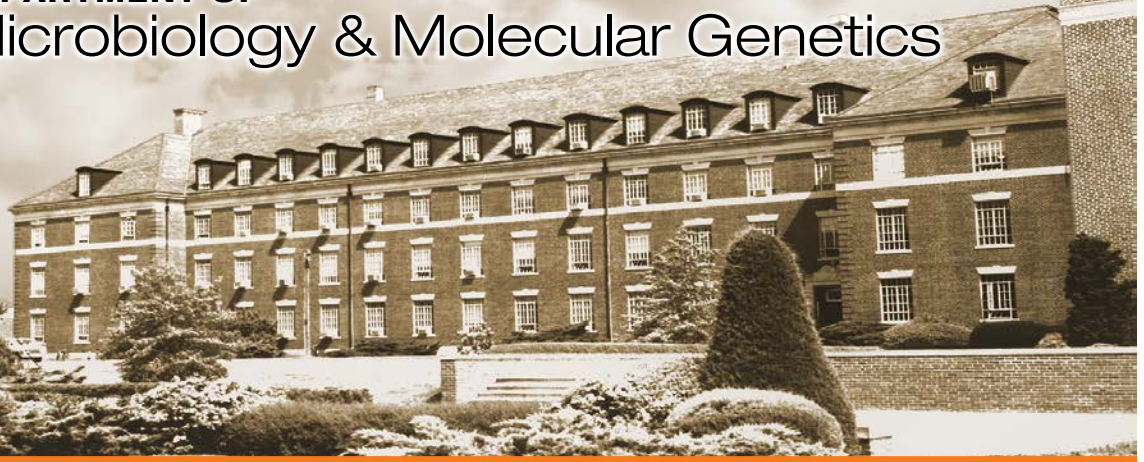




DEPARTMENT OF Microbiology & Molecular Genetics



ISSUE 6
SPRING 2018

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The Department of Microbiology and Molecular Genetics offers these degrees: Microbiology, Cell and Molecular Biology, Pre-Medical Professional and Medical Laboratory Sciences.

- Department Head**
Dr. Tyrrell Conway
- Graduate Program Coordinator**
Dr. Mostafa Elshahed
- Undergraduate Academic Advisor**
Dana Hatter
- Administrative Staff**
Becky Hergenreder & Alice Bules

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DR. TYRRELL CONWAY, DEPARTMENT HEAD

Greetings from MMG

The **Constellation Orion** is back in the evening sky and campus is bustling with activity. Students started their first day of Fall classes with the solar eclipse. The excitement level on campus was palpable. The hallways of Life Science East are filled each day with undergraduates waiting for their classes to start. *The beginning of Fall 2017 was auspicious.* Now Spring semester is underway. The 2017-18 academic year will be over before we know it.

The Microbiology faculty ended the 2016-17 academic year with 6 new grants. A summer of focused research paid off once again. The department published 3.2 manuscripts per laboratory group and our students and faculty presented 98 abstracts at scientific conferences. **Dr. Noha Youssef** was the **Arts and Sciences Outstanding Junior Faculty member** and **Dr. Erika Lutter** received the **Provost's Advising Excellence award**. **Dr. Rob Burnap** was honored by election to **Fellowship in the American Academy of Microbiology**, a mark of distinction given to only the top one-half of one percent of microbiologists from around the world. *We are a strong department and we are growing.*

Two new Assistant Professors, Dr. Matt Cabeen and Dr. Karen Wozniak, joined us last Fall. You'll hear from them inside this newsletter. The department said goodbye to Professor Kim Burnham, who retired last summer after 38 years of teaching and research in Microbiology. He will be missed as a good friend and colleague. Fortunately, we still get to see him occasionally in weekly seminars.

Microbiology has never seen higher undergraduate enrollments. Introduction to Microbiology had 409 students enrolled last semester and there were 281 students in Intro Micro Lab. Enrollments grew again in the Spring. A newly renovated teaching laboratory will open next Fall

and we anticipate it will fill to capacity immediately. That means well over 800 students will take both Intro Micro lecture and lab in the 2018-19 academic year. What a privilege it is to "teach microbiology to the masses". Every semester we scavenge the campus to find larger classrooms to accommodate larger enrollments. *It's a good problem to have.*

continues



Dr. Tyrrell Conway outside ASM in Washington, DC.

