SAINT LOUIS UNIVERSITY
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NEWS

Saint Louis University
Department of Chemistry

Letter from the Chair

Greetings to students, faculty, staff and especially our alumni. This is my 4th year as chair of the Chemistry Department, and we are trying something new this year…a newsletter. We have wanted to do this for quite some time so that we can let our students and alumni know about the great things our department (faculty, staff, and students) has been doing, but pulling something like this together takes a lot of time. In addition, since we haven't done a newsletter before, we really don't know what we are doing. So, here is what we came up with!

In this newsletter, we will give you some recent department news, updates from the faculty members, and some of our recent publications. The most important news of the past year is that we have broken ground on a new Interdisciplinary Science and Engineering Building (termed the ISE). News about the groundbreaking ceremony can be found here: https://www.slu.edu/news/2018/october/ise-groundbreaking.php (yes, that is me wearing a hardhat, 6th person from the left; Dana Baum is 5th from the right), with a few more details here: https://www.slu.edu/news/announcements/2018/october/ise-building-groundbreaking.php. This building will house many different departments including parts of chemistry, biology, computer science, and engineering. We are moving our general chemistry, principles of chemistry, and organic chemistry teaching labs to the ISE. Don't worry, we are also still in Monsanto and Shannon Halls. The vacated teachings labs in Monsanto will be remodeled and turned into research labs so that we can finally have more research space. The building should be open in time for classes in the Fall of 2020. We are excited to get our teaching labs into updated space, with fume hoods for everyone in organic!

Other big news is that we have started a new chemical biology and pharmacology degree program, both at the bachelors and masters level. Prof. Marv Meyers (new faculty member in our department) is leading this effort. As you probably know, chemical biology is the application of chemistry towards solving biological problems, and pharmacology is the study of the action of drug molecules. A key feature of this program is that students will not only take courses in chemistry but also courses from the Departments of Biology and

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this issue

HIGHLIGHTS

- Starting new undergraduate and graduate degrees in Chemical Biology
- New Interdisciplinary Science and Engineering Building opening Fall 2020
- 160 undergraduate majors (24 graduating in 2019)
- 40 full-time graduate students (recently graduated 5 Ph.D. and 6 M.S. students)
- Over $1 million in grant expenditures in FY 20, recent grant awards from NSF and NIH (including 3 R01s, an R21, and an R15)
- 45 publications last year

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Pharmacology/Physiology, leading to a well-rounded degree for students who want to continue their studies in professional/graduate school or want to work in industry. Details about specifics of these programs can be found here: https://catalog.slu.edu/colleges-schools/arts-sciences/chemistry/chemical-biology-pharmacology-bs/ and https://catalog.slu.edu/colleges-schools/arts-sciences/chemistry/chemical-biology-ms/.

We have always had great students, both undergraduate and graduate. We have information on some of their awards later in the newsletter. In terms of the numbers, we have continued to grow as a department. We currently have almost 160 undergraduate majors, and we are graduating 24 undergraduate chemistry majors in 2019 (15 biochemistry and 9 chemistry majors). Our graduate program has really grown. We currently have over 40 full-time graduate students in the department. We recently graduated five Ph.D. students and six Masters students, and we routinely bring in between 10-12 new graduate students a year. We also have four post-docs in the department.

Obviously, those students interact with our outstanding faculty. Depending on when you were last in the department, you are going to notice several new faces. Please take a look at the faculty update section to see news from faculty you interacted with and also news from new faculty who have joined the department. All total, we have 22 faculty members. In addition to all their teaching, our faculty have been very productive in their research endeavors. For this fiscal year, we are on target to come close to $1 million in grant expenditures. Just the past few months, faculty have received notices of new grants that include an NSF grant, three NIH R01s, an NIH R21, and an NIH R15. We have also included a list of publications in this newsletter for those who want to see what their old research group has been up to.

For any alumni who want to come back to the Department for a visit, just send me or any faculty member you know an email, and we would be happy to show you around and have you meet some of our current students.

