

# CHEMIGRAM

## 2017



Department of Chemistry and Biochemistry  
BRIGHAM YOUNG UNIVERSITY

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# ETTER FROM THE CHAIR



They say time flies when you are having fun. The past year has certainly flown by quickly, and we are definitely having fun in the Department of Chemistry and Biochemistry. We enjoy teaching undergraduate students, with nearly 12,000 enrollments in our courses during the past year, and with new developments such as an online version of our introductory chemistry course that potentially could let us reach more students. We love teaching graduate students, with 88 (mostly Ph.D.) students in our program last year. We love doing and publishing our research, virtually all of which involves our students, bringing in more than \$10 million in external grants and gifts to support the work last year despite a generally unfavorable funding climate. We are excited about BYU's new initiatives in providing experiential learning opportunities for students because we feel our department has a long tradition of excellence in doing chemistry and biochemistry research with our students in our laboratories.

The past year has also seen a number of changes in our faculty and staff. Professors Dan Simmons and Greg Burton have retired after long and productive careers of service to the university and to science. We express our thanks to them for jobs well done and we wish them the best as they move on. Likewise, our newer faculty are making excellent progress. Professor Josh Price was promoted to Associate Professor and received continuing faculty status; Professors Rebecca Sansom and Kara Stowers were both advanced to candidacy for continuing faculty status. We congratulate them on these achievements.

We are also excited to add new faculty members. Professor Daniel Mortensen joins us from the University of California, Berkeley. He is a mass spectrometrists who will oversee our new biological mass spectrometry facility. Professor Pam Van Ry comes to BYU from the University of Nevada, Reno. She is a biochemist who uses mouse models to study muscular dystrophy. Professor James Moody received his Ph.D. from the University of Washington, followed by postdoctoral work at Montana State. He is a biochemist who uses sophisticated computational techniques to engineer proteins for specific properties such as easy crystallization or for the diagnosis and treatment of disease. We welcome these new faculty members and look forward to working with them.

As you will see in the stories that follow, many exciting things are happening in the BYU Department of Chemistry and Biochemistry. We will continue to seek great students and great new faculty members in the coming year.

Although changes do present some challenges, overcoming them is part of the fun. It is a great privilege to be associated with the wonderful students, staff, and faculty at BYU. We expect time will continue to fly in the coming year. Finally, we love hearing from you, so please feel free to get in touch! Contact me at [david\\_dearden@byu.edu](mailto:david_dearden@byu.edu)

*David V. Dearden*

# CHEMISTRY AND BIOCHEMISTRY 2016 AT-A-GLANCE

## FULFILLING THE MISSION OF BYU

### DEPARTMENT GOALS/INITIATIVES

- \*Identify, recruit, and retain the best faculty who will fulfill the mission of the university and achieve the high standards of discipline.
- \*Prepare our students by providing engaging, rigorous classroom instruction.
- \*Provide our students with opportunities to participate in meaningful research projects.
- \*Create a sustainable structure for maintaining and replacing research and teaching instrumentation.

### EFFECTIVE TEACHING

#### Student

11,864	Students taught
	90% service teaching
406	Majors
	38% female, 62% male
74	BA or BS graduates
88	Current graduate students
19	PhD, 8 MS Graduates

#### Student Destinations

28%	Graduate School
55%	Professional School
5%	Jobs as Chemist or Biochemist
6%	Teaching Chemistry
6%	Other

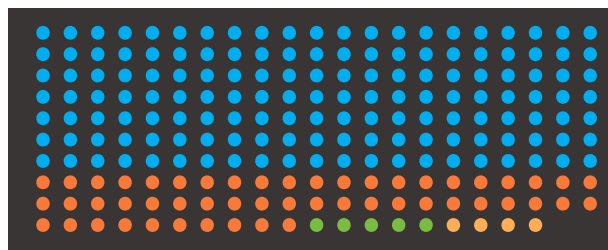
#### Student Ratings - Service Courses Taught

Chem 105	4.37/5.00
Chem 106	4.15/5.00
Chem 285	4.10/5.00
Chem 351	4.41/5.00
Chem 352	4.46/5.00

### EXPERIENTIAL LEARNING

#### Mentored Research

199	total undergraduates
147	majors
52	non-majors
5	Talmage fellows
4	HS students



• = 1 person

### PRODUCTIVE SCHOLARSHIP

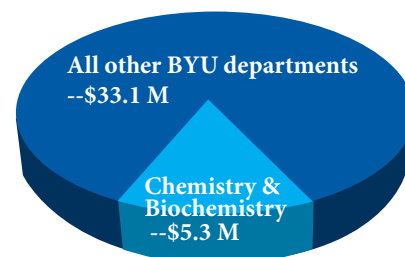
#### Scholarship

130 peer reviewed publications  
47 with student coauthor



#### BYU External Research Funding

In addition, the Department of Chemistry and Biochemistry received \$5.1 M in gifts for research



# GENEROUS GIFTS

## New This Year

### **The Fritz B. Burns Cancer Research Laboratory**

The Fritz B. Burns Foundation awarded \$5 million to Brigham Young University for the establishment of the Fritz B. Burns Cancer Research Laboratory. Dr. Joshua L. Andersen, Chemistry and Biochemistry principal investigator and director of the lab, will oversee the renovation project. The main lab will be located on the second floor, east wing of the Benson Science Building (BNSN), with a Fusion Lumos Orbitrap mass spectrometer on the first floor.

Fritz B. Burns was born in Minneapolis, Minnesota in 1899. He began developing real estate in Los Angeles after World War I, and built so many houses he was known as Mr. Housing. He was the first president of the National Association of Home Builders, and also built, owned, and operated shopping centers and hotels in California and Hawaii. His foundation was established in 1955 to help fulfill his lifelong philanthropic purposes. The foundation has been a longtime supporter of education, medical care, and medical research, among many other charitable causes.

### **The Earl M. Woolley Research Innovation Fund**

Announced at Daniel L. Simmons' retirement dinner, the Earl M. Woolley Research Innovation Fund, established through the generosity of Dan Simmons, will provide funding for chemistry and biochemistry faculty whose innovative research shows promise. The award name is in recognition of Earl M. Woolley, former department chair, who provided financial support to Simmons at an important juncture in his career. Woolley also advised Simmons to have his COX-2 research findings notarized. This was key in the successful lawsuit brought against Pfizer Pharmaceutical by BYU.

### **The Bryant E. Rossiter Lectureship Series**

Bryant W. and Betty M. Rossiter provided endowed funds for the establishment of the Bryant E. Rossiter Annual Lectureship Series in honor of their son, former BYU Chemistry and Biochemistry faculty member Bryant E. Rossiter whose life was cut short by cancer. Shawn Reese, a former student of Dr. Rossiter, paid him tribute, "Dr. Bryant Rossiter was a shining example of a student, scholar, mentor, advocate for students, and made the world around him much better because of his generosity of character and spirit. He was an example of servant-leadership, and embodied the type of scientist and person I long to be."

### **The Hiram and Permelia Dayton Scholarship**

We are pleased to announce the addition of a new department scholarship, The Hiram and Permelia Dayton Scholarship. Donated by descendants of Hiram and Permelia Dayton, the scholarship honors two biochemistry students, with one of the awards specified for a female biochemistry major. The Daytons were baptized by the Prophet Joseph Smith in Ohio in 1832. Persecution changed their lives almost immediately, and they joined the saints and traveled to the Salt Lake Valley, arriving in October 1849. Their faith, devotion, courage, perseverance, and church service are commemorated by this award.

### **The D. Clark and Pam Turner Mentored Scholars Fund**

D. Clark Turner, a former BYU chemistry graduate, and his wife, Pam, have established an endowment to specifically fund undergraduate research awards (URAs) for majors in our department. Students are selected from the pool of URA applicants to receive this honor and will correspond with the donors on the progress of their research during the award period. Through this endowment, Dr. Turner honors the mentors that assisted him in pursuing his undergraduate and graduate chemistry degrees at BYU.

