



Synapse

BYU Neuroscience Magazine

Fall 2021

CONTENTS

- 03 News in the Neuroscience Center
- 04 Letter From the Director- Jeff Edwards
- 05 New Graduate Specialist - Heidi Jensen
- 06 Getting to Know the Career Services
- 07 Neuroscience Statistics
- 08 Faculty Spotlight - Professor Dee Higley
- 10 Graduate Spotlight - Michael Von Gunten
- 11 Graduate Spotlight - Alyssa Kozlowski
- 12 Enjoying BYU to the Fullest - Andreas Grossen
- 14 Courage to Try Something New - Sarah, Undergraduate
- 16 How Neuroscience Changes Lives - Ashley Guest
- 18 Everything Will Work Out In the End - Ross Mangum
- 19 Neuro Endowment Fund



@BYUNeuroscienceCenter



@byu_neuroscience



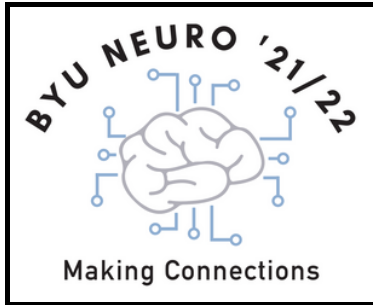
BYU Neuroscience



neuroscience.byu.edu

NEUROSCIENCE.BYU.EDU

NEWS AT THE NEUROSCIENCE CENTER



Neuroscience Club

Trying to find out what you can do with a neuroscience degree after graduation? Looking to get involved with research or volunteering? Or are you looking to make connections to other students and faculty within neuroscience? Joining the Neuroscience Club may be the answer! You can get involved with your major, participate in monthly activities, and meet with other neuroscience students. When you join the club, you get a cool shirt and become eligible for all club events and activities for the entire year. Scan the QR code to get started!



NEW HOME

The Neuroscience Center was transferred to the College of Life Science July 2021. There is a new Director, Dr. Jeff Edwards and an Associate Director, Dr. Shawn Gale.



CHIASM

Chiasm is BYU's undergraduate neuroscience journal. The student editorial staff welcome submissions of student research papers for publication including primary research when possible. Working on the Chiasm editorial staff is a great way to get experience in all facets of the publication process, including soliciting manuscripts for potential publication, editing, and publishing the journal. The editorial staff for Chiasm is accepting articles for future publications and welcomes applications to join the Chiasm editorial team.

To get involved, contact Aubrey Moedl at byuneurosciencejournal@gmail.com



A Letter from the Director

Dr. Jeff Edwards, Ph.D.

Dear Neuroscience Community of BYU,

On July 1, 2021, I took over as the new BYU Neuroscience Director from Dr. Ramona Hopkins. First, I would like to start by expressing my appreciation and gratitude to Mona for her dedication, commitment, and hard work in pushing the Neuroscience Center forward. The center has been in great hands.

In taking on this new assignment, I do so with excitement for the future of neuroscience at Brigham Young University. This is because at BYU our undergraduate students get a high-quality education with excellent research opportunities from committed neuroscience faculty in one of the fastest growing areas of science in the United States.

A major change coinciding with my start as director was the permanent move of the Neuroscience Center to the Life Science College. In the past, the Neuroscience Center was rotated between the Life Science and Family Home and Social Science Colleges every five years.

Due to the challenges faced by students whenever the center rotated, including having to find new college scholarships, counseling with different advisors, among other difficulties, it was decided by the university upon recommendation from an advisory committee to end the rotation.

Information used to inform this decision included survey data from alumni, current students, and faculty. We feel having a permanent home for the Neuroscience Center will solidify the neuroscience undergraduate experience by causing less distress in the middle of a student's undergraduate education.

With this change, however, we are determined to maintain one of the major strengths of the Neuroscience program, which is to draw on faculty from around the university to maintain the interdepartmental collaboration needed for a great neuroscience major.

This is a major strength of the program as it provides students research opportunities from faculty in fields ranging from engineering to psychology to cell biology and physiology, thus maintaining a broad and diverse representation of neuroscience research fields. I see this as the continued strength of the program.

In the past few years, the neuroscience undergraduate program has doubled in size. This growth is an indication of the increased interest in neuroscience we are seeing nationwide, and the great experience undergraduates have in neuroscience at BYU.

With this growth, we plan to continue to provide an excellent major that will be a launch pad for undergraduate careers. In addition, the graduate program recently moved from Cell Biology and Physiology to be housed permanently in the Neuroscience Center.

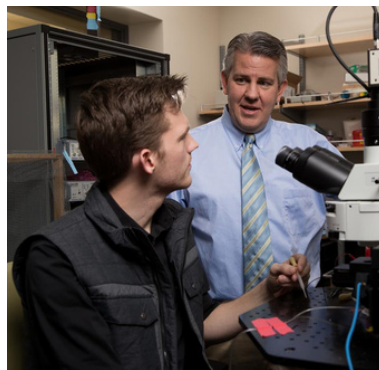
We hope to continue to develop this graduate program, which has produced students who have gone on to great careers including in medicine, research and teaching, and working for government agencies such as National Institute of Health.

In summary, I am excited for and can't wait to see what the future holds in store for our Neuroscience programs, and students coming out of this major, which I feel are among the best if not the best students at Brigham Young University.

Thank you for your support of the Neuroscience Center at BYU.