Increased enrollments reflect our growing program. We graduated a record number of students with Bachelor of Science degrees last year (48) and we started this year with a record number of Microbiology majors (246), which is up 22% from a year ago. That's 44 new faces in our program, belonging to young men and women who are important to us. Each student has his or her own story, unique talents and aspirations. *What an honor it is to serve them.*

Kayla Kifer, won the Janet Farhood scholarship and **Savannah Martin**, received the Kidd-Farrell-Conway (KFC) scholarship. **Sydney Stewart** received a prestigious Fulbright Award. Our majors tend to be as successful in research as they are in the classroom. We are proud that so many of them win **Niblack Scholarships**, the most prestigious undergraduate research award at OSU. Last year 4 of 12 selected and this year 6 of 13 of those selected are Microbiology majors.

Microbiology students tend to be well-rounded. Sophomore Microbiology major Samantha Shafer was listed as Top Freshmen Woman. Daniel McLeod is serving as President of the Arts and Sciences Student Council, the most important service organization in our College. Our recent graduates also continue to impress. For example, outstanding Microbiology Senior for 2017, Kristina Baker, just started a PhD program at Oregon State University.

Graduate students in Microbiology strive for excellence. **Sharmily Sanjida Khanam** was GPSGA Finalist for the "Phoenix Award" and she won the Summer Dissertation Writing Fellowship and the 2017 Cox Fellowship for Research in Genetics. **Prakash Sah** won the 2018 Cox Graduate Fellowship in Genetic Research. **Biraj Kayastha** won the People's Choice Award for his Three Minutes Thesis (3MT) presentation. **Juliana Artier** won the Ed and Mary Gula Graduate Fellowship, the Graduate College Dissertation Writing Workshop Award and a Summer Dissertation Fellowship. **Judyth Gulden** won the Norman Durham Graduate Fellowship. Graduate students drive the research mission of the department and we take great pride in their accomplishments.

Please read on to learn more about the many achievements and awards received by the Microbiology faculty and students. It is a pleasure to serve as Head of this exceptional department.

DR. TYRRELL CONWAY,
Regents Professor and
Department Head



Chunk "on duty" with microbiology students.



Chunk attends the Cowboy Baseball game.

Chunks of Wisdom

'My name is Chunk and I'm a Therapy Dog'

This year I have been very active. My Handler taught Introduction to Microbiology last Spring semester and I made 320 new friends! This Fall semester I met 66 new students in Arts and Sciences Freshmen Seminar class.

I love being in class and I go as often as I can. When my Handler puts my vest on me I know I will be going to the Oklahoma State University campus and I love it — except that I'm not allowed to chase the squirrels there.

Something about wearing that vest makes me calm down and look for people to pet me. The nice people in the Microbiology office feed me snacks under their desks, so the 98 times I visited the office in the past year was just not enough.

My friend Alice in the office turned me into a canine billboard by sewing my bandana emblazoned with the Brewing Microbiology course logo (that's my Handler's online class). I also made 38 appearances at various campus events in the Student Union, Library, OSU Foundation, etc. I went to a memorial service for a student who I will miss. Sometimes people just need me.

It's not bragging to say I am quite a celebrity on campus. People recognize me and greet me when I go for walks. Sometimes

they say hello to my Handler, but mostly they just talk to me. I love walking around Theta Pond. Did I mention there are a lot of squirrels there?

One of the highlights of my year was going to an OSU Cowboy Baseball game. When the crowd got loud my tail wagged. I definitely want to do that again. But my favorite thing is walking up and down the 3rd floor hallway in Life Science East, visiting with all of the students while they wait for their classes to start. I like how they get on the floor to pet me. It makes me proud to wear the orange vest and represent **Pete's Pet Posse. Go Pokes!**

Love,
CHUNK





Karen Wozniak



Matthew Cabeen

Our Newest Faculty Members

Karen Wozniak was born in Bowling Green, Kentucky and is the youngest of three children. Her father was a Sociology professor at Western Kentucky University and later served as the chair of the department, and her mother earned her degree in Social Work once Karen started school. Karen was always interested in science, but specifically became interested in microbiology in her high school AP Biology class.

Karen headed to the University of Notre Dame to pursue her bachelor's degree in Biological Sciences, where she worked in the laboratory of **Dr. John Adams** studying malaria. She also was first exposed to immunology during her senior year, and at that point Karen knew that she wanted to study the immunology of infectious diseases. She applied and was accepted to the Microbiology,

Immunology, and Parasitology graduate program at Louisiana State University Health Science Center in New Orleans, LA where she earned both a master's degree and a Ph.D. There, she joined the fungal immunology laboratory of **Dr. Paul L. Fidel, Jr.** and began studying protective immune responses to *Candida albicans* infections. Her research focused primarily on adaptive immune

continues

Matthew Cabeen was born in Pennsylvania but grew up near New Haven, Connecticut. Neither of his parents went to college, but they were intellectually curious and read seemingly endless piles of books on every subject. Matt knew by first grade that he wanted to “go to college and do science”, but none of his family members or family friends was a scientist or even knew what steps to take towards a career as a scientist. It was only thanks to a series of fortuitous meetings and key mentors that led Matt to his position here at OSU.

