Editors: Manish Mehta, Catherine Oertel, and Rachel Wysocki

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DEAR FRIENDS,

I am happy to have an opportunity to share with you the state of affairs in Oberlin’s Department of Chemistry and Biochemistry. This annual report affords a welcome opportunity for reflection, taking stock of where we stand and where we are going.

The 2016-17 academic year marked a staffing transition in organic chemistry. After 34 years of exemplary service, Michael Nee retired in summer 2017. Mike has been a model citizen, consistently doing the work required to keep the department functioning well. From taking on teaching and administrative overloads to cover for colleagues in need; to advising dozens of majors with care and thoughtfulness; to chairing institution-wide committees; to making sure the 400 MHz NMR is ready to run, we were always able to count on Mike’s steady, excellent contributions to our shared labors. I speak for my colleagues in thanking him for all he has done and in wishing him and his wife Alice a long, healthful, and well-deserved retirement. I hope you will reach out to Mike to share reminiscences, congratulations, and good wishes.

While Mike’s absence will be keenly felt, we are delighted to announce a successful search for his successor. In fall 2017, William Parsons joined our department in a tenure-track position. A graduate of Williams College, Will earned his PhD with Justin Du Bois at Stanford University and was then a postdoctoral researcher at the Scripps Research Institute with Benjamin Cravatt. Will conducts research in chemical biology, synthesizing chemical tools to study protein function. As an Oberlin faculty member, he will initiate an exciting research program at the chemistry/biology interface. We welcomed Will and his partner, Libni, to the Oberlin community this summer.

In August 2016 we said goodbye to our long-serving administrative assistant, Patricia West. Pat is tracking a new career course, taking classes at Lorain County Community College and
continuing to hone her skills in web design. I always enjoyed coming to the chair’s office in the morning and seeing Pat. Her easy good humor and rapport with all members of our community made her a delight to work with. We wish her all the best.

We are fortunate to have Duy (Zoey) Hua as a visiting professor in the department during the 2016-17 academic year. A freshly minted PhD from Carol Post’s lab at Purdue University, Zoey is a computational biophysicist and brings tremendous knowledge and enthusiasm into her courses, which include CHEM 101 and 254. We were fortunate to have her talent and enthusiasm in covering courses for Jason Belitsky during his sabbatical. Zoey is with us for a second year to cover Lisa Ryno’s pre-tenure leave.

Academic year 2016-17 was an exciting year for major equipment acquisition, with the arrival of two new analytical instruments. Robert Thompson spearheaded the acquisition of two new chromatographs, an LC-triple quad MS and a GC-single quad MS, both from Shimadzu Scientific Instruments. Other major instrumentation arrivals involving our department included a new scanning electron microscope and a new supercomputer.

In fall 2016, we welcomed back to campus 12 alumni who are now members of the National Academy of Sciences (NAS) for a reunion and symposium. Did you know that 1 percent of the NAS graduated from Oberlin? The reunion and symposium originated as the vision of two alumni of our department, Robert Singer ’66 and Larry Zipursky ’77. Other departmental alumni in attendance were Ralph Isberg ’77 and Robert Wurtz ’58. Faculty, staff, and students enjoyed unprecedented opportunities to discuss science with these leading minds. A highlight of the reunion was dinner at the new Hotel at Oberlin, where Professor Emeritus Norman Craig shared his incomparably rich perspective on the history of science research at Oberlin.

Finally, I am grateful to have this opportunity to offer my thanks to the wider Oberlin chemistry community for their
kindness in a moment of personal tragedy. January 30, 2017, marked the two-year anniversary of the unexpected death of Jesse Rowsell, a brilliant chemist, our departmental colleague, and my husband. To all those who reached out after Jesse’s death with thoughts, memories, and words of condolence, please accept my humble and heartfelt thanks. I hope that those fortunate enough to have known Jesse will keep alive his sense of curiosity, his unfailing rigor, his love of good conversation and music, and his generous sense of humor. The Rowsell Memorial Fund has been created to honor Jesse’s memory. It will offer financial support to high-achieving students engaged in research. Donations to this fund can be directed to the Oberlin’s Office of Development.

The department remains truly appreciative of the generous support of our alumni and other friends, in whatever form that support is offered.

Thank you for taking the time to look over this annual report. If you ever find yourselves in Oberlin, please be sure to stop by and say hello. We’d love to show you what’s new.

Best wishes,

Rebecca J. Whelan
Associate Professor and Chair
During the past fall and winter, we celebrated the 30th anniversary of the Hirschmann Lectures at Oberlin with talks by four distinguished chemists (see a listing of our seminars elsewhere in this issue). In 1984, Ralph Hirschmann ’43, who had risen to the position of senior vice president of basic research at Merck, Sharp, and Dohme Laboratories, received the Scientific Award of the Board of Directors. Ralph was recognized for a 34-year career that “broadly influenced the progress of Merck research.” Ralph designated the monetary award to establish and endow lectureships in his name at Oberlin and at the University of Wisconsin (PhD 1949). In 1985, both lectureships were launched by Harvard chemists—Jeremy Knowles at Oberlin and David Evans ’63 at Wisconsin. The fund currently supports seminars as well as student travel to conferences and other meetings.

Prior to each talk in this year’s anniversary seminar series, Robert Thompson gave some brief comments about Ralph Hirschmann. We thank Ralph’s daughter, Carla Hummel, for providing some of the historical information and personal photographs. Carla and her husband were able to visit Oberlin as part of the celebration and attended the talk given by Harry Gray. A portion of Rob’s comments and some photographs of Ralph follow. A complete record is available in the Oberlin College Archives.

Rudolf Franz Hirschmann was born to a Jewish banker, Carl, and his wife, Alice, in Bavaria, Germany, in 1922. Ralph, the name he assumed when later he emigrated to the United States, was the youngest and last of three children; his brothers were 11 and 13 years older.

In Germany, Ralph entered public school at the age of 6, arriving at the school by a 10-minute walk and then streetcar and joining a class of 40 students. Ralph reports that his penmanship was very
poor, he was a lazy student, and his principal interest was football (soccer). Even so, his mother was shocked when during a parent-teacher conference she was told that Ralph was the worst pupil in the class! Ralph’s academics improved somewhat, and he was fortunate, at age 10, to pass the exam for entry into the Gymnasium, required preparation for university education. The schools in Furth produced two other famous/infamous persons: Henry Kissinger, U.S. secretary of state under presidents Nixon and Ford, and Herman Goering, who became Adolf Hitler’s deputy in Nazi Germany.

As the Nazi Party and Hitler gained ever more power in Germany in the 1930s, Ralph Hirschmann began to feel the effects because of his Jewish heritage. On his walk home from school, he often had to withstand verbal insults and physical objects flung his way. He could no longer participate in some clubs or on the soccer team. Ralph grew weary of the hardships and pleaded with his parents to leave Germany. It was a difficult decision for the family since his father had a very good job as branch manager of a national bank and was highly regarded in the community. And many of their friends had decided to stay in Germany. In December 1936, the Hirschmanns, fearing that Nazi officials would soon come for them, decided to flee. They arrived in the United States and settled in Kansas City near some family members.

Upon graduation from high school, Ralph received a scholarship to the local university, the University of Kansas City (now University of Missouri, Kansas City). He matriculated and declared an economics major. A professor at the university took an interest in Ralph, seeing that he was a talented and conscientious student, and urged Ralph to look elsewhere for a more challenging curriculum. The professor suggested Oberlin College, since Oberlin’s faculty dean at the time was a friend of his. So Ralph took the advice and transferred to Oberlin. He also changed majors. In his own words, “I think that by inclination or whatever talent I might have had, I might have gone to law school ultimately. But I thought chemistry was more transferable from one country to another. If some horrible event ever caused me to have to leave the United States (one worried about these things having been through the German experience),
then I thought as a chemist I would probably make out all right. That’s more or less why I picked chemistry.”

World War II interrupted American life in late 1941 with the bombing of Pearl Harbor by the Japanese. Oberlin students volunteered for or were drafted into military service, and Ralph Hirschmann was no exception. He joined the Army soon after graduation in 1943 and interviewed with the army at Fort Leavenworth. Ralph told recruiters how he thought he could best serve as an intelligence officer since he knew German or serve in the artillery since he was well schooled in mathematics. Ralph also said that he would not be good in the medical corps since he was quite squeamish about blood and bodies. The interviewers nodded in agreement. Soon he was off to basic training in Texas to train as a medic. So much for the interview! Just before he shipped out, Ralph became a naturalized citizen of the U.S. Quoting Ralph, “It was a very nice ceremony. There were quite a few people in uniform in the courtroom. The judge made a very moving speech and it was an affair that meant a lot to me. That was a big event in my life.”

Ralph was first assigned to a station hospital in Guadalcanal, an island in the southern Pacific Ocean. Fortunately, at that time there was no military threat; soldiers were sent there for care. Ralph was given the task of setting up biochemical assays using an army training manual as guide—urinalysis for non-protein nitrogen and for chloride. He also served as organist in the chapel. Later Ralph was sent to Okinawa, an island closer to Japan. He was there when the atomic bombs were dropped on Japan, ending the war. On the return trip back to the U.S., Ralph was nearly washed overboard during a storm, breaking several bones in his leg and foot.

