

# BIOLOGY NEWS

DEPARTMENT OF BIOLOGICAL SCIENCES

FALL 2022

Dear friends,

I hope this newsletter finds you in great health and spirit. This newsletter represents our sincere efforts to reconnect with our over 1,500 alumni worldwide. Please feel free to share it with your friends and write back to us about your recent events and achievements. We will be happy to hear from you.

As I am writing these words, the colorful fall foliage is on display on our Bancroft campus. One of the privileges of living in Toledo is to experience the change of seasons. We roam in the snowy wonderland in the forest of Oak Openings Metropark, and we listen to the orioles singing in the scholar trees right outside Wolfe Hall. We enjoy the summer evening breeze passing by from Lake Erie and we savor the blossoms of Asters in the Sylvan prairie. In the change of seasons, we see and we feel life, and we recognize the change in life as constancy.

Change is also continual in academia and the Department of Biological Sciences evolves with the ever-changing higher education and research landscape. As the biggest department in the College of Natural Sciences and Mathematics, and one of the largest in the University overall, we strive to provide for the instructional needs of over 600 undergraduate students majoring in biology and medical technology. We also continue to develop innovative and high-demand programs to attract even more students. This semester, the Ohio Department of Higher Education approved a new major in neuroscience jointly offered with the Department of Neurosciences on the Health Sciences campus. This program has already attracted intense student interest and should position us well to keep



our enrollment numbers high despite the demographic challenges of fewer students graduating from area high schools in the coming years. Our research faculty have also shown innovation and flexibility to maintain robust research programs despite the ever-stiffening competition for extramural research funding, and they continue to publish world-class research in the top biomedical journals. These efforts in the academic and research arenas have kept our department robust and energetic, with more than 40 graduate students, and 25 faculty and staff members currently calling the department their academic home. Our undergraduate and graduate students are excelling at achieving their academic and career goals and bringing honors to themselves and the department. Our faculty are setting the example by their actions as proud researchers and educators making every effort to bring the best to, and out of, the next generation. And, finally, we could not achieve these goals without our staff, who work diligently to provide the critical support needed to make the department run smoothly and feel like a family.

The current members of our department deserve much credit for turning the challenge of the global pandemic and tight economic situation into new opportunities. I am happy to see they are keeping alive the tradition of care and excellence that has come to define the Department of Biological Sciences over the years. Inside please find the sampling of the achievements and stories of our students, faculty, staff, alumni and friends. I hope you enjoy reading the newsletter and we intend to publish it regularly in the future. Please accept our best wishes and stay in touch.

Happy Holidays!



Song-Tao Liu

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 Biological Sciences, UToledo

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*Would you like us to feature your career update story or achievement(s)? Please send us your news and you may appear in a future edition of our newsletter!*

## IN THE NEWS ...

### New Major: B.S. in Neuroscience

The Department of Biological Sciences in the College of Natural Sciences and Mathematics (NSM), in collaboration with the Department of Neurosciences in the College of Medicine and Life Sciences (COMLS), is launching a new Bachelor of Science in Neuroscience. Neuroscience is undergoing explosive growth and is making significant inroads into addressing Alzheimer’s disease, Parkinson’s disease, depression, drug addiction and many other neurological disorders. Spearheaded by Dr. Bruce Bamber (Biological Sciences) and Dr. David Giovannucci (Neurosciences), the program provides students with a well-rounded comprehensive knowledge base in neuroscience, and for Pre-Med students, excellent preparation for the MCAT.

The B.S. in Neuroscience degree takes

advantage of synergies between the UToledo Main and Medical Campuses. Biological Sciences has deep experience in undergraduate education and research strengths in cellular and molecular biology. The Medical Campus provides more specialized neuroscience expertise and access to clinical facilities and research. Pre-Med students will find the joint involvement of NSM and COMLS particularly valuable because they will gain exposure to a medical school environment and network with medical school faculty while earning their bachelor’s degree. Our new B.S. in Neuroscience is the only neuroscience major in Northwest Ohio jointly offered by an academic college and a medical school, although similar structures are in place at Case Western and Ohio State, where they enjoy very robust enrollment.