Sincerely,

Jeff Edwards



Dr. Edwards has been teaching at BYU since 2007 and is a highly respected professor in neuroscience.

Meet the New Graduate Specialist

Heidi Jensen



I have lived in many places across the United States including Texas, California, New York, Indiana, and Pennsylvania. My heart feels at home in Texas with all the southern accents, brisket, hot summers, and rodeos. I never planned on living in Utah.

My childhood was complicated and filled with sorrow. My mother encouraged me to attend BYU for at least one semester. Begrudgingly I came, completed my first semester and knew I did not want to be anywhere else in the world. BYU was the place for me.

Attending BYU changed my life. BYU is where I grew up and found myself. It is also where I took thought provoking classes, worked with amazing faculty, made lifelong friends with my roommates, and met Alex Jensen. Alex is my husband and a professor in the School of Family Life. Coming to BYU and marrying my husband set me on a new life path that seemed like a dream come true.

I graduated from BYU with a BS in Human Development. My favorite class was moral development. In this class I learned the importance of the simple act of knowing a person's name. Knowing a person's name helps them feel important and can leave a lasting positive impression. When we use each other's names we become a little more connected and a little less prideful.

I encourage all students to join a study abroad. I regret not participating in one as an undergrad. There is much to experience and learn living in another country. From trying new foods, to cultural experiences, and practicing the language. Living in a foreign country will enrich your life.

My family recently returned from living abroad in Croatia for seven months, where my husband was conducting a research project. Living in Croatia was wonderful and difficult. The toughest part was not knowing the Croatian language and all the Covid restrictions.

My favorite adventures of living in Croatia were visiting medieval hilltop towns, relaxing at the sea, and exploring city ruins as old as 1800 BC. One attribute that I picked up and hope to continue here at home is spending quality time with family and friends regularly and not just once in a while.

It is very common for Croats to spend hours sitting at the cafe conversing with family or friends daily. No phones and no rush for it to be over. I relished in the slower pace of life and the Croats' belief that life is to be enjoyed.

My husband and I have three young children and a new golden retriever puppy. We love to go to BYU football and basketball games. We like to relax in the mountains while camping and kayaking. I delight in seeing my children participate in their various activities of ice skating, piano, and gymnastics. Our favorite holiday is Halloween, so that we can plan and create fun family themed costumes together. We also like geocaching, Lego, and board games.

"Knowing a person's name helps them feel important and can leave a lasting positive impression. When we use each other's names we become a little more connected and a little less prideful."

I am excited for this opportunity to grow in my role as the Neuroscience Graduate Program Supervisor and to help students succeed in their educational goals. I look forward to meeting and getting to know the current and prospective graduate students. Come on over, say hello, and tell me about yourself. I look forward to meeting you!



Getting to Know the Career Services

Career Director, Sterling May

Sterling May is the career director in the College of Life Sciences. He attended BYU and completed a degree in American Studies. His first full-time job was developing the student hangout and restaurant "The Wall". Sterling was the one who managed the bowling and games center in the Wilkinson Center and later became operations manager for the campus student center.

After, Sterling then went on to earn an MBA in the BYU Marriott School of Business. After graduating with his master's degree, he decided to take a job with Proctor & Gamble (P&G). Sterling hired PhDs and scientists to develop products for the company's research and development organization.

Even while working as a human resources manager at P&G, he integrated career services into his work. Sterling made time to assist P&G employees and take calls from BYU students to offer advice in navigating career choices. Sterling expressed that when he was here at BYU as an undergraduate,



Photo by Lance Good

he was too afraid to go to the career services. He said, "It sounded like I needed to have my life together before I met with them, but the truth is that you don't. You can come in and say, 'I really have no idea what I'm doing with my life,' and we'll say, 'Great, let's talk!'"

When asked about his work, Sterling said "I'm glad BYU pays me, but I would do it for free! I love helping students figure out what they're going to do."

Career Director, Candilyn Newell

Candilyn Newell, PhD, was a concert pianist who studied and performed in Europe as a young adult. However, she took a 30-year sabbatical to raise a family and support her husband in his professional life, including 4 years spent in Stockholm, Sweden where Candilyn's husband was the United States Ambassador.

She later returned to Brigham Young University to finish her studies and graduated in American Studies/Art History followed by a PhD in Counseling Psychology in 2018. Her dissertation has been downloaded over 350 times. During her PhD program Candilyn became an Adjunct Professor at BYU and has taught professional etiquette on campus for 26 semesters.

Candilyn returned to Sweden when her husband was called to serve as the Mission President of the Stockholm Sweden Mission, and she was called as a fulltime missionary. After their return, Candilyn became the Head Sports Psychologist at Utah Valley University. She returned to BYU in the Fall of 2018 as a Career Director for the College of Life Sciences.



Candilyn loves helping students develop their resumes and personal statements as she believes it is an opportunity to present "their best self on paper". She can be regularly heard stating "Interviewing is a skill – the more you practice, the better you will get".