Nevertheless, Ralph was ready for graduate school in organic chemistry come fall 1946. Ralph chose to work with a young professor at Wisconsin, Bill Johnson, but also benefited from interactions with a professor across the hall, Al Wilds. Wilds was very interested in UV spectroscopy, but Johnson didn’t think much of it for structure determinations. (Remember this was before the use of NMR and IR in organic chemistry.) Ralph used a first-of-its-kind UV-Vis instrument from Beckman. Calculations of absorbance and plotting
were performed by hand. Using the new technique, Ralph showed Johnson that he could follow the creation and loss of double bonds in synthesis. Johnson was hooked and soon began using UV spectroscopy in many of his projects.

Immediately following his graduate work, Ralph gained employment as a chemist in developmental research at Merck in Rahway, New Jersey. This happened by sheer chance. Ralph first sought an academic career, as most of the best students did in those days. While preparing to visit the universities, Ralph decided to sign up with company recruiters to gain some interviewing experience.

One of the interviews was with Merck. They sent both their head of fundamental research, Karl Folkers, and their head of process research, Max Tishler, to recruit at Wisconsin. Ralph and Tishler really hit it off, both excitedly discussing steroid chemistry. Three days later he got a job offer to work in Tishler’s group for $8,000 a year. Needless to say, the combination of interesting chemistry, interested colleagues, and a super salary (in those days!) was enough to convince Ralph to head off to Merck to embark on what would turn out to be a long career.

Ralph loved the Merck environment because he was allowed to perform academic-like basic research while still keeping in mind the applications desire and profit motive of the company. Perhaps Ralph Hirschmann’s finest moment in research came in 1969 when he led the effort to synthesize the enzyme ribonuclease A. At the same time, Bruce Merrifield at Rockefeller University published his synthesis of ribonuclease A in the same issue of the *Journal of the American Chemical Society*. Both Ralph and Merrifield received attention for this first-ever synthesis of an enzyme. In Ralph’s words: “We held a joint press conference at Rockefeller. There were four speakers: Bernd Gutte, who was Merrifield’s collaborator, Merrifield, Bob Denkewalter, who was my boss at the time, and myself. We made the front page of just about every newspaper around the globe, including the *New York Times*. That was a pretty good day.” In 1984 Bruce Merrifield received the Nobel Prize in chemistry for the development of solid phase peptide synthesis demonstrated by his synthesis of ribonuclease A. Many in the Oberlin community
and elsewhere thought that Ralph Hirschmann should have shared that prize. A number of important medications, including Vasotec, Primaxin, and Ivermectin, were discovered or developed by Ralph’s team at Merck in the 1970s and 1980s. For the discovery of Ivermectin, a treatment for river blindness, a scourge in developing nations, two scientists, including a Merck chemist, were awarded a share of the 2015 Nobel Prize for Medicine. So Ralph Hirschmann was a major influence on two Nobel Prizes.

In 1988 Ralph was forced to leave Merck since he had reached the retirement age of 65. Ralph moved on to a second research career at the University of Pennsylvania, working with Amos Smith III on peptidomimetics for almost 20 years. Over the years Ralph Hirschmann received many honors. Just to name a few: honorary degree from Oberlin College (1969); establishment of the Ralph F. Hirschmann Award in Peptide Chemistry (1988); Nichols Award (1988); membership in the National Academy of Sciences (1999); and National Medal of Science (2000). The award citation for the Medal of Science read in part “For his seminal contributions to organic and to medicinal chemistry including the synthesis in solution of an enzyme (ribonuclease), his stimulation of peptide research in the pharmaceutical industry, and for his leadership role in fostering interdisciplinary research in academia and in industry, which led to the discovery of several widely prescribed medications for human and animal health.”

At Oberlin, Ralph will always be remembered as a loyal alum, a friend, a humble and gentle man, a generous supporter of our department, and a person with a lasting impact on students and faculty, especially through the Hirschmann Lectureship Fund.
The Class of 2016 included 17 biochemistry majors, eight chemistry majors, and three students completing both majors. They are profiled here:

Originally from Atlanta, Ariana Abayomi graduated from Oberlin with a major in biochemistry and a minor in rhetoric and composition. She was a member of the varsity tennis team and the Black Scientist Guild as well as cofounder of the ExCo class Black Lives Matter in the Sciences. She has begun medical school at the Latin American Medical School in Cuba and plans to become a pediatrician.

Cecilia Ballen graduated with a major in biochemistry.
Asher Bank graduated with a major in chemistry and a minor in geology. His goal is to pursue a career in music as a drummer, with a backup plan to attend graduate school in chemistry.

Anne Chege did research in the neuroscience department with Professor Gunnar Kwakye. She was a member of the Rhinos rugby team and the Black Scientist Guild and was active with the Oberlin College Dialogue Center. After graduating with a major in biochemistry and a minor in anthropology, Anne relocated to Tucson, Arizona, and plans eventually to pursue graduate work in public health and medical anthropology.

Wilson Chen graduated with a major in biochemistry. In addition to working in the department as a TA for Organic Chemistry (Chem 205), he helped initiate the tennis club, volunteered at Kendal, and was cochair of the Chinese Student Association. He hopes to eventually attend medical school.

Biochemistry major Nathan Danko came to Oberlin from Vermillion, Ohio, and was a member of the Oberlin men’s track and field team. After graduating, Nate enlisted in the United States Army and trained at Fort Jackson, South Carolina.

After graduating with majors in both chemistry and biochemistry, Natasha Eklund returned to her home state to
Anne Chege

Wilson Chen

Nathan Danko

attend Michigan State University in pursuit of a master’s degree in forensic science. She plans to pursue a career as a practicing scientist in the field, having developed her interest in forensics over the nearly three years she worked in the Thompson lab. Natasha also served as a TA for Analytical Chemistry (Chem 211) and as an OWL student assistant for Chemistry and Crime (Chem 045). Outside of the Science Center, Natasha enjoyed baking and cooking, using these skills as an OSCA food buyer, cook, and “tasty things maker.”

Hailing from Manitowoc, Wisconsin, Zoe Feder graduated with majors in both biochemistry and biology. She received Honors in Biology, having performed research with Associate Professor of Biology Michael Moore.

Noalle Fellah came to Oberlin from Bowling Green, Ohio, and completed majors in art history and chemistry. Having studied abroad in the Netherlands her junior year, she returned to Oberlin to perform research in the Oertel lab during her senior year. She then returned to Europe to spend the summer after graduation in the U.S-Dutch International Research Experiences for Students program. In the fall, she began her graduate studies in chemistry at New York University, where she hopes to do research relating to art conservation.
Samantha Ferguson, originally from Red Hook, New York, was active in the department as a tutor, TA, and member of the majors committee. In addition to her major in biochemistry, she also completed a major in dance and was a member of the ViBE Dance Company on campus. She did research in the Belitsky lab and hopes to find employment with a global health nonprofit organization.

Having graduated with a major in biochemistry, Felipe Firmo began medical school at Syracuse University.

Originally from McLean, Virginia, Aaron Frederick contributed to the Oberlin community in a number of ways, including scientifically as a researcher in the Mehta lab for several semesters, athletically as a member of the swim team, and
musically as part of the Obertones men’s vocal group. He was also known as the “pizza guy” during the summers, picking up lunch for the department’s weekly research talks. Having graduated with a major in chemistry, Aaron is currently seeking employment in that field, with the possible goal of pursuing a graduate degree.

In addition to a major in chemistry, Deirdre Haren completed an environmental studies major and eventually hopes to work for a company or nonprofit that focuses on water quality or environmental management. To this end, she has joined the master’s program in environmental science at Trinity College Dublin in Ireland. Deirdre came to Oberlin from Madison, Connecticut, and was a member of the swim and track and field teams and worked on campus at the “Living Machine” of the A.J. Lewis Center.

Jingyan (Lulu) Huang completed her degree with majors in biochemistry and biology, earning High Honors in Biochemistry. Hailing originally from Beijing, Lulu is working on campus as a Presidential Fellow, focusing on international student services. In addition to writing for the Oberlin Review, she was active as an OWLS leader for Structure and Reactivity (Chem 101) and Organic Chemistry (Chem 205). She also performed research in the Thompson lab prior to conducting her honors research in
the Nee lab. Lulu’s eventual plans include earning an MBA.

Biochemistry major Christopher Husted came to Oberlin from Armonk, New York, along with his twin brother. In addition to performing research in the Nee lab, Chris conducted astronomy research with Dan Strinebring and played varsity lacrosse. After graduation, Chris obtained a laboratory technician position in New York City, with the eventual goal of pursuing graduate studies in the fields of biochemistry, molecular biology, or bioinformatics.

