

# BIOLOGY NEWS

DEPARTMENT OF BIOLOGICAL SCIENCES

FALL 2024

## Help Us Support Student Fellowships in the UToledo Department of Biological Sciences

As a member of our vibrant community, you know firsthand the impact the Department of Biological Sciences has on students, research and the broader community. This semester, we are reaching out with an ambitious goal: to secure vital funds specifically for student fellowships, helping to ensure that the dedicated and hard-working students in our department have the support they need to thrive academically and professionally.

Our students, many of whom work part-time jobs to fund their education, face considerable challenges in balancing work and studies. For these students, the opportunity to fully focus on their academic pursuits is invaluable, allowing them to reach their full potential.

Your gift—every dollar counts—will have a direct impact on our students by enabling:

- **Academic Excellence:** Scholarships and fellowships not only provide critical financial support but also attract and retain exceptional

students, fostering a diverse and innovative academic environment that benefits the entire community.

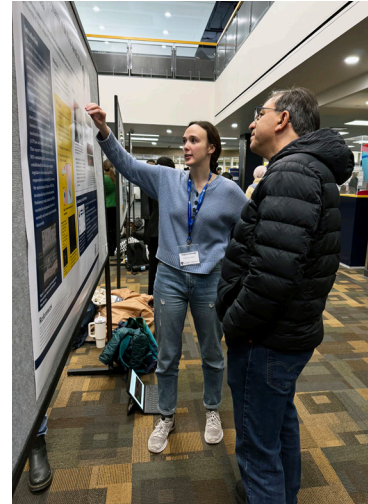
- **Research Opportunities:** Enabling students to dive into groundbreaking studies in molecular and cell biology, neuroscience, cancer and development, pushing the boundaries of scientific knowledge.

Our graduates pursue remarkable careers and make a significant impact as doctors, dentists and veterinarians, and are also driving change in research, scientific journalism, pharmaceutical sales and teaching among many other endeavors. Their achievements reflect the quality of education and training they received here—and your support is key to ensuring future students continue this legacy of excellence.

By donating to the Biology Department Merit Scholarship fund, you'll make the most direct impact on our students' lives. Contributions to other scholarships—listed below—are also incredibly valuable in advancing our mission.

Together, we can create a lasting impact on future generations of biologists who will shape the future of science and an understanding of the natural world. Join us in supporting student fellowships in the Department of Biological Sciences—your contribution, no matter the size, will have a profound and lasting impact.

Please be a part of this legacy of discovery, excellence and community. We thank you for your continued commitment to our students, our department and our shared pursuit of excellence.



For more information about giving, including **setting up scholarships or additional gift funds**, please contact Brittanie Kuhr, Director of Development - Colleges of Natural Science & Mathematics at 419.530.5418 or [brittanie.kuhr@utoledo.edu](mailto:brittanie.kuhr@utoledo.edu).

I would like to make a GIFT/PLEDGE in the amount of:  \$25  \$75  \$250  \$1,000  Other amount \$ \_\_\_\_\_

**PLEASE DESIGNATE MY GIFT TO THE FOLLOWING FUND:**

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| <input type="checkbox"/> Biology Department Progress Fund (2400441)               | <input type="checkbox"/> Fred O. Hartman Scholarship (1301403)   |
| <input type="checkbox"/> Joseph A. and Mary A. Capobianco Memorial Fund (1302290) | <input type="checkbox"/> Dr. James S. Hatfield College of Natural Sciences & Mathematics Scholarship (1302148) |
| <input type="checkbox"/> Dr. Charles Creutz Scholarship Fund (1302365)            | <input type="checkbox"/> Dr. Tony Quinn We Are STEMM Fund (1302461)  |
| <input type="checkbox"/> Dr. Bruce Crider Memorial Scholarship Fund (1301981)     | <input type="checkbox"/> C.V. Wolfe Natural Sciences Scholarship (1412003)                                     |
| <input type="checkbox"/> Other _____  |  |

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Thank you for supporting The University of Toledo. Gifts to the UToledo Foundation are tax-deductible as provided by law.

## IN THE NEWS ...

### Neuroscience Sophomore Seeks Insights into Autism in Summer Research

Annie Lei has long been fascinated by neuroscience, particularly the way that genetic variants alter brain development and result in medical conditions.

As a high school student in Edison, New Jersey, she took advantage of an opportunity to shadow a doctor who worked with patients with neurodegenerative conditions like dementia, and her current part-time job as a medical scribe puts her in contact with younger patients with neurodevelopmental conditions including autism.

The sophomore studying neuroscience hopes to work even more directly with patients like these in the future, crediting her aspirations for a medical career with initially attracting her to The University of Toledo. But as she awaits an interview with the College of Medicine and Life Sciences through UToledo's early medical school pathway BACC2MD, she's feeding her fascination with the science of the brain in the research lab of Dr. Wei Niu in the College of Natural Sciences and Mathematics. Niu's work employing human stem cells and brain organoid models to study genetic variants associated with autism spectrum disorders piqued Lei's interest almost as soon as she arrived on campus last fall.