We are confident this program will be highly successful and contribute to

the growth of Biological Sciences and the College of Natural Sciences and Mathematics. We have already begun recruiting students from our current Freshmen in Biological Sciences (class of 2026). Students have responded with significant excitement, and many students have already decided to switch into the new program. We are very grateful to the senior UToledo leadership for their commitment of nearly \$500K of reinvestment funds to hire a new faculty member in Biological Sciences and to develop/equip a neuroscience laboratory course. We anticipate the B.S. in Neuroscience will attract significant numbers of new students to UToledo who would otherwise choose different schools, as we ramp up recruiting efforts in the Spring for the Class of 2027.

Bruce Bamber, Ph.D.  
Associate Professor and Inaugural Director of the B.S. in Neuroscience

### Annual Biological Sciences Undergraduate Research Symposium

During the 2021-2022 academic year, over seventy students participated in undergraduate research each semester under the direction of faculty mentors. These faculty have primary appointments in the Department of Biological Sciences as well as various departments in the UToledo College of Medicine and Life Sciences. The research done by biology undergrads is overseen by Dr. Heather Conti, associate professor and Director of Undergraduate Research Experiences for the department. Dr. Conti

also coordinates the Annual Biological Sciences Undergraduate Research Symposium. Senior undergraduate researchers in the department (right) presented their projects at the Symposium in April 2022. The presentations are required in order for honors students to receive Honors College recognition at graduation.

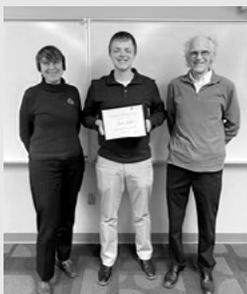
Dr. John Plenefisch, associate dean of the College of Natural Sciences & Mathematics and acting-chair of

the Department of Biological Sciences, at the time, also presented awards to the top students in the department for Spring 2022. Jacob Kahle (far left, pictured with research advisor Dr. Maria Diakonova and Dr. Plenefisch) received the Outstanding Biology Student



Award and Aditya Acharya (left, pictured with Dr. Plenefisch) from the laboratory of Dr. Malathi Krishnamurthy received Outstanding Academic Achievement for a Graduating Student in Biology.

Anyone interested in learning more about the research efforts of our undergraduate students should contact Dr. Conti at [heather.conti@utoledo.edu](mailto:heather.conti@utoledo.edu).



## Diversity, Equity and Inclusion

In 2019, Research Associate Professor Silvia Goicoechea, Department of Biological Sciences, joined the Diversity, Equity and Inclusion (DEI) university team and started serving as the new DEI Officer for the College of Natural Sciences and Mathematics (NSM). Since then, she has been working with a DEI committee formed with faculty and students representing each of the academic departments in the college. In addition to creating a DEI Strategic Plan, the DEI committee has been committed to creating an environment where every student, staff and faculty member feels included and respected. This committee continually strives to increase the number of underrepresented minority

faculty, staff and students, and to ensure that all feel welcome.

On April 22<sup>nd</sup>, 2022, the DEI Committee hosted the first DEI conference, “1<sup>st</sup> NSM Diversity Day”. This event aimed to foster and promote a more diverse community of students, faculty and staff, and encouraged collaboration among people of different backgrounds. Dr. Beronda Montgomery, MSU Foundation Professor, Michigan State University, was the Keynote speaker and exemplified the nurturing and supportive qualities of a mentor. Leslie McMurray, Transgender Education and Advocacy Associate for the Resource Center, Dallas, TX, was the Guest speaker. She talked about “The Celebration and Risks of Transgender Visibility”. They both shared their advice, stressing excellence and integrity in everything one does to help others. “1<sup>st</sup> NSM Diversity Day” also included a poster session during which faculty, staff and students learned from each other about their research, teaching and service at UToledo. Different organizations at the university level were also present sharing advice and resources.



Agustin Rabino and Luis Cedeño-Rosario (graduate students), Judi Saba and Annita Rogers (staff members) and Silvia Goicoechea (faculty), were honored with Diversity Achievement Awards during the conference. The awardees were recognized for their significant contributions in one or more of the following categories: academic performance, teaching research or service.

It is our desire to organize this conference every year.

