

BIOLOGY NEWS

DEPARTMENT OF BIOLOGICAL SCIENCES

SPRING 2023

Dear friends,

Greetings from the Bowman-Oddy Labs and Wolfe Hall!

Please join me to congratulate the achievements of our 2023 Spring

graduating students: seven B.A. and 70 B.S. Biology majors, five B.S.'s in Medical Lab Sciences and four Ph.D.'s in Biology! We are proud of you and wish you all the best in the next phase of your journey. We look forward to hearing more of your stories in the future.

Can I ask a favor? Please share this newsletter with anyone who might be interested, especially prospective students. Whether you are an alum, parent, retired faculty or staff, current student or department friend, please mention our beloved department to your social circle and let them know that we are happy to send future newsletters directly to them if they want to be added to the mailing list!

As The University of Toledo just wrapped up its 150th anniversary celebrations, in the spirit of reflection and looking forward, I also studied the archives and found some history about our own department. The Department of Biological Sciences was founded in 1919 by Dr. Howard Bowman; and the B.S. in Biology program was started the same year! In 1949 the first M.S. student graduated and in 1972 the first Ph.D. student graduated from the department. Since 2000 the Department of Biological Sciences has maintained its research and educational focus on Cell and Molecular Biology. So, we have been serving our students and community for over 100 years! Our graduates have produced positive impacts not only in the Toledo



and Northwest Ohio area, but also nationally and internationally.

To carry the historic honors forward, what have we been doing in response to the post-pandemic challenges that most U.S. colleges are now facing? For undergraduate education we continuously work to make our curricula and degrees relevant for the times and more importantly, relevant to our students' interests and future careers. The new B.S. in Neuroscience program has gained attention among students and parents. The first NSCI course was offered in the 2023 spring semester. We are going to welcome our new cohorts for the neuroscience major, as well as a new neuroscience professor, in the 2023 fall semester. Stay tuned for more on Neuroscience in the fall! The BACC2MD pipeline program is also appealing nationwide to students who aspire to become future physicians and surgeons. I also happily report that the excellent quality/cost ratio of our undergraduate programs has attracted a significant number of international students (~11% of our student population in the 2023 spring semester). Finally, we have increased efforts to make students more aware of a wide range of job options with their B.S. degree in biology, cell and molecular biology concentration. While the experiential learning in the research labs on the UToledo campus is very popular among students, we are working with UToledo Career Services to encourage students to explore job-oriented internship opportunities in biotech and pharmaceutical industries. Please help spread the message that UToledo Career Services provides LIFELONG help to all alumni throughout their career development!

We are also revamping our graduate programs not only to provide a seamless

transition to our undergraduate students, but also to meet the demand of students who have non-academic career options in mind. A shortened M.S. program from two years to 1 year + four months will begin in fall 2023 and curriculum reorganization is underway to implement a B.S.-M.S. 4+1 pipeline program, hopefully starting in the 2024-25 academic year. Different tracks in these M.S. or B.S.-M.S. programs will give students more freedom to choose what they would like to focus on after being equipped with a core knowledge of modern cell and molecular biology. We are also exploring opportunities of joint Ph.D. programs with other partners.

On the faculty side, the University held a banquet in March to celebrate tenure and promotion of faculty members, including Dr. Rafael Garcia-Mata's promotion to full professor and Dr. Qian Chen's tenure and promotion to Associate Professor. Also, UToledo just made an official announcement that Senior Lecturer Dr. Sally Harmych has been recognized as a Distinguished University Lecturer! Congratulations Rafael, Qian and Sally!

If you have an internship opportunity in your workplace, if you want to share your wisdom with current students, if you have memorable stories about the department or if you have good news at work or at home, please do not hesitate to write to us — we will be happy to include the information in our newsletter! Be sure to follow us on social media, too.

Enjoy your summer!



Song-Tao Liu

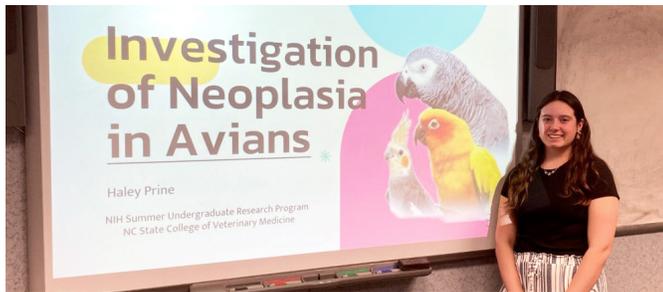
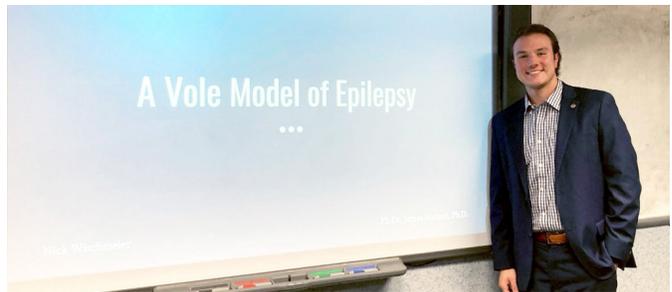
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IN THE NEWS ...