His first real scientific mentor was his high school biology teacher, who recognized his interest and aptitude for biology and introduced him to the wonderful world of molecular and cell biology through Advanced Placement biology and chemistry classes. Matt stayed in New England for college at

the University of Connecticut, where he began his college career studying human genetics but was unfamiliar with undergraduate research. By chance, a friend of his dad from a gentlemen's glee club happened to be a biology professor at Yale University who invited Matt in for a meeting. This meeting led to summer research

continues



responses (T cell responses and antibodies) at various sites of *Candida* infection. While in the Fidel laboratory, Karen had the opportunity to attend the Molecular Mycology course at the Marine Biological Laboratory in Woods Hole, MA. This course cemented Karen's interest in studying fungal diseases and fungal pathogenesis.

For her post-doctoral studies, Karen was interested in exploring innate immunity and decided to begin working on a different fungal pathogen, *Cryptococcus neoformans*. She joined the laboratory of **Stuart Levitz, M.D.** at Boston Medical Center in Boston MA, and moved with his lab two years later to the University of Massachusetts Medical School in Worcester, MA. Karen studied dendritic cell interactions with *C. neoformans* and began investigating mechanisms of dendritic cell killing of *C. neoformans*.

Karen next moved to San Antonio, TX to work as a Research Assistant Professor with her colleague **Floyd L. Wormley, Jr.** in his laboratory at the University of Texas at San Antonio. Karen

continued her work with *C. neoformans* and dendritic cells, but also took on additional projects examining vaccine-mediated immune responses to *C. neoformans*. She also was able to mentor post-docs, graduate students, and undergraduate students in the laboratory. In addition, Karen also had the opportunity to teach lectures in Microbiology, Medical Mycology, Microbial Pathogenesis, and was the instructor for her own Parasitology course.

Karen comes to OSU with her husband **John Coates** and their cat, **Toby**. When she is not in the lab, she loves experimenting with food and recipes. She is excited to begin her first research lab, and she will continue studying innate immune responses to *Cryptococcus* and other pathogenic fungi. New projects in her lab will include examining components of dendritic cells that have anti-fungal properties and determining the mechanisms by which macrophages either kill fungi or allow intracellular growth.

on *Acinetobacter* species with **Dr. Nick Ornston** at Yale, giving Matt his first taste both of research and of microbiology. His undergraduate program included a 6-month, off-site internship at a genetic testing lab. A new internship site had just been established, and he stepped out of the comfort of New England all the way to southern California, conducting the internship at a newly founded diagnostic testing lab in Irvine. There, a group of young, enthusiastic colleagues gave him the freedom to conduct his own research. Convinced that he wanted to perform research as a career, Matt worked towards an additional degree in Molecular Cell Biology and returned to southern California for a second research internship during his senior year, where he worked on developing microarray-based tests for lymphoma.

Matt returned to New England and to Yale for graduate school with cancer research in mind. He quickly became intrigued by RNA biology and riboswitches, leading to a research rotation with **Dr. Ronald Breaker** and the assumption that he would study riboswitch biology for his PhD. During a chance conversation in a stairwell, a postdoc from another laboratory recommended that he meet **Dr. Christine Jacobs-Wagner**, a new faculty member who studied *Caulobacter*.

In the resulting meeting, an enthusiastic Dr. Jacobs-Wagner turned Matt towards bacteria and became a superb PhD mentor during his studies of the bacterial cytoskeleton and specifically of a bacterial intermediate filament

protein known as crescentin. There, he characterized the structure and function of crescentin, establishing a model for how a bacterial cytoskeletal element can produce cell curvature. During his graduate work, Matt also developed a love for teaching both graduate and undergraduate students, and he taught multiple courses, including Molecular Genetics of Prokaryotes!

Seeking to remain in the field of microbiology but eager to expand his repertoire of species, Matt made a small move north to Cambridge, Massachusetts for a postdoctoral fellowship with **Dr. Rich Losick**, a renowned professor and *Bacillus subtilis* researcher. There, he introduced *Pseudomonas aeruginosa* to the lab, establishing a visual screening method to find genes associated with the formation of cell communities known as biofilms. Turning to *B. subtilis*, he also adapted microfluidics technology developed in part by the Losick lab to study how cells respond to various stresses, including ethanol and starvation. Matt plans to continue projects with both *P. aeruginosa* and *B. subtilis* in his lab at OSU.