Silvia Goicoechea, Ph.D. Research Associate Professor and Chair of the NSM DEI committee

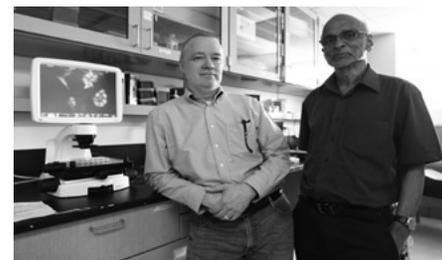


## A Decade of Collaborative Science

In the US, more than half a million people still die from cancer every year. Cancer treatment often includes small molecules that kill cancer cells in a treatment approach often called “chemotherapy”. Research labs and pharmaceutical companies are constantly looking for new, more effective chemotherapy drugs that show reduced side effects. For the last 10 years, Drs. Taylor and Tillekeratne have embarked on a collaborative scientific journey searching for new chemotherapy drugs. At this unofficial anniversary, the team has published 12 papers, three patent applications and obtained nearly a million dollars in external funding. The experiments started as an attempt to improve on Taxol, a chemotherapy drug

commonly used in the clinic against many different types of cancer, which works by arresting cells in mitosis until they die. New chemicals designed, synthesized and purified in the Tillekeratne lab are tested in living cancer cells in the Taylor lab. Initially, the team focused on Etoposide, a relative of Taxol with some potentially useful clinical properties, which they later modified chemically to create a new related molecule. Interestingly, this new molecule killed cancer cells by elevating reactive oxygen species, or ROS, a mechanism that is different than Etoposide or Taxol. As it turns out, this new compound may be targeting cancer stem cells, a small subset of cancer cells which are the most difficult to kill and can

even allow cancers to become resistant to therapy. The Tillekeratne Taylor group is now focused on using their new molecule to attack cancer stem cells to try to eliminate drug resistance in aggressive cancer. Ongoing and future work will focus on using these new drugs to target metastatic breast cancer.



Dr. William Taylor (left), Biological Sciences and Dr. L.M. Viranga Tillekeratne (right), Medicinal and Biological Chemistry. Photo credit: Dan Miller

## UToledo Cell Architecture and Dynamics Area of Excellence Showcase Nobel Laureate Who Discovered Green Fluorescent Protein

In 2018 UToledo identified three areas of research excellence at our institution that have achieved national recognition. These included: “Astronomy and Astrophysics”, “Solar Energy, Water Quality and Sustainable Technologies” and “Cell Architecture and Dynamics”.

The Cell Architecture and Dynamics (CAD) area of excellence involves the basic science researchers in Cell Biology and its translation to develop disease diagnosis and treatment avenues. CAD leadership includes Dr. Tomer Avidor-Reiss and Dr. Rafael Garcia Mata, two professors within the Department of Biological Sciences who have spearheaded many initiatives to promote and advance the research here at UToledo.



In Spring 2022, the CAD Area of Excellence had its inaugural Summit meeting showcasing cutting-edge research in Basic and Translational Cell Biology. The main objective of this Summit was to foster better collaborations among researchers, while also highlighting the role of emerging microscopy techniques in the field of Cell Biology research. This Summit featured an exciting lineup of many prominent national researchers who are well-recognized to be leaders in their fields.

The Keynote speaker was Dr. Martin Chalfie (Columbia University), who was awarded the Nobel Prize in Chemistry in 2008 for the development of Green Fluorescent Protein (GFP) technology that has revolutionized Cell Biology. Dr. Chalfie presented a seminar titled “The Continuing Need for Useless Information,” demonstrating that fundamental basic research (that may appear to be obscure initially) does lead to revolutionary discoveries in the long term. During his lecture, Dr. Chalfie commented to the effect: *Who could have guessed that studying the green*



*glowing colors of a jellyfish will ultimately transform Cell Biology by allowing us to detect single protein behavior and much more?*

Additional invited speakers included Dr. Don Cleveland, Member of the National Academy of Sciences, Chair of the Department of Cellular and Molecular Medicine, University of California, San Diego; Dr. Kristen Verhey, Professor of Cell and Developmental Biology and Professor of Biophysics, University of Michigan; and Dr. Gregory Pazour, Professor, University of Massachusetts Medical School, a fellow of the American Society for Cell Biology.

## Autumn Sunderland - Undergraduate Student Researcher Inspiring Success!

Autumn (B.S. '22) was selected this past summer to participate in the CPRIT-CURE Summer Undergraduate Research Program located in Houston, Texas. This program is designed for outstanding young scientists interested in a career in cancer research. Autumn worked at the University of Texas M.D. Anderson Cancer Center in the lab of Dr. Powell Brown, Department of Clinical Cancer Prevention, where they study breast cancer. Autumn’s project consisted of Targeting the RXR Pathway to Inhibit HER2-positive Breast Cancer Cell Growth.