Lei is continuing her work this summer through the Office of Undergraduate Research's First Year Summer Research Experience, which funds students to pursue research and creative projects during the summer following their first year on campus.

"Annie came to my office maybe two, three weeks after classes had started," recalled Niu, her faculty mentor and an assistant professor in the Department of Biological Sciences within the College of Natural Sciences and Mathematics. "She had one of my research papers in her hand. She had it highlighted, and she started asking questions.

"I've mentored a lot of undergraduate

students, and I've never had one show up with notes," she continued. "That really speaks to her commitment."

Lei has been a regular presence in Niu's lab since that memorable first impression, logging countless hours analyzing confocal images of the highly magnified brain cells they're investigating for insights into a gene that's been tied to neurodevelopmental disorders including autism spectrum disorders, intellectual disabilities and epilepsy.

While researchers know that this gene, identified as POGZ, regulates human cortical development, its precise function remains unclear. Niu and her team of undergraduate and graduate researchers are interested in zeroing in on this precise function, and in turn understanding the underlying mechanisms that lead to neurological conditions.

Lei is tackling an element of this work through her summer research project.

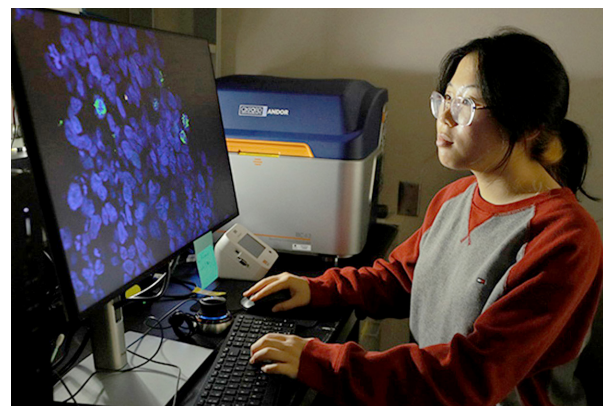
"I'm trying to investigate how POGZ regulates cell division during early neurodevelopment by processing and quantifying confocal fluorescent images," she explained. "It requires a lot of data, so it's a lot of computer work."

The First Year Summer Research Experience is one of several programs in the Office of Undergraduate Research. The office also coordinates Undergraduate Summer Research and Creative Activities Program, for example, which is a similar program that is not restricted to first-year students.

Lei is one of 15 students currently participating in the First Year Summer Research Experience, accounting for the largest cohort of students in years, said Chessica Oetjens, program coordinator in the Office of Undergraduate Research.

"They are a very passionate and energetic group," Oetjens said. "It's always exciting to watch their research evolve throughout the summer as they grow and learn."

Neuroscience is a new undergraduate



degree program at Toledo, established in response to surging interest in the field of brain research. Lei, who is also pursuing minors in psychology and chemistry, is among the first students to enroll.

The neuroscience undergraduate degree program is a unique collaboration between the College of Natural Sciences and Mathematics, where students begin to build foundational scientific knowledge in their first two years, and the College of Medicine and Life Sciences, where they spend their next two years digging into more advanced subjects like neuropharmacology and medical neuroanatomy.

Lei is looking forward to these future courses on Health Science Campus. She's had her eye on through the College of Medicine and Life Sciences since she was a student at Woodbridge Academy, a magnet school in her hometown that prioritizes the biological sciences and attracts students like her who are interested in medical careers. UToledo came onto her radar because of its early medical school pathway that allows applicable students an opportunity to sit for the Medical College Admission Test as juniors and apply to the medical college in the summer following their junior year.

After a first year that's kept her busy with student organizations like the campus chapters of the American Chemical Society and MEDLIFE, as well as the Jesup Scott Honors College, Lei said she'd welcome an acceptance from UToledo.

"That would be great," she said. "I would love to continue my education here."

*By Nicki Gorny, UToledoNews, June 27, 2024, used with permission*

## Biology Senior Advances Cancer Research, Career Goals in Prestigious Summer Internship

As Nabaa Ali considered her options for the summer ahead of her final semester at The University of Toledo, she had her pick of prestigious research opportunities.

Ali, a senior studying biology and women's and gender studies with a minor in chemistry, had landed acceptances at several National Science Foundation Research Experiences for Undergraduates (REU) sites including the University of Michigan's Cancer Research Summer Internship Program, Johns Hopkins University's Summer Internship Program and two programs at the University of Chicago: its Molecular Genetics and Cell Biology Summer Program and its Pritzker School of Medicine's Pritzker School of Medicine Experience in Research.



It was a tough choice, she said, but she thinks she made the right decision in Memorial Sloan Kettering Cancer Center's Molecular Imaging Summer Program in Manhattan.