Data and Donuts - A Platform for Undergraduate Researchers to Present Their Work

Undergraduate researchers in the Department of Biological Sciences have a new opportunity to share their findings during the Biological Sciences Undergraduate Research Seminar, held on Thursdays throughout the fall and spring semesters. Dr. Heather Conti, Director of Undergraduate Research, leads the seminar, referred to as “Data & Donuts”.

Students involved or interested in research can attend to enjoy a donut while learning about the research being conducted specifically by undergraduate researchers in the department. It is an opportunity for the students to form a community of researchers, while the presenters receive valuable feedback from their peers and faculty related to data analysis, interpretation and presentation.



Pictured is a selection of students who have recently presented. Left row: Haley Prine and right row (top to bottom): Sangeetha Pillai and Nick Wischmeier.

TriBeta Society Resumes Activity After Covid

TriBeta is a national collegiate honors society for students involved in the biological sciences field. Since emerging from a “Covid-19-induced hiatus” the current executive committee, comprised of Michelle Cherian, Sunny Yadav, Patrick Fox, Lexi Waggoner and Rudy Dua, has worked tirelessly to reboot the TriBeta honors society at UToledo.

Along with the general membership of the UToledo TriBeta society, the executive committee was excited to promote numerous activities on campus this year to highlight what UToledo biology is all about! These included hosting events to provide Biology undergraduate researchers the opportunity to present their research to their peers, as well as organizing workshops designed to help Biology students fill out the paperwork necessary to be considered for various grants offered by the UToledo Office of Undergraduate Research and Competitive Fellowships.

As the 2022-2023 school year comes to an end, the executive committee looks forward to continuing its support of TriBeta members in the future and hopes to continue improving the understanding and appreciation of biology through scientific research at UToledo.



Pictured (L-R): Lexi Waggoner (marketing coordinator), Patrick Fox (secretary), Sunny Yadav (vice president), Michelle Cherian (president) and Rudy Dua (treasurer).



8th Annual Biological Sciences GSA Research Symposium

On Friday, March 24, 2023, the Department of Biological Sciences celebrated the research performed by the department's graduate students. The symposium took place in the Thompson Student Union Ingman Room from 9 a.m. to 4 p.m.

The mission of this 8th Annual Biological Sciences GSA Research Symposium was to promote scientific discourse between faculty and graduate students in the Department of Biological Sciences and across The University of Toledo research community. Additionally, it was a great opportunity for undergraduates, the public and other institutions to foster a better understanding of modern molecular and cell biology research taking place at UToledo. Undergraduate

students were also able to learn about research opportunities offered throughout the year in the department.

This free, public event provided a forum for graduate students to present their work in a formal setting, similar to what they experience if they choose a career in science. The symposium included talks and a poster presentation by graduate students. The event also included a presentation by Dr. Alice Telesnitsky, Professor, University of Michigan. An award ceremony followed the final set of talks.

Lunch, snacks and beverages were provided during the symposium.

The event was sponsored by the Graduate Student Association, the College of Natural Sciences and



Mathematics and the Department of Biological Sciences.

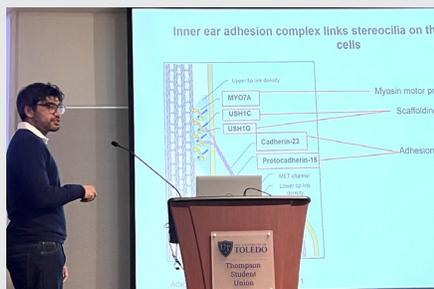
Poster Presentation Awardees:

5th year and up: Ujjwal Rimal and Bhakti Khot

4th year: Sarah Sorell and Stephen Muhindii

2nd and 3rd year: Garima Thapa and Raissa Songwa

Students selected to give a talk: Prashun Acharya, Barkha Ramnani, Debatrayee Sinha and Tanushree Majumder



Louis Stokes Midwest Regional Center of Excellence (LSMRCE)

The University of Toledo graduate students Raissa Songwa, Nahshon Puente and Agustin Rabino, all from the Department of Biological Sciences, and Seyi Ogundeji, from the Department of Environmental Sciences, received NSM Graduate Research Scholar Travel Awards to attend the LSMRCE (Louis Stokes Midwest Regional Center of Excellence) Conference, "STEM Ecosystem: Diversity, Partnership and Empowerment," held on October 28-30, 2022, in Schaumburg, Illinois.