Matt met his wife, **Rose**, during graduate school, and the couple married in 2008. They have four sons, **Thomas** (8), **Benjamin** (7), **Henry** (5), and **Ian** (2). Rose holds a degree in Mathematics and home schools their children. Moving from a two-bedroom apartment in Boston, they are thankful to have a bit more space and a backyard here in Oklahoma, and they are thrilled to become part of the OSU community!





Our Distinguished Alumnae: Dr. Brian S. McDowell

This year's distinguished Alumnus in Microbiology is Brian S. McDowell, D.O., who was honored at the Arts and Sciences Hall of Fame Banquet on September 22, 2017.

Dr. McDowell graduated from **Oklahoma State University** in 1998 with a Bachelor of Science degree in Microbiology. During his time in Stillwater he served as an Off Campus Student Association representative to the Student Government Association, and worked at Edmon Low Library. Dr. McDowell is a Kingfisher, Oklahoma native.

Following a one-year stint working in medical research, Dr. McDowell attended medical school at **OSU College of Osteopathic Medicine**, graduating in 2003. A general pediatric residency followed at **Saint Francis Children's Hospital** through the University of Oklahoma in Tulsa, where he served as Chief Resident.

Dr. McDowell is the owner and operator of **Owasso Pediatric & Adolescent Medicine**, a full service extended hours pediatric clinic which he opened in July of 2007. Owasso Pediatrics includes five medical providers serving newborns to young adults. Dr. McDowell has privileges at several area hospitals where he has served on multiple peer-review committees.

When not caring for his patients, Dr. McDowell enjoys serving the families and children of his community including as Santa in the Owasso Christmas parade for the last several years. An avid OSU sports fan, he and his wife **Lindsay** (journalism and public relations '99) are members of the **POSSE Club** and lifetime members of the **OSU Alumni Association**.

Dr. McDowell was accompanied to the Hall of Fame Banquet by his wife and their daughter, as well as his parents, Alden and Annelee McDowell. Earlier on the day of the banquet he spoke to the students in Professional Transitions, which is a course that helps to prepare Microbiology majors for the various career

opportunities that await them. Dr. McDowell described how hard students can expect to work in medical school, what it was like to be a Resident, and how he started his own business. He also shared personal stories about his favorite mentors. Needless to say, our students learned a lot and Dr. McDowell's comments were very well received.



Dr. Brian S. McDowell, center, flanked by microbiology undergraduate student, Savannah Martin and Dr. Tyrrell Conway.



In Loving Memory

We mourn the loss of **Dr. John G. Whitney**, who passed away January 28, 2017. Dr. Whitney received his PhD in Microbiology in 1967 under the supervision of his advisor, **Dr. Ed Gula**, who was *Head of Microbiology in the 1970s and 80s*.

Dr. Whitney was steered by Dr. Gula toward *Fermentation Products Research* at **Eli Lilly drug company**. Dr. Whitney was enormously successful at Lilly, *discovering several antimicrobial drugs and producing two patents*. He remained at Lilly for his entire career, first as a scientist, then Head of his department, and eventually retiring as Vice President of Lilly Research Labs. He played an important role in integrating corporate acquisitions into Lilly Research and Development. Upon retirement, Dr. Whitney and family operated a horse

farm near Indianapolis. Two summers ago Dr. Whitney visited the department with some of his children and grandchildren. Dr. Whitney was honored as **Microbiology Distinguished Alumnus** and attended the **2016 Hall of Fame banquet** with his wife and all of their children. Dr. Whitney is survived by his wife **Sherry**, daughter **Shellie Brooks** (husband **Michael**), and sons **John** (wife **Kathy**), **Jim** (wife **Angie**), **Brady** (wife **Holly**) and **Joshua** (wife **Andrea**).

MICROBIOLOGY & MOLECULAR GENETICS
DISTINGUISHED ALUMNUS

Dr. John G. Whitney

BORN

Ponca City, Okla.

TITLE

Vice President, Eli Lilly and Co., retired

DEGREES

1961 — A&S — BS General Science — OSU

1967 — A&S — PHD — Microbiology — OSU

SPOUSE & CHILDREN

Sherry L. Whitney & John Whitney, Jr., James Whitney, Joseph Whitney, Shellie Brooks, Josh Whitney, and many grandchildren

Dr. Whitney was a successful scientist, corporate leader, small business owner, and beloved family man. He will be greatly missed.