In October, Autumn attended the SACNAS 2022 National Diversity in STEM (NDiSTEM) Conference in San Juan, Puerto Rico, where she presented her research poster, “Targeting the RXR Pathway to Inhibit HER2-positive Breast Cancer Cell Growth”, from her summer internship at The University of Texas MD Anderson Cancer Center.

During the academic year Autumn conducts research in lab of Dr. Deborah Chadee. Autumn will be graduating this fall. After graduation, she plans to take the MCAT and apply to medical school.



## Toledo CelluART 2022

On September 23, 2022, Toledo CelluART, a regional scientific meeting that blends cutting-edge cytoskeleton research and art, returned after a two-year hiatus. This was the fourth edition of the free, one-day symposium, which consists of a series of lectures and scientific presentations focused on cell biology research. CelluART also features artwork inspired by scientific images of the cytoskeleton created specifically for this meeting by students in the Center for the Visual Arts. This unique gathering is held at the Center for the Visual Arts, a building designed by world-renowned architect Frank Gehry on the Toledo Museum of Art Campus.

“This year’s event included scientific presentations by faculty, postdocs and students with an audience from cities that included Columbus, Chicago, Ann Arbor and Detroit, and brought together approximately 100 researchers from 15 regional universities from Ohio and neighboring states, including Michigan, Indiana, Illinois and, for the first time, Canada”, said Dr. Rafael

Garcia-Mata, one of the events creators. The keynote speaker for the 4<sup>th</sup> edition was Dr. Tatyana Svitkina, a professor in the Department of Biology at the University of Pennsylvania. Dr. Svitkina, an expert electron microscopist, has contributed several seminal discoveries that are now included in textbooks. Her incredible technique created some of the most beautiful cytoskeleton images ever produces. In her words: “The cell is the artist. I’m a visitor to the museum to see what is in there”.



Toledo CelluART 2022 attendees. Pictured, kneeling in the front row (L-R): Agustin Rabino, Maddie Lovejoy and Diego Jacho, the student organizers.

Garcia-Mata, one of the events creators.

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Toledo CelluART also featured Dr. Janet Iwasa, an assistant professor in the Department of Biochemistry at the University of Utah, who runs the

“Animation Lab” and creates digital animations of cellular processes to support research, learning and scientific communication. The event also featured an exhibit by Fermin Uriz, an interdisciplinary designer whose work has appeared at the Met Gala and Cannes Film Festival.

Toledo CelluART is organized each year by a different team of UToledo Ph.D. students. The leadership team for the 4<sup>th</sup> edition included Agustin Rabino, Madeline Lovejoy (Ph.D. candidates in Biological Sciences) and Diego Jacho (Ph.D. candidate in Bioengineering), pictured in the photo above. For more information, visit [www.toledocelluart.org](http://www.toledocelluart.org).



Toledo CelluART 2022 art exhibit (above). One of the featured pieces of the exhibit by art students, inspired in research on fission yeast.

## OCR 2022 Discover Award to Dr. Lirim Shemshedini

Dr. Lirim Shemshedini received the 2022 Discover Award for Research presented by Ohio Cancer Research (OCR) at the Renaissance Toledo Downtown Hotel on Thursday, September 29, 2022, during the Grand Illusions Sauté event.

Dr. Shemshedini received \$50,000 in seed money grant from OCR in 2001 for a grant proposal, “Isolation of

Repressors of Androgen Receptor”, that focused on identifying novel repressor proteins targeting the transcriptional functions of the Androgen Receptor. The OCR seed money helped Dr. Shemshedini’s lab to generate nearly \$2 million in additional grant funding from other sources!



## ALUMNI NEWS ...

### Aditya Acharya

(B.S. '22) is a first-year medical student at UToledo's College of Medicine and Life Sciences. His favorite undergraduate course was Developmental Biology with Dr.



Robert Steven which was "very rigorous and pushed me to become a better version of myself to be able to succeed" in his future courses. Aditya was an active member of Dr. Malathi Krishnamurthy's lab for all four years of his undergraduate career and was one of his "most valuable experiences at UToledo"; it helped him realize his "passion to pursue a career in healthcare." As an undergraduate lab member, Aditya wrote research proposals to the Department of Undergraduate Research and was accepted to pursue research projects in Dr. Krishnamurthy's lab. Aditya's honors thesis highlighted the role of OAS1-3 enzymes on stress granule formation induced by Ebola virus proteins.