This conference offered students, faculty mentors, educational researchers and program

administrators a platform to exchange knowledge and cultivate a community of practitioners and scholars in the area of broadening the participation of underrepresented minorities in science, technology, engineering and math (STEM).

Dr. Silvia Goicoechea, Research Associate Professor in Biological Sciences and the College of Natural Sciences and Mathematics (NSM) Diversity, Equity and Inclusion Officer, coordinated the efforts for the UToledo students to attend the LSMRCE 2022 meeting.



Pictured (L-R): Diego Jacho (College of Engineering), Raissa Songwa, Nahshon Puente, Seyi Ogundeji, and (front/center) Agustin Rabino.

Tony Quinn - We Are STEMM

by Professor William Taylor



Tony Quinn was a great teacher, an innovative scientist, an inspired advocate for diversity in science, and a great friend and beloved colleague. I write this from my office, right across the hall from the lab where Tony held animated discussions with his graduate and undergraduate students as they carried out research into diabetes and other autoimmune diseases. So many times, I would wander across the hall to chat with my senior colleague asking his advice on teaching or grant writing during my pre-tenure days. But conversations often strayed from academics to politics, literature, movies, or sports. In other words, Tony was such a well-rounded and talented communicator that it is honestly still bitter-sweet to craft this short biography. Tony obtained his undergraduate degree from Mid-American Nazarene University in Olathe, a suburb of Kansas City. He earned his MSc degree from the University of Missouri in St. Louis and his Ph.D. in microbiology and immunology from the University of Oklahoma in Oklahoma City. He carried out post-doctoral research at UCLA before joining the faculty in the Department of Biological Sciences at the University of Toledo in 2001. He mentored many undergraduate and graduate researchers. Tony was passionate about engaging underrepresented minority students in science and in 2015 created the "We Are STEMM" (science, technology, engineering, mathematics and medicine) initiative designed to bring high-profile underrepresented minority scientists to UToledo. A testament to his strength, Tony continued this work while battling pancreatic cancer. It was profoundly sad news when in 2018, he lost his battle. In honor of his work, the University renamed Tony's program, the "Tony Quinn We Are STEMM Initiative." The initiative includes fellowships for graduate and professional education and mentoring programs with the goal of recruiting and retaining underrepresented minority students.

See page 10 for information on the Dr. Tony Quinn We Are STEMM Fellowship Fund, created to ensure ongoing support of underrepresented students in STEMM disciplines.

AWARDS/SCHOLARSHIPS

The following undergraduate awards and scholarships were presented during the 2022-23 academic year:

2023 Spring Outstanding Graduating Biology Student

Anish Karnani

Elmer R. and Gertrude M. Brigham Scholarship in Science

Anusha Gaddam

Jaden Maschack

Joseph A. and Mary A. Capobianco Memorial Scholarship

Mackenzie Herod

Aesha Kandlagudur

Karley Karban

Elisa Nigro

Dr. Charles Cruetz Scholarship

Tanner Schultz

Dr. Bruce A. Crider Memorial Scholarship

Seham Abutaha

Zeinab Awada

Supriya Dhar

Ryan Hefner

Mykala Reinhart

Fred O. Hartman Scholarship

Korben Leung

Dr. James S. Hatfield College of Natural Sciences and Math Scholarship

Lucas Flanagan

Jenna Maruskin

The C.V. Wolfe Scholarship

Atheer Amer

Congratulations!



2022-23 NSM 1000 Peer Mentors

Every fall semester, the Department of Biological Sciences offers an orientation course, NSM 1000, for first-year undergraduate students pursuing majors within the department. This course is designed to provide students new to UToledo with information that will help them be successful in achieving their academic goals at the university and within the department. NSM 1000 also serves as a departmental retention effort. Of the NSM 1000 students polled in fall 2022, 96% of the first-year students stated they had registered for spring 2023 courses!

Each section of NSM 1000 has an assigned Peer Mentor. Peer Mentors are students in their second or third year at UToledo and act as sources of information to first-year students based on their own experiences. Their first-hand experiences on campus give them a unique vantage point to help first-year students feel connected to campus and the department.

The department would like to thank the following students (shown below) who served as peer mentors during the 2022-23 academic year to help freshman students! Their support and presence in the classroom this academic year were invaluable!

Lilly Boone

Lilly is pursuing a B.S. in biology with minors in chemistry and legal specialties and a concentration in pre-medicine. Lilly's anticipated graduation date is Spring 2025. Lilly chose to serve as a Peer Mentor to, "share my perspective and knowledge on navigating UToledo and college in general with freshmen students. I hoped to help [make] their transition to campus less intimidating and to give them some clarity on the upcoming steps of their academic and personal life."