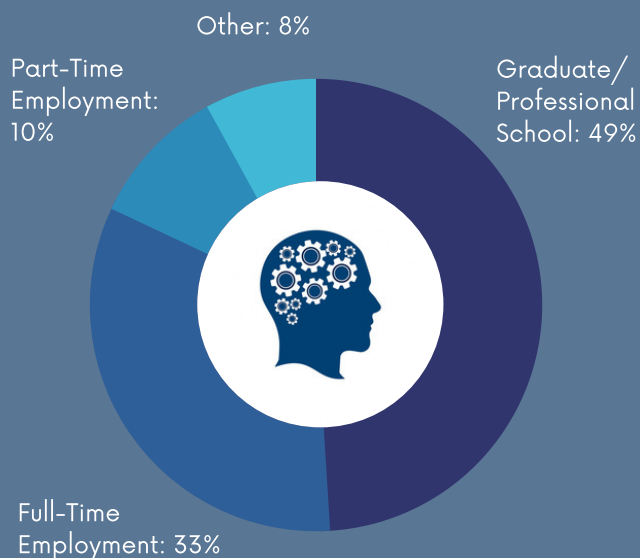
Candilyn loves sharing and practicing specific strategies for interviewing with students as she continues researching the process to better prepare students for successful interview experiences.

Candilyn enjoys half-marathons, reading (nearly every genre), movies, Pilates, board games, and spoiling her 15, soon to be 16, grandchildren.

Neuroscience

BY THE NUMBERS

Life After Graduation



Undergraduate Stats

40%

FEMALE

60%

MALE

81%

Participated in
research or field work

36%

Participated in
internships

678 UNDERGRADUATE MAJORS



Other Stats

1,568

Total
Graduates

26

Faculty
Members

171

Research
Assistants

Magazines Published

5

SYNAPSE MAGAZINES

12

CHIASM JOURNALS

Faculty Spotlight

Dee Higley

Dr. Higley's major research began with a passion to understand the effects of parents, particularly mothers, on the developing brain. Dr. Higley only partially jokes when he says his major advice concerning child rearing is: "Choose your parents well!"

His research shows that who and what we are today is a product of both genes and rearing. Parents contribute their genes, shaping the brain by providing the input to grow the right connections in the brain, exaggerating or attenuating the effects of the genes that mothers and fathers have passed on as a part of their own genetic genealogy.

Dr. Higley's most cited work comes from his studies of gene-by-environment interactions, research showing that genetic effects on the brain and behavior are typically mediated by the environment (most often by mothers), with early rearing, sex (male or female), and situations affecting the phenotypic effects of genes.

For example, his work, largely with rhesus monkeys, show that the deleterious short allele of the serotonin transporter gene lead to many things. These things include low central nervous system (CNS) serotonin, high rates of aggression, and excessive alcohol intake. This is only the case if they are reared in peer-only groups—without mothers. If they are reared by their mothers, the phenotypic negative effects of the short allele of the serotonin transporter disappears, an indication that appropriate parenting may attenuate the effects of deleterious genes.

Dr. Higley has published extensively on alcohol abuse, anxiety, aggression, social competence, and bonding. One of his early discoveries was that excessive alcohol consumption was more likely in subjects that experience maternal deprivation.

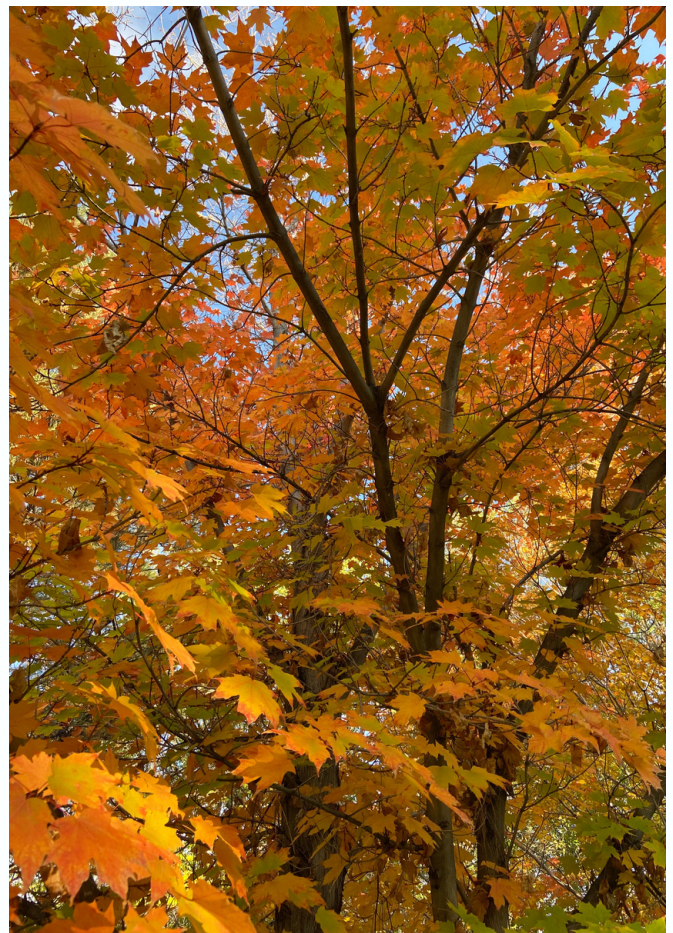
Shortly after this, Dr. Higley's laboratory showed that CNS is heritable, with genetic contributions coming from both the father and the mother. A principle discovery was that genetic influences on CNS serotonin were further exaggerated by maternal absence.

In this same study, the now adolescent subjects that were reared as infants without mothers were more likely to binge drink and to become intoxicated on a regular basis, exhibit inept social behaviors, and were frequently removed from their social groups because they were bullies, behaviors that were associated with low or impaired CNS serotonin.

