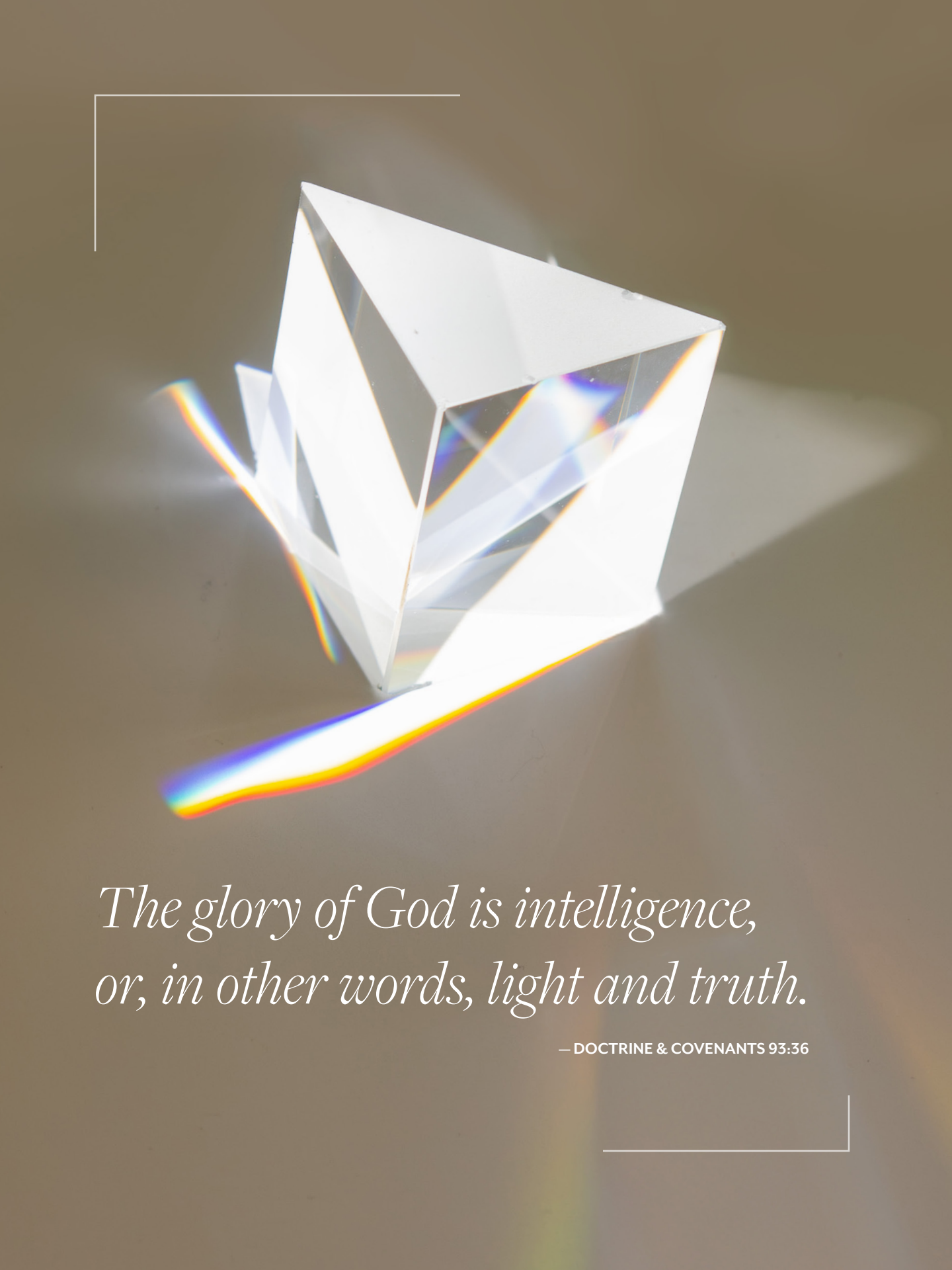
CHEMIGRAM

BYU DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY 2026



GIFTS OF LIGHT

BYU 150

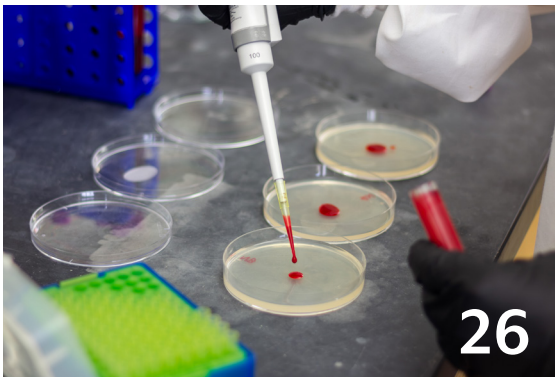


The glory of God is intelligence, or, in other words, light and truth.

— DOCTRINE & COVENANTS 93:36







CONTENTS

// 2025-2026

HIGHLIGHTS

03 150 Highlights
Celebrating BYU 150 in the Department of Chemistry and Biochemistry

08 Legacies of Light
Spiritual and academic light is impacting the world

16 Department News
Highlighting this year's lab research and events in the department

26 Student Focus
How our amazing students have shared their light this year

34 Faculty and Staff
Meet the new faces in our department and celebrate our faculty's achievements

36 Alumni Updates
Our alumni are continuing to spread their light

BEHIND THE PAGES

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Letter From the Chair

BY DR. JARON HANSEN



As we celebrate Brigham Young University's 150th anniversary, this edition of the Chemigram provides a wonderful opportunity to reflect on where we have been and, even more importantly, where we are going. Throughout BYU's history, our purpose has remained remarkably consistent: to help students gain knowledge, develop their God-given capacities, and use those gifts to bless others.

One of the great strengths of our department is the breadth and quality of experiential learning available to our students. Chemistry and biochemistry simply cannot be learned fully from a textbook or lecture. Students become scientists by doing science—asking questions whose answers are not yet known, designing experiments, learning from failure, and working alongside experienced mentors.

An increasingly important partner in this effort is our Chemistry and Biochemistry External Advisory Board. Their perspective helps us think carefully about how we prepare students not simply for their next class, but also for graduate school and beyond.

That same spirit of alumni engagement was evident at our Career Connections event, where eleven alumni and other visitors met personally with students to answer questions and share lessons from their careers (p. 6). We welcome alumni who are interested in mentoring our students to participate in this new annual event. Please feel free to reach out to me if you would like to participate. Students repeatedly described how valuable it was to receive counsel from people already doing the work they hope one day to do.

We are deeply grateful for the faculty and staff who mentor our students, for alumni and friends who open doors and share their experience, and especially for the students who bring energy and purpose to the Benson Building each day. As you read this Chemigram, I hope you will see more than a collection of accomplishments. I hope you will see people learning to use their gifts in ways that bring both intellectual and spiritual light to others.

That is a legacy worth celebrating—and a future worth building together.

Jaron Hansen

Jaron Hansen
Chair, Department of Chemistry and Biochemistry



Visit the 150-themed display near the west entrance of the Benson Building!



Celebrating 150 Years!

BY EMILY POMEROY

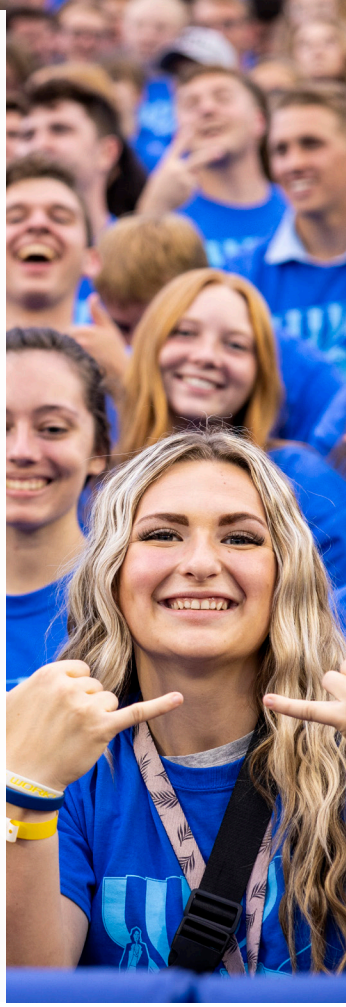


Photo courtesy of BYU Photo

In 2025, Brigham Young University celebrated its 150th year. BYU has been amplifying truth and knowledge by nurturing the divine light in... students who then share the light of Jesus Christ with the world.[1] To celebrate, the university held service projects, opened a time capsule from 1976, and hosted "nights of light" events, with the culminating event featuring a hot air balloon show, live entertainment, and fireworks.

The Chemistry department has been with BYU since the school was just an academy, with Principal Maeser teaching its first chemistry course in 1879. The academy quickly added more chemistry courses and was brought into the College of Arts and Sciences in 1921. In 1995, the department was renamed the Department of Chemistry and Biochemistry and moved to the Ezra Taft Benson building, where it is housed today. Currently, there are nearly 500 declared undergraduate majors in the Chemistry and Biochemistry department.

To commemorate BYU in its 150th year, the department unveiled a 150 display in the Benson building. This display depicts a timeline of major events that occurred in the department, such as when the first female chemistry professor was hired or the organization of the Simmons Center for Cancer Research.

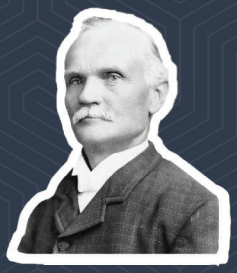
The Chemistry and Biochemistry Department is honored to be part of BYU. Through experiments, research, and mentorship, both students and professors have gained both academic and spiritual knowledge. They have received "gifts of light" through their efforts and are now sharing these gifts across the globe. Thank you to all students, current and former, who have shaped BYU into the university it is today.