Nathan Pan

Nathan is pursuing a B.S. in biology with minors in chemistry and business administration and a pre-medicine concentration. Nathan's anticipated graduation date is Fall 2024. Nathan shared that, "by becoming a Peer Mentor, I hoped that I could be relatable to most of the incoming freshmen pursuing similar career paths to myself. In this sense, I believe I was successful. By detailing the struggles that I endured and the methods by which I succeeded, I know I impacted multiple students in the same shoes I once was in."



Farzeen Fazili



Farzeen is pursuing a B.S. in biology with a minor in chemistry and concentrations in neuroscience and pre-medicine. Farzeen's anticipated graduation date is Fall 2025. Farzeen shared that, "I wanted to serve as a NSM 1000 Peer Mentor to guide freshmen through their first semesters in college based on my experiences." Farzeen's experience as a NSM 1000 Peer Mentor, "involved assisting students with specific tasks, helping the professor with class organization and logistics, and occasionally conducting class on my own."

Zainab Rahman



Zainab is pursuing a B.S. in biology with a minor in chemistry and concentrations in neuroscience and pre-medicine. Zainab's anticipated graduation date is Spring 2025. Zainab shared about her Peer Mentor experience, "I truly loved it! From building a resume and scheduling courses to deciding what academic/career path to choose, I enjoyed every part of assisting my fellow peers and being there for them when they may have felt overwhelmed during their transition to college life. It truly was amazing seeing the students' growth not only through the class but also seeing them thrive in the following semesters!"

PranavShivesh Palanichamy

PranavShivesh is pursuing a B.S. in biology with a minor in chemistry and concentrations in neuroscience and pre-medicine. PranavShivesh's anticipated graduation date is Fall 2023. As a peer mentor, "I was able to serve as a helping hand for incoming freshmen and give them the guidance that would have benefited me when I was in their place. My experience as an NSM mentor has given me a more open-minded and on-the-spot thinking mentality, as I have had to answer students' questions in class almost immediately and in a way that they can understand to resolve their concerns."



Faith Zhang

Faith is pursuing a B.S. in biology with a minor in chemistry and pre-medicine concentration. Faith will be graduating in Fall 2023. Faith chose to serve as a Peer Mentor, "because I wanted students to feel welcomed and supported during their first year in college. Being away from home and living independently for the first time can be overwhelming, so I hoped I would be able to share my experiences as a way of relieving some of the initial stress that comes with the transition to college. As a Peer Mentor, I was able to connect with NSM students and offer my advice on classes, campus organizations, housing, extracurriculars, etc. I really enjoyed getting to know new students and being able to offer them that extra support during their first year."



UToledo Senior Receives Air Force Health Professions Scholarship

Hannah Thompson is in rarefied company. The senior biology student at The University of Toledo and a cadet in Bowling Green State University's Air Force ROTC program is one of 14 ROTC students nationwide to receive the U.S. Air Force's Health Professions Scholarship.

A student in UToledo's BACC2MD program, a sequential pathway degree program where students complete their undergraduate degree followed by an M.D., Thompson liked her chances at securing the prestigious award. But she also wanted to temper those expectations.

"I never wanted to get my hopes too high," Thompson said.

Her friends and fellow cadets did that for her.

"They told me I was going to for sure get it and shouldn't worry," Thompson said. "And when I told them I got it they all gave me a big 'I told you so.'"

Set to graduate in spring, Thompson, 21, will commission into the Air Force as a second lieutenant with the Health Professions Scholarship paying 100% of her tuition in UToledo's College of Medicine and Life Sciences starting in fall 2023, as well as books and fees for four years. Additionally, she'll receive a \$20,000 signing bonus, an annual salary of \$33,000 and a monthly stipend of \$2,608/month for 10.5 months.

"I think in the back of my mind I knew I was a competitive applicant because for the past two years I have put so much time and work into keeping my GPA high and being the best cadet I could be, and it did not go unnoticed," she said.

Thompson was twice named cadet of the semester and in 2021 received the American Legion Award for Military Excellence.

"Cadet Thompson is an outstanding Air

Force ROTC cadet who is laser-focused on accomplishing her goal of becoming an Air Force physician," said Lt Col. Amy Grant, Bowling Green State University's Air Force ROTC Detachment Commander and chair and professor of its Aerospace Studies Program.

"She's successfully managed the competing priorities of a demanding undergraduate degree program, MCAT preparation, medical school application process and the weekly Air Force ROTC leadership development requirements. It's a testament to Cadet Thompson's discipline, work ethic and academic and leadership aptitude that she not only managed the priorities, but she performed so well Air Force ROTC has agreed to fund her entire undergraduate- and graduate-level education."

Through the BACC2MD program, Thompson was one of 12 juniors accepted into medical school in spring 2021. In fact, the BACC2MD program is what drew her to UToledo, the first college she visited.

"I had an interest in the BACC2MD program and it seemed like an amazing opportunity I couldn't pass up," she said. "When I stepped onto campus, I knew it was a place I could call home.