From West Hartford, Connecticut, Nigel Kidder-Wolff completed a major in chemistry and a minor in Hispanic studies. During his time at Oberlin, he performed research in the Oertel lab and was active as an instructor of the swing dancing ExCo.

Jeffrey Levy came to Oberlin from New Rochelle, New York, and completed majors in both chemistry and biochemistry. He is currently seeking employment related to chemistry while he considers returning to school for an advanced degree. His areas of interest are in the fields of organic and pharmaceutical chemistry as well as in environmental analytical chemistry. At Oberlin, Jeff was involved in a range of extracurricular roles, including radio show host, trombonist in several bands, and head cook in OSCA.
Prior to performing research in the Belitsky lab during his senior year, he had been part of the Nee and Rowsell labs.

Originally from Readington, New Jersey, Sophie Lewandowski graduated from Oberlin with High Honors in Biochemistry and has since begun graduate school at the University of Wisconsin-Madison. While at Oberlin, she was a TA and tutor in the chemistry department and wrote for *The Synapse*. Sophie also conducted research in the Belitsky lab for more than three years.

Biochemistry major Kendra Lian came to Oberlin from Granville, Ohio. In addition to her work as a tutor and TA for various general chemistry labs, Kendra performed research in the Rowsell lab and was cochair of the majors committee. Outside of the chemistry department, she was a member of the varsity field hockey team and a volunteer at Kendal and at the Nord Center. Kendra is currently working as a research technician in the lab of Dr. Hay-Oak Park at Ohio State University, with eventual plans to attend medical school.

Hailing from Pullman, Washington, Sarel Loewus graduated from Oberlin with Highest Honors in Biochemistry. She is currently pursuing a PhD at the University of Pittsburgh as part of the School of Medicine’s Interdisciplinary Biomedical Graduate Program. Her plan is to focus on microbiology, an
interest cultivated during her time studying biofilms in the Ryno lab, and to eventually conduct research in an academic or industrial setting. In addition to her work in the department, Sarel developed into a top-performing distance runner, having been for all four years a member and eventual captain of the track team and the women’s cross country team, which were conference champions in 2012, 2013, and 2014.

Liora Mael, from Lexington, Massachusetts, began graduate studies in physical chemistry at the University of California San Diego, having earned High Honors in Chemistry at Oberlin. In addition to performing research in the Elrod lab, she worked as an OWLS leader for Chem 101 and was secretary of the majors committee. Liora was also a member of the varsity swim team.

Jonathan Quirke came to Oberlin from Miami, Florida, and is currently attending Wayne State University, where he is pursuing graduate studies in chemistry. He completed both the chemistry and the biochemistry majors, having taken nearly every class offered by the department as well as additional private reading courses. He also performed research in the Belitsky lab for several semesters.

In addition to earning Honors in Chemistry, Won Hee (Harry) Ryu, originally from North Liberty, Iowa, also completed a major
in mathematics. He served the department as an OWLS leader and TA for Organic Chemistry (Chem 205) as well as conducted research in the Belitsky and Matlin labs. After graduation, Harry began graduate studies in theoretical chemistry at the University of Chicago.

Originally from China, Maine, Delia Scoville graduated from Oberlin with High Honors in Biochemistry. She afterwards moved to Madison, where she is pursuing graduate studies in biochemistry at the University of Wisconsin-Madison. Delia conducted research with the Whelan lab and at various institutions abroad and was also active as a TA and tutor. Additional extracurricular activities included working for the Green EDGE Fund and volunteering at Kendal. She hopes to eventually do work for an organization focused on equitable health research.

In the long term, Zachary Sheldon hopes to use the knowledge gained in the completion of his chemistry major to work in the fields of art conservation or food science. Originally from Washington, DC, he was active at Oberlin in OSCA and performed research in the Nee lab.

Allison Susin came to Oberlin from Naperville, Illinois. A member of the varsity swim team, she graduated with a major in
biochemistry and has begun the PharmD program at the Ohio State University College of Pharmacy.

Hailing from Chicago, Illinois, Ruben Ulloa completed majors in both biochemistry and biology. As a member of Oberlin’s chemistry department, he conducted research in the Martinez and Belitsky labs. Currently a teacher in Chicago, Ruben plans to attend graduate or medical school in the future.

Biochemistry major Joshua Urso came to Oberlin from Pittsburgh, to where he has returned to pursue graduate studies in civil and environmental engineering at the University of Pittsburgh. While at Oberlin, he was a successful member of the cross-country and track teams, qualifying for nationals in cross-country and elected track and field captain during his senior year.

Joshua Urso
Rebecca Berenbon, Neuroscience
Brandon Bertot, Biology, additional minor in History
Nathaniel Bohm-Levine, Neuroscience
Miles Brooke, Biology
Leal Carter*, Neuroscience, Biology
Sara Ebb*, Biology
Thomas Firl, Economics
Kathryn Hobart, Geology
Lisa Learman, Biology, Musical Studies
William Lynch, Neuroscience
Lisa-Qiao MacDonald, Biology
Corina Miner, Physics
Rachel Nesnevich, Biology, additional minor in Dance
Benjamin Rabin, History
Eric Rappeport, Materials Physics
Madeline Spencer*, Biology, additional minor in Anthropology
Shavonne Stanek, Environmental Studies
Emilia Varrone*, Neuroscience, additional minor in English
David Yarnell, Biology
Yan Zhong, Biology

*graduated December 2015
For details on these projects, please visit www.oberlin.edu/chemistry

Anthony Allen ’18 (Chemistry, minor in Philosophy)
“Cucurbituril Research and Synthesis,” Advisor: Michael Nee

Eric Bell ’17 (Biochemistry & Horn Performance, minor in Computer Science)
“Insights into the Binding Behavior of Chaperone SurA using in silico methods,” Advisor: Lisa Ryno

Hannah Cook ’18 (Biochemistry)
“Cucurbituril Research and Synthesis,” Advisor: Michael Nee

Diego Cortes ’18 (Chemistry)

Emily Curley ’17 (Neuroscience, minor in Chemistry)
“Monitoring the Overexpression of Stress Responsive Transcription Factors in E. coli via Real-Time PCR,” Advisor: Lisa Ryno

William Dresser ’19 (Chemistry)
“Gas Phase Oxidation Kinetics and Mechanisms for Biogenic Volatile Organic Compounds,” Advisor: Matthew Elrod

Christopher Eckdahl ’17 (Chemistry & Materials Physics)
“Explorations of Tetrahedral Packings using Monte-Carlo Simulations,” Advisor: Manish Mehta

Aidan Estelle ’17 (Biochemistry)
“Fishing for Cucubiturils,” Advisor: Michael Nee
Noalle Fellah ’16 (Chemistry & Art History)
“Synthesis of Non-Centrosymmetric Lead Oxide Carboxylates,”
Advisor: Catherine Oertel

Erin Ford ’18 (Neuroscience)
“Forensic Analytical Chemistry Experiments,”
Advisor: Robert Thompson

Aaron Frederick ’16 (Chemistry)
“Thermodynamic Measurements of Co-Crystals using Bomb Calorimetry and Differential Scanning Calorimetry,” Advisor: Manish Mehta

Calvin Gang ’17 (Biochemistry & Chemistry)
“Synthesis of Lead Oxide Carboxylate Single Crystals and Nanostructures,” Advisor: Catherine Oertel

Jingyan (Lulu) Huang ’16 (Biochemistry & Biology)
High Honors in Biochemistry
“Removal of dyes from industrial waste water with cucurbiturils,” Advisor: Michael Nee

Christopher Husted ’16 (Biochemistry)
“Cucurbituril Research and Synthesis,” Advisor: Michael Nee

Canran (Polo) Ji ’18 (Chemistry, Biochemistry, & Mathematics)
“Solid-state NMR and Diffraction Studies of Co-Crystals,”
Advisor: Manish Mehta

Kallie Jiang ’19 (Biochemistry)