*Many Thanks*

# GENEROUS DONORS



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## **DONORS** representing over **FORTY** scholarships joined students for a luncheon

**Donors representing over forty scholarships joined students for a luncheon** at the BYU Hinckley Center on Thursday, October 27 to celebrate the importance and blessing of scholarships in the College of Physical and Mathematical Sciences (CPMS). Hosted by CPMS, the luncheon started with a greeting by Brent Hall, the college's LDS Philanthropies liaison, who emphasized the immense and enduring impact that scholarships have in students' lives. "You have all made a difference," Hall said. "What you're doing is changing lives, changing families, changing the world. There's not a person in this room who didn't have a blessing of a scholarship." The luncheon emphasized the theme that scholarships should be continual and that helping others achieve their dreams is a cycle that should never end.

Written by Maureen Elinzadno/ Photo by Alyssa Lyman

..... **Alumni & Friends are Giving Back!** .....

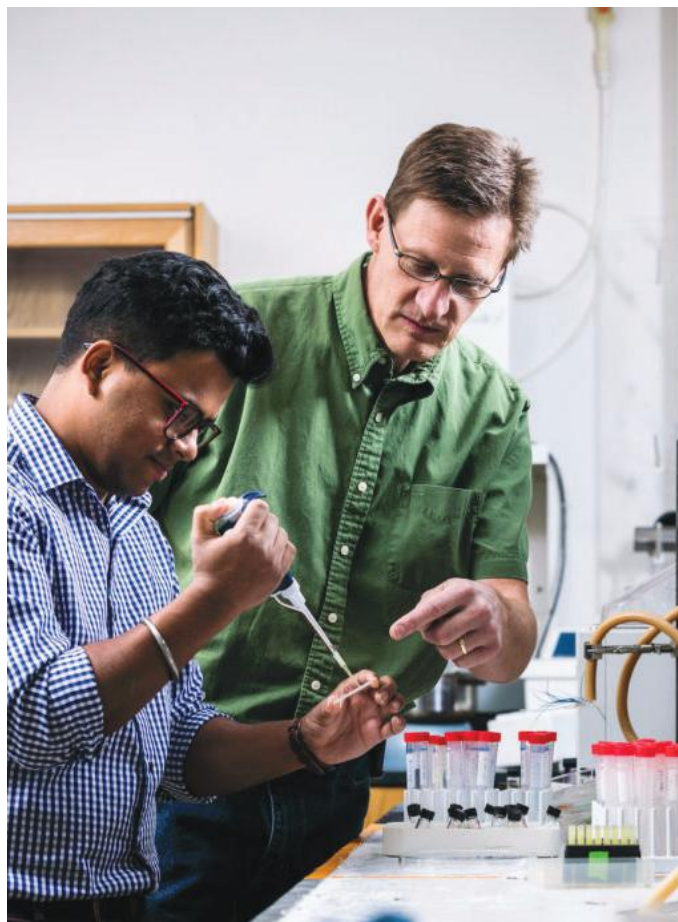
**You can help. It makes a difference.**

Click on [chemistry.byu.edu/alumni/make-a-donation/](https://chemistry.byu.edu/alumni/make-a-donation/) and make a gift to help.  
100% of your donations go to student support in our department.

If you have questions, call Brent Hall at 801-422-4501 or email [brent\\_hall@byu.edu](mailto:brent_hall@byu.edu)  
Brent is the LDS Philanthropies liaison for the College of Physical and Mathematical Sciences

# FACULTY RESEARCH

## CHIP DESIGN TO MINIMIZE PRETERM BIRTH



BYU chemistry professor, Adam Woolley, and BYU chemistry PhD student Mukul Sonker, along with BYU post-docs Radim Knob and Vishal Sahore, created the chip

Complications associated with preterm birth are the number one cause of death for children under age five, and those who live often face a range of health problems.

BYU researchers are hoping to minimize the problem of premature deliveries. The integrated microfluidic device (a palm-sized plastic rectangle with a few pinholes) is designed to predict with up to ninety percent accuracy a woman's risk for a future preterm birth.

"It's like we're shrinking a whole laboratory and fitting it into one small microchip," said BYU chemistry PhD student Mukul Sonker, who is the lead author of a study recently published in *Electrophoresis* and funded in part by the National Institutes of Health.

The goal for the device is to take a finger-prick's worth of blood and measure a panel of nine identified preterm birth biomarkers — essentially biological flags that can tip people off to diseases or other conditions. There aren't any current biomarker-based diagnostics for preterm births and doctors typically only keep tabs on women who have other clear risk factors.

For this study, Sonker and senior author Professor Adam Woolley, along with BYU post docs Radim Knob and Vishal Sahore, created the chip and a system for preconcentrating and separating biomarkers on it. That's important, explained Sonker, "because when you look at these proteins and peptides, they're present in such a trace amount, but if you preconcentrate them on the chip, you can get enough of a signal for prediction."

Among other benefits, the device is cheap, small, and fast, "Once fully developed," said Woolley, "it will help make detecting biomarkers a simple, automated task." Some peg the annual costs associated with preterm birth in the United States alone at close to \$30 billion, so one clear benefit of such a screening tool," said Woolley, "is economic. More significantly," he added, "there are a lot of preterm babies who don't survive. If we could get them to survive and thrive it would be a huge gain to society."

# DR. GREGORY BURTON CONTRIBUTES TO WORLDWIDE RESEARCH FIGHT AGAINST HIV/AIDS

BYU biochemistry professor **Dr. Gregory F. Burton** joins Harvard University and other US institutions in the George Washington University-led BELIEVE Collaboratory

BYU is teaming up with George Washington University, Harvard University, Johns Hopkins University, Simon Fraser University in Canada, the University of São Paulo in Brazil, and the Children's National Health System to fight HIV/AIDS. George Washington University received a \$28 million Martin Delaney Collaboratory Grant and the "Bench to Bed Enhanced Lymphocyte Infusions to Engineer Viral Eradication" (BELIEVE) grant awarded by the National Institutes of Health (NIH).

**"THE RESEARCH WILL FOCUS ON AN INNOVATIVE CELL THERAPY APPROACH THAT CONCENTRATES ON MAKING INDIVIDUALS' IMMUNE SYSTEMS WORK BETTER BY ELIMINATING HIV RESERVOIRS."**

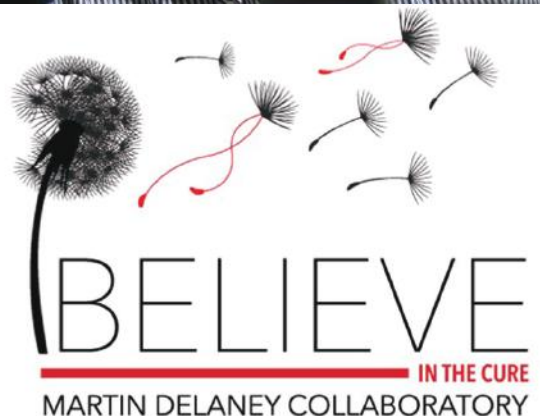
"[BYU's] goals are to look at a very specific reservoir called the follicular dendritic cell (FDC) to determine whether or not the therapy that is being designed and implemented is capable of both attacking this reservoir, and targeting those sites and decreasing the amount of virus that's there," said Dr. Gregory F. Burton.

Burton is specifically working with M.D. Connick, the head of infectious diseases at the University of Arizona, and will partner with Altor Bioscience Corporation whose cancer drug candidate ALT-803 has been found to enhance the ability of the immune system to kill HIV-infected T-lymphocytes, or T-cells. The researchers will also partner with Torque,

a biomedical engineering company that found a way to attach drugs to cytotoxic T-cells which are lymphocytes that can kill virus-infected cells.

One graduate student and two undergraduate students will help Burton with his research for BELIEVE. "While performing research with knowledgeable colleagues is one significant aspect of this grant, teaching students is also equally important," said Burton.