Finally, are you interested in helping support the department? You can do so monetarily by going to this site: https://www.slu.edu/alumni-and-donors/give/index.php, clicking on “Make a Gift”, and checking “Select the fund(s) for your gift”. If you go under the heading of College of Arts and Sciences, you can select the Chemistry Development fund and those donations will go directly to our department. If you have specific ideas around donations or if you want to help in other ways (such as working with students on resume review, etc.) feel free to contact the Department Chair (scott.martin@slu.edu).

Please let us know what you have been up to and if you have any news to share.

Best Wishes,

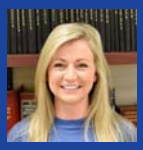
Groundbreaking for the new

Interdisciplinary Science and Engineering Building

Meet the Faculty

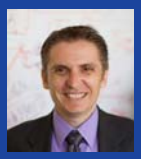
Asmira Alagic - Chemistry Education

Charles Kirkpatrick - Inorganic and Associate Department Chair



Jamie Neely - Inorganic

Christopher Arnatt - Organic



Istvan Kiss - Physical

Robert Perkins – Chemistry Education

Christy Bagwill - Organic Chemistry Education

Bruce Kowert - Physical

Daria Sokic-Lazic – Chemistry Education

Dana Baum - Biochemistry and Graduate Program Coordinator

Michael Lewis - Organic

Brian Woods – Chemistry Education

Paul Bracher - Organic

Piotr Mak - Physical

Brent Znosko – Biochemistry and Undergraduate Program Coordinator

Steven Buckner - Analytical

Scott Martin - Bioanalytical and Department Chair

Emeritus Faculty

Alexa Serfis

Staff

Ashely Baltz - Electronics Technician
Mike Briscoe - Machinist and Glass Shop
Elena Castiaux - Assistant General Chemistry Lab Coordinator
Jessica Hartling - Assistant Organic Chemistry Lab Coordinator
Fahu He - NMR Lab Manager
Angela Jouglard - Grants Development Specialist
Shontae Williams - Administrative Assistant II

Doug Crandell - Chemistry Education

Ryan McCulla - Organic

James Edwards - Analytical

Marvin Meyers - Medicinal & Organic

Paul Jelliss - Inorganic

Jennifer Monahan - Analytical

Faculty News

The faculty of Saint Louis University's Department of Chemistry are highly regarded in their fields. They are known for their extensive research across a diverse group of specialties that include the areas of analytical, biochemistry, inorganic, organic and physical chemistry.

Asmira Alagic - In fiscal year 2017-2018, I have endeared on a new adventure of implementing active learning modules in large chemistry lectures and smaller laboratory settings. After attending multiple workshops on Active learning design and implementation, I partnered with 3 other faculty members in the department to write a grant proposal to aid in development and execution of active learning modules across all large general chemistry, GOB, and basic chemistry courses. Thankfully our proposal was fully funded, allowing us to spend the summer of 2018 developing these new active learning modules. The modules are currently being implemented and data on effectiveness is being collected.

As a fun note, in spring 2018 I ran a marathon relay with another faculty member and couple of chemistry graduate students. Later in the fall, I trained and ran a half marathon with former gen chem students.

Chris Arnatt - Dr. Arnatt was awarded a Saint Louis University Research Growth Fund Award for buying equipment for the synthetic chemistry laboratories in the department. The department now has 4 automated combiflash flash chromatography units, an automated microwave synthesizer, and waterless condensers. This equipment will be used to further the department's research and teaching mission.

Dana Baum - Dr. Baum was named to the Provost's Science/Engineering@SLU Task Force in Fall 2017. This task force looked at the role and the future of science and engineering at SLU and has provided recommendations that are currently being shared and discussed with the campus as a whole. In research news, the Baum Lab has recently published in the journal *Aptamers* on herbicide-specific aptamers and continues an exciting collaboration with researchers at the University of Missouri-Columbia that is supported by NASA.

Christy Bagwill - Dr. Bagwill teaches Principles of Chemistry lecture and labs, and organic labs. This is an exciting time as we are preparing to move to newly renovated lab space in Macelwane Hall. Stay tuned to find out more about these developments! Dr. Bagwill was also part of a team of Chemistry faculty members that were awarded a KEEN grant that focuses on the development of new teaching methodologies that encourage entrepreneurial mindset.