1. BYU 150, https://150.byu.edu

Learn more about the history of the BYU chemistry department! Scan the QR code or visit **chemat150.byu.edu**

Timeline

Learn about the history behinnd the BYU Chemistry and Biochemistry Department!



1879

FIRST CHEMISTRY COURSE TAUGHT

Principal Karl G. Maeser taught the first chemistry course at BYA.



1875

BRIGHAM YOUNG ACADEMY IS ESTABLISHED

Brigham Young Academy (BYA) was founded officially as a high school on October 16, 1875.



1903

FIRST FORMALLY TRAINED CHEMISTRY PROFESSOR

Charles E. Maw, who graduated BYA in 1897, was hired to teach chemistry. He was the first professor at BYA to have a bachelor's in chemistry.

1903

BYA BECOMES BYU

On November 16th, the Board of Trustees renamed Brigham Young Academy to Brigham Young University, encouraging more diversity in course offerings and faculty.

1921

CHEMISTRY DEPARTMENT BECOMES PART OF THE COLLLEGE OF ARTS AND SCIENCES

This change offered chemistry students the chance to work within specialized learning spaces rather than being scattered generally on campus.

1922

BYU OFFERS MASTER DEGREES IN CHEMISTRY



1939

CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS FORMALLY

Although BYA and BYU were associated with and created by Church members and leaders, the Church's first official funding of the institution did not occur until 1939.



1946

JOSEPH NICHOLES BECOMES CHEMISTRY DEPARTMENT

Dr. Nicholes was the second chair of the department, replacing Dr. Maw.

1947

SIGNIFICANT INCREASE IN CHEMISTRY FACULTY

BYU was able to hire three full-time chemistry faculty in one year, the first additions to the department in over a decade. There were only five faculty in the department before this point: four doctorates, and one professor.

1954

CHEMISTRY DEPARTMENT TRANSFERRED TO THE COLLEGE OF PHYSICAL AND ENGINEERING SCIENCES

1955

DEPARTMENT CHAIR CALLED TO THREE-YEAR TERM

Before 1955, the department chair was an indefinite position. Dr. Maw served for forty-three years, and Dr. Nicholes served for nine.

1950

EYERING SCIENCE CENTER IS COMPLETED

The Eyring Science Center was able to house the Chemistry Department.





2022

CHEMISTRY AND BIOCHEMISTRY EXTERNAL ADVISORY BOARD CREATED

The Board brings together Chemistry and Biochemistry alumnus from their current fields of academia, healthcare, and industry to give the department feedback, plan for future programs, and provide support.

2018

WOMEN IN CHEM CLUB ESTABLISHED

The Chemistry and Biochemistry's Women in Chemistry Club (WIC) began in 2018 as a place to support and inspire undergraduate and graduate scientists.

2001

FIRST ALUMNI EVENT HELD AT HOMECOMING

1998

BIOCHEMISTRY ADDED AS REQUIREMENT FOR CHEMISTRY DEGREE

1997

SIMMONS CENTER FOR CANCER RESEARCH

The SCCR is the department's cancer research facility.



2013

AMERICAN SAMOA RHEUMATIC RELIEF PROGRAM FOUNDED

In 2013, the program was officially organized, and in 2016, the program joined with BYU's Chemistry and Biochemistry department, bringing faculty and students to research rheumatic heart disease in Samoa.



1997

BYU ALUMNUS WON NOBEL PRIZE IN CHEMISTRY

Paul D. Boyer, a department alumnus, won a Nobel prize in Chemistry.

1995

EZRA TAFT BENSON BUILDING DEDICATED

The Department of Chemistry and Biochemistry moved to the Ezra Taft Benson Building.



1995

CHEMISTRY DEPARTMENT RENAMED TO DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

1982

FIRST FEMALE CHEMISTRY PROFESSOR HIRED

Dr. Juliana Boerio-Goates was hired as BYU's first female chemistry professor. She was named the Karl G. Maeser Distinguished Faculty Lecturer, BYU's most prestigious faculty honor, in 2005.

1956

FIRST BYU CHEMISTRY STOCKROOM ESTABLISHED

Richard L. Meibos developed BYU's first chemical stores and instrument shops, aiding academic and research programs.



1958

CHEMICAL ENGINEERING BECOMES ITS OWN DEPARTMENT

The Chemical Engineering program split off from the Chemistry Department.

1975

MAJOR CHANGE IN HANDLING FEDERAL RESEARCH FUNDS AT BYU

Leo P. Vernon, Assistant Academic Vice President, made major changes in guidelines for handling federal research funds at BYU. Because of these changes, external funds increased from ~$2 million to almost $6 million per year.

1961

CHEMISTRY DEPARTMENT AWARDS FIRST PHDS



Career Connections

Inspiring and connecting students and mentors

WRITTEN BY EMILY POMEROY



Last February, the Department of Chemistry and Biochemistry hosted its second annual Career Connections event. As part of the event, 11 alumni and visitors came to BYU to speak with students. These included:

- David Chamberlain: Health
- Nick Chartrand: Resident, UC Davis
- John Fjeldsted: Analytical Chemistry Technology
- Hernan Fuentes: Senior Director of Analytical Development
- Naomi Handly: VP of Platform, Octant, Inc.
- Spencer Jones: Associate Vice President, Eli Lilly and Company
- Philip Low: Drug Research & Development, Purdue University
- Tom Lowery: Chief Executive Officer, Satellite Bio
- Ryan Marshall: Intellectual Property Prosecutor
- Jared Rutter: Professor of Biochemistry, University of Utah
- Susan Ward: Dean of Faculty Development, BYU-Idaho

Students had the opportunity to visit with these alumni and ask them questions about their careers. One graduate student, Samantha Hatfield, expressed that, "It is so valuable as a graduate student to hear from people who are doing what you want to do in the future." She especially enjoyed speaking with Spencer Jones and hearing about his career journey.

Other students enjoyed receiving expert advice. Another student, Landon Parker, recalled how much he loved that he "could ask [alumni] questions that [he's] worried about and was able to get advice from people who are now experts in their own fields."

Students even found spiritual connections from this experience. Russell Mercer recalled that, "There were several things said [at the event] that felt inspired by the Spirit," which helped him feel more guidance about how he should proceed with future career plans.

"I COULD ASK ALUMNI QUESTIONS THAT I WAS WORRIED ABOUT AND GET ADVICE FROM PEOPLE WHO ARE NOW EXPERTS IN THEIR OWN FIELDS"

Thank you to all the alumni who attended the event and spoke with students. We appreciate the time and effort it took to attend the event and share your insights. Thank you also to all students and staff who attended and assisted with the event. We couldn't have done it without you!



Homecoming Highlight

BY EMILY POMEROY



The Department of Chemistry and Biochemistry celebrated BYU's Sesquicentennial year by bringing a newer, updated homecoming to students and alumni in 2025. Last year's free event featured a magic show, slime making, rocket building, and a scavenger hunt. J-Dawgs and a potato bar were served at the event.

The Star Wars-themed magic show featured liquid nitrogen, balloon animals, and color-changing substances. Tricks were performed by undergraduate student Colton Dixon (see page 27 for an in-depth interview with Colton). One student who attended the event, Mikalia Worthen, noted that "slime making was a huge hit; all of the kids loved creating their own personal slime and playing with it for the rest of the night."

A scavenger hunt allowed alumni families to take a tour through the Benson building, visiting different labs and pieces of equipment along the way. Visitors learned about the atomic structure of molecules in the NMR facility, molecular mass and fragmentation patterns at the Mass Spectrometry facility, separating molecules at the Spectroscopy lab, and the 3D atomic structure of solid materials at the XRD facility. After looking into each lab, small gifts including stickers, magnets, flashlights, and candy were given to visitors as a memento of their visit.

Mikalia recalled, "My husband and I loved walking around and seeing all the different rooms! We learned a lot about what goes on in each of the labs. It was really fun to get all of the trinkets and stickers too."

Thank you to the faculty and staff who planned and prepared to make this event possible, and to all who attended homecoming. We can't wait to see you again in October!

Above: Volunteers from the Women in Chem club prepare nitrogen ice cream served at the homecoming event.

Join us for this year's Homecoming event!

THURSDAY, OCTOBER, 8, 2026

5:00 pm | Registration and start time for dinner and activities

ACTIVITIES:

Alka seltzer rockets, volcanoes and magic shows

Food will be provided by J-Dawgs and BYU Food-to-Go. Nitrogen ice cream will also be served.



BUILDING *Legacies* OF LIGHT

BYU students and alumni are using spiritual and academic light to impact the world

WRITTEN BY EMILY POMEROY

Photo courtesy of BYU photo

BUILDING LEGACIES OF LIGHT

BYU students and alumni are using spiritual and academic light to impact the world

WRITTEN BY EMILY POMEROY

"And God said, Let there be light: and there was light."[1]

Our world began with light. It was the first command in Genesis that our Heavenly Father gave, and light has been with the earth ever since.

Light has been abundant in the Department of Chemistry and Biochemistry for the past 150 years, from the expansion of chemistry courses offered on campus to the wide variety of labs and projects occurring, which are seeking to cure a variety of illnesses for the benefit of the world. Today, there are about 500 undergraduate students who are either a major or minor in chemistry or biochemistry programs. That means there are 500 people who can share their knowledge, love, and light with the world by using what they learned in chemistry.

Light comes in many forms. It can be manipulated, broken, or combined. It can bring warmth, omit darkness, and come in a wide spectrum of color. Most importantly, light can grow to have an incredible impact on those in its reach. As humans, we survive because of the light and warmth that the sun brings. As people living in the 21st century, we use light to read, to write, and to use technology. As students, alumni, and disciples of Christ, we can use light both academically and spiritually. These "gifts of light" then bring small moments of joy to those who surround us.