"It's been fantastic," Ali said, speaking shortly before the recent conclusion of the 10-week program at what U.S. News and World Report ranks as the second-best cancer hospital in the United States. "I've been doing a lot of chemistry work, a lot of biology work. The program has been quite helpful in terms of helping me figure out what I want to do in the future, as well as just building those lab skills that of course are so important."

The REU program supports active research participation by undergraduate students in areas of research funded by the

National Science Foundation. Designated sites across the country welcome intern cohorts each summer, with UToledo's Department of Physics and Astronomy among them in 2024.

Ali was one of 10 undergraduate students who participated in the Memorial Sloan Kettering Cancer Center's Molecular Imaging Summer Program, where they've benefited not only from valuable bench-side mentorship, but opportunities to network with many of the center's leading scientists and physicians. In line with her interests in biomedical research, Ali worked alongside a postdoctoral researcher on a project related to radiopharmaceuticals for targeted diagnosis and treatment of cancer.

Ali has a strong interest in biomedical research as it applies to the advancement of cancer therapies and aspirations to translate this work to the field of international public health. With plans to continue to medical school, potentially to pursue a combined M.D.-Ph.D. program, she's interested in ultimately exploring therapies that are not only effective but also accessible and affordable in developing nations — a goal she in part credits to her childhood experiences in Libya and participation in medical missions to Honduras and Guatemala.

Ali was 13 years old when her family immigrated to Sylvania in 2016. She began enrolling in courses at UToledo shortly after through the state's College Credit Plus program, which allows students to begin taking college courses while still in high school and allowed her to earn an associate degree from UToledo even before her diploma from Toledo Early College High School in 2021. Ali said the research opportunities and welcoming environment she found on campus enticed her to enroll as a full-time student at UToledo.

She's since enjoyed participating in Relay for Life at UToledo, through which she led a team of more than 30 students in raising money for patients and cancer research at the American Cancer Society. Ali was



also quick to join the research laboratory of Dr. Rafael Garcia-Mata, a professor in UToledo's Department of Biological Sciences.

Garcia-Mata studies Rho GTPases, a family of enzymes that control many aspects of cell behavior, with a particular eye toward their role in cancer progression. Under the mentorship of Garcia-Mata, Dr. Silvia Goicoechea, a research associate professor, and several doctoral students, Ali has specifically been researching SGEF-mediated regulation of tight and adherens junctions.

"Junctions serve as the 'glue' between cells and their environment," Ali said. "It is important to understand how they are regulated as their downregulation has been linked to cancerous metastasis."

Garcia-Mata speaks highly of his undergraduate researcher.

"Nabaa has impeccable work ethic, and she's also curious and ambitious and always looking for new opportunities to expand her horizons," Garcia-Mata said. "I'm excited to see where she takes this research at Sloan Kettering Memorial."

*By Nicki Gorny, UToledoNews, August 8, 2024, used with permission*



## Biology Student Wins \$25,000 Scholarship From Taco Bell



Will Zeller was a UToledo biology student working at Taco Bell when he landed a life-changing opportunity.

"My manager told me about the Taco Bell Foundation's Live Más scholarship program and

encouraged me to apply," Zeller said.

"A couple months later, my manager excitedly called me and told me that I won the \$25,000 scholarship."

The Live Mas Scholarship is to help support Taco Bell employees who are pursuing higher education who demonstrate a passion for making a positive impact in their communities. More than over 13,000 employees nationwide apply each year, with only 12 awarded the \$25,000 scholarship, which is renewable up to three times.

Zeller's fortune didn't stop with the scholarship.

He also received another offer from Taco Bell, this time asking if he would like to be a part of the scholarship ad campaign.

"I said yes, of course, and they flew me out to Irvine, California, for a photoshoot with four other scholars," he said. "They treated us so nicely there, and they even

gave us a personal tour of the Taco Bell Headquarters."

Zeller's image is now featured across national Taco Bell locations advertising the program.

As a part of this scholarship, Zeller was awarded an all-expenses paid trip to San Diego to attend a leadership and networking conference with more than 300 other Live Mas scholars. He may apply to attend again every year.

To apply for the scholarship, Zeller was required to record a two-minute video discussing his career goals and service in the community.

He talked about his own project, Saving Senior Smiles.

"Saving Senior Smiles was a service project that I created in 2020 during the pandemic," he said. "I usually participated in several different service projects in my community each year, but almost all of them were cancelled when the pandemic hit. With dentistry in mind, I was also worried that with all the other health concerns at the time, oral health was likely not a priority, especially for the older generations."

Zeller talked with his local dentists and was able to gather over 200 donations that would go to the local senior centers. Each package was delivered safely with social distancing in mind.

"This project was a safe and effective

way to serve the elderly population in my community," Zeller said. "I wanted to let them know they weren't being forgotten about during the pandemic."

Now a senior, Zeller chose UToledo for the unique direct-admit dental program partnership with Case Western Reserve University. This year, he started his first year at Case Western's School of Dental Medicine, which he can more comfortably attend with the scholarship supporting him.

Also supporting him is Dr. Deborah Hendricks, director of the Pre-Health Advising Center, who called Zeller a highly motivated and hardworking student.