Paul Bracher - In 2018, the Bracher Group celebrated the graduation of its first Ph.D. student, Thomas Campbell. Members of the group traveled to give presentations in Galveston (Origins of Life Gordon Conference), Atlanta (Center for Chemical Evolution), and Philadelphia (SMASH NMR Conference). The group's research on potassium and the origin of life was covered by HEC-TV (https://youtu.be/OwTaZbEiEeo). Finally, Paul's story from the March 2018 Story Collider is available online at KWMU/St. Louis Public Radio (https://bit.ly/2G2zDH3).

Steven Buckner - Calvin Nyapete defended his dissertation in the summer of 2018 (Synthesis and Characterization of Aluminum Nanoparticles Stabilized Within Constricted Environments and by Using Polymer Coating Approaches) and he is now working at MilliporeSigma. Mohammed Kader joined the group in the Fall of 2018. Our group has started two new collaborative projects, one with Professor Sara McBride at SLU's medical campus and one with Professor Scott Sell in Biomedical Engineering at Parks.

Doug Crandell – Dr. Crandell spent the year teaching the general chemistry sequence and the advanced inorganic lab course. In the lab, students synthesize and characterize organometallic compounds while also learning to investigate electronic structure using density functional theory. The highlight is getting to construct solar cells from our ruthenium nanoparticles and taking them outside to test at the end of each semester.

James Edwards - The Edwards Lab has recently been busy using the new high resolution orbitrap mass spectrometer to analyze defects in human vasculature and

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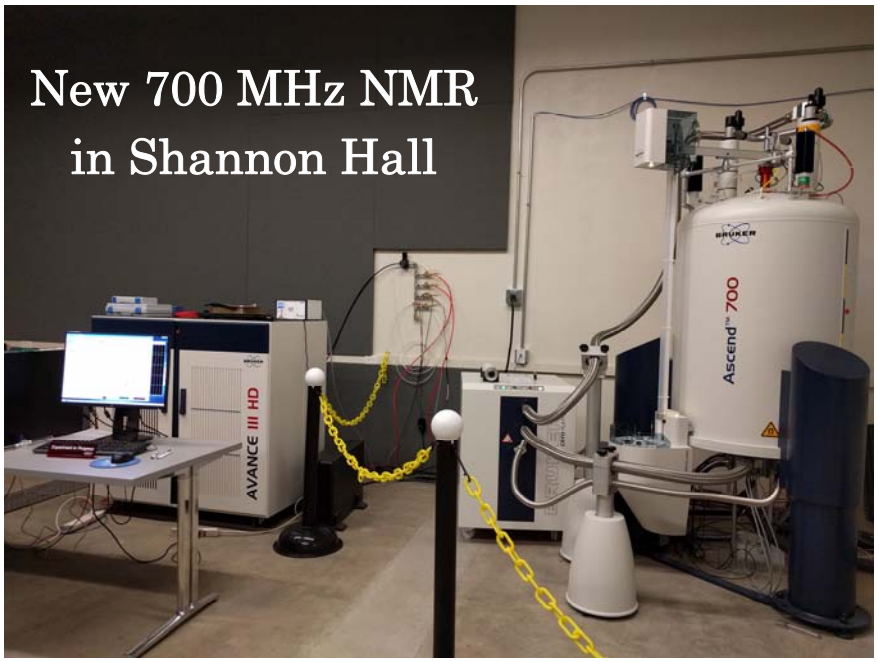
develop a universal chemical tagging system (with the Arnatt Lab) to boost mass spec sensitivity for all small molecules. This past year we've published in the Analytical Chemistry (ACS), Analyst (RSC), Analytica Chimica Acta, Journal of Chromatography A, Cell Metabolism, and a Fundamental Review for Analytical Chemistry.

Paul Jelliss - Dr Jelliss has been teaching General Chemistry courses throughout the year, including the Summer session. Research time is split between synthesizing and developing novel nanomaterials and studying metallacarborane complexes. A small portion of his time has been dedicated to helping run a start-up business, nanoMetallix LLC, which employs two students who have graduated from SLU. The company specializes in producing nanocomposite materials for energetics applications, such as rocket propellants.