Nigel Kidder-Wolff ’16 (Chemistry, minor in Hispanic Studies)
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<tr>
<th>Name</th>
<th>Major</th>
<th>Thesis Title</th>
<th>Advisor</th>
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<tr>
<td>Jeffrey Levy ’16</td>
<td>(Chemistry &amp; Biochemistry)</td>
<td>“Synthesis of Eumelanin Analogs,”</td>
<td>Jason Belitsky</td>
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<tr>
<td>Sophie Lewandowski ’16</td>
<td>(Biochemistry)</td>
<td>High Honors in Biochemistry “Spectroscopic Investigation of Catechol-Based Heavy Metal Sensors,”</td>
<td>Jason Belitsky</td>
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<tr>
<td>Sarel Loewus ’16</td>
<td>(Biochemistry)</td>
<td>Highest Honors in Biochemistry “Investigating the Effect of the RpoH Transcription Factor on E.coli Biofilm Formation,”</td>
<td>Lisa Ryno</td>
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<tr>
<td>Emilie Lozier ’18</td>
<td>(Chemistry &amp; French, minor in Geology)</td>
<td>“Synthesis of Pyrochlore-Related Silver Niobium Oxides,”</td>
<td>Catherine Oertel</td>
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<tr>
<td>Liora Mael ’16</td>
<td>(Chemistry), High Honors in Chemistry</td>
<td>“Gas Phase Oxidation Kinetics and Mechanisms for Biogenic Volatile Organic Compounds,”</td>
<td>Matthew Elrod</td>
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<tr>
<td>Daniel Markus ’18</td>
<td>(Biochemistry)</td>
<td>“Synthetic Melanin Filtration Agents,”</td>
<td>Jason Belitsky</td>
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<td>Lele Mathis ’18</td>
<td>(Chemistry &amp; Materials Physics)</td>
<td>“Synthesis of Lead Oxide Phosphonates,”</td>
<td>Catherine Oertel</td>
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<td>Kepler Mears ’17</td>
<td>(Chemistry, Biochemistry &amp; Mathematics)</td>
<td>“Selection of Aptamers for Ovarian Cancer Biomarkers,”</td>
<td>Rebecca Whelan</td>
</tr>
<tr>
<td>Karstan Minanov ’18</td>
<td>(Chemistry &amp; Economics)</td>
<td>“Cucurbituril Research and Synthesis,”</td>
<td>Michael Nee</td>
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Samantha Moores ’17 (Biochemistry & East Asian Studies)
“Exploring the Role of Heterocycles in Synthetic Eumelanin Formation,” Advisor: Jason Belitsky

Jonathan Quirke ’16 (Chemistry & Biochemistry)
“Synthesis of Eumelanin Analogs,” Advisor: Jason Belitsky

Won Hee (Harry) Ryu ’16 (Chemistry & Mathematics)
Honors in Chemistry
“Investigation of the Organocatalyzed Nazarov Cyclization Reaction,” Advisor: Albert Matlin

Andrew Santiago ’19 (Materials Physics, 3-2 Engineering, & Flute Performance, minor in Chemistry)
“Synthesis of Lead Oxide Phosphonates,” Advisor: Catherine Oertel

Delia Scoville ’16 (Biochemistry), High Honors in Biochemistry
“Characterization of Aptamer Binding Affinity to the Cancer Biomarker CA125,” Advisor: Rebecca Whelan

Santino Stropoli ’18 (Chemistry & Violin Performance)

Alejandro Vera ’17 (Anthropology)
“Synthetic Melanin Filtration Agents,” Advisor: Jason Belitsky

Cecilia Wallace ’19 (3-2 Engineering)
“Environmental Applications of Coatings Inspired by Melanin,” Advisor: Jason Belitsky

Gabrielle Walsh ’18 (Biochemistry and Biology)
“Investigation of the Organocatalyzed Nazarov Cyclization Reaction,” Advisor: Albert Matlin
Anna Weiss ’17 (Chemistry & Biology)  
“Characterization of Artists’ Oil Paint,”  
Advisor: Robert Thompson

Yinuo (Helen) Zhang ’17 (Environmental Studies, minor in Chemistry)  
“Forensic Analytical Chemistry Experiments,” Advisor: Robert Thompson

Erica Zheng ’17 (Biochemistry & Flute Performance)  
“Expression and Purification of the Periplasmic Chaperone SurA,” Advisor: Lisa Ryno

STUDENT SUMMER RESEARCH 2016

For details on these projects, please visit www.oberlin.edu/chemistry

Victoria Abraham ’20 (undeclared)  
“Characterization of Aptamer Stability in Diverse Solvent Environments,” Advisor: Rebecca Whelan

Eric Bell ’17 (Biochemistry & Horn Performance, minor in Computer Science)  
“Insights into the Binding Behavior of Chaperone SurA using in silico methods,” Advisor: Lisa Ryno

Emma Brezel ’17 (Biochemistry, minor in Religion)  
“Activating Stress-Responsive Signaling Pathways in E. coli,” Advisor: Lisa Ryno

Diego Cortes ’18 (Chemistry)  
William Dresser ’19 (Chemistry)
“Gas Phase Oxidation Kinetics and Mechanisms for Biogenic Volatile Organic Compounds,” Advisor: Matthew Elrod

Daniel Hill ’21 (High School student at the time, entered OC Fall 2017)

Mikaila Hoffman ’18 (Chemistry, minor in Cognitive Sciences)
“Catalyzing Effect of Organic Vapors on Spontaneous Cocrystal Development,” Advisor: Manish Mehta

Canran (Polo) Ji ’17 (Chemistry, Biochemistry, & Mathematics)
“Spontaneous Cocrystal Formation with Organic Vapor Assistance,” Advisor: Manish Mehta

Jeffrey Levy ’16 (Chemistry & Biochemistry)
“Synthesis of Eumelanin Analogs,” Advisor: Jason Belitsky

Yushu (Eve) Liu ’17 (Chemistry, minor in 3-2 Engineering)
“Analysis of Bowerbird Paint,” Advisor: Rebecca Whelan

Daniel Markus ’18 (Biochemistry)
“Benchmarking the Thrombin Binding Aptamers with Fluorescence Anisotropy,” Advisor: Rebecca Whelan

Kepler Mears ’17 (Chemistry, Biochemistry, & Mathematics)
“Benchmarking the Thrombin Binding Aptamers with Affinity Probe Capillary Electrophoresis,” Advisor: Rebecca Whelan

Samantha Moores ’17 (Biochemistry & East Asian Studies)
“Exploring the Role of Heterocycles in Synthetic Eumelanin Formation,” Advisor: Jason Belitsky
Naviya Schuster-Little ’17 (Biochemistry)
“Optimization of Modified PCR Methods for Aptamer Selection,”
Advisor: Rebecca Whelan

Santino Stropoli ’18 (Chemistry & Violin Performance)

Alejandro Vera ’17 (Anthropology)
“Synthetic Melanin Filtration Agents,” Advisor: Jason Belitsky

Anna Weiss ’17 (Chemistry & Biology)
“Analysis of Bowerbird Paint,” Advisor: Rebecca Whelan

Erica Zheng ’17 (Biochemistry & Flute Performance)
“Discovering Inhibitors of the Periplasmic Chaperone SurA for Novel Antibiotic Development,” Advisor: Lisa Ryno
2016 CHEMISTRY AND BIOCHEMISTRY AWARDS

FIRST-YEAR AWARDS
CRC Press Chemistry Achievement Award
Sponsored by the CRC Press, an imprint of the Taylor & Francis Group, and awarded to first-year students for high academic achievement in general chemistry.
   Riley Davies, Laura Dynes, Emma Eisenbraun, Angel Nuñez, Helene Tiley, Jiahang Zhang

SECOND-YEAR AWARDS
Frank Fanning Jewett Award
Awarded to second-year students who show remarkable promise in the field of chemistry.
   Anthony Allen, Elena Hartley, Mikaila Hoffman, Emilie Lozier, Lele Mathis

JUNIOR-YEAR AWARDS
Harrol W. and Virginia M. Baker Scholarship
Awarded to at least one outstanding chemistry or biochemistry major, to be applied to his or her senior year tuition.
   Galen Brennan, Christopher Eckdahl, Calvin Gang

William B. and Helen K. Miller Memorial Scholarship
Awarded to a worthy chemistry or biochemistry major for his or her senior year.
   Erica Zheng

Norman C. Craig ’53 Chemistry Scholarship
Awarded to a worthy chemistry or biochemistry major with an outstanding academic record in that field.
   Eric Bell
Undergraduate Award in Analytical Chemistry
Sponsored by the American Chemical Society Division of Analytical Chemistry and awarded to a junior who has achieved excellence in the field of analytical chemistry, as demonstrated by his or her research, coursework, motivation, or any combination thereof, and whose future plans include a career in chemistry.
Christopher Eckdahl

GRADUATING CLASS AWARDS
Harry N. Holmes Prize
Awarded to graduating chemistry or biochemistry majors in recognition of high achievement in chemistry.
Jingyan (Lulu) Huang, Sarel Loewus, Won Hee (Harry) Ryu, Delia Scoville

David A. Evans ’63 Chemistry Prize
Awarded to a worthy graduating chemistry or biochemistry major who has preferably demonstrated an interest in organic chemistry.
Sophie Lewandowski

Merck Index Award
Awarded to an outstanding senior chemistry or biochemistry major with interests in medicine or biological chemistry.
Felipe Firmo

Undergraduate Award in Inorganic Chemistry
Sponsored by the American Chemical Society Division of Inorganic Chemistry and awarded to a senior who has achieved excellence in the field of inorganic chemistry, as demonstrated by his or her research, coursework, motivation, or any combination thereof, and whose future plans include a career in chemistry.
Noalle Fellah
Undergraduate Award in Organic Chemistry
Sponsored by the American Chemical Society Division of Organic Chemistry and awarded to a senior who has achieved excellence in the field of organic chemistry, as demonstrated by his or her research, coursework, motivation, or any combination thereof, and whose future plans include a career in chemistry.