Written by Taelin Wilford/ Photo by BYU Photo



# CRASH TESTING BACTERIA

BYU chemistry Professor **Daniel Austin** and his graduate students try to find fatal limit

BYU chemistry professor Daniel Austin and his graduate students, funded by NASA, are studying the high velocity impact of bacterial spores. More specifically, the group is trying to find the speed limit above which bacteria won't survive when they crash into a hard surface.

"There should be a velocity at which they'll splat and die but we haven't reached it," Austin said.

**"WE CAN GET PRETTY CLOSE TO THE SPEED OF SOUND, AND WE'RE PLANNING TO GO TO HIGHER VELOCITIES IN THE NEAR FUTURE, BUT IT'S NOT EASY TO DO."**

The group's recently published study in *Planetary and Space Science* is the first of its kind to test the impact survivability rate of bare bacteria.

Although the main focus of the research is answering the question of how much force the bacteria can withstand, NASA has funded the research because of the planetary protection implications of the study: if bacteria can survive the ejection from one planet and the impact of landing on another planet, there are potential concerns about cross contamination of bacteria between those planets. However, Austin is quick to acknowledge that there are other factors, like UV light, that may kill the bacteria in transition.

"We seem so frequently surprised at what bacteria can survive, and this just adds to the list," Austin said. "Our understanding of the limits of life have expanded a lot since the 1970s as we find bacteria surviving and even thriving under extreme conditions."

Austin's team has additionally observed an unusual elasticity of the bacterial spores, which may have potential applications in nanotechnology.

Written by: Taelin Wilford / Photo by BYU Photo





# HOW EATING LESS CAN SLOW THE AGING PROCESS

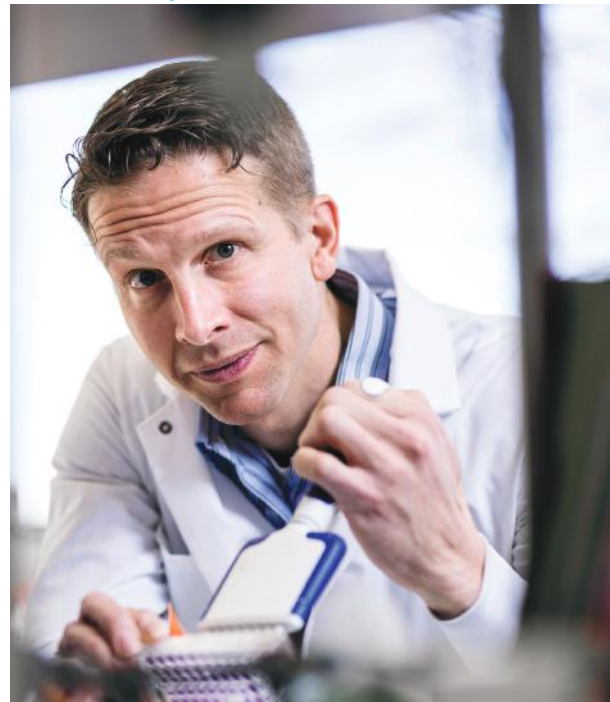
BYU biochemistry professor **JC Price** and his fellow researchers observed the connection between consuming fewer calories and improved lifespan

There's a multi-billion-dollar industry devoted to products that fight signs of aging, but moisturizers only go skin deep. Aging occurs deeper — at a cellular level — and scientists have found that eating less can slow this cellular process. Recent research published in *Molecular & Cellular Proteomics* offers one glimpse into how cutting calories impacts aging inside a cell. The researchers found that when ribosomes — the cell's protein makers — slow down, the aging process slows too. The decreased speed lowers production but gives ribosomes extra time to repair themselves. "The ribosome is a very complex machine, sort of like your car, and it periodically needs maintenance to replace the parts that wear out the fastest," said senior author JC Price. "When tires wear out, you don't throw the whole car away and buy a new one. It's cheaper to replace the tires."

Calorie restriction has not been tested in humans as an anti-aging strategy, and the essential message is understanding the importance of taking care of our bodies.

"Food isn't just material to be burned — it's a signal that tells our body and cells how to respond," Price said. "We're getting down to the mechanisms of aging which may help us make more educated decisions about what we eat."

Written by Brooke Adams / Photo by Nate Edward



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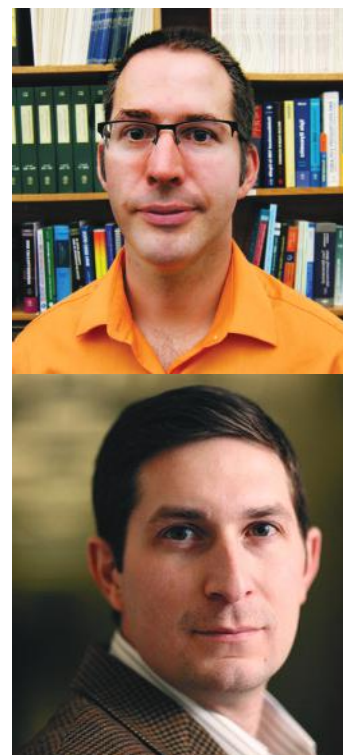
## MULTI-INSTITUTION COLLABORATION

**Dr. Daniel H. Ess and Scott Burt** joined a multi-institution collaboration to disclose in *Science* a new catalytic chemical reaction

Department of Chemistry and Biochemistry professors Dr. Daniel H. Ess and Dr. Scott Burt were part of a multi-institution collaboration to disclose in *Science* a new catalytic chemical reaction that replaces hydrocarbon bonds with nitrogen. The collaboration, headed by Professors László Kürti at Rice University and John Falck at the University of Texas Southwestern Medical Center, developed a one-step reaction to convert arene hydrocarbons to aryl amines which are key molecular precursors for the preparation of drugs and bioactive molecules. The team's success achieves a previously elusive synthetic chemistry goal.

For Dr. Ess, this is his group's third contribution to a *Science* publication in just three years. In 2014, the same team explored the molecular details of directly synthesizing aziridine compounds from alkenes and played a major role in discovering that main-group metal compounds facilitate C-H activation chemistry en route to oxygen functionalization of light alkanes found in natural gas. The success of the Ess Group is the result of using and developing powerful state-of-the-art computational chemistry techniques to reveal the molecular details of complex reactions that propel teams to discover new catalysts.

Written by: Taelin Wilford / Photo by BYU Photo

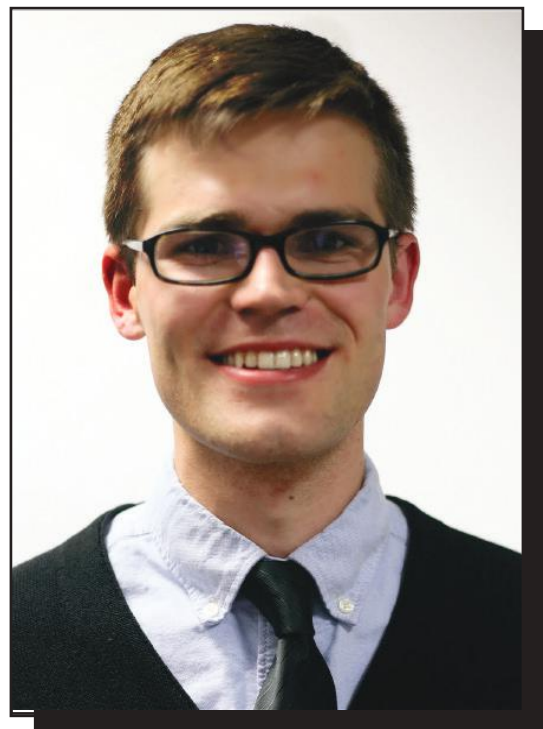


# SELECTED UNDERGRADUATE

## Edward Pimentel

*Mentored by Professor Merritt B. Andrus*

The Fall 2016 Undergraduate Research Award allowed me to make significant progress towards the synthesis of my kidney cancer drug target. I completed a novel Michael Addition reaction that is one of the two key steps of my synthetic pathway, and fully characterized the product. I also began work on several different procedures for the completion of the next key step, a radical cyclization using samarium metal. This progress gives me hope that I'll soon be able to submit my product for testing against kidney cancer cells. This work was significant to me because it was the first time I had ever successfully run a novel chemical reaction, and I learned that I need to be persistent and to be a problem-solver to push novel research forward. It also allowed me to focus my attention on my research, which has helped me to support my family and has driven me to learn to be more effective and efficient in the laboratory.