Istvan Kiss – Dr. Kiss was appointed as one of the Editors of an American Institute of Physics journal, 'Chaos', and organized a major conference in Switzerland, the Gordon Research Conference on Oscillations and Dynamic Instabilities in Chemical Systems.

Chuck Kirkpatrick – Dr. Kirkpatrick has been working on calculating weak interactions between carbon nanotubes and also working with the Znosko group on a major revision and expansion of CoSSMos (www.rnacossmos.com), which is web-based search tool for identifying RNA mismatches from structures deposited in the Protein Data Bank. He also coordinates the undergraduate research program of the department and normally teaches a general chemistry course every semester.

Bruce Kowert - Dr. Kowert continues to teach general and physical chemistry - the particle is still in the box in physical chemistry 2. His research remains focused on translational and rotational diffusion in liquids.



Piotr Mak - The Mak Lab celebrated recently the opening of a new laser lab. The laboratory consists of brand new cutting-edge spectroscopic equipment. The Innova Kr^+ laser is a source of several excitation laser lines. The Horiba's high-resolution spectrometer, with enormous 1250 mm focal length, allows measurements of isotopic shifts down to 1-2 wavenumbers. The liquid nitrogen cooled Princeton Instrument CCD detector provides unmatched levels of detections, even from weakly scattering samples. This top of the line advanced spectroscopic system will be used to study heme enzymes that play crucial roles in human physiology.

Scott Martin – In addition to being Department Chair, I have been acting as Editor-in-Chief of *Analytical Methods* for the last 2 years. We published 4 papers in 2018 and received a new NIH grant with collaborators at Michigan State and Indiana University. This past year has seen the departure of Dr. Chengpeng Chen (started faculty position and the University of Maryland -Baltimore County), Dr. Ben Mehl (started job at Exxon), Hannah Birk (working at Monsanto) and Mellissa Kimlinger (medical school at Vanderbilt). We welcomed 3 new group members, Dr. Andre Castiaux (post-doc), Logan Robart (graduate student), and Alesia Gjoni (undergraduate student) to join the existing group of Alli and Beth.

Ryan McCulla - The McCulla group's research focus continues to focus on photodeoxygenation reactions and the effect of these reactions on biological systems. This has led to a number of collaborations with researchers at SLU and other universities, such as Boston University. The hope is this research could lead to new insights into redox biology and new treatments for disease such as cancer. In 2018, the group

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published 3 papers, and Prof. McCulla was awarded the Graduate Student Association's Mentorship Award, which honors one outstanding mentor at the university each year. On a bittersweet note, Sara Omlid finished her Ph.D. in the spring, and took a position at Atomwise in California.

Marvin Meyers - As the newest member of the department, 2018 was a year of moving the former CWHM chemistry lab from Schwitalla Hall into Monsanto Hall and setting up a new academic medicinal chemistry group. The group grew quickly from a team of two undergrads in 2017 to five undergrads, three grad students and a post-doc. We are continuing to work on collaborative drug discovery projects, mostly for infectious diseases including malaria, cryptosporidiosis, tuberculosis and viral diseases, and have smaller projects for rare diseases and cancer. On the academic side, we are in the process of launching a new interdisciplinary program in Chemical Biology with a new BS, MA and MS degree options starting in the fall of 2019.