Dr. Higley's showed that like humans with antisocial behavior problems, nonhuman primates with low low brain serotonin are prone to impulse control deficits and unprovoked risky, impulsive behaviors. While monkeys



Dr. Higley's major research began with a passion to understand the effects of parents, particularly mothers, on the developing brain. His research shows that who and what we are today is a product of both genes and rearing.



His advice to students, read, read, read. Reading is the gateway to success in life. It is where you can find your life-passion.

with impaired CNS serotonin were not more aggressive than average, they were more likely to engage in impulsive aggression that often escalated to violence.

Consequently, they were more likely to die prematurely, at an early age, most often as a result of violence. These subjects were also more likely to be ostracized by their peers, and as adolescents were unlikely to be selected by the females as companions and fathers.

Paralleling these laboratory findings, in one of Dr. Higley's most widely cited studies, he was able to tease apart the independent contributions of CNS testosterone and serotonin on competitive aggression directed at maintaining status, impulse control deficits, and impulsive aggression.

His findings showed that (a.) CSF free testosterone concentrations were positively correlated with aggressiveness and with behaviors indicative of high social dominance, but not with behaviors indicative of impulsivity. (b.) CSF 5-HIAA concentrations were negatively correlated with impulsive leaps, frequent jumping into food-baited traps and violent aggression that escalates into assaults, wounds and prolonged chase sequences (escalated aggression), but CSF 5-HIAA was not correlated with overall rates of aggression.

Impulsive leaps were positively correlated with escalated aggression, but not overall rates of aggression. These findings suggest that testosterone-mediated aggression may serve functional and possibly positive purposes among healthy nonhuman primates with normal central serotonin functioning and that impulsive, dysregulated aggression which escalates to impulsive aggression and violence is strongly associated with serotonin deficits.



Dr. Higley has been teaching neuroscience for more than 30 years. He enjoys teaching about the brain because of its "amazing, miraculous complexity." A fun fact about him is that he has enough monkey ties and t-shirts to get him through a full semester without wearing either twice! His advice to students, read, read, read. Reading is the gateway to success in life. It is where you can find your life-passion.



Dr. Higley grew up on a small family farm in South Weber, Utah, a small rural farming community located at the mouth of Weber Canyon (population in the 1950s was about 400—and yes, everyone did know your dirty laundry because it got hung outside on a clothesline to dry). He was trained as a developmental psychologist, and developed a passion for his research subjects—monkeys, but his real passion is for his children and grandchildren.

When asked about his interests, he is quick to reply, "I love people". As a hobby, he studies church history and loves to visit church history sites. He plays basketball and loves to ski. Dr. Higley also loves to play with his grandchildren. His favorite quote is "The past is the best predictor of the future."

Graduate Student Spotlight

Michael Von Guten

Michael Von Guten grew up in West Jordan, Utah in a family with nine kids. He loves to play the piano and guitar, as well as rock climb. Along with loving to run marathons and participate in triathlons, Michael has always loved biology.

As an undergraduate, he studied psychology and really enjoyed being able to study the mind. Michael knew he wanted to study neuroscience because he wanted a more empirical approach for his PhD following his major in psychology.

His favorite fact about the mind is that we can change our brains. When asked about this, Michael said "I study plasticity, which is the way in which connections in the brain get stronger or weaker. We can change our brains, break habits, overcome addictions, and learn new skills."



The primary research that Michael is participating in is reward and drug addiction, specifically polydrug effect, and how it changes the brain. Michael has been working with Dr. Jeff Edwards, who has not only taught him about these areas, but also to have a good work/life balance.

Michael has also commented on how he admires how much trust Dr. Edwards has in his students. Michael says, "[Dr. Edwards] doesn't hover over me all the time to make sure I am doing what I need to. That is something that I want to emulate in my career."

If you are not enjoying your life as a student, maybe you are too busy. School should be challenging, but fun!

While working with Dr. Jordan Yorgason, Michael says he learned you can still have fun in the lab, even if you're stuck on campus all day long doing experiments. Dr. Yorgason also taught him to always have a light heart and a good dad joke.



In working with Dr. Matheson, Michael shared that she taught him to "genuinely care about the people in my life. She is one of the most sincere and caring people I know." These lessons are things Michael has learned from his professors and through his hard work at BYU.

Michael's advice to other students is to work hard, but not so hard that you're miserable. He says "If you are not enjoying your life as a student, maybe you are too busy. School should be challenging, but fun!" A scripture that has helped Michael throughout his life and schooling is 2 Corinthians 4:16-17. It says:

17 For our light affliction, which is but for a moment, worketh for us a far more exceeding and eternal weight of glory;

18 While we look not at the things which are seen, but at the things which are not seen: for the things which are seen are temporal; but the things which are not seen are eternal."

Michael's favorite quote is one from Winston Churchill, "Courage is what it takes to stand up and speak; courage is also what it takes to sit down and listen." These lessons, quotes, and scriptures are principles that Michael will take with him throughout his life.



To relax and unwind, Michael likes to go trail running in Rock Canyon. He also loves to hike and work on cars in his spare time, specifically a model 1969 VW Beetle. Michael says he would love to learn and get into base jumping too.