### Adnan Siddiqui

(Ph.D. '15, Krishnamurthy) chose to attend UToledo because of the diversity and the depth of the faculty, and the research areas. Through his thesis research,



Adnan worked on determining the role of RNase L in autophagy induction and regulating the crosstalk between autophagy and apoptosis during viral infections. This work prepared Adnan for his current position as an Associate Research Scientist at Columbia University Irving Medical Center. One of his fondest memories was attending Friday seminars and having valuable discussions with the presenting faculty which allowed him to engage in productive conversations that helped him step out of his comfort zone and ask questions about new techniques.

### Nicole Carter

(B.S. Biology, M.S. Bioinformatics '15)

"This dual-degree program was excellent as it allowed me to begin taking graduate courses as an undergraduate.



The academic transition was efficient and eliminated both the extra time and funds it would have required for me to complete both degrees in a more traditional method. Furthermore, the MSBS internship served as the ultimate steppingstone for me, as I began a successful career as a Bioinformatician with the company where I interned. Over the years, I have been able to contribute to innovative products supporting women's health and cancer diagnostics. I'm currently a Senior Software Engineer at Delfi Diagnostics, whose mission is to save lives by making cancer screening more accessible to all. I find my career to be very rewarding and I thank the experienced faculty and staff involved in the program, who provided invaluable mentorship every step of the way and beyond."

### Abel Castillo

(B.S. '20) is a third-year medical student at UToledo's College of Medicine and Life Sciences. He chose to attend UToledo for its strong biological sciences program and affiliation with the medical school. He decision was confirmed when he was awarded the Presidential Scholarship (2016-2020).



"During my time in the biology department, I had the incredible opportunity to conduct research in Dr. Rafael Garcia-Mata's lab. While there, I learned so much about advanced lab techniques such as cell culture, cloning, and various imaging modalities. Beyond bench work, I also had the opportunity to grow as a scientist

and further develop my skills as a pre-professional student. To say that I was treated like family in Dr. Rafael's lab would be an understatement. I am so grateful and proud to have been surrounded by such incredible people during my four years of research. Beyond the completion of an Honors Thesis, my time in this lab also provided me with invaluable experiences that I continue to draw upon as a medical student."

### Alan Hammer

(B.S. '10 & Ph.D.

'16, Diakonova) is a Senior Manager of Medical Writing at Neurocrine Biosciences where he manages the clinical and medical writing for



INGREZZA (an FDA-approved drug to treat tardive dyskinesia). Alan originally chose UToledo because he had the opportunity to do undergraduate research during his freshman year that he found both interesting and compelling. He continued at UToledo for graduate studies to continue research in the lab of Dr. Maria Diakonova working on the molecular mechanisms guiding cancer cell motility and adhesion. "One of my favorite parts of research is analyzing the data and communicating it. Therefore, after I graduated, I pursued an alternative career path into medical and regulatory medical writing ... I can't thank UToledo enough for the opportunities I was provided, and I can't thank Dr. Diakonova enough for giving me the chance to explore my passions and to have faith in whatever I put my mind to."

### Sarah Harmych

(B.S. '20) is a second-year Ph.D. student in the department of Cell and Developmental Biology at Vanderbilt University. "UToledo gave me invaluable



skills that have helped me to be successful in my graduate career. My participation in undergraduate research sparked a passion for research that inspired me to attend graduate school and molded me into an independent researcher ready for the challenge. I will continue to use the lessons my time at UToledo taught me, both during graduate school and as I move forward in my career."

Following graduate school Sarah plans to pursue a career in science policy and communication.

### Brian Hibbard

(B.S. '17 & M.S. '20) is a third-year medical student at UToledo's College of Medicine and Life Sciences. As an undergraduate student at UToledo, Brian worked in Dr. Krishnamurthy's



lab studying innate immune responses to viral infection. His favorite course as a graduate student was Molecular Biology with Dr. Shemshedini. "This course was challenging and filled with great discussion. After this course I felt like I truly had a great grasp of what I was studying." Upon graduation from UTMC, Brian plans to pursue a career in psychiatry.