LIGHT DISPELS DARKNESS

Light has a powerful effect on its environment. As Elder Robert D. Hales observed, "Light and darkness cannot occupy the same space at the same time. Light dispels darkness. When light is present, darkness is vanquished and must depart. More importantly, darkness cannot conquer light unless the light is diminished or departs."[2] Therefore, the more light we have, the less darkness that is present. When darker moments come, we can turn to light. This can come through friends, family, the words of the Savior, religious leaders, or even personal revelation.

This revelation can occur as a light is "turned on in a dark room," Elder David A. Bednar explained. He continued, "very suddenly, the darkness is expelled, and you can see everything in the room quite clearly and brilliantly." Speaking of a second type of light, Elder Bednar stated, "when light comes gradually… like the rising of the sun, you can discern the increase of light on the horizon but never all at once."[3] These patterns of light may take different amounts of time to enter in their fullness, but they both have the same result: dismissing darkness and inviting light.

This light can come as revelation to students, professors, and alumni alike. The scriptures



Courtesy of BYU Photo



A CMY color cube combines light to create a variety of colors

state that "the glory of God is intelligence."[4] This intelligence can be seen in the work of chemists, doctors, researchers, and professors. God cares about the work being done by those in the Chemistry department and its graduates across the world. They can receive revelation instantly, like turning on a light switch, or more slowly, such as a sunrise. Regardless of the way revelation comes, answers can come for questions of any kind. As President Henry B. Eyring taught, as we "wait upon the Lord,"[5] blessings and insights will come.

COLOR CREATES VARIETY

Light can come in a wide range of colors, from the amber glow of a hearth to the bright green hues produced by chemical reactions. Color can be both a thing of beauty and a signal of light's presence. Chemicals come in a wide variety of colors, and burning an element will allow one to know what element is present. Additionally, natural flame colors indicate heat levels in the fire. A blue fire will be much warmer than an orange one, for example.

In addition to color variation from fires, prisms display light and color through refraction. "Short-wavelength visible light, such as blue light, may be refracted at a greater angle than long-wavelength visible light, such as red. As a result, light passing through a prism ends up sorted by wavelength. This produces a rainbow-like effect wherein the colors that comprise visible light are separated by their differing wavelengths."[6] These wavelengths pass through the prism and are separated to create something unique and beautiful.

Like the spectrum of colors seen through fires or light passing through a prism, the Chemistry department is full of individuals with unique talents.

"LIGHT AND DARKNESS CANNOT OCCUPY THE SAME SPACE AT THE SAME TIME. WHEN LIGHT IS PRESENT, DARKNESS IS VANQUISHED AND MUST DEPART."



They teach a variety of courses in the department, reflecting their differing backgrounds, and their classes are full of students who come from a wide range of experiences. When time is taken to get to know people with different rays of light, collaboration can be found, and greater insights can be shared. As President Jeffrey R. Holland has taught: "It is by divine design that not all the voices in God's choir are the same. It takes variety—sopranos and altos, baritones and basses—to make rich music."[7] Whether thinking about music or light, we can gain depth in our understanding as we embrace unique thoughts and perspectives.

IMPACT

All of us are born with the Light of Christ, regardless of religious affiliation or activity. It helps us know right from wrong, do good, and serve others. The Light of Christ "proceedeth forth from the presence of God to fill the immensity of space." It is "the light which is in all things, which giveth life to all things, which is the law by which all things are governed."[8]

Check out a series of light-based chemical demonstrations as performed by Dr. Macedone!

When we use the Light of Christ to uplift the world in which we live, we can have an incredible impact on others. A student can help another with a difficult chemistry equation. A professor can extend an arm of mercy to a student going through a difficult time. An alumnus can be ethical in their professional work. When this light is seen, it can be shared with others, which will create a broader impact on the world. As the Savior declared, "Neither do men light a candle, and put it under a bushel, but on a candlestick; and it giveth light unto all that are in the house."[9]

BEING A BUILDER OF LIGHT IS NOT A PASSIVE ACT. IT REQUIRES BOTH WORK AND FAITH.

Chemists can take this instruction from the Savior and produce reactions that magnify light. For example, "Ignition of iron oxide and aluminum powder with a magnesium strip causes a violent reaction that produces molten iron."[10] This explosive reaction far surpasses the light of an individual element. This light is more noticeable and brilliant. It draws attention.

When spiritual light is combined with academic shine, results can be just as incredible. One professor in the department recalled that while serving in the temple, he received revelation for an experiment he had been working on. Looking beyond personal revelation, students and instructors traveled across the world to provide humanitarian service to children in need, using the skills they learned through chemistry courses. This light was brought by many students to even more children, magnifying light across the globe.

As Brigham Young University looks to its upcoming years, decades, and beyond, the legacy of sharing light will be vast. Disciples of all ages can share their own light and knowledge through testimony, or engage in academic pursuits that enlighten the lives of those around them. Whether through the more subtle inner light of living the gospel of Jesus Christ or the more volatile reactions of chemical experiments, light may be seen and shared.

Being a builder of light is not a passive act. It requires work and faith, but the rewards can be immense. Becoming a legacy of light needs us to look at the life we have built and the mark we want to leave. As we all do our best to learn, love, and uplift, we can truly become the BYU motto of "Enter to Learn, Go Forth to Serve".

SOURCES:

1. "Genesis 1:3." King James Version. 2. Hales, Robert D. "Out of Darkness into His Marvelous Light." General Conference, April 2002. The Church of Jesus Christ of Latter-day Saints. https://www.churchofjesuschrist.org/study/general-conference/2002/04/out-of-darkness-into-his-marvelous-light?lang=eng 3. Bednar, David A. "Light of Christ." Church of Jesus Christ of Latter-day Saints. Gospel Topics. https://www.churchofjesuschrist.org/study/manual/gospel-topics/light-of-christ?lang=eng. 4. Doctrine and Covenants 93:36. 5. Eyring, Henry B. "Waiting Upon the Lord." BYU Speeches. October 1, 2002. https://speeches.byu.edu/talks/henry-b-eyring/waiting-upon-lord/. 6. EBSCO. "Prisms." Research Starters. https://www.ebsco.com/research-starters/science/prisms. 7. Holland, Jeffrey R. "Songs Sung and Unsung." General Conference, April 2017. The Church of Jesus Christ of Latter-day Saints. 8. "In a Word: Light of Christ." New Era, December 2007, 37. The Church of Jesus Christ of Latter-day Saints. 9. "Matthew 5:15." King James Version. 10. Macedone, Jeffrey H. "Light and Inspiration." YouTube video. https://www.youtube.com/watch?v=MYMj4aAlvgA.



Lab Highlights

WHEN DR. PAMELA VAN RY WAS RAISING HER CHILDREN, *she rekindled a passion for scientific discovery from family diagnoses in pulmonary fibrosis. Now, she runs a lab dedicated to developing medication for pulmonary fibrosis, lung cancer, and muscular dystrophy. Through trusting in the Lord, she has created a lab where she can learn more about these diseases and mentor students. Learn more about Dr. Van Ry and her story on page 20.*



Illuminating Organic Synthesis

Dr. Castle uses light and organic synthesis to inspire future generations

WRITTEN BY EMILY POMEROY

Dr. Steven Castle was first introduced to chemistry by his grandfather. Over the summers in Tampa, Florida, he would work at his grandfather's lab as a summer research assistant. This is where the young Dr. Castle was introduced to his future course of study, organic synthesis.

Castle went on to receive a Bachelor's degree at BYU (class of '95), a PhD at The Scripps Research Institute (class of '00), and was a postdoctoral fellow at UC Irvine ('00-'02). Through it all, he continued to be involved with organic synthesis, which involves the creation of newer, complex molecules. Castle's research looks at synthesizing existing molecules in nature.

"These molecules could be produced by a variety of types of organisms, bacteria, fungi, plants, and marine organisms like sponges," the professor explained. "A marine sponge lives in a predator-rich environment. So, if it's going to survive, it has to produce molecules that would be toxic to its predators. Many of these molecules are also toxic to other things, such as cancer cells. So, we worked on the synthesis of a natural product from a marine sponge that was a potent anti-cancer agent. But that's not what it was designed for in nature."



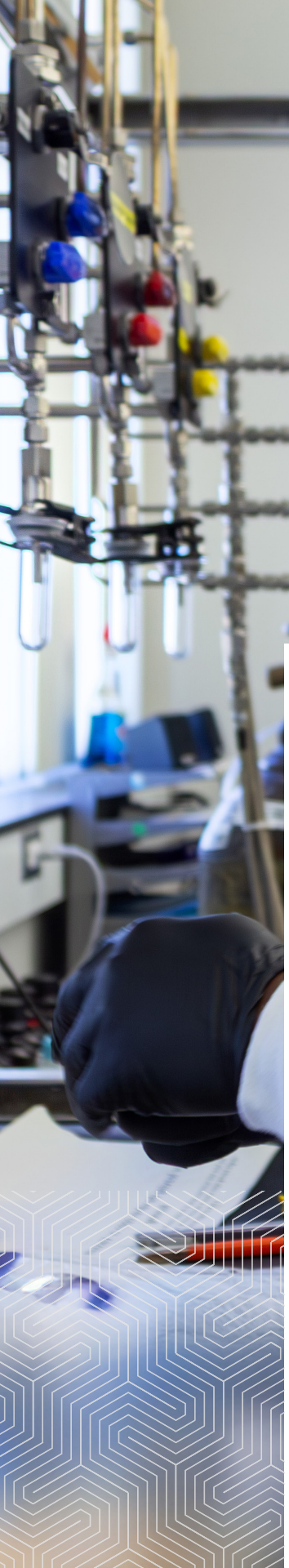
He continued, "So it may not have the ideal structure to be an anti-cancer agent.