I grew up in Palmdale, California, a city about 40 miles northeast of Los Angeles. It is just on the other side of the mountains, and is very much a desert, the only things out there are dirt and Joshua trees, so I was very excited to move away and come to school for a bit of change in scenery! I love acquiring new hobbies and learning new things.

Some of my favorites are horseback riding/horse training, playing piano, singing, doing embroidery, and hiking. I love the outdoors, and my husband and I often go hiking and camping when the weather is warm enough. In December of last year we welcomed a daughter to our family, and we are excited to share our loves of music and the outdoors with her.

I have always loved interdisciplinary science, and I have always loved the brain and thought it one of God's most amazing creations. In light of that view, it seemed easy that neuroscience would be a good fit for me as a major.

I originally wanted to make a career going into the world of prosthetics, so I started out as a mechanical engineering major, but eventually I decided that it wasn't for me. I switched to neuroscience, and it won my heart!

I am passionate about science, and about learning about the brain, and integrating the knowledge we have into practical applications. I have participated in several different research projects here at BYU. As an undergraduate,



Graduate Student Spotlight

Alyssa Kozlowski

the main research project I worked on was in the religion department, with Dr. Justin Dyer, researching the connections between adolescent religiosity and suicidality. Some of these exciting results have recently been published, and he and his team are continuing to find amazing things.

Currently I am working with Dr. Jared Nielsen, researching correlations between brain connectivity and behavior in autism. There are truly some amazing things to be found in the brain!

My advice would be to have courage
to do what you think you can't do...
there's no harm in trying..."

I love being at BYU because it combines academic rigor with spiritual upliftment. I know that my professors and other students support me in all aspects of my life, not just academic or social aspects; this has a lot of value to me because the spiritual part of my life is very important to me. I feel privileged to have been able to take advantage of this environment both as an undergraduate and a graduate student.



If I could give advice to other students, my advice would be to have courage to do what you think you can't do. Take the leap; apply for the job you want that you don't feel qualified for, change your major to something that seems hard, take the class that sounds interesting to you, go to that event, have that difficult conversation, make that phone call!

Have the courage to do the things that are scary. Not only will that help you progress and grow, it will help God bring circumstances and people into your life that will teach you and help you to be better. It will help you live without regrets and become the person you really want to be.

There's no harm in trying, and failure will teach you just as much—and sometimes more than—success.



Patience and lots of practice have helped me learn many things.



Enjoying BYU to the Fullest

Andreas Grossen

When I was a senior in high school, I decided to look through BYU's list of majors. While looking through this list I came across Neuroscience and thought it would be an interesting major. Neuroscience was perfect for me because it combines my interests in chemistry, biology, psychology, and the brain.

Out of all the Neuroscience classes, my favorite class was Dr. Brown's neuroanatomy class. I still think this class is one of the hardest 2 credit hour classes you will ever take, but it is also the most interesting and rewarding one you will ever take. I spent more time studying neuroanatomy than organic chemistry, or any other class.

Upon completion of Dr. Brown's neuroanatomy class, I knew that I would love to be a TA for the class. I was excited when I received an email from Dr. Brown asking if I would be willing to be a TA for neuroanatomy; I promptly replied that I would love to TA for his class.

While TAing for Dr. Brown's class, one struggle I dealt with was my first TA review. It did not go as smoothly as planned. I used the previous TA's review slides and realized that they just didn't work with my teaching style. After that review, I spent many hours developing my own review slides so that I could provide quality reviews for my students. I learned that I needed to make the slides my own in order to best help my students.

Over the past three years, I have had the pleasure of meeting and working with many neuroscience students, all with diverse backgrounds and unique challenges.

I have loved watching my students go on to fulfill their dreams as they complete their degrees; whether they go on to research in graduate school, become a doctor, become a lawyer, be a stay-at-home mom, or anything else.

Along with Neuroscience, I participated in many activities while at BYU. During my freshman year, I developed an interest in piano technology when I met another student who was tuning and repairing pianos at the BYU piano shop.

I have played the piano since I was seven and every year when we got our piano tuned, I would often watch and listen to the piano tuner as he worked his magic on our piano, restoring the sound to perfection.

Unfortunately, BYU did not have any open spots for a training student piano technician, so I became an unpaid apprentice at the piano shop. After months of practice and experience, BYU hired me as a student piano technician.

At the piano shop, I have learned to do more than just tune pianos, including regulating, voicing, and rebuilding pianos. Patience and lots of practice have helped me learn many things.



Along with my apprenticeship, ballroom dance became another important part of my BYU undergraduate experience. When I first came to BYU, I had no intention of graduating with a minor in ballroom dance, even though I took ballroom classes in high school.

However, I changed my mind after I attended BYU's World of Dance concert where I saw BYU's Ballroom Dance Company, Contemporary Dance Theatre, International Folk Dance Ensemble, Living Legends, and Theatre Ballet perform.

The performance convinced me to take a ballroom dance class and join an intermediate folk dance team. I later joined an intermediate ballroom dance team at BYU. Being a part of a team was my favorite thing in both ballroom and folk dance because rather than working against each other, we worked with each other.

Being part of a team was my favorite thing... because rather than working against each other we worked with each other.

While here at BYU, I also had the opportunity to participate in a few Y-Serve programs such as Anatomy Academy, Gym Kids, and Adaptive Aquatics programs. Anatomy Academy focuses on teaching elementary school students the basics of anatomy and how exercise and nutrition impact the human body. Each lesson is informative and fun for the students.