"Between that initial feeling and the BACC2MD program, I knew this was where I wanted to spend the next four years."

The biology program proved to be a rewarding challenge, she said, one that forced her to "rediscover" herself as a student and as a person.

"My classes and professors are constantly pushing me to become a better student and break down barriers I thought I never would," Thompson said. "This drive and work ethic the biology program instilled in me helped me succeed in my Air Force

ROTC career and ultimately helped me stand out from other applicants for the HPSP award."



"Her ability to earn this scholarship is a direct result of UToledo's outstanding biology program," Grant added.

Because of a bad sports injury she suffered as a high school senior that led to multiple surgeries and yearlong recovery, Thompson said she is considering trauma orthopedic surgery as a medical specialty. She also has an interest in becoming an Air Force flight surgeon, working in a fighter pilot squadron.

Her brother, Jacob, is now a second lieutenant in the Air Force, after graduating from Ohio State University Air Force ROTC in December 2021.

"He has been my rock and biggest influence throughout the program," Thompson said. "But I had a village backing me up during this entire process. Every step of the way, all the good and bad moments, they were there to cheer me on and lift me up."

By Kirk Baird (reprinted with permission of UToledo News as published January 25, 2023) https://news.utoledo.edu/index.php/01_25_2023/utoledo-senior-receives-air-force-health-professions-scholarship

All Students in UToledo Course Co-Author Research Published in Scientific Journal

In the competitive world of conducting research, advancing science and announcing breakthroughs ranging anywhere from cancer therapy to fusion energy, the peer-review process upholds scientific integrity and quality.

At The University of Toledo, faculty researchers involve undergraduate and graduate students in their laboratory experiments and the resulting paper-writing process to train the next generation of scientists and kick-start their careers as co-authors on published research.

One particular UToledo class achieved a special victory in 2022: At the professor's first attempt [Dr. Tomer Avidor-Reiss, a professor of biological sciences at UToledo and a groundbreaking scientist in the field of male infertility], all 12 participants in the Research Project Laboratory (BIOL 3910) course co-authored and successfully submitted a paper for publication in a scientific journal [[microPublication Biology](#)],

along with two medical students who perform summer research as part of the Medical Student Research program.

"On the first day of class, the professor walks in and goes, 'We're changing things up with this class. Now the goal is to find something no one has ever found before and publish a paper,'" said Kelsie Ruble, a senior studying biology and French to achieve her goal of becoming a doctor who fluently speaks French to someday participate in Doctors Without Borders.

"I was like, what? That's crazy. I thought there was no way I could do it. I can't find something new right now and write about it. That's not possible. I was mind blown. But as we went on and did the research, I thought maybe this isn't impossible."

"His [Dr. Avidor-Reiss] lab came up with a huge discovery in 2018 about centrioles within the sperm," said Rami Moussa, who graduated in December with a

bachelor's degree in biology. "On the first day we went over that research, and we began to understand the stakes and impact our work could have. We are studying something that could possibly take us to the next step in understanding male infertility to help families have babies."

The course is designed for students to learn how to formulate a hypothesis, design and execute the experiments, and write the result for publication.

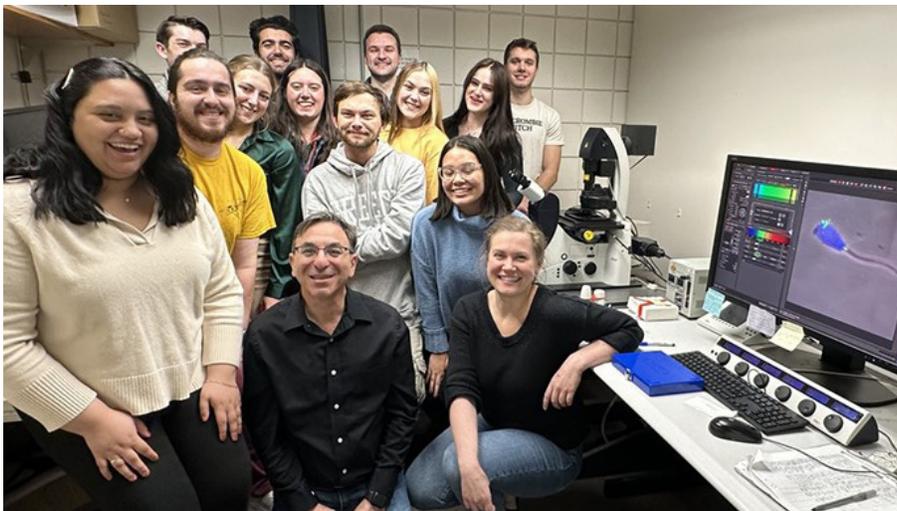
"This learning experience provides students with a comprehensive knowledge of the scientific process," Avidor-Reiss said.