So, if we can synthesize the natural product first, then we can make modifications to our synthetic route and synthesize analogs of the natural product. That could either teach us something about which structural features of the molecule are important for the activity that we're interested in or make it better for what we want to use it for."

This research has resulted in collaboration with pharmaceutical companies to test these anti-cancer compounds. The potential impacts of this work are enormous. As new compounds are made, new research is released. Then, other researchers can use the work to make their own discoveries and continue to improve the world.

Castle's work has provided many opportunities for his students. Organic synthesis can be complex work, so students





learn skills in problem solving and planning. Labs can produce unexpected results, which require students to rethink, replan, and consider a different approach. Castle emphasized that this type of thinking can be especially useful for those either pursuing or currently in PhD programs, as these programs often involve critically examining research.

Light itself has been a gift in Castle's research. He shared that "people have figured out how to harness light and its power more selectively for certain molecules that absorb certain wavelengths of light." He continued to explain that light can "transmit energy to the molecules in your reaction mixture in a more selective way."

Castle has seen spiritual correlations with his work and light. In his academic work, he has seen light as having a "wave-particle duality", thinking of light as either a wave or a particle. Relating to a more religious context, Castle compared this way of thinking to thinking of light as having a physical or spiritual form. Light can have many practical uses: it helps people to see, it gives energy, and it can be manipulated through other objects. Spiritually, however, the light of Christ can bring a warmth and a joy to life that cannot be seen with the human eye. It can bring people closer to their Heavenly Father.

Castle hopes that "students who are working on the projects can kind of see the spiritual significance of working with light and trying to share the light of BYU and by extension the light of the gospel with the world."

Learn more about the Castle Lab! Scan the QR code to visit their website.

A Look Into the Laser Lab

How Jeremy Johnson's lab group is lighting the way

WRITTEN BY EMILY POMEROY

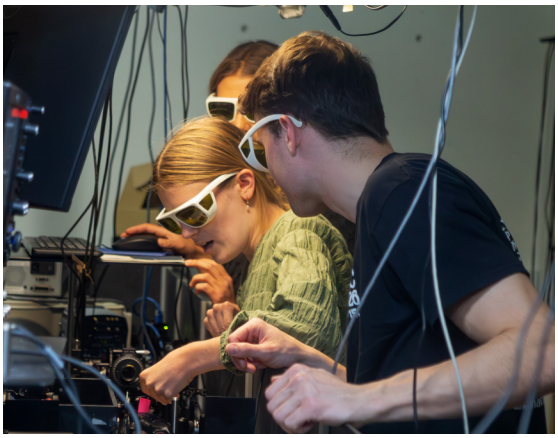
Jeremy Johnson has always been fascinated with light.

As a young boy, he would peer out of his large living room windows, his attention captured by the bright rays streaming in all directions. This fascination would later become the focus of his research.

A BYU Chemistry department alumnus (class of '06), Johnson went on to get a PhD at the Massachusetts Institute of Technology (MIT '11), and completed his postdoctoral work in Switzerland at Paul Scherrer Institute. After his schooling, Johnson returned to BYU in 2015 and began teaching. His research at BYU has led him to study matter with terahertz (THz) frequency light.

Terahertz light lies between infrared and microwaves on the electromagnetic spectrum. Johnson's lab uses pulses of THz light in ultrafast spectroscopy to study, characterize, and control material properties on trillionth-of-a-second time scales. Research focuses include:

1. **TERAHERTZ GENERATION.** Data science and computational techniques are used, in tandem with synthesis in the David Michaelis lab, to develop new organic materials for THz generation in the search for new ways to create high-field, broadband THz light.
2. **NONLINEAR SPECTROSCOPY.** The lab explores the nonlinear THz excitation of collective vibrational, electronic, and spin degrees of freedom in solids using 2D THz spectroscopy to understand the interplay between fundamental excitations. Such experiments are laying the foundation for the development of extremely fast switches that will be central to future high-speed electronic devices.
3. **HYPERSPECTRAL IMAGING.** The lab is developing improved THz hyperspectral imaging techniques to differentiate components in complex heterogeneous materials



Johnson's research aims to adjust the structure and control the properties of different materials using THz light. He is currently researching the chiral motions of atoms, which can influence magnetic properties in materials. Students in his lab are demonstrating that shining THz light on non-magnetic materials, in the right way, makes them temporarily magnetic.

This research to control material properties with light has potential to create high-speed computing applications. The lab looks to adjust the properties of something as rudimentary as the zeros and ones that make up your computer chip and switch them at a much faster rate, which could lead to computer components that are "millions of times faster than current computer technology."

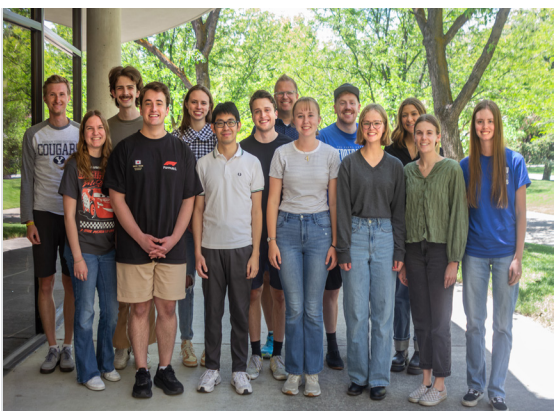
Johnson's contributions extend far beyond his own laboratory. In collaboration with Dr. David Michaelis, he has developed materials that facilitate the generation and measurement of Terahertz light.

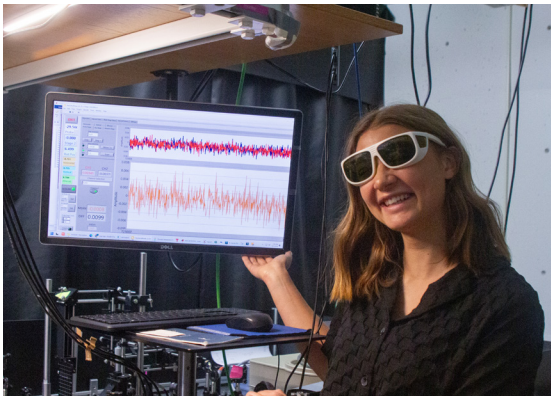
These experimental techniques and materials have been adopted by over 100 research laboratories globally.

Most importantly, through this work at BYU, Johnson has worked with many phenomenal students. Undergraduate and PhD students have been mentored in their lab work, developing knowledge and skills that can be applied to future scientific research, careers, and other opportunities beyond the classroom. Johnson stated that "there are so many opportunities for personal growth; I love thinking about how the students are developing skills that don't just benefit them, but others as well."

Thinking of his students, Johnson shared that he has seen "their eyes open up as they realize 'oh, I could do this as a career.'" He has had many students who were not considering Chemistry long term at the start of their schooling now in prestigious doctoral programs around the country, as well as graduated PhD students making wonderful contributions in a variety of careers.

Johnson's desire to share light extends beyond the intellectual and into the spiritual. He encourages all of his lab students to set goals, and recently, a spiritual goal has been added to the mix. Many students make these spiritual goals, and Johnson follows up every couple of months on how their goals are going. One lab student in particular "was likening some of the research. . . she was working on in the lab to different gospel principles, then sharing that with her family." Her connection to intellectual and spiritual light had a wider reach when she shared these insights with her family members, exemplifying the scripture that "the glory of God is intelligence." [1]





"I LOVE THINKING ABOUT HOW THE STUDENTS ARE DEVELOPING SKILLS THAT DON'T JUST BENEFIT THEM, BUT OTHERS AS WELL"

Working with students, he often has the opportunity "to see a light com[e] on in their eyes spiritually." Light has penetrated many aspects of Johnson's work, providing an intersection between rigorous scientific exploration and faith. Ultimately, the effort to share both scientific and spiritual light creates a foundation that reaches far beyond the walls of the Benson Building, blessing the lives of the students and everyone they interact with in the future.

1. D&C 93:36

Check out the Johnson Lab's site to learn more about their research!

Guided by Light

Dr. Pamela Van Ry's lab advances the search for new pulmonary fibrosis treatments

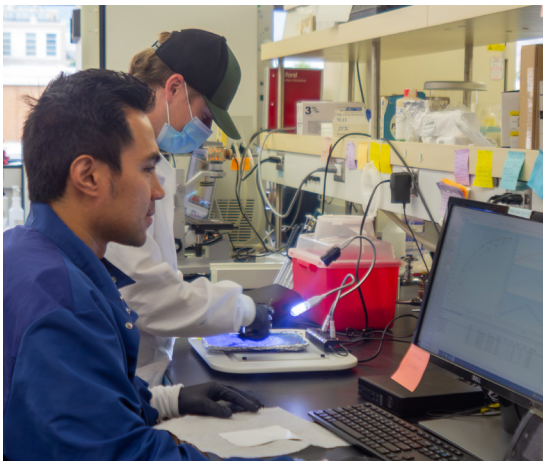
WRITTEN BY EMILY POMEROY

"I went into pulmonary fibrosis because my family has pulmonary fibrosis."

This was how Dr. Pamela Van Ry became interested in her field. After earning an undergraduate degree in chemistry, Van Ry taught high school chemistry and math while raising her children. Years later, when her mother was diagnosed with pulmonary fibrosis, she began to notice a pattern in her family's medical history. She recalled, "My uncle at the same time was seriously ill with idiopathic pulmonary fibrosis (IPF), and my grandfather died of pulmonary fibrosis when my mom was eight. I kept thinking, 'This is not making any sense. This surely has to be a genetic problem.' All the doctors that we saw kept saying, 'No, it can't be a genetic problem. It's very, very rare.'"