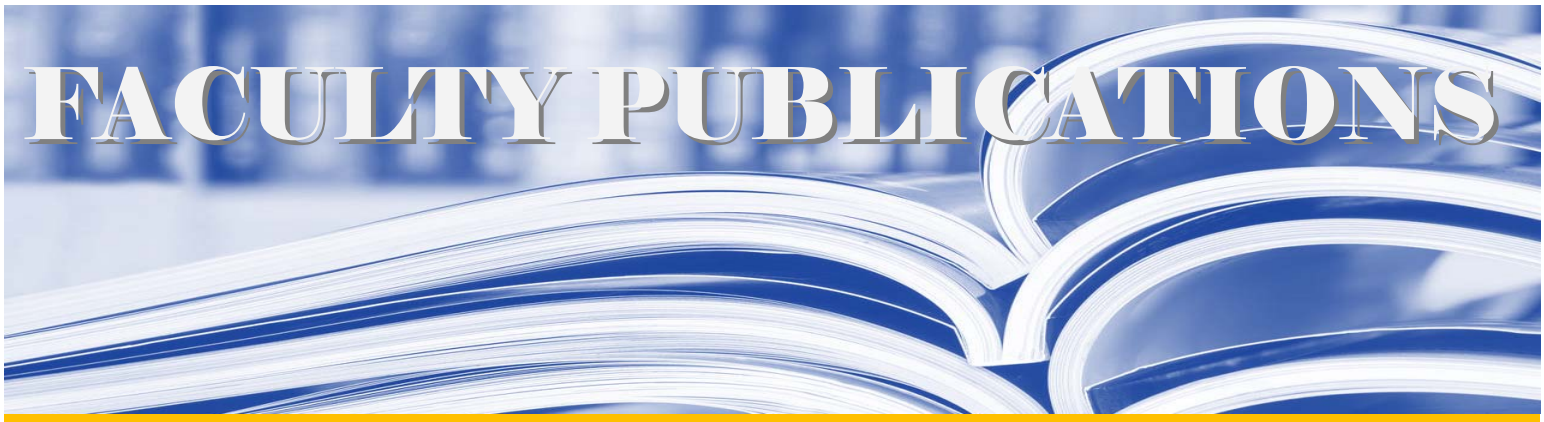
Jennifer Monahan - Dr. Monahan continues to teach several Upper Level lab Courses and has added Fall Nursing Chemistry to her repertoire. This past year in Physical Chemistry Lab we added poster presentations to the traditional lab report writing sequence. Student get to link one of their classic, wet-chemistry Physical Chemistry Experiment to a cutting edge literature paper -- demonstrating how foundation science links to novel science. In Fall 2018 Dr. Monahan finished hiking the 240 mile long Katy Trail from east-to-west across the state of Missouri! (...completed in segments over a series of weekends. 'cause it is hard to explain to your students why the professor is unavailable for 27 days...)

Jamie Neely - Dr. Neely joined the department in Fall 2017. Since then, she has taught Inorganic, Organometallic, and Organic Chemistry and has established a research group. The Neely group uses both inorganic and organic chemistry to understand the underlying reactivity of transition metal complexes during catalytic reactions. This work focuses on the development of new catalysts based on cheap and abundant first -row transition metals including iron and manganese.

Daria Sokic-Lazic - Daria Sokic-Lazic has completely revamped the General Chemistry Laboratory I and II curriculum with the help of the graduate teaching assistants. The new curriculum consists of twenty new experiments which are accompanied by an online lab manual and pre—formatted lab worksheets. More than half of the experiments utilize the Vernier technology and software allowing for more creative ways to teach chemistry. In addition to the laboratory curriculum change, as a member of a group of four chemistry faculty that has received the KEEN program transformation grant, Daria Sokic-Lazic has been developing different teaching modules. These modules are being used in freshman level chemistry courses this academic year including the Basic Chemistry Course enforcing students' entrepreneurial mindset.

Brian Woods - Dr. Woods joined the department in Fall 2017, when he designed and implemented the new recitation sections for General Chemistry. The recitations are now a co-listed course with General Chemistry where students meet once a week in smaller class sizes to work on their problem-solving skills in an active-learning environment. This past year Dr. Woods began teaching Organic Chemistry and recently started research in organic synthesis with two eager and talented undergraduates, Roee Dar and Sachin Suresh.

Brent Znosko – Dr. Znosko continues to teach biochemistry courses, run an NIH-funded research lab investigating the stability and structure of nucleic acids, and serve as the department's undergraduate program coordinator. I currently have three PhD students, one MS student, and four undergrads working in the lab. In 2018, we published three articles, had one accepted for publication (a collaboration with a group in Poland), and submitted three more for review (one is a collaboration with a group in Brazil). The lab's research was cited 64 times in 2018, including in review articles published in *Chemical Reviews*, *Wiley Interdisciplinary Reviews-RNA*, *ChemBioChem*, and *Virology*. I gave seminar at Missouri Baptist, SIUE, and the Donald Danforth Plant Science Center. Several members of the lab attended the RNA Society meeting in Berkley, CA. I will take most of the "blame" for this newsletter, so feel free to send feedback and suggestions for future editions (brent.znosko@slu.edu). When I'm not working, my two boys (now eight and five) keep me busy with sporting events.