The class's hypothesis was an attempt to advance Avidor-Reiss's previous research.

In 2018, he changed the dogma in reproductive biology with his discovery that the sperm has a new structure in its neck, called the atypical distal centriole, which may be how men contribute to infertility. And then in 2021, his laboratory discovered this structure is atypical because it acts as a transmission system with moving parts, rather than a rigid structure or shock absorber, opening innovative avenues to help diagnose and treat male infertility.

The 2022 class split into groups to test its new hypothesis about a step that needs to happen in sperm for it to successfully function: To work correctly and stabilize its moving parts, the atypical distal centriole in the sperm should be chemically modified by proteins, large molecules which do most of the work in cells and play critical roles in the body, to the point that those changes act like a transmission oil to protect the moving parts.

(continued on page 8)



Back row, from left to right: Derek F. Kluczynski, a junior studying biology; Bami B. Moussa, a senior studying biology; John M. Pap, a senior studying biology; and Ryan J. Hefner, a sophomore studying biology. Second row from the back, from left to right: Kelsie Ruble, a senior studying biology and French; Haley D. Prine, a sophomore studying biology; Mia B. Moran, a senior studying biology; Taylor G. Boyd, a junior studying biology. Third row from the back, from left to right: Benjamin A. Kujawski, a senior studying medical technology; Lucas J. Flanagan, a senior studying biology; Emily R. Crossley, a senior studying biology. Front row, from left to right: Marlena M. LaBoy, a senior studying biology; Dr. Tomer Avidor-Reiss, a professor of biological sciences; Katerina A. Turner, a Ph.D. candidate.

All Students in UToledo Course Co-Author Research Published in Scientific Journal (continued from page 7)

Those chemical changes are known as post-translational modifications — processes that can determine, or disturb, a cell's function.

In both human and cattle sperm, the class looked for the presence of three post-translational modifications known as acetylation, glutamylation and glycylation.

The idea is that without one of those, sperm can't fertilize an egg.

"This was a very different experience from any other lab class I had been in," Ruble said. "That's what made it challenging. Every week we would walk in and not know what we were doing because we didn't know if last week's experiments went well or were contaminated. It was a surprise every single day when we walked in. Fun and a

little scary."

The big takeaway: The class found acetylation and glutamylation in the sperm of both species.

Most of the students went their separate ways at the end of the semester, but Moussa had a big role in the next step — helping organize and finish the paper.

"It was exciting because none of this was known and we now had the opportunity to tell the professional scientific world. You could put in a lot of time and effort and don't get the shiny result. We found something that is new," Moussa said. "I was writing. I was reading. I was adding any missing information we needed to find. I was preparing the pictures so we could present them in our figures."

When the work was complete, Avidor-Reiss formally submitted the sperm

research paper to a journal to enter the peer-review process.

"We went through three or four stages of: We sent it in, got edits back, check it again, these are the things we need to change again," Ruble said. "And then Tomer emailed, 'Here is the link to your published paper. Congratulations!'"

"It made me appreciate the people who do research a lot more," Ruble said. "I knew it was very tedious and time-consuming, but I didn't realize how much until I was actually doing it. It also opened my eyes to see how much we really don't know when it comes to science. You're never going to run out of work."

By Christine Billau (reprinted, in part, with permission of UToledo News, published January 10, 2023) https://news.utoledo.edu/index.php/01_10_2023/all-students-in-utoledo-course-co-author-research-published-in-scientific-journal

ALUMNI NEWS ...

Megan Bickford (B.S. '14)

"I chose The University of Toledo mainly because I was awarded a merit-based scholarship which covered much of my tuition and also because my parents both graduated



from UToledo in 1991 and 1990. My favorite class was a Biology based Journal club that my undergrad mentor Dr. Anthony Quinn (RIP) suggested that I take. During my studies, I was also able to work under the supervision of Dr. Anthony Quinn doing research with cell lines and type 1 diabetes gene expression.

After graduation, I went to grad school at the UToledo medical campus and when, in a bizarre turn of events, my mentor Dr. Westerink took a position with the Medical University of South Carolina, she allowed me to transfer schools and come with her. Following this move I enrolled at MUSC and graduated with my masters in May 2017. I currently work at Emory University Winship Cancer Institute as a Clinical Research Operations Manager for liquid tumors.

The University of Toledo helped me explore during my undergrad career and decide whether wet lab research was what I wanted to do. My fondest memory is meeting my now best friend Maria (Paulett) Chandler. She has been my rock and I am so happy that living in the Carter Hall dorm at UToledo brought her to me

If I could go back in time to when I was a freshman, I would tell myself not to put so much pressure on myself if I had uncertainties in my mind. I changed my mind about what I wanted to do at least three times as an undergrad. I stayed within the biology field, but I am not a medical doctor and there is so much more in clinical research than what I thought. I would have also liked to mentor young new undergrad graduates in my professional life and help them to see that there is more than just being a doctor or a nurse. I love helping wide eyed fresh minds and developing them into well rounded adults with a passion and a purpose."