Jonathan Quirke

Hypercube Scholar Award
Sponsored by Hypercube, Inc. and awarded to an outstanding senior chemistry or biochemistry major with demonstrated interest in computational chemistry.

Won Hee (Harry) Ryu

American Chemical Society Certified Bachelor’s Degree
Awarded to students who complete the rigorous ACS undergraduate curriculum

Chemistry: Won Hee (Harry) Ryu
Biochemistry: Jeffrey Levy
Chemistry and Biochemistry: Natasha Eklund, Jonathan Quirke

Sigma Xi Inductees
Known as the Scientific Research Honor Society, this is the international honor society of science and engineering.

Lauren Choban, Noalle Fellah, Jeffrey Levy,
Sophie Lewandowski, Sarel Loewus, Liora Mael,
Jonathan Quirke, Won Hee (Harry) Ryu, Delia Scoville

Phi Beta Kappa Inductees
Members join in the honor society’s mission of celebrating and advocating excellence in the liberal arts and sciences.

Jingyan (Lulu) Huang, Sarel Loewus, Delia Scoville
## 2015-16 SEMINAR PROGRAM

### FALL 2015

**Klaus Schulten**, University of Illinois at Urbana-Champaign, “Towards an Atomic Level Description of a Whole Living Cell—The Photosynthetic Chromatophore of Purple Bacteria, a Key Milestone” ∞

**Douglas Rohde**, Lake County Crime Laboratory, “Application of Chemistry in Forensic Investigation: the Cleveland Cyanide Murder Case” †

**Jonathan Wilson ’00**, Merck & Co., “Impact of Catalysis Screening Methodology on Drug Discovery at Merck and the Discovery of Novel Indoline CETP Inhibitors” ‡


**Marcy Waters**, University of North Carolina at Chapel Hill, “From Host-Guest Chemistry to the Nucleosome: Studies in Bimolecular Recognition” ‡

### SPRING 2016

**Laurence Yeung ’04**, Rice University, “Find the Others: Using Rare-Isotope ‘Clumping’ to Trace Chemistry and Transport in the Earth System” †

Jason R. Dwyer, University of Rhode Island, “Clowns in a Car: Nanofluidics for Single-Molecule Science” †

Kate Plass, Franklin and Marshall College, “Vacancy Formation in Copper Sulfide Nanoparticles: The joy and pain” †

§ Sponsored by the Ray Alte Blumenof Lectureship Fund
‡ Sponsored by the Ralph F. Hirschmann Lectureship Fund
† Sponsored by the Luke E. Steiner Lectureship Fund
∞ Sponsored by the Oberlin College Department of Biology
Jason Belitsky reports that 2015-16 has been an exciting year in lab, with projects ranging from organic synthesis to fluorescence spectroscopy, and the honors thesis of four-year Belitsky Lab veteran Sophie Lewandowski. A highlight of the year was the arrival of Postdoctoral Researcher Andrew Aebly in March. Andy has been a transformative addition to the lab. Events in Flint, Michigan, and other U.S. cities lent unfortunate significance to the lab’s work on colorimetric sensors and binding agents for lead. These projects grew out of fundamental studies on melanins and related materials. The Belitsky Lab is now working on synthetic melanin-based filtration agents for lead in collaboration with Nanotech Innovations, a company based here in Oberlin. Also this year, the lab continued a project that began...
in the Chem 254 (Bioorganic Chemistry) teaching lab as part of the spring 2015 iteration of the NSF-supported course-based research experience on the “Bioorganic Chemistry of Eumelanin.” This year, Jason taught general chemistry (Chem 101) in the fall and Chem 254 in the spring. The spring 2016 iteration of the course-based research experience included student-designed experiments, with more time for planning and repeating the experiments, increasing their ownership of the projects. As program director of Oberlin’s Howard Hughes Medical Institute (HHMI) grant, Jason oversaw the activities of the Center for Learning, Education, and Research in the Sciences (CLEAR), including operation of the peer-staffed Quantitative Skills Center; the Oberlin Workshop Learning Sessions (OWLS) peer-mentoring program; and the annual “Lab Crawl,” which had a Halloween trick-or-treating theme. Jason and his colleagues were pleased that Oberlin’s pre-proposal for the next HHMI grant, on the theme of persistence in the sciences, was accepted, and they are working on full proposal due October 2016. Through his association with HHMI, Jason also worked with colleagues from six other institutions on the development of an assessment instrument called BioSQuaRE and on a manuscript about the instrument and the collaborative process of its development. Jason took a number of trips throughout the year, with one highlight being a three-day symposium in March at Caltech and the ACS National Meeting in San Diego, in honor of Jason’s PhD advisor, Peter Dervan’s 70th birthday. Jason reports that it was great to see many of his former lab-mates, all the different scientific directions that they have taken from their common training, and to give a presentation at Caltech (in the same room where Jason’s thesis defense was held!). Another highlight was a trip to Europe for the Bio-Inspired Materials Gordon Research Conference in Les Diablerets, Switzerland, which is in the Alps in the French-speaking portion of the country. Jason also visited Geneva, Lausanne, Bern, and Interlaken, Switzerland; Nice, France; and Monaco. He looks forward to his next trip to Europe!
Ann and Norm Craig continue the process of getting settled in the Kendal Retirement Community one year in. Ann has adapted quickly, but Norm remains an anomaly because he is intent on doing productive work. Research associations enabled by the internet continue. The fall involved considerable teaching: supplying a reading course on group theory for two chemistry students, helping Padmaja Sandararaj, a visiting Shansi Fellow from the faculty of Lady Doak College (Madurai, India), apply vibrational spectroscopy to her study of “solid” electrolytes for lithium-ion cells, and assisting Lisa Ryno with a Raman spectroscopy experiment on phospholipids in the biochemistry laboratory. Ann and Norm delight in keeping abreast of their children and grandchildren. Visiting Mary’s family in Germany in the early fall has become an annual pilgrimage. Visiting Julie’s family in Toronto also takes Ann and Norm to another country. Julie retired from her global managerial position at Glaxo, Smith, Kline at the end of 2015 and is enjoying doing a variety of home-related projects. David and his family live in Indianapolis. All but two of five grandchildren have finished high school and gone on to college.

Matthew Elrod taught Structure and Reactivity (Chem 101) and Environmental Chemistry (Chem 208) in the fall and Quantum Chemistry and Kinetics (Chem 339) in the spring. In Chem 101, Matt implemented an online homework assignment system, which students appreciated for its instant feedback facility. In Chem 339, a new stopped flow kinetics experiment was implemented, and the human experimenters have now become the rate-limiting step in the performance of that laboratory! Matt was a member of the Environmental Studies, Educational Plans and Policies,
and the Board of Trustees Academic Affairs committees during the academic year. He and his students continue to work on a project concerning the atmospheric role of biogenic volatile organic compounds in the formation of ground level ozone and aerosols. In January, Matt took several of his research students to a symposium in honor of his postdoctoral advisor, Mario Molina, winner of the 1995 Nobel Prize in Chemistry. Matt’s daughter, Julia, graduated from Oberlin High School in June 2016 and is now attending Kenyon College. His son, John, finished his first year at OHS and enjoys playing soccer and baseball at the high school level.

Cortland Hill continued his management of the Chem 101/102 laboratory program and taught three lab sections of Chem 101 in the Fall and three sections of Chem 102 in the Spring. He continues to play on the Oberlin Plague ice hockey team and was frequently paired with Tim Elgren, dean of the College of Arts and Sciences, on defense. Ice hockey continued through the summer with Tim Elgren, Laurence Ducker ’13, Erin Adair ’13, Matt Simons ’16, and Cortland representing Oberlin. Laurence has completed his first year of medical school at Case Western Reserve. Erin is a tutor in math and science at Lorain County Community College. She began playing ice hockey this spring in the ice hockey exco and is now firmly launched on a hockey career. In May, Cortland and his wife, Nina Jaffe ’76, joined Amy ’68 and Robert Singer ’65 for Rob’s Half Century Luncheon at the newly opened Hotel at Oberlin where Rob was the featured speaker. Cortland embarked on his annual kayaking trip with Russ Walker ’77 on Lake Powell in southern Utah. This year he was joined by his sons, Ethan ’19 and Daniel, who intends to apply to Oberlin this fall. In July he, Daniel, and Nina flew to Maine with Tom Cooper ’78 and his wife, Evon, for a visit following the Cooper Competition. Daniel was Tom’s co-pilot on the flights to and from Maine.
This past year Albert Matlin taught his usual set of courses: “Principles of Organic Chemistry” (Chem 205, lecture and two lab sections), 70 students; “Organic Mechanism and Synthesis” (Chem 325, lecture), 16 students; and “Topics in Organic Chemistry” (Chem 405, seminar), four students. Harry Ryu joined the Matlin lab and worked on an honors research project trying to extend the lab’s recent discovery that hydroxlylamine catalyzes the Nazarov cyclization of divinyl ketones. The current focus of the project is directed at developing enantioselective Nazarov cyclizations and enantioselective tandem Nazarov cyclization/cycloaddition reactions. During the academic year Albert served as chair of the Research and Development Committee. This committee funds proposals from the faculty of the college and the conservatory to support various aspects of faculty research.