Arnatt

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Baum

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Bracher

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Crandell

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Jelliss

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Kiss

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Kowert

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Mak

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Martin

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McCulla

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Meyers

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Woods

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Znosko

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2018 – 2019 Department Awards

Student Awards

SLU's Chemistry Club was recognized by the American Chemical Society Student Affiliate Commendable Award.

Undergraduates **Sravya Ainapurapu** and **Andrew Shaughnessy** were awarded the National Oceanic and Atmospheric Administration Ernest F. Hollings Undergraduate Scholarship.

Undergraduates **Emily Des Biens** and **Caitlin Salloum** were inducted into Gamma Sigma Epsilon (national chemistry honor society).

Graduate student **Miranda Adams** was awarded an RNA Society Travel Grant and an American Chemical Society Travel Award.

Graduate student **Thomas Campbell** was awarded the NASA Earth and Space Sciences Fellowship.

Graduate student **Katie Richardson** was award an RNA Society Travel Grant.

Graduate student **Melissa Hopfinger** was award an RNA Society Travel Grant.

Faculty Awards

Asmira Alagic was awarded the Chauncey E. Finch Award for Excellence in Undergraduate Mentoring from the College of Arts and Sciences.

Asmira Alagic was awarded the Faculty Excellence Award from the Student Government Association.

Ryan McCulla was awarded the SLU Graduate Student Association Faculty Mentorship Award.

Erin Whitteck was awarded the William V. Stauder, S. J. Award for Excellence in Undergraduate Teaching in the Natural Sciences from the College of Arts and Sciences.

Brent Znosko was awarded the Students and Teachers as Research Scientists (STARS) Distinguished Service Award for 10-years of service as a mentor to students in the STARS program.

Departmental Award Winners

Outstanding Freshman Chemistry Student ..... **San Kwon**

Vincent Spaziano Memorial Scholarship ..... **Conor Honan**

Hugh B. Donahoe Award in Organic Chemistry ..... **Roee Dar**

American Chemical Society Undergraduate Award in Analytical Chemistry ..... **Roee Dar**

Upperclassmen Chemistry Scholarship ..... **Daniel Ranciglio**

Saint Louis Section American Chemical Society

Outstanding Junior Chemistry Award ..... **Sravya Ainapurapu**

American Chemical Society Undergraduate Award in Physical Chemistry ..... **Kimberly Tomchak**

James D. Collins Award for Excellence in Student Academic Achievement ..... **Holly Kleinschmidt**

American Chemical Society Undergraduate Award in Organic Chemistry ..... **Mingyu Choi**

American Chemical Society Undergraduate Award in Inorganic Chemistry ..... **Sravya Ainapurapu**

CRC Press Chemistry Achievement Award (Undergraduate) ..... **Rishi Patel**

Royal Society of Chemistry Certificate of Excellence (Undergraduate) ..... **Mingyu Choi**

American Institute of Chemists Outstanding Senior Student Award ..... **Kimberly Tomchak**

CRC Press Chemistry Achievement Award (MS) ..... **Elizabeth Hayter**

Royal Society of Chemistry Certificate of Excellence (MS) ..... **Corey Richards**

American Institute of Chemists Outstanding Masters Student Award ..... **Jack Samuelian**

Carol M. and Joseph R. Franks Graduate Award in Chemistry ..... **Rio Rebrian**

CRC Press Chemistry Achievement Award (PhD) ..... **Alexandra Harrison**

American Institute of Chemists Outstanding PhD Student Award ..... **Yifan Liu**

Royal Society of Chemistry Certificate of Excellence (PhD) ..... **Katie Richardson**

SLU Chemistry Department Teaching Award ..... **Katie Sanders and John Throgmorton**

Donor Spotlight

The Department of Chemistry has two awards for undergraduate chemistry and biochemistry majors. The awards are named after two SLU organic chemists that both made substantial contributions to the department and had a close working relationship; one was the other's postdoctoral research associate.