### Jihad Aoun

(B.S. '19 & M.S. '20) is a third-year medical student at UToledo's College of Medicine and Life Sciences. Jihad moved to the US from Lebanon in 2014 and attended his senior year of



high school in Toledo where he was able to experience a campus visit to the University of Toledo. "My experience was superb and encouraged me to attend the university for my undergraduate studies in biology. I met a ton of friends and faculty who became more of a family to me. It did not take much to convince me to stay in Toledo for my graduate and professional programs. In the biology department, I joined a lab to conduct research in the field of cellular and cancer

biology. We had regular lab bonding times such as lunches, dinner, holiday and social gatherings. This further pulled me towards the city, the University of Toledo and my research in the department. So, for that, I want to thank and shout out to Dr. Rafael Garcia-Mata and Dr. Silvia Goicoechea. I am currently in my third-year of medical school and I sincerely believe that if it wasn't for the friends, mentors and staff that I met through the biology department, and my experiences, I would probably not have made it this far. It all shaped the person I am today and for that I am super thankful."

### Praveen Manivannan

(Ph.D. '20, Krishnamurthy) is currently completing a post-doc at the University of Michigan with research focused on HIV-1 and COVID related projects.



During his time at UToledo, he worked in the lab of Dr. Malathi Krishnamurthy on various projects focused on the role of RNase L during viral infection and how stress granules are formed during viral infection. As a student in the Department of Biological Sciences, Praveen was able to gain experience in modern research techniques and present his work at multiple platforms which allowed him to improve his communication skills and showcase his work to different fields of science. Praveen shared his words of advice for first-year students: "Everything will not work on first try. But science is about research and with every failure you are one step closer to success."

### Ashtyn Zinn

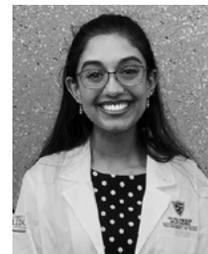
(M.P.H. '18 & Ph.D. '19, Garcia-Mata) is the Director of Technical Services and Manufacturing Sciences at Elanco in Fort Dodge, IA. Ashtyn's research in Dr. Rafael Garcia-Mata's lab focused on the role of Rho proteins in cell migration dynamics.



"During my time in Dr. Garcia-Mata's lab I learned to think critically through failed experiments and unexpected results, how to ask the 'right' questions." As a graduate student at UToledo, Ashtyn discovered a passion for data analysis, project management and collaboration. She organized the first ever Toledo CellulART annual meeting and enjoyed writing outside of the lab for various student-led scientific communication columns. Ashtyn has carried forward lab legacies by promoting non-traditional career development of others. Her goal is to continue using her background as a scientist to provide innovative products to the world's population to ensure continued progress towards a healthier society.

### Sarah Jaggernauth

(B.S. '21) is currently a medical student at UToledo's College of Medicine and Life Sciences. UToledo stood out from other universities Sarah visited for several reasons -



scholarship opportunities, the ability to live at home while in college, the BACC2MD program, and the collaborative and friendly environment. As an undergraduate student, she worked in Dr. Krishnamurthy's lab for three years. Sarah shared her thoughts on undergraduate research: "I learned much more about the innate immune system than I would have learned through my classes, and even more than what I had to learn in medical school. My undergraduate research experiences made completing research in medical school much easier since I was able to work more independently." A few of Sarah's favorite courses as an undergrad were immunology, physiology and psychology 101. "I have always been fascinated by how the human brain works and aspire to be a psychiatrist one day."