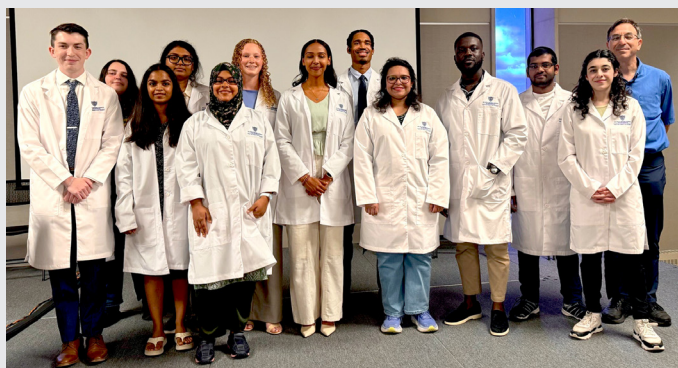
"His smile brightens the room and matches his warm and inviting personality," Hendricks said. "It has been a joy to watch him grow and move closer to his goal of becoming a dentist these past three years. I am proud of his accomplishments and am confident he will carry that same smile and inviting demeanor into his future dental practice."

Zeller said he is grateful for what Taco Bell has done for him.

"The Live Más scholarship program is more than just the money," he said. "Receiving this scholarship was truly life-changing, and it's going to help me out immensely in paying for dental school."

*By Natalie Burgess, UToledoNews, October 8, 2024, used with permission*

## 2024 Graduate Student White Coat Ceremony



On August 19<sup>th</sup> 2024, the incoming Fall 2024 graduate students in the Department of Biological Sciences, together with those from the other departments, were officially welcomed to the College of Natural Sciences and Mathematics with our first ever Lab Coat Ceremony. The ceremony opened with a welcoming address by Dean Marc Seigar, followed by the reading of an oath and presentation of lab coats to M.S. and Ph.D. students, the highlight of the event. This was the first ever Lab Coat Ceremony in the history of our graduate program. The Lab Coat Ceremony is a significant milestone, symbolizing each student's dedication to the study of biology and the ethical responsibilities that come with it.

Pictured above (L-R): Derek Kluczynski, Chelyan Edwards, Jasvinder Kaur Bharaj, Aiswarya Pazhoormattom Haridas, Sadika Tul Jannat Tonu, Sydney Conrad, Rowaida Hamdan, Obadele Casel, Sadia Haque Khan, Vincent Ntiamoah, Dhananjaya Rankoth Gedara, Lucia Gonzalez Blotta and Dr. Tomer Avidor-Reiss. (Not pictured: Nauman Ahmad and Nikita Jadhav)

## Undergraduate Parents Build Community, Savor Success at UToledo

A few pre-semester nerves were nothing new to Christie Hoeflinger.

She'd already logged several college credits toward her long-term goal of veterinary school by the time she was preparing for her first day of classes at The University of Toledo in fall 2023. But she also knew that semester would look a little different for her.

It would be her first as a mother to a 9-month-old baby.



"We have a lot of family support, but I still didn't know how I was going to do it with such a young child. And I don't know how my fiancé and I were both going to do it," said Hoeflinger, currently a health sciences junior at UToledo. "What happens when the baby gets sick

and we've both got exams?"

Hoeflinger and Hayden Grady, a biology sophomore, count themselves lucky that they haven't yet had to tackle that particular question since they enrolled in the same semester at UToledo. But they have navigated plenty of other joys and challenges as student parents, a slice of the campus community that the Catharine S. Eberly Center is recognizing in September for National Student Parent Month.

A diaper drive and professional development series for faculty and staff will extend throughout September, while Carlson Library hosts an open house for its Family Resource Room from 11 a.m. to 2 p.m. Thursday, Sept. 12, and a student parent focus group meets over lunch in the Eberly Center from noon to 1 p.m. Wednesday, Sept. 18.

For more information on National Student Parent Month programming at UToledo, go to the Eberly Center website.

Hoeflinger and Grady have become

regulars at the Eberly Center, where student-parent initiatives fall under a broader mission to promote and advance gender equity at UToledo. Eberly Center Associate Director Danielle Lutman is the advisor to the student organization the couple launched in the spring, Rocket Parents and Caregivers, which aims to build community and peer support among students who know firsthand what it's like to juggle simultaneous commitments to classes and children.

Members meet monthly for conversation and children's crafts in the center lounge.

"Christie and Hayden are amazing student leaders and student parents," Lutman said. "Recognizing that student parents need a continuous community, they reached out to the Office of Student Engagement and within a month had a student organization up and running for student parents and caregivers. Their dedication to making UToledo more family friendly is encouraging and they're already on the way to accomplishing that goal."

Hoeflinger had put in semesters at Ohio State University and University of Cincinnati, ultimately withdrawing during the coronavirus pandemic, by the time she met Grady in 2021. That was at an animal hospital in Bloomington, Indiana.