John Whitney, center, is joined with family members, **John Whitney, Jr.**, **Josh Whitney**, **Sherry Whitney**, **Michael** and **Shellie Brooks**, and **Joseph Whitney**.

Happy Retirement to Kim Burnham!



Dr. Kim Burnham joined the department in 1988 and he liked it so much that he never left. Kim received his BS and MS in Microbiology from Brigham Young University. He got his PhD at UT Southwestern and did postdoctoral research with Dr. Raymond Daynes at the University of Utah Medical Center. Kim was promoted to Associate Professor in 1993.

He served as the first **Director of the Native Americans in Biological Science program**. He won various teaching awards and mentored more than 50 undergraduate students. He served as **Graduate Coordinator** from 2004-07. In 2014-15 Kim was **interim department head**, which he said was a 20 hour per week job, accomplished in 5 min increments (lots of interruptions).

A highlight of Kim's career was a **Fulbright Senior Scholar Award**, which took him in 2003 to New Zealand, where he began researching the immune system of a reptile called Tuatara. This led him to work on the Western fence lizard, while continuing his research on mammalian dendritic cells. Kim taught one of our toughest courses, Immunology, and enrollment grew each year under his supervision.



The New Zealand Tuatara.



One of Kim's passions was the **Medical Laboratory Sciences program**. He served as **President of the Oklahoma Society of Clinical Laboratory Educators** in 1998. He was advisor for the **Medical Technology program** (and the corresponding student club) until 2004 and after the program name changed he advised MLS students until his retirement.

In years to come, **Drs. Shaw and Wozniak** will take the reins of Immunology. They will build on Kim's tradition of teaching excellence.

When he is away from the university Kim is an author, volunteer, and church leader, and now he has more time for those activities. The department is grateful to Dr. Burnham for his dedication to Microbiology programs and wish him and his wife **Jeanie** the best during retirement.

From our Advisor



Great things have been happening for our students! One update is our department's addition of a "**Pre-Medical Professional**" option. This was designed for our students whose career goal is healthcare. Since many of our students have been accepted into medical, dental, optometry, and pharmacy programs, we wanted a new degree option which encompasses the prerequisites for these programs. Our goal is to get students where they want to go with the best preparation for success. This new option goes perfectly with OSU's "**Finish in Four**" program which was designed to help students graduate in a timely manner.

The university also has new computer systems in place. One is for the new enrollment system (XE). It allows students to find courses more easily, plan ahead, and view options. As an advisor, I love this!

Our students tire of hearing me tell them to "Be a good consumer of your educational time and money. College is one of the most expensive and important purchases you will ever make." I believe students should be more in control of their education. I think this system will be a useful tool.

Another great program is our "**Degree Works**" system. It is how the university now does graduation audits. What I like most about this program is that it clearly shows students exactly what courses count towards their degree. Most college students have a nightmare of being told at graduation: "There was a problem, you are a class short and you can't graduate now. Sorry." This program eliminates any doubts. Each semester, students will know exactly where they stand. And that they will graduate on time.

DANA HATTER,
Microbiology Advisor

Graduate Coordinator's Report



Our graduate program is growing! In 2017, Thirty-two students have actively participated in our graduate program (22 PhD and 10 MS students). Four PhD and 5 MS degrees have been awarded in 2017.

Between August 2016-August 2017, our graduate students were co-authors of nineteen different publications in highly respected peer-reviewed scientific journals such as *The Journal of Physical Chemistry Letters*, *Applied and Environmental Microbiology*, *Protist*, *Algal Research*, *Journal of Microbiological Methods*, *Mycologia*, *Bioprotocols*, *PLOS ONE*, *Cell Calcium*, *Frontiers in Microbiology*, and *Genomics Data*.

Our graduate students published approximately 0.76 papers per student in 2016-2017. This publication metric has been showing continuous improvement, with values of 0.67, 0.59, and 0.39 for the prior three years. Our graduate students publish, on average, 3.8 papers during their PhD, with an average Ph.D. completion time of five years.

Students in our graduate program continue to be very active in attending and presenting their research at scientific conferences. On average, each graduate student in our program is involved in 2.3 scientific presentations per year, with 31% of these presentations occurring at major national and international meetings.

In Fall 2017, we admitted seven new Ph.D. students and six new MS students into our program. In short, our graduate program is still going strong! We are very proud of our wonderful graduate students, and we will always strive to mentor them to the best of our abilities.

DR. MOSTAFA ELSHAHED,
Graduate Coordinator

Graduate Student Association President's Report



The academic year of 2017-2018 represents a time of change for the **Microbiology and Molecular Genetics Graduate Student Association**. I'm proud to announce my second term as president, and proud to announce **Vice President Nick Kuburich**. While reinforcing the successful strategies of previous administrations, we will streamline our organizational events while increasing fellowship activities between our graduate student community.

