee Toldo, Paul Yager

Transitions Committee

Jill Custer (Editor)
Dawna Carlberg
Kate Swanson Kallevig
Romesh Lakhan
Bilin Tsai

Student Awards, continued

Departmental Outstanding Service Award

2013/14: Emmalee Toldo

Chemistry and Biochemistry Outstanding Undergraduate Teaching Assistant

2013/14: Jonathan Fuchs, Christine Hedstrom, Alexandra Sauer, Patricia Westergren

GRADUATE AWARDS:

John C. Cothran Memorial Fellowship

2013/14: John Alfveby, Spencer Gardeen, Adam Jersett, Amber Nelson

Moses Passer Graduate Fellowship

2013/14: Scott Klasen, Ryan Mahling, Rochelle Warner

UMD Siders Chemistry Graduate Fellowship

2013/14: Brent Kastern

SCSE Outstanding Graduate Teaching Assistant

2013/14: Evan Anderson, Bogdana Krivogorsky, Ryan Mahling

Chemistry and Biochemistry Outstanding Graduate Teaching Assistant

2013/14: Nathan Erickson, Shirisha Gurrapu, Garrett Stoddard

CAMPUS AWARDS:

University Honors

2013/14: Kristina Larson, Emmalee Toldo

William Maupins Memorial Scholarship

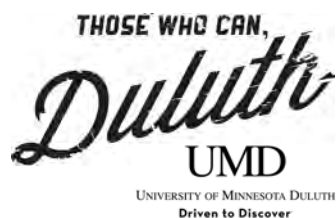
2013/14: Benedicth Ukhueduan



2013-2014 Award Recipients

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