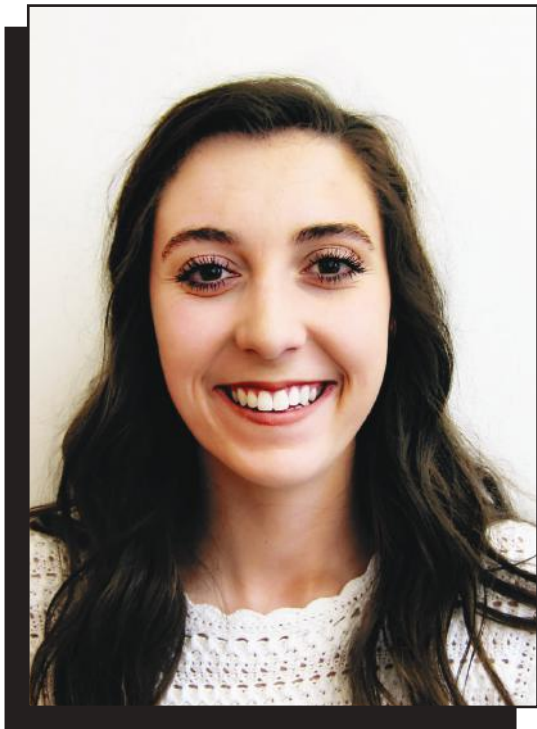
## Katherine Collins

*Mentored by Professor Rebecca L. Sansom*

This semester I did chemistry education research for Dr. Rebecca Sansom. We have been researching the reasoning patterns undergraduate students use when interpreting experimental observations in an effort to design laboratory experiments that will allow students to make connections between submicroscopic, macroscopic, and symbolic levels of representation and thereby increase their overall understanding of chemical concepts. The majority of this semester was spent interpreting the data we collected last semester and writing an article to submit to *Chemistry Education Research and Practice*. The experiences I had with Dr. Sansom this semester have been invaluable. I was able to expand my knowledge of the research process from simply performing experiments to analysis interpretation and effective reporting of data. I had the opportunity to write part of the paper we are submitting which allowed me to develop a skill that I will use the rest of my life in both my future schooling and career. This mentored research experience has provided me with opportunities that I wouldn't have had anywhere else and I am extremely grateful that I was able to participate in such a wonderful program.



# RESEARCH



## Mercedee Erickson

*Mentored by Professor Paul B. Farnsworth*

My research project images mouse brains using Desorption ElectroSpray Ionization (DESI), coupled with a mass spectrometer. This allows us to trace lipid turnover rates in different structures of the brain. One component of the research is the 5% deuterated water diet that incorporates deuterium into the lipids. We monitor the change in isotope patterns of each lipid at different levels of deuterium incorporation. Our most recent results include creating images of spatially regulated lipid metabolism in mouse brain slices, and the monitoring of metabolic pathways for four main lipids, discovering that turnover rates vary between lipids and in relation to different brain structures. Lipid metabolism is important for understanding various diseases such as cancer and neurodegeneration, so our current focus is applying our DESI-MS technique to an Alzheimer's diseased mouse brain model to see if there's any significant variation in lipid metabolism compared to healthy control brains.

## Logan Larsen

*Mentored by Professor Joshua L. Andersen*

The project I worked on over the semester was centered around the protein TNK1. TNK1 is suspected to be a cancer promoter when present. We did research to determine where exactly TNK1 binds to the 14-3-3z protein, which would allow it to promote the spread and growth of cancer cells. While narrowing down the region that the binding site would be found, we made an interesting discovery. We did a C-terminal deletion, removing just the end part of the protein and saw something interesting happen. Removing the C-terminal makes binding to TNK1 more prevalent. This led us to believe that either there is some sort of inhibitor of TNK1 in the C-terminal or the C-terminal is folded over onto an active binding site on the protein. There is a lot more we can do to understand how and why this happens. Looking forward, we can analyze the crystal structure and learn more about what is really occurring in the C-terminal. If we are to understand it more, we can potentially inhibit binding to TNK1 even more.



# ANNUAL LECTURESHIPS

## Bryant E. Rossiter Lecture: Adam Cohen

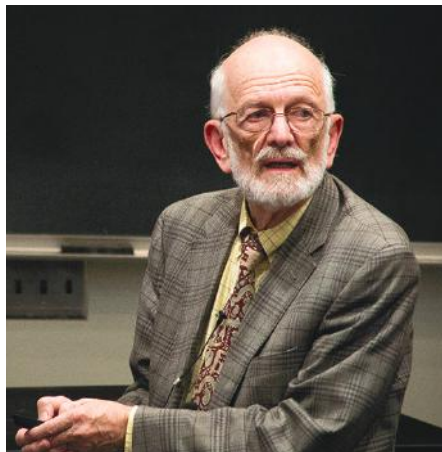
Dr. Jeremy Johnson introduced Dr. Adam Cohen, the inaugural guest lecturer for the newly-established Bryant E. Rossiter lecture series and shared some insights, both inspiring and humorous, from Dr. Rossiter's career as professor in the Department of Chemistry and Biochemistry from 1985-1994. In honor of Dr. Rossiter, whose life was prematurely cut short by cancer, this lectureship will highlight early-career principal investigators whose research is promising and clearly on an upward trajectory.

Cohen's first talk, "Bringing Bioelectricity to Light," focused on the photochemistry of microbial rhodopsins, and some applications to unusual bioelectrical systems.

In his second talk, "Studying Function in Rodent and Human Neurons," Cohen describes how he has used all-optical electrophysiology to study neural function in primary neurons *in vitro*. This groundbreaking research provides insights into diseases such as pain, epilepsy, and ALS.



## Izatt-Christensen Lecture: R. Graham Cooks



Dr. R. Graham Cooks, one of the world's foremost experts on mass spectrometry and a distinguished professor at Purdue University, presented the ninth annual Reed M. Izatt and James J. Christensen Lecture at BYU, March 20-21, 2017.

Cooks graduated with a PhD from the University of Natal in South Africa in 1965 and earned another PhD at Cambridge University in 1967. His studies have covered all aspects of mass spectrometry: research, instrumentation, and analytical applications.

Cooks's first presentation, "Mass Spectrometry (MS): Synthesis and Analysis for the Greater Good," summarized what mass spectrometry is—the science of analyzing ions to identify and quantify molecules in a mixture—and how the science has changed over time. He then gave examples of mass spectrometry's applications in food safety, forensics, drug screening, and brain cancer diagnostics.

His second presentation, "Mass Spectrometry (MS): Instrumentation and Chemistry," delved deeper into how mass spectrometry can be thought of as a method of synthesis—the formation of a chemical compound made from two simpler compounds or elements. Cooks emphasized the hope that chemists will someday be able to use mass spectrometry without a vacuum.

Photo by Cassie Prettyman

## Izatt-Christensen Faculty Excellence in Research: Barry M. Willardson

The 2016 Reed M. Izatt and James J. Christensen Faculty Excellence in Research Award was presented to Barry M. Willardson. Dr. Willardson gave a seminar titled, "Mechanisms of Assembly of Signaling Complexes."

Summarizing his research, Dr. Willardson explained, "Cells recognize and respond to physiological stimuli in a process called cell signaling. This process requires intricate cellular machinery made from proteins on the cell surface and in the cell interior."