She was working behind the counter when he walked in with a cat.

"The rest is history," Hoeflinger joked. "We still have that cat."

The couple left Bloomington for Hoeflinger's hometown in Ottawa Hills before they welcomed their son, Archer, on Thanksgiving 2022.

By the following summer, the new mother was thinking about going back to school and continuing to work toward her goal of becoming a veterinarian.

Grady, who said he hadn't thought much about college after dropping out of high school and working trade jobs while pursuing his GED, decided he would join her. A first-generation college student, he's now eyeing medical school.

Both described a positive on-campus experience at UToledo, with faculty and

staff who support their family situation and career aspirations.

For Hoeflinger, who is among the first undergraduate students to pursue a degree under the new health sciences program, that's particularly true of the Pre-Health Advising Center.

Meanwhile, Grady connected in his first semester with Dr. Song-Tao Liu, a professor and chair of the Department of Biological Sciences, with whom he's been studying a protein that regulates the cell cycle as an undergraduate researcher.

Grady also just completed a First Year Summer Research Experience with Liu. One of several programs in UToledo's Office of Undergraduate Research, the First Year Summer Research Experience funds students to pursue research and creative projects under the mentorship of UToledo faculty member during the summer following their first year on campus.

"I think it's really cool that this is a research university," Grady said. "The opportunities are so diverse. Whatever you're interested in, you can find someone doing it."

As Hoeflinger and Grady begin their second academic year on campus, they're looking forward to growing membership for Rocket Parents and Caregivers. The half-dozen or so parents and caregivers who regularly attended last semester became a supportive on-campus network for them, and a complement to the friendships they've developed with classmates whose home lives look very different from theirs.

They hope the student organization can be a similar resource for other student parents.

"It's rewarding when you can connect with someone in the same situation," Hoeflinger said. "If there are other student parents experiencing the same struggles as us and potentially feeling alone in those struggles, we want to provide a space for them to feel supported and welcomed on campus."

*By Nicki Gorny, UToledoNews, September 10, 2024, used with permission*



## Departmental Halloween Parade

Our Department of Biological Sciences graduate students celebrated Halloween in style with science-inspired costumes and engaging activities! They hosted lab tours for undergraduates, offering an exciting glimpse into the cutting-edge research happening in our labs. The event highlighted the department's creativity and camaraderie, with plenty of candy to sweeten the day. It was a fantastic mix of science, fun and Halloween spirit!





## UToledo–Salford Exchange Program Celebrates 40<sup>th</sup> Anniversary

On Saturday, April 13, approximately 50 alumni, current and retired faculty, and students, came to campus to celebrate the 40<sup>th</sup> Anniversary of The University of Toledo–University of Salford Exchange Program. The Exchange Program began shortly after Dr. David Dollimore, a chemistry professor from Salford, was recruited to UToledo to be Chair of the Department of Chemistry. Once here, he recognized the similarities between the two institutions and thought it would be a good opportunity to establish an exchange program.

The first students participated in the exchange during the 1984–1985 academic year when four chemistry students from Salford came to the U.S. to study at the University of Toledo. The following year, the first three chemistry students from UToledo—Kent Dauterman, Adele (Koehler) and Laura DeWitt—exchanged at Salford. During the 1987–1988 academic year, the first biology students to participate in the exchange went to Salford and since its

inception, more than 550 students have exchanged between the two Universities.

The celebration began in the afternoon with testimonials from past participants followed by

a walk around campus on what was a beautiful spring day. In the evening a celebratory dinner was held in the Student Union and featured testimonials from the first three participants—Kent, Adele and Laura. We also heard from Peter Norris, Sean Cush and John Willsher, three of the four students from Salford who were the first to come to



UToledo for the 1984–1985 academic year. Sean Cush and John Willsher, along with Gerard Nation (who came to UToledo during the 1986–1987 academic year) all traveled to Toledo from England and Germany to attend the celebration, their first time back on campus since their exchange years. It was clear from hearing the testimonials during the day and at dinner that the Exchange Program had a significant and very positive impact on the participants lives, which was clearly demonstrated by the distance they and other guests traveled from to attend the celebration.

As a way to celebrate the contributions to the exchange by faculty and staff at both institutions, the College of Natural Sciences and Mathematics established the University of Toledo–University of Salford Exchange Program Hall of Fame and three people were inducted as the founding members. Dr. David Dollimore was inducted for his vision in recognizing the opportunity and establishing the exchange program. Roy Whitehead, a physics professor at Salford, was influential at the University of Salford in both recruiting Salford students to participate in the exchange and in welcoming and hosting UToledo students to Salford during the early years of the exchange. The third inductee was Dr. Patricia Komuniecki. Dr. Komuniecki served as the Director of the Exchange Program from 1992 to 2010. During her tenure as director, she had 141 UToledo students and 288 total students participate in the exchange. As many alumni know, Dr.



Above: Kent Dauterman (one of the first three students who exchanged at Salford) sharing memories from his exchange experience.