## AWARDS/SCHOLARSHIPS

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



### Biology Merit Scholarship

Michelle Cherian

### Joseph A. and Mary A. Capobianco Memorial Scholarship

Nabaa Ali

Serenity Osborne

### Dr. Bruce A. Crider Memorial Scholarship

Zeinab Awada

Jonathan R. Bell

Jonathan Kopacz

Haley Prine

Sajan Shah

Autumn Sunderland

Nicholas M. Vannette

Abigail Weidner

### Dr. Charles Cruetz Scholarship

Anish Karnani

### Dr. Peter C. Fraleigh Memorial Scholarship

Nicholas Huss

### Fred O. Hartman Scholarship

Megan Good

### The C.V. Wolfe Scholarship

Sara AlShahad

Atheer Amer

## SELECT GRANTS - FY21

TITLE	SPONSOR	FACULTY	TOTAL AWARD
The role of platelets in oral candidiasis	National Institute of Dental and Craniofacial Research	Conti	\$240,971
STELLARIS Award - Equipment	Leica Microsystems	Garcia-Mata	\$401,644
Regulation of epithelial junctions and lumen morphogenesis by the Scribble/SGEF/Dlg1 complex	National Institute of General Medical Sciences	Garcia-Mata and Goicoechea	\$216,690
RESEARCH - PGR: Elucidating Maize Gene Regulatory Networks to Accelerate Translational Genomics	National Science Foundation through Michigan State University	Gray	\$128,835
Immune Evasion in Aquatic Rhabdoviral Pathogens	U.S. Department of Agriculture	Krishnamurthy	\$287,791
Analysis of mechanisms involved in induction of abiotic and biotic stress tolerance in Horticulture Crops Through Nutrition or Temperature	U.S. Department of Agriculture	Leisner	\$176,180
Regulation of Ferroptosis by the p53/CDK/Rb Axis	National Institute of General Medical Sciences	Taylor	\$300,000

## SELECTED PUBLICATIONS

- Cedeño-Rosario L., Honda D., Sunderland A.M., Lewandowski M.D., Taylor W.R., Chadee D.N. (2022) Phosphorylation of mixed lineage kinase MLK3 by cyclin-dependent kinases CDK1 and CDK2 controls ovarian cancer cell division. *J Biol Chem.* 298(8):102263. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9399292/pdf/main.pdf>
- Cooke M., Kreider-Letterman G., Baker M.J., Zhang S., Sullivan N.T., Eruslanov E., Abba M.C., Goicoechea S.M., García-Mata R., Kazanietz M.G. (2021) FARP1, ARHGEF39, and TIAM2 are essential receptor tyrosine kinase effectors for Rac1-dependent cell motility in human lung adenocarcinoma. *Cell Rep.* 37(5):109905. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8627373/>
- Debnath A., Williams P. D. E., and Bamber B. A. (2022) Reduced Ca<sup>2+</sup> transient amplitudes may signify increased or decreased depolarization depending on the neuromodulatory signaling pathway. *Frontiers in Neuroscience* 16:931328. <https://www.frontiersin.org/articles/10.3389/fnins.2022.931328/full>
- Han Z., Rimal U., Khatiwada P., Brandman J., Zhou J., Hussain M., Viola R.E., Shemshedini L. (2022) Dual Acting Peptides Target EZH2 and AR: a New Paradigm for Effective Treatment of Castration-Resistant Prostate Cancer. *Endocrinology* (in press). <https://pubmed.ncbi.nlm.nih.gov/36288553/>
- Khanal S., Leung M.R., Royfman A., Fishman E.L., Saltzman B., Bloomfield-Gadêlha H., Zeev-Ben-Mordehai T. and Avidor-Reiss T. (2021) A dynamic basal complex modulates mammalian sperm movement. *Nature Communications.* Volume 12, Article number: 3808. <https://www.nature.com/articles/s41467-021-24011-0>
- Kreider-Letterman G., Carr N.M., Garcia-Mata R. (2022) Fixing the GAP: the role of RhoGAPs in cancer. *Eur J Cell Biol.* 101(2):151209. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9081277/>
- Kuganesan N., Dlamini S, Tillekeratne V.L.M. and Taylor W.R. (2021) Tumor suppressor p53 promotes ferroptosis in oxidative stress conditions independent of modulation of ferroptosis by p21, CDKs, Rb and E2F. *J. Biol. Chem.* 297(6) 101365. <https://pubmed.ncbi.nlm.nih.gov/34728216/>
- Kuganesan N., Dlamini S, McDaniel J., Tillekeratne V.L.M. and Taylor W.R. (2021) Identification and initial characterization of a potent inhibitor of ferroptosis. *J. Cell. Biochem.* 122, 413-424. <https://pubmed.ncbi.nlm.nih.gov/33377232/>
- Malla M., Pollard T.D., and Chen Q. (2022) Counting actin in contractile rings reveals novel contributions of cofilin and type II myosins to fission yeast cytokinesis. *Mol Biol Cell.* 33(6). <https://www.molbiolcell.org/doi/10.1091/mbc.E21-08-0376>
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## 2022 College of Natural Sciences and Mathematics Distinguished Alumni Awardee Dr. Douglas Geiger

Dr. Douglas Geiger was selected as the 2022 Distinguished Alum for the College of Natural Sciences and Mathematics! He obtained his B.A. ('82), M.S. ('84) and M.D. ('87) at The University of Toledo. Dr. Geiger is a board-certified surgeon specializing in neurological surgery and orthopedic surgery of the spine. He has been in practice for approximately 30 years.