Attending Gym Kids and Adaptive Aquatics became my favorite hour of the week. These programs are wonderful opportunities to interact with children who have special needs. Volunteers participate in games and activities in a gymnasium or a pool.

The children are all full of energy and almost always smiling despite any physical or mental limitations they might have. I highly recommend participation in both programs.

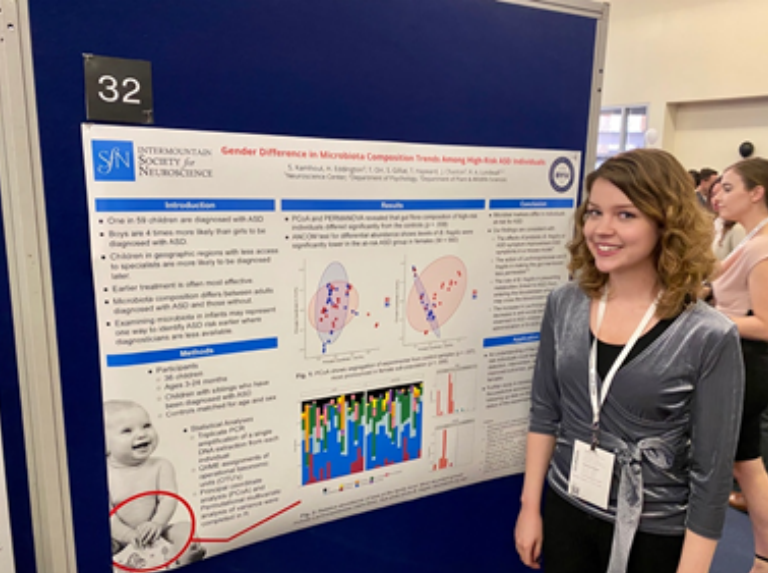
A BYU experience would not be complete without some quality recreational events! During my free hours, I put my BYU ROC pass to good use by attending as many BYU football, basketball, and women's soccer games as my schedule would allow.

I look forward to my future because I can look back on my experiences.

I will be graduating from BYU in December 2021 with a bachelor's degree in neuroscience and a minor in ballroom dance and am currently in the process of applying to medical schools.

I am thankful for my teachers, mentors, and students who have been an integral part of my experience at BYU. I look forward to my future because I can look back on my experiences.





Courage to Try Something New

Sarah, Undergraduate at BYU

At the beginning of my sophomore year I saw an announcement in the Neuroscience Newsletter for RA openings in the Development of Visual Cognition Lab. At that point, I don't think I understood what cognition was. I thought that working with infants sounded fun and with a little experience with a vision test using binocular rivalry, I applied.

After filling out the application, I looked up Dr. Lundwall on Google Scholar and started diving into related articles. There is cool stuff to learn in Neuro, and before I knew it, I was hired and performing the protocol on my own. I'm really glad I had the courage to dive into something new!

While I have been very fortunate to work in three different labs, I have spent the most time with Dr. Lundwall studying developmental disorders through the lenses of reflexive attention during eye-tracking tasks, genetic SNPs, and microbiota sampling via fecal samples. While preforming our research,

We are especially mindful of the autistic community, particularly within underserved and underrecognized groups, such as children in more rural areas and women.

I'm also wrapping up a thesis project with Dr. Lundwall, Dr. Nielsen, and Dr. Steffensen using a binocular rivalry task to gain insight into the overlap in social symptoms experienced by women with traits of autism and/or PTSD.

Dr. Lundwall is also part of the Many Babies Consortium. Because of this, we've been able to work on some unique projects on replicability, including one where many different labs followed the same infant-directed speech protocol and compared data.

Participating in research has enhanced my education in more ways than I could have imagined when I first applied.

I highly encourage all students, even those who might not know their specific career plans yet, to join a lab. It's kind of scary to approach professors, but they love geeking out about their research topics and will be happy that you want to learn more with them.



Participating in research has enhanced my education in more ways than I could have imagined when I first applied. Not only did lab work help me practice the concepts we were learning in class in real-world settings, but it also helped me learn how to explore my own questions, think more critically, and even understand news articles better.



In addition, developing individual mentor relationships with professors and making friends in lab helped a big campus feel much more approachable. The Kimball tower has become a second home.

Dr. Lundwall has taught me that compassion inspires good research, and that good research inspires compassion. It has been a privilege to watch her interact with the clinical community as well as our student team and see how she listens to the concerns people are experiencing and then finds ways to address those through our work.

A great quote that Dr. Lundwall has in the lab room says, “Nothing takes the place of persistence, not even talent, genius, or education”.

While she is obviously a very gifted academic, I have seen her live by that as our software inevitably malfunctions after updates, babies cry and funding changes, etc. Although she goes through these troubles, she keeps persisting, finding new ways to fix the problems and keep going.

I have learned I don't have to know everything in order to get started, and there will always be lots of opportunities to learn along the way.

Her drive, along with the safe environment she fosters, has inspired me to keep stepping out of my comfort zone. I strive to do this even when I'm afraid to try something I don't feel naturally talented at, which for an undergraduate like myself, is honestly still most things.

I have learned I don't have to know everything in order to get started, and there will always be lots of opportunities to learn along the way.