Komuniecki was truly dedicated to the exchange program, nurturing it and the students who participated, and really building the exchange into the strong program that we have today.

At present, the Exchange Program continues to be strong even with some issues brought on by the pandemic (there was no exchange during the 2020–2021 or 2021–2022 academic years). We are in the process of renewing the exchange agreement between UToledo and Salford for another five years and are continuing to look for other areas to expand the exchange to give more students the opportunity to study abroad. Currently, the exchange has expanded to include students majoring in biochemistry, environmental sciences, physics and geography & planning (starting in the 2022–2023 academic year), in addition to chemistry and biology majors.

*By Dr. Brian Ashburner, Director, UToledo–Salford Exchange Program*



Above (L–R): John Willsher, Sean Cush and Peter Norris along with Jacob Davinson and Oskar Czembor (exchange students during the 2023–2024 academic year) at the celebratory dinner.

## Biology Alumna Awarded Full Tuition Scholarship to Attend Medical School ... Juliana Odu

"While working towards my Bachelor of Science in Biology degree, I spent a good amount of time interacting with the professors and other administrative staff within the department. The willingness of professors within this department to support me throughout my academic journey and provide me with many opportunities for learning was a highlight of my time at UToledo. In the spring of my freshman year, I attended one of the research symposiums hosted by the department and came across a poster presentation of the work being done in the Chen Lab. This was the beginning of my interest in research and I was accepted as an undergraduate researcher in that same lab the following semester. As a member of the Chen Lab, I received mentorship, support and guidance, not just from my Principal Investigator but from the Graduate Students in the lab as well, and with their help, I applied to and was awarded funding for the Undergraduate Summer Research and Creative Activity Program (USR-CAP). Though my award was administratively withheld due to the COVID-19 pandemic, this along with the research skills I gained prepared me for my participation

in Graduate Research during my MPH degree and prepared me for my current role as part of a research team within the Center for Child Health Equity and Outcomes Research at the Abigail Wexner Research Institute at Nationwide Children's Hospital.

After graduation, I continued to receive support and encouragement from the Department of Biological Sciences; this support also came in the form of recommendation letters for my medical school applications from professors within the department. I am happy to share that thanks to the department's support over the years and specifically with my medical school application, I am now the recipient of the Dean's Distinguished Scholar Full Tuition Award at The University of Colorado School of Medicine, where I will start medical school this fall."



## Alumni in the News ...

### Arianne Lovey Cruz (B.S. in biology, minor in chemistry, 2013)



A proud graduate of The University of Toledo, Arianne has followed a fascinating and unconventional career path since her time at the university. Choosing UToledo was a deliberate decision for Arianne. She was drawn to its well-rounded biological sciences program, which offered a perfect balance of opportunity and community. As a recipient of the prestigious merit-based Rocket Scholar award, Arianne felt her hard work in high school was acknowledged, helping her solidify her decision to attend UToledo.

While at UToledo, Arianne found herself challenged and captivated by a subject many students shy away from—organic chemistry. Under the guidance of Dr. James Zubricky, her passion for learning flourished, even in her weakest subject, making organic chemistry her favorite class.

Arianne also had the opportunity to conduct honors research under the mentorship of Dr. Malathi Krishnamurthy. She delved into the intricate relationship between RNaseL and autophagy, a research experience that would later shape her career. However, her most cherished memory from UToledo wasn't confined to the lab. Through the UToledo-Salford Exchange Program, Arianne

expanded her horizons, forging lasting friendships and gaining invaluable global perspectives—an experience she describes as the highlight of her undergraduate years.

After graduating from UToledo, Arianne's passion for bench research led her to the University of Salford, where she completed an MSc in Parasitology, followed by a Ph.D. in TB immunology. Today, she is an Adjunct Research Assistant Professor and Senior Research Scientist at the University at Buffalo, where she plays a critical role in drug development research, focusing on finding new treatments for antimicrobial-resistant organisms.

Reflecting on her time at UToledo, Arianne believes the university shaped her career in unexpected ways. Initially set on



becoming a pediatrician, her experience in research opened her eyes to the exciting world of bench science. Now, rather than working directly with patients, she contributes to life-saving drug development efforts that may impact millions globally.

To freshmen at UToledo, Arianne offers sage advice: "The 4 years will go fast! Be as involved as you can and don't be too narrow-minded about your career goals." Her journey is a testament to the power of staying open to new experiences and embracing the unexpected.

We're thrilled to share that Arianne remains connected with UToledo and is looking forward to receiving our Biology Department newsletters. Her journey from UToledo to Buffalo demonstrates how a foundation in the biological sciences at UToledo can propel graduates into fulfilling, impactful careers.