Emily (Lilli) Fishman (Ph.D. '19)

"I graduated from The University of Toledo with a Ph.D. degree in 2019. I chose UToledo because during my interview I met people full of passion, who were willing to invest in

me. One of my favorite graduate classes was molecular biology, where I learned a lot. I also enjoyed helping teach the authentic research course to undergraduates.

My Ph.D. project was conducted in the laboratory of Dr. Tomer Avidor-Reiss. With Tomer's guidance, I helped discover the second centriole of human (and bovine) spermatozoa and began the groundwork to determine its role in fertility and development.

After graduating from UToledo, I was a postdoc at UC Davis working with Pablo Ross on bovine embryo epigenetics. Shortly after, I accepted a position to run the academic programs at the SENS Research Foundation, a non-profit anti-aging research foundation. I'm currently the Director of Academic Affairs at SENS.



UToledo allowed me to be a leader in ways that wouldn't have been possible at a different school. I was able to lead projects that led to impactful work, and wrote grants

and managed budgets, which was critical to my success after graduation. I was also a leader in student government.

I have a lot of good memories socializing with the other grad students, but my greatest memories are associated with the big scientific findings I was involved with. I loved the embryo work, and I remember vividly pulling Tomer into the microscope room to look at the embryos. Talking through new ideas and then seeing those ideas come to life under the microscope was indescribable.

If I could go back to my first year of grad school, I'd tell myself that it's going to be hard, especially years three and four. But I would tell myself to work hard and know that all students experience the same difficulties. I would also tell myself to take advantage of every learning experience I am offered, even if it wasn't an experience I initially wanted. Trust the process.

After doing my postdoc at a bigger university, I have to commend UToledo's administrative team. The administrative offices (research and sponsored programs, graduate studies, technology transfer, the IRB, etc.) are remarkably accessible and will work with you. Overall, the accessibility of UToledo's professors and administrators is unparalleled. And also important to my success is that Tomer is a fantastic lifelong mentor."

Brittini Morris (B.S. '18)

"I graduated from the University of Toledo in 2018 with my B.S. in Biology and a minor in Chemistry. I was originally interested in UToledo because of the close proximity to my hometown. Once I visited the campus though, it quickly became my top choice because of the research opportunities and strong biology program. During my time at UToledo, I was a member of the Chen Lab with Dr. Qian Chen. I worked on the project: "Fission yeast TRP channel Pkd2p localizes to the cleavage furrow and regulates cell separation during cytokinesis." After taking a gap year, I started the Veterinary Medicine Program at Purdue University. I am currently in my final year of the program and am looking forward to graduating in May of 2023.



UToledo gave me a strong foundation in biology and chemistry, which has helped me

succeed in veterinary school. The research I participated in strengthened what I learned in the classroom and made me a stronger candidate when applying to veterinary schools. The biggest piece of advice I can give to an incoming student would be to get involved. I spent the majority of my time as a freshman focusing on my classes, which is extremely important. However, balance is also important and I would have benefited from becoming more involved in research and other organizations earlier on in my undergraduate career. I am very grateful to the University of Toledo for paving the way for my future career."

John Najjar (B.S. '21)

John is a first-year medical student at the University of Toledo College of Medicine and Life Sciences. He began his undergraduate studies in



Lebanon and moved to the US in 2019. He transferred to UToledo because he believed this institution had the resources and vision to allow him to excel in beginning his career, better than he otherwise could. "My research experiences began at the lab of Dr. David Kennedy during my spring semester in 2020. They continued through a stimulating Biology Literature and Communications course which I took under the directorship of Dr. Garcia-Mata. From learning the structure of a scientific paper, to various lab techniques, to performing literature reviews and translating medical research into evidence-based guidelines, I gained a better understanding of the implications of published and evidence-based research in driving our knowledge. I could not have made it this far if it weren't for the guidance I received from my mentors and I really appreciated Dr. Garcia-Mata's support throughout my undergraduate journey. I am fortunate to have been able to stay in Toledo to continue my graduate studies in such a promoting educational environment."

Madhu Rami-Reddy (B.S. '23)

"I am currently a senior and will be graduating in Spring 2023. I chose UToledo due to the resources it provides its students, specifically the access to faculty and staff that will go the extra mile to assist you. Coming from

Novi, Michigan, I also wanted to be close to home and choose a university relatively nearby. Moreover, due to the size of UToledo, I appreciated the ease at which I can involve myself in several facets on campus, such as service, leadership, research, etc. Moreover, with my intention of attending medical school, my choice in UToledo was solidified due to the BACC2MD program which gave me an opportunity at early assurance acceptance into medical school.