Dr. Geiger's surgical work has included a wide array of procedures - from major reconstructive deformity correction in children and adults, to currently focusing on minimally invasive and outpatient spinal surgery. He implanted the first artificial disc in a patient in Michigan and currently consults with industry leaders in developing innovative devices. He is a member of the distinguished group the Scoliosis Research Society and also the North American Spine Society.

Dr. Geiger was born and raised in Toledo and is married to Marilyn Bischoff Geiger, B.S.N. ('81). They have four children, three boys and a girl, and their youngest son Matthew, is currently a 3<sup>rd</sup> year medical student at UToledo's College of Medicine.

Dr. Geiger sent a letter to Dr. Song-Tao Liu about his visit to

UToledo on September 30, 2022, to attend the Homecoming Alumni Gala, which includes the Distinguished Alumni award ceremony, and the Homecoming Parade the next day. In the letter, he remembered, *"By the time I was a senior student, and certainly as a graduate student, I felt a kinship with my professors, almost collegial in our interactions"*. Regarding his recent visit, he said, *"38 years after leaving the university I toured the biology facilities and had a private audience with several professors and learned of the exciting and creative work that they are doing in the lab and in the community. I was inspired all over again and secretly wished I could be a student with them"*. Dr. Geiger's full article can be found using the QR code to the right, or online at: [utoledo.edu/nsm/bio/alumni/geiger.html](https://utoledo.edu/nsm/bio/alumni/geiger.html)



## Why I Give - Dr. James S. Hatfield

Dr. James S. Hatfield studied at the department between 1969-1978 and obtained both M.Sc. and Ph.D. in Biological Sciences under the guidance of Dr. Clifford J.V. Smith. Before his retirement, he was Section Head of Anatomical Pathology at the Veteran Affairs Medical Center in Detroit, Michigan. He and his wife Susan have set up the Dr. James S. Hatfield College of Natural Sciences and Mathematics Scholarship endowment to "enhance education in the Biological Sciences department". Dr. Hatfield's full article recollecting his time spent at UToledo while completing his graduate studies in biology can be found using the QR code to the right, or online at: [utoledo.edu/nsm/bio/alumni/j-hatfield.html](https://utoledo.edu/nsm/bio/alumni/j-hatfield.html)



### *In his own words ...*



*"My graduate education at UToledo had a profound, defining impact on the course of my life and career. On reflection about the past 50 or more years, I regard my time at UToledo as the most rewarding period of my educational activities. I feel that I owe a debt of gratitude to UToledo and to my mentors, Dr. Clifford*

*Smith and Dr. Ben Pansky, who guided me through the research efforts which resulted in my M.S., Ph.D. and the direction of my eventual career. The scholarships are established in part as*

*payback to UToledo for providing me the education and degrees which allowed me to have a long, successful career in the biomedical sciences. I also wish to encourage future scientists with these financial contributions, which I hope will give some incentive to pursue their own dreams.*

*I would suggest that undergraduates and graduate students should be bold and not hesitate to reach out to professors in fields of potential interest, to take courses they offer and to consider performing research projects in their laboratories. One never knows what realm of study will prove exciting and inspirational until interactions occur with these specialists. I was most fortunate to find my direction in life through studies with my mentors. I truly appreciate their support and encouragement; their influence was of major importance to my career."*

## 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 Nick Butler, Director of Development - Colleges of Natural Science & Mathematics at 419.530.5413 or [nick.butler@utoledo.edu](mailto:nick.butler@utoledo.edu).

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DEPARTMENT OF BIOLOGICAL SCIENCES

FALL 2022



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For 150 years The University of Toledo has been fueling tomorrows, and we are just getting started. Established in 1872, UToledo has a storied history and network of more than 168,000 alumni around the world. Proudly located in Toledo, Ohio, UToledo is a public, research university with an academic medical center powering opportunity for students and caring for patients across northwest Ohio. Known for ground-breaking research in astronomy and astrophysics; solar energy, water quality and sustainable technologies; and cell architecture and dynamics, UToledo is committed to improving the human condition around the world.