In February, Albert took a four-day ski trip to Breckenridge, Colorado. The snow was great, and the views from 12,000 feet were inspiring. The trip also gave Albert the chance to try out a new app: Ski Tracks. According to “Ski Tracks” on day 2, Albert skied 20 miles downhill, ~16,000 total vertical feet, at an average speed of 9 mph, and a maximum speed of 36 mph. Spring break found Albert and his family visiting colleges on the east coast for his daughter Anastasia.

Manish Mehta taught his usual set of courses in the 2015-16 academic year: Chemical and Statistical Thermodynamics (Chem 349), Basic Chemistry (Chem 050), and Chemical Principles (Chem 102). All these years into his Oberlin position, he still finds it hard to believe that thermodynamics is his favorite subject to teach (both at the introductory and advanced levels). Fall 2015 marked the beginning of the first year of his new NSF grant to study
the structure and formation of organic co-crystals using NMR Crystallography. As of August 2016, he is now the secretary of the new “Commission on NMR Crystallography and Related Methods” within the International Union of Crystallography. He continues to chair the Faculty Committee on Fellowships and to coordinate the department’s summer research program. In September 2016, he oversaw the installation of the department’s new differential scanning calorimeter. The DSC instrument joins a precision bomb calorimeter the department acquired in January 2015, as well as the microgram balance, which was installed in January 2016. These state-of-the-art instruments will not only be used in faculty research, but they will also see use in two labs in Chem 349. It is Manish’s aim to have student teams in Chem 349 make original measurements on different co-crystal systems and publish the results together as a class in a peer-reviewed thermodynamics journal. Manish turned 50 last February, and as part of that celebration, he and his family took a trip to the Grand Canyon.

In the fall, Mike Nee returned to teaching general chemistry (Chem 101). In addition, Mike taught the lecture portion of the Synthesis Laboratory (Chem 327) and a section of the organic chemistry (Chem 205) laboratory. In the spring, Mike taught organic chemistry (Chem 205) lecture with its two laboratory sections. During the academic year, Mike was chair of the academic standing committee. Bike-riding occupied any spare time. Most notable were the 55th tour of the Scioto River Valley (TOSRV), riding 113 miles from Columbus, Ohio, to Portsmouth, Ohio, then back the next day in May and four days riding in the Berkshires with his brother.

In fall 2015, Catherine Oertel taught the Chem 103 lecture and laboratory and the laboratory portion of Chem 327 (Synthesis
Laboratory). In spring 2016, she taught Chem 213 (Inorganic Chemistry) and its accompanying lab sections. Katie chaired the Winter Term Committee and served on the search committee for the new campus library director. As a member of the pre-health advising committee, Katie was a co-organizer of “Training the Eye: Art Engagement in the Medical Profession,” a workshop for pre-med students at the Allen Memorial Art Museum. This session featured two guest presenters who are active in using art in the training of medical students in Cleveland. Katie worked with five research students in her laboratory during the semesters and winter term. During summer 2016, Katie spent six weeks working in the laboratory of Jamie Neilson at Colorado State University. In the later part of the summer, she presented a poster at the Gordon Research Conference on Scientific Methods for Cultural Heritage Research. She also traveled to Ithaca, N.Y., for a group reunion in honor of the retirement of her graduate advisor, Frank DiSalvo.

Fall 2015 began Lisa Ryno’s second year at Oberlin College. In Chem 374, Lisa incorporated a new interdisciplinary module exploring the mechanisms and ethical use of pesticides that was cotaught by Cheryl Cottine in the religion department and successfully encouraged discussion between Chem 374 and Religion 248 (Religion, Ethics and Environment) students. During winter term, three students worked on individual projects in the Ryno laboratory. In the spring of 2016 Lisa taught two sections of Chem 102 and one laboratory section of Chem 254. In March 2016, Lisa traveled with two of her research students to the American Chemical Society meeting in San Diego, where the students presented their research during poster sessions and enjoyed the surreal San Diego climate. Student research continued into
the summer months with three students working on individual projects in the laboratory. Lisa and her husband, Tony, took their annual vacation in Kentucky, where they explored the depths of Mammoth Cave and kayaked on peaceful Lake Barkley.

*Robert Thompson* taught general chemistry (Chem 101) in the fall semester, trace analysis (Chem 341) in the spring, and sections of the general chemistry laboratory throughout the year. In the research lab, Rob and undergraduates analyzed drying oils in artists’ oil paints by gas chromatography. This completed the set of experiments to be included in a laboratory manual intended for college analytical chemistry courses. Rob’s five-year effort of research and writing culminated in publication of the book *Instrumental Investigations: A Laboratory Manual of Forensic Analytical Chemistry* in February 2016. He is now beginning work on a companion lab manual with a focus on environmental analytical chemistry. In 2016 Rob and Jan celebrated the birth of their first grandchild Wesley William and delight in seeing him grow via FaceTime as often as possible.

In fall 2015, *Rebecca Whelan* taught Analytical Chemistry (Chem 211) as a Writing Intensive course, with a dual emphasis on instrumental analysis and effective communication. In spring 2016, she was released from teaching to develop a new First Year Seminar course on gender and science, titled Marie Curie’s Legacy: Radium Girls and Glowing Matter. Rebecca is currently in her third of a four-year term as chair of the department.
* Oberlin undergraduate
Presenter(s) underlined, if not the faculty member


**Jason M. Belitsky**, “Catechol-Based Coatings Inspired by Melanin as Colorimetric Metal-Ion Sensors,” Presentation, American Chemical Society Central Regional Meeting, Covington, KY, May 2016.


Sergey V. Krasnoshchekov, Norman C. Craig, Roman S. Schutsky, and Nikolay F. Stepanov, “Anharmonic Analysis of Three Dihalogenated Methanes Using Higher Order Canonical Perturbation Theory: Achieving ‘Spectroscopic Accuracy’ for Pentatomic Molecules,” 25th Austin Symposium on Molecular Structure and Dynamics at Dallas, Southern Methodist University, Dallas, TX, March 5, 2016.

Norman C. Craig. “Comments about Charles Hall,” presented at the luncheon as part of the Oberlin Heritage Center field trip to the Alcoa Works in Cleveland, OH, April 11, 2016.


Norman C. Craig, Jean Demaison, Ranil Gurusinghe, and Michael J. Tubergen, “Microwave Spectra for the Two Conformers of Propene-3-d1 and Rotational Constants for These Species,” MI10, 71st International Symposium on Molecular Spectroscopy, University of Illinois, Urbana, IL, June 20, 2016.


Manish A. Mehta, “In Situ Solid-state NMR Studies of Co-Crystal Formation,” Ohio State NMR Facility Inauguration Symposium, Ohio State University, October, 2015.


Liliana Milkova, Shalini LeGall, Cathy D. Collins, Martha Holland, Taylor Allen, Catherine M. Oertel, “STEM to STEAM: Integrating the Arts into Higher Education,” Association

**Noalle Fellah***, Matthias Zeller, **Catherine M. Oertel**, “Structural Characterization of Lead Oxide Carboxylate and Simple Lead Carboxylate Single Crystals,” Ohio Inorganic Weekend, Bowling Green State University, Bowling Green, OH, November 13-14, 2015. Poster presentation.


**Sarel J. Loewus***, Emily M. Curley*, **Lisa M. Ryno**, “Stress-responsive signaling pathways as targets for modulating biofilm growth.” Poster. 251st American Chemical Society National Meeting, Biological Chemistry Division, March 2016, San Diego, CA.


Oberlin undergraduate


## GRANTS 2015-16

<table>
<thead>
<tr>
<th>Grant Details</th>
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<tbody>
<tr>
<td>Michael Moore, Aaron Goldman, <strong>Manish A. Mehta</strong>, Robert Owen, and <strong>Matthew J. Elrod</strong>, “Acquisition of a High-Performance Computing Cluster to Enhance Undergraduate Research and Education Across the Sciences at Oberlin College,” National Science Foundation Major Research Instrumentation Grant (NSF MRI), 2014-17, $486,256.</td>
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</tbody>
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Rebecca J. Whelan, “Analytical approaches to the characterization and detection of ovarian cancer biomarkers,” Henry Dreyfus Teacher-Scholar Award, 2011-2016, $60,000.
The department is indebted to those individuals, private companies, and foundations, as well as the United States government, who provide generous financial support. Unrestricted gifts allow us the flexibility of applying funds to the most appropriate area of any given year. Capital equipment purchases and support for student-faculty research were the principal uses of unrestricted funds in the period covered by this report. While the majority of student summer research was supported by various grants, donor gifts enabled the department to supplement grant-sponsored stipends to bring each to $4,500 per student for 10 weeks of research. Many alumni and friends made donations to the department during the period from July 2015 to June 2016. Thank you.