Donahoe Award

The Donahoe Award is named in honor of Dr. Hugh B. Donahoe, a member of the SLU chemistry faculty for over 20 years before his death in December 1972. It is given to a sophomore major who has displayed outstanding performance on a special exam given at the end of the two-semester undergraduate organic chemistry sequence. Professor Donahoe's wife, the late Jo Donahoe, established the award.

He was active in research, teaching, and service during his time in the department. His teaching responsibilities were in the organic division but he had a strong interest in medicinal chemistry going back to his days in graduate school at the University of Kansas. The title of his Ph.D. dissertation, completed in 1950, was "Hybrid Antimalarials; the Reaction of 8-Aminoquinolines with Nitrodiols". His B.S. degree in chemistry was from Rockhurst College in 1943. He also completed an M.S. thesis at Kansas in 1947; its title was "A New Derivative Method for the Identification of Olefins".

Dr. Donahoe organized an active medicinal chemistry program at SLU, which produced graduates through the Ph.D. level. Most of his research appeared in peer-reviewed organic and medicinal chemistry journals; among them were the Journal of Organic Chemistry, the Journal of Immunology, the Journal of Medicinal Chemistry, the Journal of Medicinal and Pharmaceutical Chemistry, Applied Microbiology, and Archives internationales de pharmacodynamie et de thérapie. He also published the Journal of Chemical Education and in Industrial and Engineering Chemistry (a precursor of Analytical Chemistry).

Professor Donahoe's work was supported by research contracts with government agencies, private foundations, and corporations. He served the chemistry department as acting chair and associate chair. Other SLU activities included heading the University's NASA committee, membership on the executive committee of the Project 21 Task Force, and serving on the admissions committee of Sigma Xi, the honorary scientific organization.

The list of Professor Donahoe's accomplishments, while impressive, would certainly have been longer had he not passed away at the age of 50. One of his postdoctoral co-workers at the time, Dr. Vincent Spaziano, was hired as his replacement and served the department with distinction as chair from 1987 to 2002. The department's Vincent Spaziano Memorial Scholarship is named in his honor. It was established by the Department of Chemistry to honor his many contributions as an advisor, teacher, faculty colleague, and administrator. It is given annually to an undergraduate student for outstanding achievement in organic chemistry.

Spaziano Award

Vincent Thomas Spaziano was born and raised in Philadelphia, PA. He graduated with a B.S. and M.S. in Chemistry from St. Joseph's College and served as a chemistry teacher and research chemist before obtaining his Ph.D. in Chemistry from Villanova University in 1970. He came to Saint Louis University as a postdoctoral research associate with Professor Donahoe. He joined the faculty as an Assistant Professor in 1973, became an Associate Professor in 1977, and Professor of Chemistry in 1986. An organic chemist, he had an active research interest in medicinal chemistry, publishing fourteen papers, garnering over $200,000 in grants, and presenting papers at several conferences.

He was Chair of the Department of Chemistry from 1987 until 2002 and Associate Dean of the College of Arts and Sciences, from 2002 until his retirement in 2010. During his tenure as Chair, the chemistry department upgraded its instrumentation and expanded from eight to ten tenure track faculty and from one to two laboratory coordinators. During his retirement party in 2010, Dean Michael Barber, S.J., noted that as associate dean, "Vince did much to hold the College together during the many changes it has undergone. He was always extremely generous, serving on 30 committees in his 39 years at the University. He was the kind of person that colleagues, other chairs, and deans confided in, and, when he mentioned during his retirement party that he had never had a 'cross word' with anyone in his many years in the University, that fact had much to do with the way he treated everyone else. His love for the University was shown not only in his dedication as a teacher, scholar, and administrator, but also in his being an avid fan of the Billiken basketball team. One of his favorite hobbies was watching thoroughbred horse racing."

Spaziano passed away in November of 2010. At that time, Dean Barber said, "The College of Arts and Sciences will deeply miss this gentle, dedicated man who was available to the University community and whose strong commitment to the University anchored the commitment of so many others.

Alumni Update

We would love to hear from you. Please fill out this brief form here:
http://chemistry.slu.edu/newsletter_alumni