### **Trevor Lambert (B.S. in biology, minor in chemistry, 2022)**

"I graduated with Honors from The Department of Biological Sciences in the College of Natural Sciences and Mathematics as well as the Jesup Scott Honors College in December of 2022 with a B.S. in biology and a minor in chemistry. I chose the University of Toledo as it was somewhat close to my hometown and it offered an excellent education in the sciences, which is important for pursuing a future career in medicine. Throughout my time at UToledo, I was a part of many organizations and activities including Camp Kesem, Relay for Life and HOSA Future Health Professionals, as well as Signal Transduction research.

I completed two and a half years of research under the supervision and direction of Dr. Maria Diakonova in the Department of Biological Sciences. Throughout this time I explored JAK2 and its impact on primary cilia formation and cell migration. This experience offered me the opportunity to have a better understanding of how lab research is conducted, as well giving me a better comprehension of how microscopic biological processes take place in cells. Over the course of my time in Dr. Diakonova's lab, I learned many different modalities of experimentation including cell

culturing, immunofluorescent staining and immunofluorescence/phase contrast/light microscopy, as well as statistical analysis. Not only has this experience offered me the chance to bolster my medical school application with in-depth biological research, but it has also allowed me to improve the understanding of the complexities of cellular mechanisms.

Dr. Diakonova offered helpful insight and was always available to discuss questions that may have come up over the course of an experiment. She truly wanted us to better understand what we were researching and how it impacted future research. Similarly, working in her lab taught collaborative skills through scientific endeavors which is truly an asset to any undergraduate student. She also helped her students with writing our thesis and creating presentations of our research that were shown at the Biological Sciences Research Symposium. Thanks to my time under the guidance of Dr. Diakonova, I am now a better scientific writer and thinker, which is an irreplaceable attribute for any student looking to further their career in the field of biology or medicine.

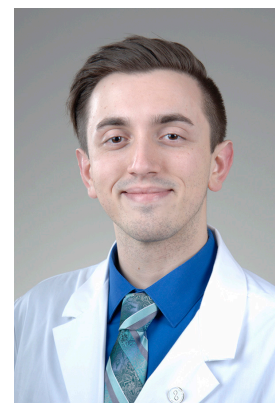
Likewise, the faculty of the Department of Biological Sciences also helped to shape me into the lifelong learner I am today. I felt that no matter what professor I had, they always had an open-door policy when it came to helping their students. This is one of the biggest advantages of obtaining my degree at UToledo, as I felt welcome to learn and ask questions every day!

After graduation from UToledo I chose to take a gap year to prepare for the MCAT and medical school application cycle. I have recently started my medical education at the University of Toledo College of Medicine and Life Sciences. Aided by my time and experiences at the University of Toledo, I am well prepared for a future in the field of medicine."

### **Drew Pariseau (B.S. in biology, minor in chemistry, 2021)**

"Since completing my biology undergraduate degree at the University of Toledo in 2021, I have transitioned into the University of Toledo College of Medicine and Life Sciences, now a second-year medical student. The knowledge and skills acquired during my biology program have proven invaluable, laying the groundwork for my success in medical school. The program's extensive curriculum and practical experiences have formed the cornerstone of my medical education.

One notable aspect of my postgraduate journey has been my active involvement in the CommunityCare Clinics, where I have had the privilege to serve on the executive board. The comprehensive biology curriculum at the undergraduate level has been instrumental in refining my analytical and problem-solving skills, qualities that have proven indispensable in my clinical and administrative endeavors within the clinic. The coursework in genetics, physiology and microbiology has also provided me with a solid foundation of the intricacies of human health, enabling me to approach patient cases with a well-rounded perspective.



(Alumni in the News, continued from page 9)

Continuing my engagement with lab research has been another significant facet of my postgraduate journey. Building upon the research and laboratory experiences from my undergraduate program, I have been able to delve deeper into specific medical and life sciences topics with confidence. The research-oriented coursework, especially in molecular biology and biochemistry, has provided me a strong comprehension of experimental design and a passion for scientific inquiry. In particular, I appreciated the Biology Literature and Communication course as it offered a vital opportunity to explore the sciences at a professional level.

As I navigate the complexities of medical education, I am grateful for the solid foundation laid by the University of Toledo's biology program. The program not only instilled a passion for scientific inquiry but also fostered a commitment to service and community engagement. These values continue to guide me in my pursuit of becoming a compassionate and skilled healthcare professional."

### Hannah Vandebroek (B.S. in biology, minor in chemistry, 2022)

"I am from Clarksville, Tennessee, and decided to attend The University of Toledo in 2018 for multiple reasons. For starters, there were no universities near home that were decent for pre-medicine due to the lack of healthcare opportunities in the area and lack of available research. Thus, for these two reasons the University of Toledo was a much better fit. I also wanted to remain close to family. While my immediate family was 500 miles away, my father is one of 15 children and most of them still reside in the Toledo area where he grew up. I visited UToledo for Experience Day in 2018 and once I learned about all of the opportunities that it presented to its undergraduate students, my mother started crying because she knew that I had already made up my mind even though being away from home would be difficult.