Dr. Willardson's collaborative research with the lab of Jose M. Valpuesta at the Centro Nacional de Biotecnología in Madrid, Spain, focuses on determining the ways the cell assembles signaling machinery from their component proteins.

Dr. Willardson's current work is to determine the molecular mechanism of chaperone-mediated assembly of two important signaling complexes, the G protein heterotrimer and the mTOR oligomer.



# NEW FACES

## NEW FACULTY MEMBERS

**Dr. Pam Van Ry**



Dr. Pam M. Van Ry, who joined the department faculty on July 1, 2017, earned her undergraduate degree from the University of Nevada, graduating with a Bachelor of Science Chemistry degree. In 2014, Van Ry earned her PhD from the University of Nevada, Reno where she received her degree in cellular and molecular pharmacology and physiology. During her doctoral and postdoctoral studies, she studied protein therapeutics for muscular dystrophy at the University of Nevada School of Medicine. When asked why she went into her chosen field of study she said, "I love the translation nature of the work I was able to participate in. Meeting patients and realizing the work we do in the lab can translate into meaningful quality of life changes for these patients is amazing, BYU offers an amazing opportunity to work in an incredibly collaborative environment where I can share my love of science, research, and the gospel." Pam and her husband, Kevin love to fly fish together and look forward to exploring all the rivers and lakes in the area.

**Dr. James Moody**



James Moody completed his undergraduate studies at Brigham Young University. He took a molecular biology course in the College of Life Sciences. In the textbook, he saw his first protein, a ribbon diagram of a DNA binding protein. As a kid, all he ever wanted for Christmas or birthdays were Legos. Once he learned about proteins, he knew that he wanted to engineer proteins to solve biological problems in the same way you might build something out of Legos. In graduate school he studied computational protein design at the University of Washington. Then at Montana State University, he studied radical SAM enzymology and protein crystallography. In the middle of all of this, his wife, Amelia and he had two daughters, Genevieve and Giselle. When he is not doing protein engineering, he enjoys spending time with his family, singing, drawing, running, hiking, camping, and playing with Legos with his daughters. Dr. Moody will be joining the department on August 1st.

**Dr. Daniel Mortensen**



Dr. Daniel N. Mortensen earned his undergraduate degree from BYU, where he researched with Dr. David V. Dearden using mass spectrometry to study pumpkin-shaped molecules known as cucurbiturils that have potential applications in selective drug delivery. He graduated in April 2011 with a BS in chemistry and then headed to the University of California, Berkeley for his doctoral studies. After Dr. Mortensen earned his PhD in 2016, he secured a postdoctoral position here at BYU. In March 2017, Dr. Mortensen began his newly-offered faculty position. We welcome Daniel Mortensen and his family. Dr. Mortensen is running a new Biological Mass Spectrometry and Cell Sorting Core Facility in the department, where researchers can have their samples analyzed for things such as protein or metabolite content.

## NEW STAFF MEMBERS



**Nicole Cuthbert**  
Assistant to the Chairs



**Todd Fluckiger**  
Stockroom Receiving  
Manager

# DEPARTMENT NEWS



## Emeritus News

### Dr. Milton Lee Awarded the “Chromatographic Society of India Lifetime Contribution Award”

Dr. Milton Lee, Professor Emeritus, was honored with the Chromatographic Society of India (CSI) Lifetime Contribution Award for his contributions to developing various chromatographic techniques and for his research and applications in SFC technique.

This award was presented at the CSI International symposium on the Recent Development in Chromatography and Mass Spectrometry that was held at the Institute of Chemical Technology, Mumbai, India on 18-19 November, 2016. Professor Lee gave two talks at the symposium entitled “Super-critical Fluid Chromatography” and “Novel Chromatographic and Mass Spectrometric Instrumentation: From Concept to Commercialization.”

Written by Taelin Wilford/Photo by Abhijit Ghosh

## Alumni News

### BYU Alumnus Joseph M. Cardon, a current graduate student at UC Irvine, receives an NSF Graduate Research Fellowship

The NSF Graduate Research Fellowship Program recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based master's and doctoral degrees at accredited United States institutions. Cardon's research centers around multi-electron catalysts for use in dye-sensitized solar cells which will prevent the formation of energy-wasting radicals and allow creation of dye-sensitized solar cells that rival the efficiency of silicon solar cells. At BYU Cardon spent several years as an undergraduate research assistant in Dr. Steven Castle's organic synthesis and methodology lab working towards the total synthesis of yaku'amide A, a natural product with potent anticancer properties, especially towards leukemia cancer lines. “As long as the research will help someone someday, I am equally happy to study cancer cures, renewable energy, or better plastics using organic, inorganic, or electrochemistry,” says Cardon.



Written by Taelin Wilford/ Photo by BYU Photo

## Graduates News

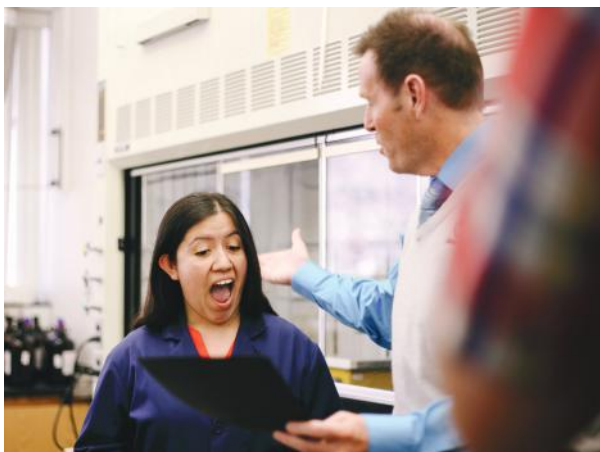
### Chemistry PhD Candidate Cody V. Cushman given award by The American Ceramic Society

PhD chemistry student Cody V. Cushman was selected as a finalist for the Graduate Excellence in Materials Science (GEMS) award by The American Ceramic Society (ACerS). The GEMS awards “recognize the outstanding achievements of graduate students in Materials Science and Engineering.”

Cushman's oral presentation was entitled: “Multi-instrument Depth Profiling of Advanced Glass Materials.” Flat panel displays are an integral part of consumer electronic devices. Cushman's research uses a suite of surface sensitive techniques including X-ray photoelectron spectroscopy (XPS), time-of-flight secondary ion mass spectrometry (ToF-SIMS), low energy ion scattering (LEIS), and spectroscopic ellipsometry (SE) to understand how the surface composition of display glass changes in response to chemical treatments used during the display manufacturing process. These techniques work together to provide a detailed picture of the chemistry of display glasses as a function of depth. This research is an important step towards developing the next generation of flat panel display substrates.



Written by Taelin Wilford/ Photo by BYU Photo



### 3MT People's Choice Award - Diana Saavedra

PhD chemistry student Diana Saavedra took first place for her video presentation on “Total Synthesis Anticancer Deoxypodophyllotoxin” in the College of Physical Mathematical and Sciences 3MT competition and was also selected as People's Choice award winner for the university-wide competition. As winner of this award she received \$2,000.00.

3MT, meaning “Three Minute Thesis,” is an annual event that challenges students working on a graduate degree to present their thesis in just three minutes. And to make matters more interesting, the students must explain it using language that a non-specialist audience will understand. The judges critique participants on how well they: 1) explain their research; 2) spark the audience's desire to

know more; and 3) communicate in language “appropriate to an intelligent but non-specialist audience.”

“I'm grateful for the opportunity that I have to study at BYU and for the amazing research that is being done here. I felt very honored to be able to represent the College of Physical and Mathematics Sciences. This is definitely a very special university and I'm trying to take every chance that I have to learn,” says Saavedra.

Written by Taelin Wilford/ Photos by Lauren Stolworthy

## Undergraduates News

### Farnsworth and Smith Represent BYU at the National ACS Conference

Alex Farnsworth and Scott Smith represented the Patterson Lab and BYU at the National American Chemical Society (ACS) web press conference. Their research focuses on how green lasers represent a way to test the soundness of materials without destroying them.