For me, the most fulfilling part of research is working with the participants. From moms, who describe how worried they are about their infant's speech development during Covid-19, to women sharing the difficulties they have experienced accessing mental health care due to social stigmas.

Nothing takes the place of persistence, not even talent genius or education.

Even the times I got puked on while setting up the eye tracker, babies are especially unpredictable, connecting with others has been the most important part of remembering why we do what we do. Furthermore, because of my experience with research, it has helped me have a much greater appreciation for every bit of knowledge that we have in the field.



Before I worked in a lab, I took the studies we learned about in our textbooks for granted. Now I realize that for every diagnostic criterion and psychological theory, research teams and countless participants have offered up their time, energy, and vulnerability.

The work we do and the understanding it inspires influences real people's quality of life. We have a great duty to our participants and the populations that they represent to collect and interpret the data as accurately as we can.

It's about so much more than vision paradigms and test tubes, even though we are obsessed with those in the best way. Research helps others know they are not alone, that people do care about understanding them, and the nuances of the struggles and triumphs that they face.

How Neuroscience Can Change Lives

Ashley Guest, Alumni Spotlight

I grew up in Gilbert, Arizona, where I graduated from Gilbert High School in 2011. Growing up I ran cross country and track, swam in the pool to escape the Arizona heat, played with my three younger siblings, read lots of books, and ate lots of otter pops. I married Andy Guest in 2019 and we had our first baby (a boy) in May 2021.

During my free time these days, I enjoy hanging out with family and friends, listening to audiobooks and podcasts, traveling, running, hiking, playing sports, watching movies, and playing board games.

I first became interested in neuroscience at the end of high school while working on a paper for my English class. That paper prompted me to get an internship working with Jeffrey Kleim at Arizona State University during the summer between high school and college.

I saw my first neurons under a microscope and learned how to do some behavioral studies with rats. I was already hooked on neuroscience when I headed to BYU and after taking Neuro 205 I was a full neuroscience addict.

My love of the brain has driven many of my career choices and the classes I took at BYU played a big role. I had so much fun in my neuro classes, and I remain fascinated by the brain—I am still trying to learn more about it!

In 2017, I started the MD/PhD program at the University of Arizona College of Medicine-Phoenix, where I am currently starting my 5th year.

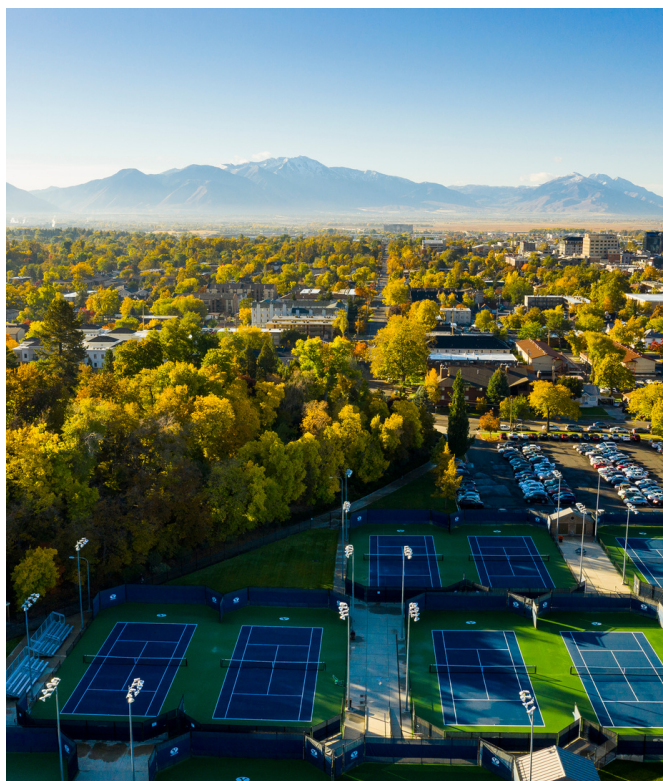
I am working in Bradley Greger's lab at Arizona State University and Barrow Neurological Institute where we are researching the mechanism of deep brain stimulation.

...learning about neuroscience increased my compassion for people suffering from mental illness or neurological disease.

My top clinical interest is in child neurology because I like kids and I like the brain (surprise, surprise). I want to become a physician-scientist, someone who works in medicine and research to advance treatments and our understanding of diseases to help patients have better outcomes.



My love of the brain has driven many of my career choices and the classes I took at BYU played a big role... after taking Neuro 205 I was a full neuroscience addict.



As I alluded to above, neuroscience opened the door for me to pursue a career as a physician-scientist. The passion I feel for neuroscience has driven me to pursue additional learning about the brain, and then to seek to use that knowledge to help people suffering from neurological disease.



In my personal life, neuroscience comes up all the time! Nearly all people are interested in the brain and love hearing about how it works. Additionally, I feel that learning about neuroscience increased my compassion for people suffering from mental illness or neurological disease. I also constantly feel the influence of becoming a scientist as I look for evidence to support my opinions and decisions.

Lately, I've been working on a side project reviewing some literature about the development of functional resting state networks in the infant brain. It has been a fascinating project as a new mother since I have a two-month-old baby at home who is in the process of forming the networks I'm reading about.

Find the path that is best for YOU! That's the advice I give most often to other students that I mentor, to my own family members, and to the young women I serve in church.