After these diagnoses, Van Ry traveled with her mother to the University of Washington to meet with a world-renowned pulmonary fibrosis specialist. She recalled, "When we were talking to him, [he] said, 'You should go back and get your degree, and you should do research on this.'" This line of thinking helped Van Ry to think about receiving higher education. Continuing, Van Ry stated, "I went back to school, getting my degree in Cellular and Molecular Pharmacology and Physiology, and now I work with my mother's physician." This path led her to research two different drugs for pulmonary fibrosis.





Establishing a research program was not always easy, but Pam felt influence from the Savior as she pursued her goals, especially in creating connections with others. Pam remembered, "I wasn't sure how I was going to continue doing pulmonary fibrosis research because I didn't have funding [or many] connections in Utah." With these challenges, however, she continued networking and seeking the funding she needed. Oftentimes she felt "the Lord shine his light and go, 'Hey, Pam, it's this way.'" These small spiritual moments allowed her to meet people who have strengthened her research and connected her with others in her field.

Today, Van Ry's lab studies pulmonary fibrosis, lung cancer, and muscular dystrophy. Her group investigates both the origins and mechanisms of



disease while also evaluating potential small-molecule and protein-based therapies. In its pulmonary fibrosis work, the lab uses mouse models, CT imaging, lung histology, and lung function analysis to evaluate disease progression and treatment response. Her team has also been studying a drug candidate that it hopes will continue progressing toward FDA approval, while related work explores protein therapy for muscular dystrophy.

Leading her lab has given Van Ry a place to help students develop as scientists. She has great respect for her students, stating that “they're extraordinary in not only their motivation, but their willingness to work hard.” She also values the structure of labs and classes, stating, “I love that they can come here, take their classes, and get some work experience that will help them on their way to their next goal.”

Van Ry also appreciates seeing growth among both undergraduate and graduate students. She emphasized, “To be able to see [students] grow both as undergrads and graduate students, it's amazing to see them add to their field in whatever way that they can, steadily building on the knowledge that they started with when they first got here.”

Van Ry has seen student connection to the sesquicentennial celebration held by BYU this year, stating, "When I think about the 150-year symbol of the sun, [with] beams going out, I feel like the students are BYU’s beams... it's students going outward and sharing and making that sunshine go further and further away from where we are."

Scan the QR code to learn more about the VanRy Lab!

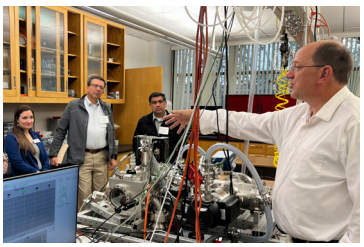
NAWCWD Visit

The Naval Air Warfare Center Weapons Division opens a door to new opportunities

WRITTEN BY EMILY POMEROY



"IT WAS CLEAR THAT STUDENTS WERE SEEING REAL POSSIBILITIES"





The Department of Chemistry and Biochemistry was honored to host the Naval Air Warfare Center Weapons Division (NAWCWD) on April 2, 2026. Naval Officers spent the day in interviews with faculty, receiving individual lab tours, visiting the Engineering Capstone Fair and poster session, having lunch with students, joining a poster session hosted by faculty and students, and participating in back-to-back NAWCWD presentations to faculty and students

Dr. Christine Ackroyd, who helped to organize the event, said, "I think that pursuing a career in defense research isn't always one of the choices students think about. However, it was clear from the active conversations we observed between students and NAWCWD representatives [that] students were seeing real possibilities."

The NAWCWD brought several subject matter experts to the event, including:

- Chief Technology Officer: Felipe Jauregui
- Director of University Engagement: Dr. Patrick W. Fedick
- Head of Advanced Capabilities Division: Dr.John W. Jensen
- Director of Research Department: Dr. Philip Peters
- Deputy Director for Energetics: Dr. Ephraim B. Washburn
- Cooperative Research and Development Agreement Manager: Phoebe Blowers

Collaboration between NAWCWD and BYU students went very well. Dr. Ackroyd expressed, "During the Capstone Fair, multiple [NAWCWD] team members told me that they had already asked themselves, 'How did we not know all this great work was happening at BYU?' Later in the day, the team expressed to faculty that they had been so impressed with the BYU students that they would love to have BYU students on their research teams."

Dr. Ackroyd continued,"Prior to the NAWCWD visit, our team wasn't familiar with the many internship and scholarship opportunities available from the military." Due to this new positive partnership, the "NAWCWD has now set up an Educational Partnership Agreement with BYU that will allow them to fund collaborations" and bring internships to BYU students.

Rossiter Lecture

Erin Baker sheds light on chemical exposure and human health

WRITTEN BY EMILY POMEROY



On Thursday, February 5, and Friday, February 6, the Chemistry and Biochemistry department was honored to host Professor Erin S. Baker from the University of North Carolina at Chapel Hill. She has published over 200 papers studying environmental and biological systems. Dr. Baker's research group uses advanced separations and software capabilities to examine the effects of chemical exposure on human health.

Dr. Baker gave two lectures to BYU students and faculty, including "You are What you Breathe and Eat: Linking Chemical Exposure and Molecular Responses" and "Living in a Chemical World: How It Affects Your Health."

When attending the lectures, one graduate research assistant, Madelyn Wahlen, stated that "it's really important to see chemists and the work that they do."

Baker's first presentation focused on anthropogenic (human-caused) chemical pollution. This pollution type can pose a large threat to both human health and the environment. Baker believes there is a need to conduct more thorough studies of chemical exposure. Doing so can heighten global awareness about the risks posed by chemical usage, dispersal, and disposal.

With this concern, the second lecture dove into how analytical chemistry is being utilized to find new chemicals that may be harmful to both humans and the environment. The lecture also discussed a push for more intelligent chemical use and disposal across the world.

In addition to giving the Rossiter lecture, Dr. Baker also had lunch with members of the Women in Chem club. Recalling the experience, Madelyn mentioned, "Getting to know people who have done great work in chemistry on a personal level helps you to think that [pursuing chemistry is] more attainable for yourself."

Visit us next March 15-16, 2027, for our next Rossiter lecture with Professor Conner Coley from MIT. Dr. Coley is a Class of 1957 Career Development Professor and an Associate Professor of Chemical Engineering, Electrical Engineering and Computer Science.

These lectures were given in honor of Professor Bryant E. Rossiter, a faculty member in the BYU Department of Chemistry and Biochemistry from 1985 to 1995. We thank the Rossiters for their generous donation in making this lecture possible.



Above: Erin Baker and the Women in Chem club smile for a picture.



Student Spotlight

STUDENTS IN THE CHEMISTRY AND BIOCHEMISTRY *Department have many amazing opportunities to research with professors. This year, we chose to highlight three exceptional undergraduate research assistants in the department: John Breinholt, Colton Dixon, and Natalie Parkinson. All three of these students have done research in a variety of areas, including discovering research to assist sepsis patients, engaging in pharmaceutical research, or measuring heat in technologically important materials. Keep reading to learn more about each of these students.*



John Breinholt

Saving lives by shortening sepsis testing times

WRITTEN BY EMILY POMEROY



"The hospital felt like the temple to me."

That's how John knew he wanted to become an open-heart surgeon. After serving a two-year mission for the Church of Jesus Christ of Latter-Day Saints, John felt that he would have a clear prompting for what career path he should pursue. Seeking direction, he shadowed his father, who is an interventional pediatric cardiologist. He soon after felt a spiritual connection to the hospital, and knew this was the career path he should pursue.

John is not a 9-to-5 job kind of person; he loves dramatic science. He works in Dr. Roger Harrison's lab, overseeing their current project, where they use magnetic nanoparticles to capture bacteria. The lab's goal is to help sepsis patients receive care more quickly.

"Our goal is to capture bacteria from blood. The reason that's important is if you go to a hospital right now with sepsis or a blood infection, [doctors] have to wait multiple days before they can figure out exactly what you're infected with. They will start general antibiotics immediately, but won't know what specific antibiotic to use until the bacterial strain is identified. So, [technicians] take your blood, culture it on a plate, and let it sit overnight, sometimes multiple days."John explained.

Continuing on, he shared that, "the issue with this method is if you need immediate care, [doctors] can't give you a specific antibiotic until they know what you have. So people die."

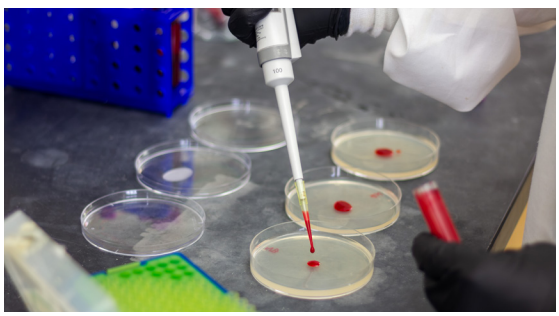
Harrison's lab is looking to make bacterial testing as short as 30 minutes. Hundreds of thousands of people go to the hospital with sepsis, so this research could save "thousands of lives." Their research has progressed far enough that the lab hopes to have two papers with their findings published by the end of the year.

Speaking of Dr. Harrison, John mentioned, "The thing that I really appreciate about Dr. Harrison is that he gives us a lot of creative freedom. There are a lot of things that we're given free rein to figure out, and I don't know if we would have been able to figure out what we have without that kind of leadership."

Ultimately, John is pursuing medical research because of the meaningful impact he can have on others. This has led him to see medical work as akin to spirituality.

"Healing, in a way, is the most similar we can get to Jesus Christ. I've always thought of nurses and doctors as a type of the Savior. And so, to me, that's what's most attractive about it."

John Breinholt is a Chemistry student studying to become an open-heart surgeon. A native Texan, John knew he wanted to be a doctor from a young age. He served a mission in Arkansas and has been married for a year and a half.