My favorite class that I took during my degree was Biochemistry II. I really enjoyed the relevance of the lecture content to human physiology and the teaching style of Dr. Bellizzi.

I also conducted research with Dr. Malathi Krishnamurthy. Two specific projects I worked on are "Cellular Metabolism and its Impact on Viral Infection" and "Impact of Ebola Viral Proteins on the Innate Immune System."

My fondest memory about attending UToledo is the fact that I was able to celebrate with my mentors, letter of recommendation writers, friends and family at each successful step of my journey, especially getting accepted into Medical School.

Upon graduating in spring, I will be attending UToledo's College of Medicine and Life Sciences in Fall 2023 for an MD degree.

UToledo allowed me to join organizations with like-minded individuals who rather than viewing me as competition, embraced me and supported me through my journey. Moreover, research was an integral part of my identity, and UToledo made it possible for me to get involved in research as soon as the second semester of my freshman year and gave me an opportunity to work with an amazing PI and a lovely team of graduate students!

If I could go back in time to when I was a freshman, the advice I would give myself is to limit myself from stretching too thin with too many responsibilities. Instead, focus on a select few that are meaningful, build lasting relationships and take time to grow holistically."



Alumni Spotlight



Dr. Angela Messmer-Blust is an outstanding UToledo alumna who has made substantial contributions to science in many ways. She graduated from UToledo with a B.S. in Biology ('03) before deciding to pursue a Ph.D. in Cell Biology ('09) from the Department of Biological Sciences. Working with her doctoral advisor, Dr. Deborah Vestal, she published a highly influential paper that was nominated for the "Paper of the Year" award by the journal *Molecular Biology of the Cell*. However, she credits her interaction with the late UToledo biology professor Dr. Tony Quinn as having made the greatest impact on her. He passed to Dr. Messmer-Blust a life-long passion for scientific outreach and promotion of diversity and equality in science.

Dr. Messmer-Blust is a trailblazer in her "unconventional" career

path. After obtaining her doctoral degree from UToledo, she joined Harvard Medical School as a postdoctoral fellow to study the cell biology of heart diseases. There she was productive publishing over 10 papers in just three years. Nevertheless, she did not follow the conventional academia path to stay at the bench. Instead, she followed her passion of science outreach into the world of academic publishing where she served as a prominent scientific publisher, including at Cell Press, over the next five years.

Since 2017, Dr. Messmer-Blust has been working at the UMass Medical School as a faculty member and a senior scientific advisor. She has a wide range of responsibilities including organizing conferences and promoting scientific outreach and diversity. Her activities, particularly those focused on scientific outreach, have been supported by NIH (National Institutes of Health) and widely recognized for their innovative nature. This is demonstrated by her many invited speaking engagements at prominent academic institutions including Harvard, Yale and the Moffitt Cancer Center. All of these serve as compelling evidence of her creative and tireless approach in promoting diversity and equality in science.

Today, Dr. Messmer-Blust lives with her husband Zach Blust, who is also a UToledo graduate ('05), and their two young children in the Boston area. She is a freelance landscape photographer in her free time and remains a dedicated supporter of her alma mater, The University of Toledo.

Why I Give - Dr. Angela Messmer-Blust

In her own words ...

"Reflecting on my undergraduate and graduate years, Dr. Anthony Quinn had a huge impact on not only my career, but my overall philosophy on life. In addition to his outstanding contributions to the immunology field, his passion for increasing diversity, equity and inclusion in STEM was inspiring. All while battling pancreatic cancer, he co-developed UToledo's strategic plan, co-directed the Multicultural Emerging Scholars Summer Bridge and Living Learning Community Program and led the Brothers on the Rise mentoring program. His mentoring and work at The University of Toledo continues to guide my career and the initiatives I am developing in my current department, the RNA Therapeutics Institute (RTI) at UMass Chan Medical School. I hope to further Dr. Quinn's legacy by not only giving to his fellowship, Tony Quinn We Are STEM Initiative, but to continue the work necessary for students traditionally underrepresented in STEM to be able to

see themselves in these fields. To support the exploration of RNA therapeutics research for trainees and early career researchers who are underrepresented in the scientific community, I created travel, inclusivity and family support awards for trainees and young investigators to attend the annual RNA Therapeutics meeting that I co-organize annually. Additionally, efforts to recruit and retain underrepresented minority future faculty will be supported, in part, by an endowment created with funds that I raise annually to advance the RTI's mission."

To learn more about The Dr. Tony Quinn We Are STEM Fellowship, visit: utfoundation.org/give/quinnfellowship or scan the QR code to the right.



GIVE A GIFT, MAKE A DIFFERENCE!

Please join other alumni in supporting education and excellence in the UToledo Department of Biological Sciences!

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.

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DEPARTMENT OF BIOLOGICAL SCIENCES

SPRING 2023



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