Other undergraduate students who presented were Ben Rencher, Brigham Pope, Edward Pimentel, Paul Joshua Hurst, Kei Webber, Carrie Hansen, Erika Weir, and graduate student Jonathan Lynch.

Written by Nicole Cuthbert



# RETIREMENTS

## Daniel Simmons



The Daniel L. Simmons retirement dinner was held 28 March, 2017 in the Benson Building. David V. Dearden, the department chair, gave the introductory remarks, followed by thank-you remarks from Dr. Simmons.

“Some of you were involved in a very unusual undertaking at BYU, a lawsuit against the largest pharmaceutical company in the world ... I am honored by your presence and for my association with you as family, friends, and as colleagues in this wonderful department over the past 28 years. Thank you, and I am so grateful that you are here,” said Simmons.

All those involved in any way with the court case were recognized by Simmons and thanked for their efforts.

Simmons joined the Department of Chemistry and Biochemistry in 1989 and served as director of the Cancer Research Center from 1997-2014. The Center was renamed in Dr. Simmons' honor to The Simmons Center for Cancer Research in 2014.

Shortly after coming to BYU he discovered a new aspirin-sensitive protein, which led to the development of the new drug, COX-2 during the time when Earl M. Woolley was department chair. Simmons together with BYU's legal team began the 14-year legal battle against Pfizer's summary judgement on the inventorship of Celebrex. The notarizing of Simmons's discovery, at the suggestion of Woolley, was key to winning Simmons the court case. Simmons retired from the Department of Chemistry and Biochemistry in 2016. Dearden read the Pfizer history per Woolley's and Simmons's recollection and then announced the establishment of the Earl M. Woolley Fund which will, among other things, be used to grant Earl M. Woolley Research Innovation Awards to faculty.

Simmons concluded: “Earl M. Woolley is a not only a pillar of our department, he played a pivotal part in my career, for which I am extremely grateful. I have requested that funds coming from the Pfizer settlement to the Department of Chemistry and Biochemistry be used to establish the Earl M. Woolley Fund.”

Written by Taelin Wilford/ Photo by BYU Photo

After just over 12 years of exceptional service, Linda Richards, the Chemistry Stockroom Receiving Manager, retired August 2016.

In 2004 Linda began her career at BYU as Assistant Manager for the Chemistry Central Stockroom and received a President's Appreciation Award “for exceptional service creativity, and competence.” In 2012 Linda was promoted to Receiving Manager. Linda “has been one of the greatest resources the department has had; she has consistently been able to help students and faculty with whatever they need,” said Matthew Allen, the Chemistry Central Stockroom Manager.

Over the years Linda developed many great procedures for the chemistry stockroom and was crucial to the training of the excellent BYU students who worked under her. She developed a rigorous training program that enables the students to both learn and be prepared; she was responsible for the upgrading of the liquid nitrogen storage and delivery system; and improved the ordering of specialty gases for the research labs.

We wish Linda all the best in her retirement and thank her for her years of dedication and service.

Written by Taelin Wilford/ Photo by BYU Photo

## Linda Richards





Dr. Gregory F. Burton certainly is a pivotal figure who will be sorely missed by the department. Burton graduated from the University of Utah with a double major in mathematics and medical technology. He went on to earn his master's degree from BYU and a doctorate from the Medical College of Virginia, Virginia Commonwealth University. He then pursued a postdoctoral fellowship (1989-1991) at the same institution and was appointed assistant professor in the Department of Microbiology and Immunology in the School of Medicine where he stayed for five years.

He began his career as an associate professor at BYU in 1997 for the Department of Microbiology. In 2003 he became a professor in the Department of Chemistry and Biochemistry where he went on to serve as department chair for six years. Dr. Burton was also a visiting scientist for the Department of Neurology, School of Medicine, at Johns Hopkins University from 2004 to 2009.

Dr. Burton's contributions to the study of HIV and AIDS have been pivotal to this field of research. With over 60 published journal articles, Burton's research focuses on the molecular contributions of follicular dendritic cells to the pathogenesis of this disease. "Greg is the world's expert on FDCs and HIV infection and I admire his excellent work," said John G. Tew, former Associate Dean of the School of Basic Health Sciences at Virginia Commonwealth University. Burton's 1995 article on "Follicular Dendritic Cells and Human Immunodeficiency Virus Infectivity"-published in the US National Library of Medicine National Institutes of Health - was the first paper demonstrating that HIV on FDC (follicular dendritic cells) was infectious. This discovery was a monumental contribution to the field of HIV and AIDS. In 2016 Burton became part of the BELIEVE project: a five year research collaboration led by the National Institutes of Health whose aim is to find a cure for the HIV and AIDS pandemic. Like many of our faculty, Burton will extend his research beyond retirement.

His most notable awards include being honored with the Medical College of Virginia NIH/NCI Training Grant and Predoctoral Fellowship (1986-1988), the BYU College of Biology and Agriculture Creative Achievement Award (2001), and the John A. Widtsoe Fellowship (2004). Burton is also a member of the American Chemical Society, American Association of Immunologists, American Society for Microbiology, and the American Association for the Advancement of Science.

Many agree that one of Burton's greatest contributions to his field, however, were the 116 undergraduate and 17 graduate students who he trained in his lab at BYU. Burton treated his students like family, celebrating their triumphs and supporting them in difficult moments. Today, many of his students have become professors themselves, while others have gone on to pursue careers in medicine. Regardless of their career paths, they agree that Burton's influence helped them to reach their goals.

During his retirement Burton plans to spend his time continuing work with the BELIEVE project; pursuing his passions for photography, biking, hiking, and fly fishing. He also enjoys spending time with his grandchildren, children, and beloved wife Ann. We congratulate Dr. Burton on his success and wish him the best for his well-deserved retirement.

## Gregory Burton



Written by Taelin Wilford/ Photo by BYU Photo

# UNIVERSITY AWARDS



## **Richard Piccolo, Fred A. Schwendiman Award**

Richard Piccolo, the BYU custodial department's area supervisor for the Benson and Nicholes buildings, was chosen to receive the Fred A. Schwendiman award.

Piccolo was raised a Boston sports fanatic in Watertown, Massachusetts. After high school, his older sister, who was a convert to the Church of Jesus Christ of Latter-day Saints, convinced him to attend BYU. He knew nothing about the Church at the time, nor did he know that his decision to come to BYU would change his life.

"After attending BYU for two years and being fellowshipped and taught by hundreds of eager Latter-day Saints, I was baptized on May 17, 1970, in a font that used to be in the JKB," said Piccolo. During his time at BYU, Piccolo also met his future wife, Alice, when he was assigned to be her home teacher.

By the end of 2017, all eight of Piccolo's children will have graduated from a BYU campus, and his oldest son is a professor in the College of Life Sciences at BYU Provo.

Piccolo has worked at BYU for 37 years, and he works hard to coordinate all the cleaning in the Benson and Nicholes buildings. "The Benson is used seven days a week," he explained, "with six wards that meet here each Sunday, so it is challenge to keep the building clean."

The Schwendiman award honors Piccolo for his great contributions to the university: his dedication, his integrity, and his respect for all individuals. Piccolo was surprised to learn of his nomination and attributes his success to the hard-working team of full-time and student employees under his supervision.

"Any recognition I receive," he said, "is mostly because of the dedicated work of our team of custodians, full and part-time, who strive to maintain a high standard of cleanliness day after day. It has been a great blessing to me and my family to be employed at the Lord's University."

Written by Taelin Wilford/ Photo by BYU Photo

## **Matt Allen, Staff and Administrative Employee Recognition Award**

Congratulations to Matthew Allen for receiving the Staff and Administrative Employee Recognition Award (SAERA) for innovation from BYU Department of Human Resources.