Colton Dixon

Making a mark through measuring molecular mass

WRITTEN BY EMILY POMEROY



Colton Dixon wants to better the world around him. To be on this path, he is a pre-med student and works in the Kenny Lee lab.

In this lab, Colton and his colleagues use a technique called ion mobility mass spectrometry to measure molecular mass, focusing on how solution conditions affect oligomer formation. The lab is using this technology to study insulin and its self-binding via aggregation, and is looking to improve the "purity and effectiveness of insulin pharmaceuticals" by extending the shelf life of the drug, which is currently only about a month.

The group's research philosophy is to push mass spectrometry technology to address challenging molecular characterization. They leverage the unique vacuum environment in the technology to isolate and probe specific species. This approach allows them to separate and characterize different molecular forms of a species, including isomers and conformations.[1]

Colton has loved doing this research, especially with Dr. Lee. "Engaging with research and the scientific method has changed the way that I see the world; trying to be more curious and inquisitive improved my general problem-solving skills." Colton reflected. Speaking of his lab professor, Colton stated, "I feel like [Dr. Lee has] done a really great job of letting me take the lead on certain aspects of the project and engage with the scientific method myself."

This has led to growth and further research opportunities for Colton, even outside of Utah. Colton reflected, "I had the opportunity to do an oral presentation at BYU's student research conference, and just last week our lab traveled to San Diego for the ASMS conference, and I had a poster there." These opportunities gave Colton and other students the ability to practice explaining research to colleagues and network with professionals. Beyond academia, Colton strives to use his talents for good. He mentioned that there are many "different ways that we can use our gifts and abilities to help other people and… improve the world." In his case, he uses his research in "pharmaceuticals and the way we use insulin… to make the world a better place."

"ENGAGING WITH RESEARCH AND THE SCIENTIFIC METHOD HAS CHANGED THE WAY THAT I SEE THE WORLD"

Colton Dixon is a rising senior in the Biochemistry program at BYU. He is from Mesa, Arizona, and is the oldest of six children. He enjoys playing board games with friends, playing the piano, and watching musical theater. Colton hopes to go to medical school and become a pediatrician.

1. Kenneth W. Lee Lab, https://labs.chem.byu.edu/kenneth-w-lee-lab

Natalie Parkinson

Sharing heat capacity research across the world

WRITTEN BY EMILY POMEROY



Natalie Parkinson is a member of the Woodfield lab. Originally a chemical engineering major, Natalie switched to biochemistry to spend more time learning about molecules.

In the Woodfield lab, students measure the heat capacity of solids from near zero Kelvin to room temperature. Heat capacity near zero Kelvin can reveal interesting properties of a sample, including magnetic, electronic, and nuclear features. Low-temperature heat capacity data can also be used to calculate absolute entropy. Natalie explained, "If you want to understand how something is going to behave in different reactions, you need to know its entropy, which comes from heat capacity."

Through her lab experience, Natalie has received opportunities to share her research. Natalie is an Honors student and defended her Honors thesis, The Low-Temperature Heat Capacity and Thermodynamic Functions of Mg3N2, Ca3N2, and Sr3N2, in April. This summer, she traveled to Italy to present at a thermodynamics conference and learn from her peers. The conference helped her become more comfortable with networking, a former foe.

Natalie has loved working in the lab, especially with Dr. Woodfield. She expressed, "Dr. Woodfield is an excellent mentor. He has given me resources, independence, and support so that I can go out and learn how to do research." Research has enabled Natalie, in turn, to become a mentor to her fellow undergraduate students.

"I like being able to mentor; I enjoy helping others learn and feel at home."

As she continued her research, Natalie discovered a love for X-ray diffraction, a technique used to determine the structures of samples. This shaped Natalie's plans to pursue a PhD in structural biochemistry. She hopes to use cryo-electron microscopy to perform disease and pharmaceutical research.

"I LIKE BEING ABLE TO MENTOR. I ENJOY HELPING OTHERS LEARN AND FEEL AT HOME."

Natalie feels a spiritual connection to this field. Natalie shared, "I definitely feel that biochemistry is important to my life mission. Each person has a responsibility to do their best to help others, and I feel that this is one of the ways in which I will be able to help others in the future."

As her career progresses, Natalie hopes to either teach or work in Biotech: "I think being a professor would be meaningful because I enjoy teaching and mentoring, but being in Biotech would be empowering because of the potential for interdisciplinary collaboration."

Natalie Parkinson is a Biochemistry major at BYU. She was born in Michigan and grew up in Pennsylvania. Natalie enjoys running, reading, and singing in the BYU Women's Chorus.

ACS Conference

WRITTEN BY EMILY POMEROY



A group of students and professors attended the American Chemical Society conference in March 2026. The American Chemical Society looks to advance scientific knowledge, empower a global community, and champion scientific integrity.[1] The conference was held in Atlanta, Georgia, from Friday, March 20, to Thursday, March 26. This conference gave students the opportunity to showcase lab work, attend lectures, and create lasting connections.

Madison Ess, a lab student who attended the conference, thoroughly enjoyed her time at ACS. She stated, "My favorite experience at the ACS conference was the opportunity to create and present a poster showing everything I had been working on in the lab that year… I presented on the design, synthesis, and testing of tyrosine derivatives as LAT1 inhibitors, targeting glioblastoma multiforme." Madison continued, "I loved being in an environment surrounded by other scientists and people who cared about chemistry. It felt like such an accomplishment being able to discuss my work with others."

Jefferson Skinner, a student who met his fiancé at the conference, had a positive experience at the conference as well. He recalled, "My favorite experience was presenting at the poster session [about] crystallization and optimization of NLO terahertz-generating crystals… and chatting with chemistry professionals about my crystallization techniques." Jefferson continued, "My favorite speaker was Dr. Hoye of Oxford University because of his work [in] perovskites and electroluminescence." Jefferson acknowledged that Dr. Hoye's work "has many connections to [Jefferson's] current research," so he was grateful for all he was able to learn.

Participating in the 2026 ACS conference allowed students to share their discoveries, learn from peers and other academics, and become more proficient chemists.

1. ACS, https://www.acs.org.



"I LOVED BEING IN AN ENVIRONMENT SURROUNDED BY OTHER SCIENTISTS AND PEOPLE WHO CARE ABOUT CHEMISTRY"



Top: BYU students attended the ACS Conference in Atlanta, Georgia in March 2026
Bottom: Jefferson Skinner presenting during the poster session



A Bright Future for Young Hearts

How the Rheumatic Relief Program is changing lives in Samoa

On April 23, 2026, thirty-two students and staff made their way to the island of Samoa. Their goal was to provide children with knowledge about Rheumatic Heart Disease and conduct tests to ensure children who have the disease receive access to care and medication.

Program directors Valerie and Paul Savage have been going to Samoa for several years. Speaking of testing, the directors shared, "We screened 5,624 children in Samoa and had 122 positive cases of Rheumatic Heart Disease. 2.2% of children screened were positive." These 2.2% of children then received access to medicine and healthcare professionals so they could get the help they needed.

Not only were these children screened for heart disease, but they were also taught preventive measures for staying safe through a song and puppet show performed by the students. Christine Behunin, a pre-med student trip participant, recalled that her favorite part of the trip was "seeing the kids' excitement." Remembering the puppet show and song, she continued, "It was always so fun to have [the kids] laughing and dancing along."

This program helped students to find avenues to share their light. For Christine, this experience "deepened [her] desire to help create a healthcare system where access to quality care is not limited by geography, language, or socioeconomic circumstance."

Photo courtesy of Montery King
Article written by Emily Pomeroy

3-Minute Thesis Competition

WRITTEN BY SYDNEY GANT

On February 20th, 2026, chemistry students Denise Procopio, Sudam Mane, and Jhon Sia competed in the annual 3MT competition. At the College of Physical and Mathematical Sciences competition, Denise was awarded first place, Jhon was awarded third place, and Sudam received an Honorable Mention. On March 5th, Denise took second place in the University-level competition.

Jhon's research studies a new compound in Bleomycin-Induced Idiopathic Pulmonary Fibrosis (IPF), a chronic lung disease.

In order to effectively present, Jhon had to be selective in what parts of his research he could share while still giving the diverse audience enough information. He did this by identifying the main thesis of his research and focusing his presentation on it.

"I only included data that actually helped with answering [my thesis] rather than telling the whole story," Jhon shares. "It's also important to highlight why this study is relevant, especially since my research is focusing on translational research and how it impacts patients in the long run."

Sudam's research focuses on developing efficient methods for distinguishing isomers: nearly identical drug molecules with structural differences that greatly affect how they react within the human body. To do this, Sudam uses ion mobility spectrometry, sending the molecules through a hollow tube and measuring their unique speeds to tell them apart.

Sudam had to condense much of his research to fit the parameters of the competition.

"I spent a lot of time thinking about which nuances were essential and how to communicate them clearly using relatable analogies," Sudam shares. "I aimed to balance background, the problem statement, methodology, results, and impact — all within a very limited timeframe."

Denise's research focuses on Limb-Girdle Muscular Dystrophy type 2B, a rare disease that causes muscle weakness. She studies how the immune system behaves in this disease to better understand the inflammatory environment and how it can influence disease progression. She also studies the effects of the Galectin-1 protein—known to support muscle repair—in her disease model, evaluating its anti-inflammatory properties with the goal of moving her research forward to clinical trials.



Like Sudam and Jhon, Denise had to skip many of the details of her research to be able to successfully share what she needed to during her presentation.

"A lot of the credit goes to the courses and professors in our department who continuously train us to communicate science effectively," Denise shares. "Once I identified the data that created that complete story, I removed details and experiments that, while scientifically interesting, were not essential to understanding the main conclusion."