I had a difficult time deciding which path I would pursue after my undergraduate graduation—it was one of my toughest challenges while at BYU. I had many days of soul searching and felt torn between a career in research or a career in medicine.

"There are many good choices in life and many paths to get to the same choice. Find what is best for you and believe in yourself to achieve that dream. "

The scientific method and discovering something new was thrilling to me, but at the same time I felt drawn to working with people in a patient-oriented career. I also pondered

how my career would interact with my personal life. Ultimately, I decided to pursue medical research and as a step along that path I chose the MD/PhD program.

You need to ask yourself two big questions: where do you want to end up? And what do you want your training experience to be like? There are many good choices in life and many paths to get to the same choice. Find what is best for you and believe in yourself to achieve that dream.

During the last four years of the MD/PhD program, I've experienced a few bouts of imposter syndrome. Each time has been a bit different, but in general I have felt that I am not good enough to accomplish my goals, and that others are much more talented than I am.

"I encourage you to find those habits and mantras that work for you and develop them as a foundation..."



Those feelings are still challenging for me to handle, but I have gained strength through prioritizing family time, recognizing that I am capable, and connecting with God and with others, including patients and colleagues.

The things that help me make decisions and persevere through tough feelings may or may not be the same things that help you. I encourage you to find those habits and mantras that work for you and develop them as a foundation for your career and personal life.

Everything Will Work Out In the End

Ross Mangum, Alumni Spotlight

When I started at BYU, I did not have much interest in pursuing a scientific major and had no plans to go into medicine. I enjoyed my Psychology 101 course freshmen year, but felt a desire to better understand the neuro-anatomical and neuro-physiological principles that explained the various theories and concepts we were learning about human behavior.

As a missionary in Brazil, I loved playing a role in helping people change their lives by making simple life choices. This was the first time the idea of becoming a physician entered my mind.

I chose neuroscience as my major because it offered the “hard science” foundation I needed and helped me develop all the necessary tools for a career in medicine. I graduated from BYU in 2010 and moved back to my hometown Columbus Ohio with my wife Jill. There, I was able to attend the medical school at Ohio State University College of Medicine.

We stuck around Columbus for my pediatrics residency at Nationwide Children’s Hospital and then moved to Houston, Texas where I completed a fellowship in Pediatric Hematology/Oncology at Texas Children’s Hospital. We now live in Phoenix, Arizona where I work as a Neuro-Oncologist at Phoenix Children’s Hospital.

I’ve learned that if you just work your hardest, don’t complain about stuff out of your control, and treat others with respect, then things tend to work out in life.

As a Pediatric Neuro-Oncologist, I treat children with cancer of the central nervous system. Thus, I utilize knowledge acquired as a BYU neuroscience major every single day. Childhood brain and spinal cord tumors comprise the second most common type of pediatric cancer after leukemia, but represent an unacceptable percentage of deaths in this patient population.

We have made exceptional progress over the last several decades at improving our available treatment options and patient outcomes but still have a long way to go. My understanding of our role as sons and daughters of a loving Heavenly Father and the potential for eternal familial



relationships have helped me navigate the many challenging conversations that occur throughout the journey of childhood cancer.

There were numerous times during the undergraduate years and throughout medical training that I felt stretched to my limits. Whether it was preparing for the MCAT, struggling through a particularly challenging rotation in residency, taking board exams, or dealing with the loss of a patient, the whole journey has been full of humbling experiences.

I’ve learned that if you just work your hardest, don’t complain about stuff out of your control, and treat others with respect, then things tend to work out in life. It may not follow the exact script you planned from the beginning, but at key points you will be able to look back and see how things have worked out for a reason.



Neuro Endowment Fund

Dear colleagues, students, and alumni

Imagine if you could help students achieve their educational goals and learn through experience. The Neuroscience Endowment Fund will provide funding for:

- Scholarships
- Internships
- Experiential learning experiences

All funds go directly to the students. We are asking for your help as we cannot do this without you. Please join us in supporting students in their neuroscience education.

If you wish to donate, please follow the link below:

<https://donate.churchofjesuschrist.org/donations/byu/univ-wide-priorities.html?cde2=799-home>



Instructions:

- Search: "Select other funds" box and choose "BYU" under "Other Funds"
- Scroll down to "FHSS – Neuroscience – BYU" and hit "Select" (this will add the Neuroscience Fund Option)
- Enter an amount and then scroll down to the Frequency and Method of Payment sections
- In the section "Add Comment or Memoriam Information," select the "Comments or instructions" box and enter the Neuroscience Endowment Fund to which you would like to donate

We want to thank you for all your generous donations that have changed the lives of so many students and families. We could not do it without you!

BYU Neuroscience

BYU Neuroscience Center
S-192 Eyring Science Center
Brigham Young University
Provo, Utah 84602



If you would like to send
feedback or be featured
in our next edition,
please email us at:

neuroscience@byu.edu

For more information and updates
about BYU Neuroscience, visit our
website: neuroscience.byu.edu.

Photography by
BYU Photo and
Sarah Baker

BYU Neuroscience
Newsletter Issue:
Fall 2021

Created by the BYU
Neuroscience Center

- Sarah Baker and
Samantha McBride

EXPLORE
BYU
MAJORS

Please visit [https://universityadvisement.
byu.edu/major-exploration](https://universityadvisement.byu.edu/major-exploration)



BYU
NEUROSCIENCE