W. Lawrence Armstrong ’60
Mary-Helen Binger ’68
Brian J. Brown ’85
Michelle M. Bushey ’82
Yin-Yee Chan ’89
Mrs. Albert Claus ’59
Alva L. Collins, Jr. ’62
Cameron J. Dasch ’73
Kelly A. Dobos ’01
Robert C. Fay ’57
Gini F. Fleming ’81
Theodore ’66 and Kelly Frankiewicz ’67
W. Logan ’66 and Joanne Fry ’69
Joel M. Goldberg ’78
Leslie C. Hardy ’79 and Andrea M. Hauser ’80
David J. Hickson, Jr. ’82 and Rachel A. Hickson ’80
Jennifer Hines ’84
Ralph R. Isberg ’77
Roy Jacobson ’80
Adam R. Johnson ’93
David Katz ’82
William E. Katzin ’74 and Katherine Solender ’77
Michael L. Kerns ’91
Hidong Kim ’87
Gregory B. Krivchenia II ’77
Martin P. ’58 and Hedy Kunstmann
Sidney R. Kushner ’65
Paul Y. Kwo ’84
Janet L. Langon ’85
John T. Lemley ’66
Karl E. ’47 and Kathryn Lemmerman ’46
John C. Light
Mark Linzer ’73
Phillip C. Liu ’84
Richard A. MacPhail ’76
Joan M. Mansour ’52
Paul T. ’87 and Laura Martin
Scott E. ’74 and Terry McQuillin
Christopher Mears and Karen Katz
Thomas A. ’58 and Joanne Dyer Montzka ’58
James A. Morrell ’73
Tuan Ngoc (John) Nguyen ’98
David C. Oertel ’01
Richard P. ’64 and Mary Oertel
Polly Comegys Olmsted-Fine ’45
Catherine J. Page ’80
Hiren R. Patel ’92
Earl Peters ’47
Richard Podoll and Mindy Harris
Joanne Henderson Pratt ’48
David Ranney ’65
Jacqueline M. Richter ’77
Mary Saecker ’88
C. H. Schwalbe ’63
Deborah Hsu Serianni ’83
  James D. Shelton ’69
  Aaron D. Shmookler ’06
  David F. Starks ’71
  Philip S. Stevens ’84
  Laura K. Stultz ’86
  Catherine L. Perry Sullivan ’91
  Wesley P. Titterington ’53
  Richard B. van Breemen ’80
  Ted J. Watanabe ’72
  John C. Wheeler ’63
  Joseph L. Womack ’83
Taking a photo of the graduating class of chemistry majors has apparently been a long tradition at Oberlin. This photo of the Class of 1934 was donated to the college in 2016 by Martha Braun, the daughter of Ruth Morrow Braun ’34, who appears in the front row of the photo.

This year we invited updates from alumni of every class year, and we were delighted to receive contributions from graduates from classes spanning the 1950s to the 2010s. We have read all of your updates and are happy to share excerpts here. If you would like to contribute an update for next year’s annual report, please send it to chemistry@oberlin.edu.

1950s

John E. Tanner, Jr. ’51 earned a master’s degree in physical chemistry at Indiana University in 1954 followed by a PhD in physical chemistry at the University of Wisconsin in 1966. He was made an honorary member of the International Society for Magnetic Resonance in Medicine in 2016.

William Graham Hoover ’58 earned a master’s degree and PhD
at the University of Michigan. During 43 years at the Livermore Laboratory and the University of California at Davis, he wrote six books on topics ranging from molecular dynamics to chaos and dynamical systems and about 300 research articles. Since 2005, he and his wife, Carol Griswold Hoover, have lived in the cattle-ranching Ruby Valley of Nevada.

**Martin P. Kunstmann ’58** received a PhD in chemistry at the University of Rochester in 1962. He spent his working life in the pharmaceutical industry—spending time at Lederle, Wyeth, and Pfizer until retiring in 1996. He and his wife, Hedy, then relocated to the country in Damascus Township, Pa. He is involved with the township planning commission and recycling program as well as other activities.

**Alison Smith Claus ’59** spent more than 40 years in science and math education. She earned an MAT in science teaching at Harvard/Radcliffe and did post-master’s work in math teaching at Northwestern University. She is still working with middle school students on the Science Olympiad competition and coaches an event called CrimeBusters. Her team last year won the National Championship!

**Anthony Norman ’59** graduated with a PhD in biochemistry from the University of Wisconsin and held a faculty position in biochemistry at the University of California, Riverside.

**1960s**

**Michael Z. Lowenstein ’60** earned an MS (1962) and PhD (1965) from Arizona State University. His career included teaching at Adams State College, working in solar and biomass energy programs, and founding a company, Harmonics Limited, to manufacture and market electrical harmonic filter products. He retired in 2006 and now works as a consultant. He enjoys his 56-year marriage and many hobbies.
Richard Robey ’62 earned an MBA at Columbia University in 1966. His career was in the transportation industry, and he founded several small railroad corporations. His hobbies include golf and playing in his local concert band.

Jeff Taylor ’63 holds a master’s degree in education. His career has included 20 years as a high school chemistry teacher and 10 years as a community college instructor. He is a Platinum Life Master in the American Contract Bridge League and a scuba divemaster.

Lee A. Witters ’65 holds an MD from the University of Rochester and is the Eugene W. Leonard 1921 Professor of Medicine & Biochemistry and Professor of Biological Sciences at Dartmouth College. Witters has also served as the faculty advisor to the Nathan Smith Society for many years. The inaugural Lee A. Witters Award for Outstanding Teaching and Social Justice was recently presented to James O’Connell, the head of Boston’s Health Care for the Homeless Program.

Elaine Munsey Tobin ’66 spent one year in the department of biology at Stanford, then went on to complete a PhD in biology at Harvard. Her research focus has been the effects of light on plant growth and development, and she most recently worked on circadian rhythms in plants. She is a professor at UCLA.

Jim Bellows ’67 retired in April 2015 after almost 37 years at Westinghouse, then Siemens Power Generation. He established James Bellows and Associates (no associates as of yet) to consult to the power industry, mostly on chemistry in the steam cycle. He also supplies guitar and vocal accompaniment to the Flamenco dance classes that his daughter teaches.

John Mast ’68 earned an MD and completed a residency at Tufts and St. Elizabeth Hospital in Boston. He recently retired after 38 years of practice as a general surgeon and enjoys playing the tuba, hunting, fishing, and sailing.
Thomas Ukena ’68 earned an MD and PhD in physiology at Harvard. He worked for several decades as a pathologist with a specialty in clinical chemistry. Currently retired, he is active in several choral music groups. He and his wife are avid fly fishers.

John Baclawski ’69 is retired from chemical business management and sales, where he worked with vinyl resins, cellulosics, and silicon metal, as well as synthetic quartz for fiber optics. He enjoys travel, golf, hiking, biking, and time with family and friends.

1970s
Laura Morrissey von Doenhoff ’70 obtained her MD at the University of Cincinnati in 1976 and completed an internal medicine residency and cardiology fellowship in Rochester, N.Y. She writes, “I found my way from chemistry to music to psychiatry to family medicine to internal medicine to cardiology, then opened a private solo practice of echocardiography in 1982. A year ago I retired from that, and am now having the time of my life teaching EKG and echo interpretation to medical residents at Rochester General Hospital.” She is deeply involved in community music as principal oboe of the Brighton Symphony Orchestra and as vice-president and oboist of the Genesee Valley Orchestra and Chorus.

Donald Mills ’72 earned an MBA at the University of Pittsburgh. His career has included serving as director of global sales in the fire retardant additives business unit of Huber Engineered Materials.

Bill Burdick ’75 earned an MD at Cornell University and an MSEd at the University of Pennsylvania. His career has involved international development in health workforce education, and he enjoys cycling and hiking.

David Knecht ’75 earned a PhD at the University of Wisconsin, Madison, and is a professor of molecular and cell biology at the
University of Connecticut. His goal is to retire soon so he can do more “outside work,” including racing sailboats, cruising the Connecticut and Long Island coasts, and playing basketball with “other old guys.” He and his wife, Lori Smolin, pursue ambitious cycling trips. They have chronicled them at http://yearinscotland.blogspot.com.

Martin Bergman ’76 completed a master’s degree in microbiology at Wagner College, Staten Island, N.Y., then three years of medical school at the Libero Istituto Universitario di Medicina e Chirurgia dell’Aquila in L’Aquila, Italy, before graduating with an MD from the Medical College of Wisconsin in 1982. He is now chief of rheumatology at Taylor Hospital in Ridley Park, Pa., and clinical associate professor of medicine at Drexel University College of Medicine in Philadelphia. He has become a fan of lacrosse due to the involvement of both of his sons at a collegiate and post-grad level.

Mary Anne Hardy ’77 earned a BSN at Case Western Reserve University in 1979 and an MPH at Johns Hopkins in 1986. In 2012, she founded Montgomery Health Advocates to “help those who feel lost and frustrated in the medical maze.”