Last year, we hosted the **9th annual Student Research Symposium** on March 27 to great acclaim. With participation from both the undergraduate and graduate researchers, our department took advantage of the festive atmosphere to celebrate each other's scientific contributions. During the Spring 2018 semester, we are proud to announce keynote speaker **Dr. James Golihar**, an exciting scientist who works for **Gingko Bioworks** out of Boston, an exciting new synthetic biology company. This event will build on the success of last year's symposium and establish a format for future Oklahoma State Microbiology and Molecular Genetics events.

Under the supervision of new graduate coordinator **Dr. Mostafa S. Elshahed**, doctoral graduate students increase participation in our department's weekly seminar series. In the Fall, **Anton Avramov, Radwa Hanafy, Biraj Kayastha, Michelle King, Jonny Riggs, and Prakash Sah** presented their individual research, with the Spring students yet to be announced.

This year will also focus on enhancing the graduate community. Informal socials were planned for October and February to strengthen bonds between our members. The department hosted a table for **2017 OSU Homecoming Walk Around**, to fundraise and educate participants about the value of sanitation. Finally, we plan to increase coordination with the university **Graduate Student General Assembly** and **Regional ASM Missouri Valley Branch**.

As the yearly challenges arrive, we strive to meet them together, encourage each other, and conquer them without fail. As an organization, we envision the best academic year this department has seen, and look forward to what's to come.

JONNY RIGGS,
MMGSGA President



Raising money at **Homecoming** with the water balloon toss.

Oh The Places We'll Go



Fun Inside and Outside the Micro Department



Microbiology Association



The Microbiology Club had a very eventful year. Some of the activities the club took part in included touring the Oklahoma Medical Research Foundation, hosting a Q&A meeting with professionals in careers with microbiology degrees, pizza parties during finals, and a skate night. We also were able to continue the departmental undergraduate research symposium for the second year. This awesome event gave undergraduate students the opportunity to present their research.

The approaching school year holds many opportunities for the club. There are several new officers, including the new vice president, Alison Bates, and the new president, Samantha Shafer. This new group has many exciting and fresh ideas to bring to the club. Their goals for the coming year include more undergraduate involvement and club activities.

SAMANTHA SHAFER,
President





Grandparents University (GPU)

Last summer, the Department of Microbiology and Molecular Genetics hosted a major for Grandparents University entitled “Wonderful World of Bacteria”. Grandparents and Legacies were invited into our department to get a broad overview of important topics and techniques in microbiology. On Day 1, Legacies and Grandparents were welcomed into our “world of bacteria” with a talk about lab safety. After this discussion, Chunk showed the kids the best places on the OSU campus to collect environmental

samples! After plating the environmental samples, we moved on to talk about antibiotic resistance and the Grandparents and Legacies were taught how to spread a plate with *E. coli* using a glass hockey stick. Disks were then applied with different concentrations of antibiotics on them to determine which antibiotics would kill *E. coli*.

Next, the kids were allowed to express their artistic side by making works of art with bacteria! The last activity completed on the first day was starting a PCR and talking

about DNA amplification. Day 2 started with making DNA strands, observing the plates that were struck the first day and, of course, making observations in their notebooks. They took some time looking at prepared slides of different bacterial structures, shapes, and fungus. The last activity consisted of learning about gel electrophoresis, running the PCR products from the previous day, and visualizing the gel of the PCR products.

MICHELLE KING,
GPU Coordinator and
Graduate Student



Student Awards

GRADUATE STUDENT AWARDS

Juliana Artier

Edward A. Grula Graduate Fellowship
Registration Scholarship for the 12th
Workshop on Cyanobacteria
Graduate College Dissertation Writing Workshop Award
Summer Dissertation Fellowship



Neil Miller

Registration Scholarship for the 12th
Workshop on Cyanobacteria



Judyth Gulden

Norman Durham Graduate Fellowship

Radwa Hanafy

Distinguished Graduate Fellowship Nominee
1st Place, 2016 Oklahoma Microscopy Society
Student Micrograph Competition

Nick Kuburich

1st Place Graduate Student Poster, MMG Symposium

Shelby Calkins

2nd Place Graduate Student Poster, MMG Symposium

Sharmily Sanjida Khanam

3rd Place Graduate Student Poster, MMG Symposium
GPSGA Finalist for the "Phoenix Award"
Summer Dissertation Writing Fellowship
Cox Fellowship for Research in Genetics
3rd Place Poster, 3rd Annual OCRID Research Retreat