I participated in undergraduate research with Dr. William Taylor in 2019. Although I came in a few times during the pandemic, this was difficult because I initially had to leave my dorm and go back home to Tennessee, and following this, it was hard to find time to come in. The time I spent in this lab was very enjoyable and I was able to work with a graduate student on a project regarding a protein that was found to be over-expressed in cancer (C9orf78). I mostly focused on immunofluorescence experiments and this project has since been published (*hC9ORF78 Localizes to Kinetochores and is Required for Proper Chromosome Segregation*. *bioRxiv* 2021.02.03.429653). Overall I enjoyed the experience and working with Dr. Taylor very much. It was a great learning experience and everyone was so inviting.

I started classes in my degree pathway but my favorite class was Developmental Biology taught by Dr. Robert Steven. I took this class as an honors class during the pandemic when everything was virtual. The honors meeting was online and ended five minutes before my in-person physics, so I had to attempt to participate in the discussion in the hallway of McMaster, which made the experience rather comical at times. I thoroughly enjoyed the content of this class and how relevant it was to what I was interested in pursuing in the future.

I graduated from the University of Toledo in May of 2022 with my B.S. in Biology. During my time at UToledo, I also took paramedic courses at the health science campus as an elective and am finishing up testing to get my certification and license, though this is not my end goal. I am currently in a gap year after graduation working as a medical scribe for Medical Scribing Solutions while applying to medical school. I am unsure if I will work as a paramedic in this gap year as well or not; however, I am so excited for what the future holds. The education and experiences have helped prepare me for where I am now as I am able to apply what I have learned in my biology and chemistry classes to the clinical setting, making me much more excited to pursue medical school.

If anyone is reading this and is still in college just know that things will not happen according to plan. I had planned on studying abroad at Salford, continuing research through graduation and getting straight into medical school. However, I did not anticipate the pandemic throwing a wrench in those plans, moving home during college, becoming a medical scribe (I did not even know this was a thing initially), studying and being licensed in EMS, taking the MCAT multiple times, meeting and forming relationships with many physicians and paramedics, and finding ways that I can work in and with the surrounding community regardless of where I end up in the future. Plans change, things may not work out and you fall down and get back up. College is a rocky journey especially for STEM majors, as I have found out personally and through friends, but it will all be well worth the hard work and dedication in the end."





## Alumni Spotlight ...

I came to The University of Toledo as a wide-eyed freshman in 1979 looking to earn my B.A. degree in biology and advance my education to medical school. I remember my four years living on campus in Parks Tower, room 514, with a sincere fondness that fostered my education and personal growth. The campus atmosphere was a tight knit community that was supportive and created a “family” environment. My perspective was that it was just the right size... not too big and not too small. Most of my classes were in the former Engineering Science and Bowman-Oddy Laboratories. But I did get to attend classes all over the campus. My professors knew me by name and sincerely cared about my education.

Our pre-med advisor was James Stebbins. Likewise, he knew all of the students by name and somehow was able to keep track of our progress throughout all of our majors and the program. We were part of his flock and his experience, wisdom and direction helped guide the careers of countless physicians and dentists that graduated from the program.

As I was preparing to graduate with my B.A., I began the process of applying to medical schools. I applied to four - the Medical College of Ohio at Toledo (now known as UTMC), Northeast Ohio College of Medicine, Cincinnati College of Medicine and Wright State. My degree, education and the support of the faculty and my family helped me get accepted at all four of these schools. In fact, I was accepted at Cincinnati at the interview. I chose MCO (UTMC). I had fallen in love with the city of Toledo, and it had become home.



My undergraduate degree served me well. I had four difficult but educational years at MCO and received my Doctorate of Medicine in 1987. Once again, faced with furthering my education, I applied to and was accepted at the Flower Hospital Family Medicine Residency. Here I spent the next three years as an intern and resident physician, becoming the “Chief Resident” my third and final year.



Upon my Residency graduation, I opened a practice in Metamora, Ohio, that was sponsored by Flower Hospital. Feeling the need to give back to my alma mater, I volunteered to be a preceptor for student physicians doing AHEC (Area Health Education Center) rotations for MCO students. I additionally became active in medical staff leadership at Flower Hospital where I eventually became Chief of Staff. My leadership was recognized by administration and I was offered the position of Vice President of Medical Affairs (VPMA) at Flower Hospital. A few years later, I took on the same position at Defiance Regional Hospital. Additionally, the ProMedica Physician Group named me the Director of Medical Operations (DMO) for our Psychiatry Service Line. To date I am a practicing Family Physician in Metamora, the VPMA at ProMedica Flower Hospital and VPMA at Defiance Regional Hospital as well as the DMO of our Psychiatry Service Line. I currently hold two volunteer faculty positions at UTMC in Family Medicine as well as the PA School.

I am 63 years old looking at the fourth quarter of my career. I certainly have come a long way since my matriculation to UToledo. However, I sincerely doubt the outcome would be the same had it not been for the educational experience I received from the professors and mentors that helped me attain my first educational goal, the B.A. in Biology from The University of Toledo.

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Fall 2024

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