During the different levels of the competition, Denise was nervous but excited, happy to watch her amazing peers also present their research.

"Listening to such diverse and impressive research was so inspiring," Denise continues. "It brought me a lot of joy and reminded me why I love being a scientist."

We wish to congratulate these three students on their dedication to their work and their stellar representation of our department.

Student Awards

KEITH P. ANDERSON AWARDS FOR OUSTANDING PERFORMANCE:

Outstanding Freshman Chem Non-Major	Christian Wengler
Oustanding Freshamn Chem Major	Nicole Daily
Oustanding Organic Chem Non-Major	Gavin Van Alfen
Outstanding Organic Chem Major	Madison Ess
Outstanding Analytical Sophomore	Tyler Poulos
Chemistry Literature Award	Amanda Richael
Outstanding Biochemistry Student Non-Major	Isaac Speirs
Outstanding Biochemistry Student Major	Kelly Amsden
Outstanding Biochemistry Student (Junior/senior)	Natalie Parkinson
Oustanding Physical Chemistry Student	Dallin Chipman
Outstanding Inorganic Chemistry Student	Laura McPhie
Oustanding Senior Analytical Chemistry Student	Abigail Banks
Oustanding Biochemistry Lab Student	Brian Lewis
Eliot Butler Service Award (anonymous)	Sofia Zubeldia Ouzts
Oustanding Graduating Senior – Chem	James Corey
Oustanding Graduating Senior – Biochem	Zach Cluff
Ida Tanner Hamblin – Outstanding Junior Biochem	Kayla Krstic
Ida Tanner Hamblin – Outstanding Junior Chem	John Breinholt

ADDITIONAL AWARDS:

Morgan Payne	Full year Simmons Center Fellowship, SRC Winner
Ayden Marler	Summer Simmons Center Fellowship
Clayton Tacker	Full year Simmons Center Fellowship
Seth Kelly	SRC Winner
Ebunolwa Kukoyi	Professional Presentation Award, BYU Graduate Student Society
Gabriel Poulson	Garth L. Lee Undergraduate Teaching Award
Katie Siegfried	Nicholes-Maw Fellowship, Garth L. Lee Award, Department Teaching Award
Alexis Gibson	Department Roland K. Robins Fellowship, Best Oral Contribution Award at the International Symposium on Chemical Thermodynamics for Young Researchers
Laurel Smith	Best Oral Presentation at the Utah Polymer Symposium 2026

Scholarships and Fellowships

IDA TANNER HAMBLIN:
Lillie Marriott
Carmen Maruri

SNOW FAMILY:
Asher Bridge
Jackson Goodrich
Laurel Guttierez
Carson Johnson
Emma Payne

BYRON J. WILSON:
Sebastian Pelaez
Jacob West

GARTH LEE:
Jade Peterson
Hayley Garrett

PARLEY NELS & PARLEY LEROI NELSON:
Bennett Allen
Rebekah Windham

DOUG & NANCY LAWSON:
Shane Koslow
Bailee Shirley

KENNETH W. BRIGHTON:
Katelyn Bodine
Emma Esplin
Brandon Judd
Taytum Stratton
Cole Tapia
Miriam Thomas

BOYD A. WAITE:
Andrew Crowther
Michael Goode
Nicholas McBride

HIRAM & PERMELIA DAYTON:
Katya Cross
Ravi Finn
Caelen Jones
Blake Nelson
Ella Norton
Gus Phillips
Spencer Ricks
Meredith Shull
Samuel Wang
Kyler Westphal

EDWARD G. PAUL:
Denise Vizcarra

H. TRACY HALL:
Aaron Berry
Anna Bott
Faith Lee
Joshua Morgan
Jacob Orchard
Cole Pearson
Annika Southern

LAWRENCE MARK LEE:
Shane Koslow
Bailee Shirley

MARTHA HUGHES CANNON:
Campion Welsh

DENNIS V. & SHIRLEY J. KNUDSON:
Dallin Chipman
Jeffrey Evenson
Russell Lee
Deven Prestwich

New Faces



DR. GEORGI LUKOV was born and raised in Bulgaria. He met and married his wife, Tatyana, while living in Bulgaria, and they were later sealed in the Idaho Falls Temple. They have three daughters and one grandson. Georgi loves to go on road trips, enjoy nature, watch interesting shows and documentaries, and explore new ideas.

After high school, Georgi earned a degree in medicine from the Medical University in Plovdiv, Bulgaria, where he trained as a physician. He later pursued graduate studies in the United States and earned a Ph.D. in Biochemistry from Brigham Young University. Following his doctorate, Georgi conducted research at the Cell and Gene Therapy Center at Baylor College of Medicine. He comes to BYU from BYU–Hawaii, where he has taught Chemistry and Biochemistry as a faculty member since 2010.



DR. CLARK ANDERSEN has recently joined the teaching faculty in the BYU Department of Chemistry. He earned his B.S. from Brigham Young University and his Ph.D. from East Carolina University, with an emphasis on chemistry education research. His favorite part of earning his Ph.D. was spending time with the undergraduates and helping them form self-efficacy in learning Chemistry.

A native of Brigham City, Utah, Dr. Andersen has also lived in Price, Utah, and Ogden, Utah, where he taught middle and high school science; Greenville, North Carolina, where he earned his Ph.D.; and Romania and Moldova, where he served as an LDS missionary. Dr. Andersen married his wife Alison in the Salt Lake Temple in 2011, and they are the parents of three children. In his free time, Dr. Andersen enjoys watching baseball and football, camping and hiking, and making East Carolina-style barbecue.



DR. PAUL JOSHUA HURST grew up in Laie, Hawai'i, and served in the Norway, Oslo mission. He attended BYU, where he earned his B.S. in Chemistry in 2018, then completed his Ph.D. at the University of California, Irvine under the direction of Joe Patterson, where he developed and investigated reaction-driven soft matter self-assembly systems. Following his doctoral studies, he was a Ruth L. Kirschstein NRSA Postdoctoral fellow at Stanford University.

At BYU, Paul Joshua builds on these experiences to investigate how the chemical properties of polymers influence self-assembly, structure, and function. His research focuses on developing new polymer systems and polymerization strategies for multifunctional and biomimetic materials. He hopes his research will inspire students to appreciate the wonders of the natural world while demonstrating how scientific research can solve problems in advanced materials and medicine.

Paul Joshua lives with his wife, Morgan, and their three children: two girls and a boy, ranging from one to six years old. In addition to spending quality time with his family, he enjoys classical music, being outdoors, and gardening.



EILEEN HARGRAVES recently joined BYU as the chemistry program coordinator. She earned her BA in English from BYU and her master's in education from WGU. Before joining the BYU Chemistry and Biochemistry department, Eileen edited courses and assessments for WGU, helped coordinate BYU study abroad programs, tutored at Project Read (Utah), and worked as an editor and designer of nonfiction books for a local publisher. Outside of work, she enjoys crafts, video games, spending time with family, and art and music. She also loves traveling, especially discovering local favorites and exploring unique museums. She is a strong believer in the power of education to improve lives and has been grateful for the opportunity to support learners throughout her career.



LAUREL HANSEN is a Utah native who grew up in the Heber Valley. She earned her bachelor's degree in psychology from the University of Utah and is currently working toward a master's degree. Before entering higher education, Laurel owned and managed a veterinary practice with her husband, Billy, a veterinarian. That experience, along with raising a large family, gave her a varied background and a love for working with people and solving problems.

Laurel and Billy live in the Heber Valley with their six children, four boys and twin girls, ranging in age from 6 to 18. Animals have always been a big part of their lives, and their household currently includes dogs, cats, chickens, sheep, a milk cow, a horse, and a pony. Between six kids and the animals, there's never a shortage of activity or noise at their house.

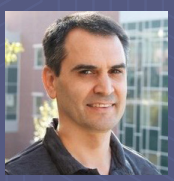
When she has free time, Laurel loves being outdoors. She loves skiing in the winter, and wake surfing and boating with her family in the summer. She loves traveling, camping, photography, and spending time with her family in the mountains.

As part of the Chemistry and Biochemistry Department, Laurel enjoys getting to know students and helping them find solutions, make plans, and feel a little more confident about where they're headed next.

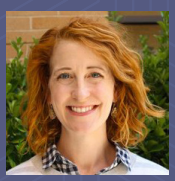
FACULTY AWARDS:



DR. JEFF MACEDONE
Good Samaritan Mentored Learning Award

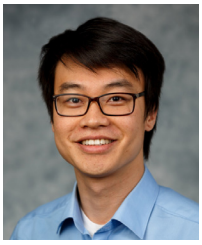


DR. RYAN KELLY
University Sponsored Research Award



DR. KARA STOWERS
Wesley P. Lloyd Award for Distinction in Graduate Education

Alumni Updates



DR. DOO-HYUN KWON is a computational chemist who took the "scenic route" from the University of Utah (B.S.) to a Ph.D. at BYU (Ess Lab). During his Ph.D., his thesis work involved close collaboration with Chevron Phillips on modeling industrial catalysis. Post graduation, he moved into the pharmaceutical industry, serving as a molecular modeler at GSK in drug discovery and later joined the startup Proteovant Therapeutics to design molecular glues and degraders. He eventually followed his goal of returning to Utah and now serves as a Molecular Designer at Recursion Pharmaceuticals in downtown Salt Lake City.



DR. JOHN FJELDSTED received his undergraduate and doctoral degrees from BYU. In 1984, he joined Hewlett-Packard as the principal research and development scientist. In the 1990's, John led HP's initial investigation in electrospray ionization - mass spectrometry, and oversaw the development of HP's first MS/MS mass spectrometer. Later, John led a project team in the development of Agilent's first electrospray, triple quad, and quadrupole time-of-flight mass spectrometers. In 2011, as Vice President for the LC/MS business, John's attention focused on expanding the use of Agilent's LC/MS spectrometry products. During the last decade of John's professional work, he led Agilent's ion-mobility mass spectrometry program, which resulted in global deployment of the instrument. In 2018, John was named Agilent's first "Distinguished Scientist".