Biraj Kayastha

People's Choice Award, Three Minutes
Thesis, College of Arts & Sciences

Nirakar Adhikari

GPSGA Travel Reimbursement Award
OSU Foundation Award

UNDERGRADUATE STUDENT AWARDS

Kristina Baker

Outstanding Senior

Paige Martin

Outstanding Senior Finalist

Chelsea Murphy

Outstanding Senior Finalist
Outstanding Undergraduate Researcher Nominee
1st Place Undergraduate Poster MMG Symposium

Justin Tom

Outstanding Senior Finalist

Sydni Caet Smith

Outstanding Undergraduate Researcher

Jordan Fleming

Outstanding Undergraduate Researcher Finalist
Wentz Research Grant
OK-LSAMP Scholarship
SACNAS Travel Award
NIH Diversity Supplement

Rendi Rogers

Outstanding Undergraduate Researcher Finalist
Niblack Research Scholarship
3rd Place Poster Presentation MMG Symposium

Amanda Demackiewicz

Outstanding Undergraduate Researcher Finalist

Matt Hart

Outstanding Undergraduate Researcher Nominee

Brit Johnson

Outstanding Undergraduate Researcher Nominee

Cheyenne Prescott

Outstanding Undergraduate Researcher Nominee

Savannah Martin

Kidd-Ferrell-Conway Scholarship

Kayla Kifer

Janet Farhood Scholarship

Alicia Aguilar

National Goldwater Scholars Honorable Mention

William Starr

2nd Place Undergraduate Poster MMG Symposium

SACNAS Travel Award

SACNAS Meeting Presentation Award

Council on Undergraduate Research (CUR)

Biology Student Travel Award

Cullen Travel Award

Wentz Research Grant

Niblack Research Scholarship

OK-LSAMP Scholarship

Outstanding Undergraduate Poster,

Researchers' Reception

Joseph Fleming Memorial Continuing Scholarship

Gilbert R. Emde & Phillips Endowed Scholarship

Arts & Sciences Outstanding Junior Award



Daniel McLeod

4th place Undergraduate Arts and
Science 3MT Competition

Best Undergraduate Poster Presentation,
4th Annual OCRID Meeting

Sydney Stewart

Fulbright Grant Recipient

Caroline Graham

Niblack Research Scholarship

Emily Gietzen

Niblack Research Scholarship

Kassidy Ford

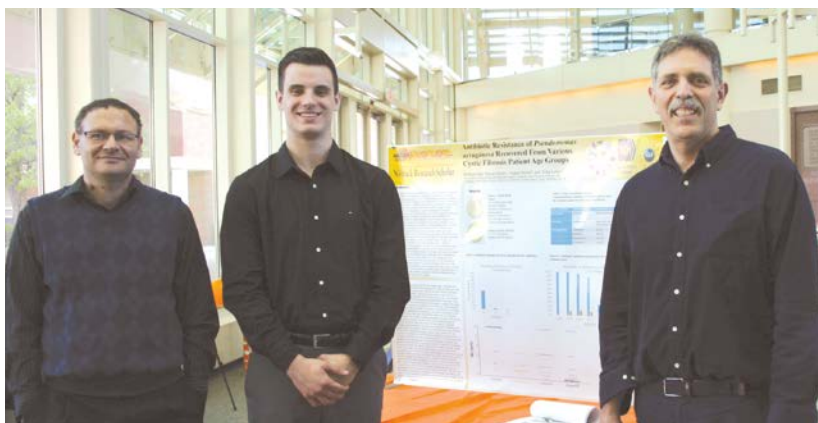
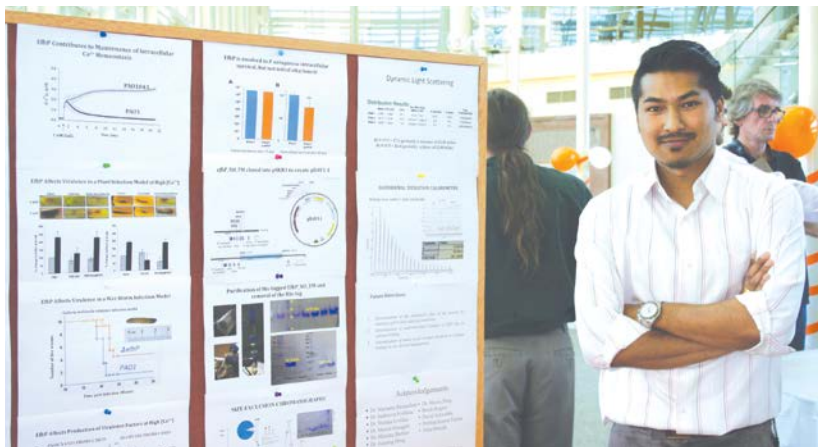
Niblack Research Scholarship

Mandy Truelock

Internship Award, Summer Undergraduate Research
Program in Biochemistry at Texas A&M



Annual MMG Research Symposium



Development Corner



The Department is grateful to alumni and friends who contribute generously to Microbiology endowments and general fund. Scholarships continue to be a top priority because undergraduate Microbiology majors face increasing financial pressures.