The SAERA recognizes staff and administrative employees-including part-time non-student employee-who demonstrate values of competency, respect for sacred resources, integrity, teamwork, exceeding customer expectations, respect for all individuals, innovation and accountability in their work.

Matt received this award for his innovative improvements in laboratory safety, laboratory safety training for all students working in research laboratories, and his expert organization of the Chemistry Central Stockroom, which is now the clearinghouse for all chemicals delivered to campus.



## **Bart Whitehead, President's Appreciation Award**

Bart Whitehead is an exceptional employee who works as an instrumentation engineer in the Science Support Shop. This facility is responsible for the service and maintenance of all teaching and faculty laboratory instrumentation in both the Department of Chemistry & Biochemistry and the College of Life Sciences.

Nearly two years ago, due to employee changes in the shop, Bart took on additional assignments, including a portion of the instrument repair work along with his chief area of responsibility, electronic instrument design. At this time, the College of Life Sciences was moving to their new building and Bart was integrally involved in the process.

While his willingness to take on additional responsibilities and help with the College move are notable, he most recently recognized the need to develop expertise in the instrument control language programming, LabView. LabView is a language that is widely used in both teaching and research labs.

Bart has become the resident expert on LabView programming and put forth the effort to become officially certified. Bart has become a great resource to students and especially graduate students working with LabView. Bart enthusiastically helps students answer their questions and solve their problems. He is a team player and service oriented, one who has recognized and jumped in to fill the needs of both the Science Support Shop and our students.



Written by Taelin Wilford/ Photo by BYU Photo

## **David Dearden, Continuing Education Faculty Teaching Award**

The Faculty Teaching Award recognizes teaching excellence and service to students within Continuing Education programs. The Department of Continuing Education is delighted to honor Dr. David Dearden for his contributions.

Professor David V. Dearden is a beloved Physical Science (PS) 100 teacher at the BYU Salt Lake Center. He loves his students at the BYU Salt Lake Center as much as he loves science and his association with BYU and the Church. We consider Dr. Dearden a dear friend of BYU Continuing Education. He is not only deserving of this faculty teaching award but also of our deepest respect and appreciation. We look forward to our continuing relationship with him and the Chemistry Department for years to come.

Written by Lee J. Glines, Dean, BYU Continuing Education.



# COMMUNITY OUTREACH



## Chemistry Camp Inspiring Young Minds

The BYU CHEM CAMP is an inspiring event where children ages 9-12 participate in hands-on, inquiry-based chemistry experiments in BYU laboratories (<https://chemcamp.byu.edu/>). The inaugural camp in 2016 focused on the chemistry of medicine, materials, and food. Camp days are filled with experiments and scientific discussions and presentations made possible by amazing undergraduate students that act as counselors and overseen by department faculty Professors Daniel Ess, Jennifer Nielson, Rebecca Sansom, Kara Stowers and Josh Andersen. In 2017 BioCHEM CAMP was added for youth ages 13-14 to experience experiments in isolating and manipulating DNA. The campers and camp directors are grateful to the Department of Chemistry and Biochemistry, the College of Physical and Mathematical Sciences, and private donors for generous contributions that made the camp possible.

Written by Dan Ess

## Y-CHEM – Sharing the Love of Chemistry and “Magic” through Service within the Community

BYU’s student chapter of the American Chemical Society (Y-CHEM) is dedicated to making chemistry more accessible to the public and to uniting chemistry majors by giving them opportunities to use their skills to serve the community. During the past year, Y-CHEM was able to visit 17 area public schools and give chemical demonstrations as a way to educate and promote the love of chemistry to a wider audience.

This past year, in addition to participating in activities surrounding National Chemistry Week, and Open Lab Day Y-CHEM hosted an event for the President’s Leadership Council Family Reunion in September. Over 100 donors and their families participated in a variety of hands-on chemistry demonstrations, including making their own bowl of liquid nitrogen (LN<sub>2</sub>) ice cream. Thanks to Y-CHEM students and their enthusiasm for chemistry, this was a highlight of the family reunion weekend events.

Written by Sue Mortensen/

## Dr. Nielson Research in Uganda

In July 2017, a team headed by Dr. Jennifer Nielson returned to Uganda and spent two weeks to 1) organize teacher development workshops and 2) collaborate with districts and the Ugandan Ministry of Education to implement a pilot program on a new national chemistry curriculum.

They conducted two successful "Learning Chemistry through Experimentation" workshops at Mbarara University of Science and Technology (MUST), similar to the workshops previously conducted each summer at universities in Uganda since 2013. One important addition was a safety presentation by Alex Farnsworth, a biochemistry undergraduate, based on the new RAMP safety program designed by the American Chemical Society last year. There is a huge need in Uganda for lab safety training in secondary schools. The chair of the science education department at MUST, Immanuel Ntambi, was very impressed and is going to use Alex's presentation in his introduction class for first-year students when classes begin in August.

This summer, the new national chemistry curriculum is being piloted in two districts (similar to states in the U.S.) before it is implemented by the entire country. The curriculum, designed by our BYU research team, the Uganda National Examination Board, and the National Curriculum Development Centre, will include new hands-on learning activities. A study of the pilot program will determine the impact of these learning activities on student understanding of chemistry concepts.

Written by Jennifer Nielson

## BYU's Open Lab Day

Titration, precipitation and recrystallizations were just a few of the experiments that took place as Brigham Young University opened its labs to local students on Saturday May 6, 2017 for Open Lab Day. The BYU chapter of the American Chemical Society, Y-Chem, organized the event and members of the student-run club helped elementary, middle school, and high school students participate in several different experiments targeted to each age group. Besides experiments, students got to enjoy a chemistry magic show, eat liquid nitrogen ice cream, and tour BYU's research labs. The Open Lab Day gave students who are curious about chemistry a chance to explore the science, and those already oriented with chemistry a chance to learn more.

Written by Isaac Hale

## ACS High School Awards

Many of the faculty from our department are members of the American Chemical Society. A few ACS officers of the local section of the ACS and plan outreach events like the annual high school awards banquet held on May 9, 2017. Fifty-two high school students from 18 high schools were recognized for being the top first-year and second-year chemistry students from their high schools. Many of the students' parents and teachers attended the banquet; over 130 people came. Five Y-Chem members helped with providing the attendees with a tour of chemistry labs. The awardees and their families were treated to a presentation of chemistry demonstrations. Also, an award was presented to Steven Haderlie, Central Utah high school teacher of the year. Haderlie is a former adjunct instructor at BYU and Springville High school teacher.

Written by Jeffrey Macedone/ Photo by Jeffrey Macedone

## Announcing National Chemistry Week, October 23-28, 2017

"Chemistry Rocks" is this year's theme. Activities will include chemical magical demonstrations, a hands-on-workshop especially for kids at the Provo City Library, a symposium hosted by the Department of Chemistry and Biochemistry, and a research poster session highlighting current student research. Liquid nitrogen ice cream will be sold throughout the week to the student crowd, and before and after evening "magic shows".

Free tickets will be available at <http://www.chem.byu.edu/about/chemistry-magic-shows/> on October 1, 2017.

# UNDERGRADUATE STUDENT AWARDS

*Special Thanks to the Keith P. Anderson Endowment for funding these awards*

## **Chemistry Literature Award**

CHELSEA BROADBENT

Recognizes an outstanding student in technical writing.

## **Physical Chemistry Award**

ED PIMENTEL

Recognizes an outstanding student in physical chemistry.

## **Analytical Chemistry Award**

JASON RAY

Recognizes an outstanding student in analytical chemistry.

## **Biochemistry Award**

MAX BEERS

Recognizes an outstanding student in biochemistry.

## **Freshman Chemistry Award**

PETER ROSEN,(MAJOR  
TANNER NELSON, (NON-MAJOR  
AARON CHEUNG,(NON-MAJOR(

Recognizes outstanding students in general chemistry.