DR. JARED RUTTER is a Distinguished Professor of Biochemistry and holds the Dee Glen and Ida Smith Endowed Chair for Cancer Research at the University of Utah, where he has been a faculty member since 2003. In 2015, Dr. Rutter was appointed as an Investigator of the Howard Hughes Medical Institute. The Rutter laboratory has identified the functions of several previously uncharacterized mitochondrial proteins, including the discovery of the mitochondrial pyruvate carrier. This knowledge has shown that this metabolic step is impaired in a variety of human diseases. Dr. Rutter also serves as co-Director of the Center for Metabolic Health at the University of Utah and co-Leader of the Nuclear Control of Cell Growth and Differentiation at Huntsman Cancer Institute.

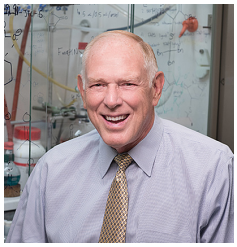


DR. PETER MPAATA earned his BS in Chemistry and Biology Education from Mbarara University of Science and Technology, Uganda; his MS in Pharmacology from Makerere University, Kampala, Uganda; and his PhD in Chemistry from Brigham Young University. His doctoral research centered on carbohydrate chemistry and glycoconjugate vaccine development and joined the Savage Group at BYU as a postdoctoral fellow.

Peter has since returned to his home country, Uganda, where he serves as Founding Director of the Phytochemical Research Institute Uganda Limited, a nonprofit institute advancing natural products research, training, and drug discovery. He remains deeply grateful for the training and mentorship he received from BYU's faculty and equipment donations from the Department of Chemistry and Biochemistry.

In Memoriam

Remembering Dr. Philip Low and Dr. LaRell Smith



The Department of Chemistry and Biochemistry remembers the life and legacy of Dr. Philip Low, who passed away on March 4, 2026, in his home in West Lafayette, IN. Dr. Low was born on August 8, 1947, in Ames, IA. He married Joan Foord in Salt Lake City, UT, on December 19, 1969.

We are grateful for Dr. Low's involvement with BYU. He received an undergraduate degree in Chemistry from BYU, was a member of the basketball team, and was an active member of the Chemistry external advisory board. Low was also a generous supporter of the Simmons Center for Cancer Research (SCCR).

"In addition to creating an endowment that is used to fund deserving BYU students engaged in cancer research, Phil also hired former fellows or alumni of the Center to work in his lab at Purdue," stated Steven Castle, Director for the SCCR. "He had a profound positive influence on the Center, and he will be sorely missed."

After receiving his degree, Dr. Low spent many years as a faculty member at Purdue. While there, Low served as Purdue's Presidential Scholar for Drug Discovery, was awarded the Ralph C. Corley Distinguished Professor of Chemistry, and was a faculty member in the Purdue Institute for Drug Discovery and the Purdue Institute for Cancer Research. Over his career, he held over 100 patents and is listed on about 600 patents. He also founded seven companies: Endocyte Inc., OnTarget Laboratories Inc., Novosteo Inc., Erythrocure Inc., Umoja Biopharma Inc., Morphimmune Inc., and Eradivir Inc.

When speaking of his work, Dr. Low stated, "I believe I may have a gift or ability to see strategies that can successfully treat important human diseases, perhaps better than most people," in a 2024 interview looking back on his career. "I also believe that I have—associated with that gift—an obligation to do whatever I can to relieve pain and suffering."

Dr. Low is survived by his wife, Joan, and his five children: Philip, Justin, Stewart, Tara, and Emily.



The Department of Chemistry and Biochemistry wishes to express its condolences for the passing of faculty member LaRell Smith.

LaRell was born September 19, 1943, to Ren Smith and Milda Schwendiman in Orange, California, and grew up in Provo, Utah. After graduating from Provo High School, LaRell served a full-time mission in northern Germany. LaRell met his wife Jill at BYU, and the couple was married on June 8, 1967. They had three children: a daughter, Robyn Smith Barlow (1971), and two sons, Brooke Doxey Smith (1974) and Ryan Doxey Smith (1980).

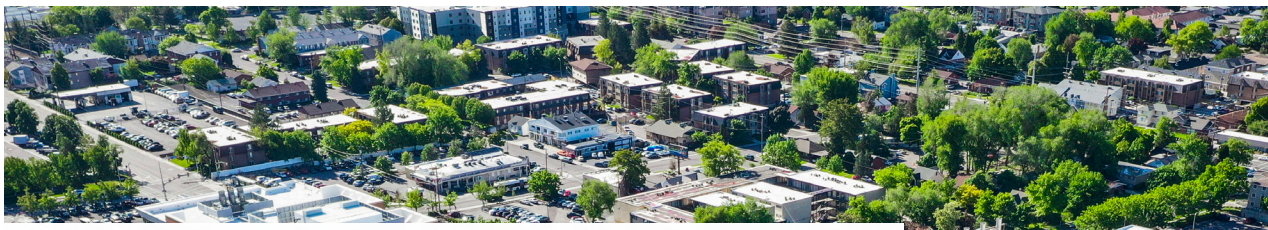
LaRell received a bachelor's degree in Chemistry from Brigham Young University in 1968 and a PhD in Physical Chemistry from the University of Utah in 1976. His dissertation work was in the field of chromatography. LaRell took a position at Brigham Young University in 1994. His professional work revolved around chemistry, physics, research analysis, and the practical applications of scientific knowledge

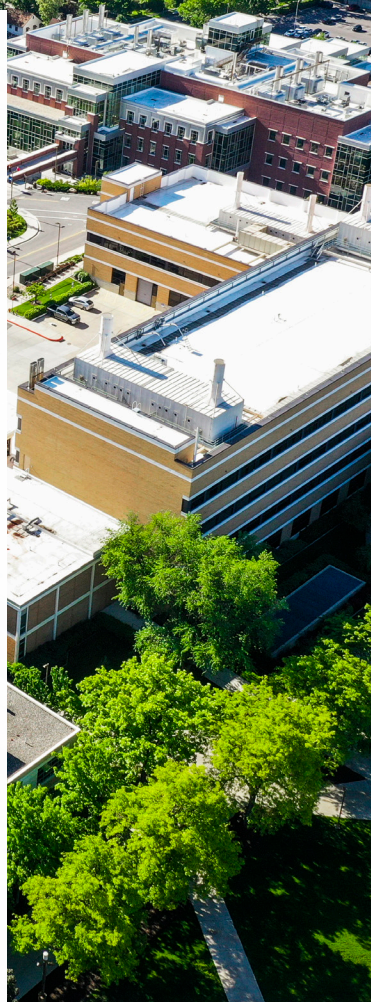
On July 8, 1995, LaRell suffered a massive stroke that left him hemiplegic and without speech. For the next 31 years of his life, he lived with profound physical limitations while continuing to engage wholeheartedly with the world around him with independence, a love for others and his community, and deep-seated grit.

2025 AT-A-GLANCE

- 176 STUDENT AUTHORED & CO-AUTHORED PAPERS
- $384,294 GRADUATE FELLOWSHIPS
- 2,195.117 CREDIT HOURS TAUGHT
- 487 UNDERGRADUATE MAJORS
- 53 DEGREES AWARDED
- 83 SCHOLARSHIPS
- $160,452 UNDERGRADUATE SCHOLARSHIPS
- $2,156,000 URA FUNDING
- 338 STUDENT CONFERENCE PRESENTATIONS
- 13 STATES GRADUATES IN
- 9,923 STUDENTS SERVED
- 769 URA STUDENTS
- 193 PUBLICATIONS







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Internship Impact

How an internship at Rhyz Analytical Labs propelled Wyatt Hansen towards his career

Wyatt Hansen recently completed an internship at Rhyz Analytical Labs. A Gilbert, Arizona, native, Wyatt heard about the internship last fall and was hooked. Once there, he recalled, "A great portion of my time over the first month was being trained on how to properly and consistently use tools such as pipettes, volumetric flasks, and centrifuge tubes." He continued, "While these seem like simple instruments, manipulating them carefully to give exact results is an essential skill set for any chemist, and requires much more time and concentration than I thought. This would become important as we used these skills… and created solutions of precise measurement."

Wyatt is incredibly grateful for all he learned in this internship. He stated, "This internship has given me great skills to work in future labs. I now have experience with instruments that are commonly used across a wide field of industries, and… I can easily campaign myself into a starting position in almost any lab setting."

Thinking of those who helped him along the way, Wyatt is especially grateful for BYU Alum Monique Speirs. She shared insights about graduate studies and how she found her career path. Wyatt explained, "One of the best parts of this internship was connecting with the lab employees and asking what their career paths had looked like up to that point."

Thank you to the Rhyz lab for providing an opportunity for students like Wyatt to learn new skills in a hands-on environment.

Above: Wyatt Hansen (right) poses with his team at Rhyz Analytical Labs

Let's Chat!



Anna Kennington | *Career Services*

My role is to connect chemistry and biochemistry students with alumni and employers who want to make a difference!

I support our students by helping them with:

- ***Career readiness***
- ***Graduate school preparation***
- ***Internship and job connections***
- ***Alumni mentoring and networking***
- ***Employer Partnerships***

Great careers rarely happen by accident; they grow through preparation, opportunity, and the people willing to help along the way!

If you are interested in learning more about our Career Services, or have an internship or job opportunity, reach out to me at:

anna.kennington@byu.edu
(801) 422-5944

Check out the chemistry careers website!
https://chemcareers.chem.byu.edu

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