Dan D. Levy ’77 earned a PhD in environmental oncology at NYU. He works at the U.S. Food and Drug Administration as program chair of the Cancer Assessment Committee, part of the Center for Food Safety & Applied Nutrition. He is married to Chingchai Wanidworanun and enjoys traveling and hosting visitors through Airbnb.

1980s

Maren Laughlin ’82 graduated from Yale with a PhD in 1988 and is currently a program director at the National Institute of Diabetes and Digestive and Kidney Diseases, NIH. Her interests include diabetes, obesity, and exercise research with a focus on imaging, integrative physiology, and kinetic metabolic research.
She writes, “I remain passionate about music, which I owe to my Oberlin experience.”

Berkley A. Lynch ’82 earned a PhD in biochemistry at the Rockefeller University in 1990 and did postdoctoral research in the laboratory of Daniel E. Koshland Jr., at the University of California, Berkeley. She has spent her career in biotechnology and pharmaceuticals, focusing largely on preclinical drug development with targets from epilepsy to neurodegenerative diseases.

Paul Y. Kwo ’84 was at the Indiana University School of Medicine for 21 years as medical director of liver transplantation before moving this year to the Stanford University School of Medicine as director of hepatology. He still tries to play tennis and swims every day.

George S. Sheppard ’84 received his PhD in organic chemistry at the University of California, Berkeley, in 1988 and was an NIH Postdoctoral Fellow at Harvard University. He joined Abbott Laboratories in 1990 and became part of AbbVie when it spun off as a separate company in 2013. He is currently a senior principal scientist working in Oncology Drug Discovery. He enjoys travel and spending time with his wife, Diana, and his children: Julia ’15, William, and George Henry.

Brian Brown ’85 has spent the last 25 years in semiconductor technology and engineering, currently as senior director of technology at Applied Materials in Santa Clara, Calif. He earned his MS and PhD in materials science and engineering at Stanford University.

Laura Mizoue ’87 completed her PhD in chemistry at Caltech. She recently started a new job as a communications specialist at SomaLogic, a biotech company in Boulder, Colo.
Peter Weishampel ’87 recalls, “Biology Professor David Eggloff’s ecology course in 1986 sparked my interest in ecosystem ecology and biogeochemistry.” His graduate research at the University of Virginia and Cornell and his postdoc at the University of Minnesota focused on the roles of forest and wetland soils as sources, sinks, and transformers of nutrients and greenhouse gases. After teaching at Northland College for several years, he accepted his current role as manager of the National Ecological Observatory Network’s field ecology work in the Great Lakes Region. He enjoys the outdoors in his spare time, wandering in the forests of northern Wisconsin and the Upper Peninsula with his dog, Ariel.

1990s
Rebecca Edelstein ’92 earned a PhD in chemistry at the University of Minnesota. She currently works at the EPA, regulating industrial chemicals. She has two sons and plays the violin in a Washington, D.C.-area orchestra.

Anna Marie Detert ’93 earned an MBA and was recently appointed a partner at KPMG in the UK. She works mainly with life sciences and global pharma companies on organizational transformation. She is a board member of the London Institute of Contemporary Christianity.

Jennifer Grant ’93 earned a PhD at Case Western Reserve University in 2004. Her work involves protein and peptide chemistry, proteomics, and mass spectrometry, and she enjoys wildlife photography.

Rhonda L. Smith ’93 completed her master’s degree in food science and nutritional Cornell University in Ithaca, N.Y. and a PhD in nutritional sciences at Howard University in Washington, D.C., in 2013. She is active in health and fitness activities, teaching Zumba, Nia, and KickBoxing. She is certified in Cardiopulmonary Resuscitation (CPR), Automated External Defibrillator (AED), and First Aid by the American Red Cross.
Andy Bernstein ’94 went to medical school at the University of Wisconsin Madison School of Medicine and Public Health and did a pediatric residency at Northwestern University McGaw Medical Center. He makes music in his spare time, currently playing the bass with a cover band.

2000s

Kelly Dobos ’01 earned an MPS at the University of Cincinnati and an MSB at Cleveland State University. She reports, “I was just elected to the role of vice president-elect for the Society of Cosmetic Chemists, which puts me in line to be the president of the society of 2017.”

Jonathan Steckel ’01 joined Apple, Inc., in 2014 and is a lead technologist working on emerging display technology development. He cofounded QD Vision, Inc. in 2005, starting as director of chemistry and eventually advancing to director of research and advanced development. QD Vision was a spin-off of his PhD work in chemistry at MIT. He was awarded the 2011 Semi Award for North America and the 2014 Presidential Green Chemistry Challenge Award. He is an avid runner and road cyclist.

Rachel Delston ’02 received her PhD in molecular and cellular biology at Washington University in St. Louis in 2010. She is currently a principal scientist at Confluence Life Sciences, developing immunotherapeutics to treat cancer. She says of her sons, “Andy (7) and Charlie (4) both want to be scientists when they grow up!”

Anique Olivier-Mason ’02 completed a PhD in molecular and cellular biology and directs a summer undergraduate science research program for the Brandeis Materials Research Science Engineering Center.

Kari Barlan ’04 completed a PhD in cell and molecular biology at Northwestern University in 2013. She is currently in the third
year of a postdoctoral fellowship at the University of Chicago, in the lab of Sally Horne-Badovinac. In the past couple years, she has become a “bona fide Drosophila geneticist” and uses genetic techniques in this animal to understand how cells communicate with one another during collective behaviors important during development.

**Rebecca A. French ’04** earned an MS in soil science at Cornell University in 2007 and a PhD in geosciences at Virginia Tech in 2011. Since August 2014, she has been the director of community engagement for the Connecticut Institute for Resilience and Climate Adaptation at the University of Connecticut. Previously, she was an AAAS Science & Technology Policy Fellow at the U.S. EPA Office of Research and Development Innovation Team and a Congressional Science Fellow in the Office of Senator Bernie Sanders (I-VT), advising the senator on energy and environmental science policy.

**Bryan McLain ’08** earned an MS in science education and is a chemistry teacher at Granville High School in Ohio.

**Hadley Iliff ’09** completed an MA in biochemistry at Duke University in 2013 and an MBA at the University of North Carolina, Greensboro, in 2016. She works in regulatory affairs at a small, privately owned German pharmaceuticals company. At the time of her update, she was planning her wedding to Justin Nolan for May 2017 and reported that Emily Minerath ’09 would be a bridesmaid.

**2010s**

**Alex Chapman ’10** completed a PhD in chemistry at Colorado State University in May 2016. He is currently a postdoctoral fellow in the laboratory of David Tirrell at Caltech.

**Elizabeth Huff ’10** completed an MS in counseling and works at a high school in Atlanta. She is interested in STEM education
and looks forward to sending her students off to STEM fields after they graduate and go to college. She writes, “I care a lot about the environment, so I don’t own a car, I compost, I don’t eat meat, and I use simple cleaning products.”

**Asishana (Shana) Osho ’10** earned an MPH at the Yale University School of Public Health and an MD at the Duke University School of Medicine. His professional interests are in cardiothoracic surgery and transplantation.

**Joseph Thome ’10** received his MA, MPhil, and PhD in microbiology and immunology from Columbia University in 2016. He reports that he graduated first in his class from the Columbia University Graduate School of Arts and Sciences and received the Dean’s Award For Excellence in Research. Following graduation, he began a position at Cowen and Company working as an equity research associate covering publicly traded companies in the biotechnology sector.

**Christine Moore ’11** completed a D.O. at the West Virginia School of Osteopathic Medicine in 2016. She is currently a resident in the internal medicine residency program with Quillen College of Medicine and East Tennessee State University in Johnson City, Tenn. She is interested in specialties in hematology and oncology. She wrote that she and Clara Shaw ’10 have visited one another and enjoyed reminiscing about Oberlin.

**Kiefer Forsch ’12** is in his third year of pursuing a PhD in chemical oceanography at the Scripps Institution of Oceanography, U.C. San Diego. He has participated in numerous research expeditions, including two to the West Antarctic Peninsula as part of the FjordEco project exploring climate-sensitive fjord ecosystems. Outside of his studies, he is active in conveying climate change research to diverse audiences. Since his move to La Jolla, he has taken up diving and surfing.
Annika Sullivan ’12 followed her Oberlin degree with a BS in civil engineering at Oregon State University in 2015. She works as a hydrologist engineer-in-training at Environmental Science Associates in San Francisco. She is also working toward certification as an Iyengar yoga teacher.

Jamie Yelland ’13 was recently hired as a laboratory technician for the science programs at Wenatchee Valley College in his hometown of Omak, Washington (pop. 5,000). He’s looking forward to returning to his roots, contributing to education in a rural community.

Michael McDonald ’14 is a third-year medical student at the Perelman School of Medicine at the University of Pennsylvania. His current career interests include cardiac anesthesia. He wrote that he was engaged to Haylee Winikoff ’15 with a wedding date set for August 2017.
The annual report is also available as a PDF. If you are interested in subscribing to the Annual Report PDF, please email your request to chemistry@oberlin.edu.