## **Inorganic Chemistry Award**

MIKAELA DICKINSON

Recognizes an outstanding student in inorganic chemistry .

## **Organic Chemistry Award**

PARKER ROBINSON

Recognizes an outstanding student in organic chemistry.

## **Catalyst Club Award**

ASHLEY EATON

Recognizes an outstanding junior female student in chemistry or biochemistry.

## **Keith P. Anderson Outstanding Graduating Senior**

KRISTINE SENKANE

Recognizes an outstanding graduating senior for overall scholarship and professionalism and classroom performance. This award is named in honor of Keith P. Anderson, a physical chemist who taught at BYU for more than 35 years.

## **Eliot A. Butler Service Award**

ALEX FARNSWORTH

Recognizes a student who has provided significant service to the department. This award is named in honor of Eliot A. Butler, who was a former professor, chair, dean, and associate vice president.

## **Hypercube Scholar Award**

SAM HICKENLOOPER

Recognizes scholastic excellence in chemistry. Provided by Hypercube Inc.

## **ACS Analytical Division Undergraduate**

MERCEDE ERICKSON

## **ACS Organic Division Senior**

KYLIE LYTLE

## **ACS Inorganic Division Undergraduate**

JD SINGLETON

## **Student Research Conference First Place Winners**

WADE ELLIS	EDWARD PIMENTEL
NITISH BHARDWAJ	TSZ MING JEREMY
NATHAN WOHLGEMUTH	TSANG
KATHERINE COLLINS	MARJAN HASHEMI
CLAYTON MOSS	DANIEL POOLE
MEGAN ASPLUND	ANDREW HALTERMANN
DOO-HYUN KWON	PAUL HURST
SAMUEL HICKENLOOPER	JACOB WARREN
MASON SMITH	

## **Student Research Conference Second Place Winners**

MICHAEL BEAUCHAMP	JAMES COOMBS
DANIEL THURSTON	MIKAELA DICKINSON
PARKER SALMANS	ANKUR JALAN
JACOB NIELSEN	RICHARD CARSON
JASON CALVIN	COLLIN SANDERSON
LARRY HEKI	FERNANDO AMAYA
ZHENG ZHOU	RYNE PETERS
BRIGHTAM POPE	MICHAEL KINGHORN

*Awards provided by the Central Utah Section of American Chemical Society*

## GRADUATE STUDENT AWARDS

### Telford & Frank Woolley Memorial Research Award

ANKUR JALAN      DIANA SAAVEDRA

Recognizes outstanding students who are conducting significant research in cancer or in other health related areas. This award is named in honor of Telford Woolley, a physician who passed away prematurely due to cancer.

### Garth L. Lee Award

CHLOE ENCE

Recognizes an outstanding continuing graduate student for religious commitment, service and scholarship. This fellowship is named in honor of Professor Garth L. Lee, who was a professor of chemistry at Utah State University for many years.

### Outstanding Graduating Master's Student

JESSICA LARSEN

### Jennie R. Swensen Award

BRAD NAYLOR      SHILADITYA CHATTERJEEJ.  
SAI LUM LEE

Recognizes advanced continuing graduate students. This award is named by Dr. Albert D. Swensen in memory of his wife, Jennie Romney Swensen.

### Loren and Maurine F. Bryner Award

ANH (CHRISTINE)      ROBERT L. HANSON  
NGUYEN SORENSON      SEYED HADI NAZARI

Recognizes advanced continuing graduate students. This award is in honor of Chemistry Emeritus Professor Loren C. Bryner and Emeritus Maurine F. Bryner.

### Outstanding Graduating PhD Student

MUKUL SONKER

## GRADUATE RESEARCH FELLOWSHIPS

### Rex and Marcia A. Goates Fellowship

SHAWN AVERETT      RICHARD CARSON

Recognizes an advanced chemistry graduate student for outstanding scholarship and achievement in research. This award is named in honor of Dr. J. Rex and Marcia A. Goates. Dr. Goates served as department chair and dean of the college and was a Maeser Distinguished Faculty Lecturer. Dr. Rex Goates is the father of current faculty member Dr. Steven Goates.

### Bradshaw Organic Chemistry Fellowship

DIANA SAAVEDRA

Recognizes an advanced organic chemistry graduate student for scholarship and achievement in research. This award is named in honor of Jerald S. Bradshaw, an outstanding emeritus faculty member.

### Roland K. Robins Fellowships

ANNA V. NIELSEN      NICOLE TENSMEYER  
DOO-HYUN KWON      MICHAEL J. BEAUCHAMP  
JONATHAN LYNCH      MARJAN HASHEMI  
JUSTIN PARK      GRANT LUDLAM  
ZHENG ZHOU      MONIQUE SPEIRS

Recognizes outstanding graduate students for outstanding scholarship and promise in research. These awards were created to honor Dr. Roland K. Robins, who was world-renowned for his creativity and activity in the syntheses of new medicinal compounds.

## UNDERGRADUATE SCHOLARSHIP AWARDS

### Kenneth W. Brighton Scholarship

WENDY WILLIAMS      JACOB DAVIS

### H. Tracy Hall Scholarship

BLAKE CHRISTENSEN      ALEX FARNSWORTH  
WILLIAM BEARD      ERIN STANSEL  
CHRISTOPHER BIGGS      BLAKE SCULLIN  
,NATHAN ZUNIGA

### Boyd A. Waite Scholarship

BRIGHAM POPE

### Ida Tanner Hamblin Scholarship

RACHEL CLAY, CAMILLE JACKSON

### Byron J. Wilson Scholarship

MISAEEL LARARO TRIGO      DALTON SMITH  
JACOB AMINI

### Hiram and Permelia Dayton Scholarship

TANIA NANCE      COLTON CROWTHER

*We express our gratitude to the donors who make these scholarships, fellowships, and awards possible. Thank you for the confidence you express in the rising generation of scientists by your generous contribution.*



DEPARTMENT OF CHEMISTRY  
AND BIOCHEMISTRY  
BRIGHAM YOUNG UNIVERSITY  
C-100 BNSN  
PROVO, UT 84602-5700



# HOMECOMING EVENTS 2017

Photo by Jaren Wilkey/BYU

Mark your calendars and plan to renew your friendships in the department at our homecoming activities

## DEPARTMENT OF Chemistry & Biochemistry ACTIVITIES

### October 5th

6:00 pm RECEPTION  
6:30 pm DINNER  
7:30 pm AWARD PRESENTATION  
AND SPEAKER

## BRIGHAM YOUNG University ACTIVITIES

### October 6th

8:15 pm BYU VS. BOISE STATE

### October 7th

8:30 am PANCAKE BREAKFAST  
10:00 am PARADE

**Below is a reservation form for the Department Dinner. Please RSVP by one of the following:**

- Send to return address above
- (801) 422-4636
- [coffice@chem.byu.edu](mailto:coffice@chem.byu.edu)

or sign up at the google doc below

[https://docs.google.com/a/chem.byu.edu/forms/d/e/1FAIpQLSeaCs0C4twMO8zE9fhmARG62kqLgSw\\_J-eQjo0x5Cn5Gd00UA/viewform?c=0&w=1&includes\\_info\\_params=true](https://docs.google.com/a/chem.byu.edu/forms/d/e/1FAIpQLSeaCs0C4twMO8zE9fhmARG62kqLgSw_J-eQjo0x5Cn5Gd00UA/viewform?c=0&w=1&includes_info_params=true)

### I PLAN TO ATTEND:

Reception & Dinner  
*Thursday, October 5, 6:00 pm*

Number Attending \_\_\_\_\_

Number who are BYU Chemistry & Biochemistry  
Alumni \_\_\_\_\_

*(Please include yourself in both totals.)*

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

e-mail: \_\_\_\_\_

Contact telephone: \_\_\_\_\_

**PLEASE RSVP NO LATER THAN SEPTEMBER 15**

# CHEMIGRAM

Graphic Designer: Yao Kuang Lee / Editor: Taelin Wilford

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