The **Janet Farhood and KFC** scholarships will be awarded this year for the second and third times, respectively, to students with financial need. The endowed **Durham and Grula Fellowships** support meritorious graduate students in Microbiology. Gifts to the general fund support the **Microbiology seminar series**, **Spring Awards Banquet**, and student activities, such as the **Microbiology Ambassadors** and annual **Student Research Symposium**.

Last year the Department received substantial donations from **Mary Jane** and **Brent Wooten**, as well as **David Shelden**. Seminar speakers could not be invited without gifts like these. Invited lecturers from last year included **Jun Li** from the University of Miami, **Barry Wanner** from Harvard Medical School, **John Morgan** from Purdue University, **Michelle Visser** from the University of Buffalo, and **Brett Baker** from the University of Texas Marine Science Institute.

Dr. Baker, whose laboratory and home in Port Aransas barely survived Hurricane Harvey, gave a brilliant lecture on microbial diversity last March. The work he described is shaking the foundations of science by challenging the three domain model of phylogeny. The data suggest that eukaryotic organisms branched out of the Archaea, a controversial interpretation that will be discussed and tested for years to come.

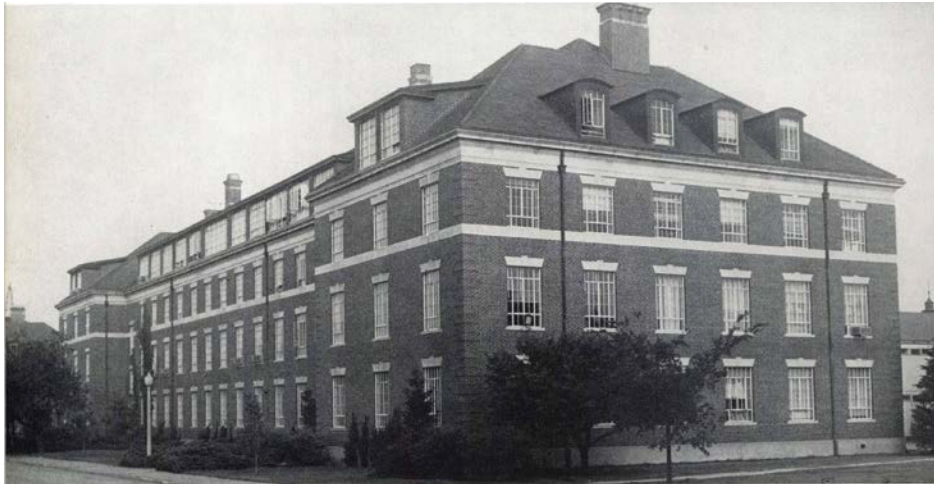
Family, friends and former students of **Ed and Mary Grula** have stepped up their giving to the **Grula Lectureship**. The Grula's left an indelible mark on Oklahoma State University. Dr. Edward A. Grula was known on campus as "Big Ed", because he had such a big personality. To his graduate students, he was just "Doc". His wife was affectionately known as "Dr. Mary". She was a gentle person and brilliant researcher, a Professor of Microbiology until her retirement in 1990. She passed away in 2001.

Doc was a US Army veteran and a kind-hearted intellectual. He died too young, at the age of 57. The Grula Lectureship was established in his honor.

This year the Department reconnected with the Grula children. **John, Marjori, Tom, and Lorraine** have joined several alumni and former Grula graduate students in the campaign to complete endowment of the Grula Lectureship.

Completing the Grula Lectureship endowment is a top priority because it will expose current students to world-class scientists. *Please join in contributing to the Grula Lectureship Fund.*

If you are on campus and have a little time, please stop by Life Science East to say hello. The building may have changed a little, but it will bring back great memories. You are always welcome. *Thank you again for your support of Oklahoma State University Microbiology.*



New Grants

Many of you know already that microbiology research is expensive and without funding from federal agencies it would not be possible to keep our laboratories open. It is a big moment in the life of a laboratory group when a new grant is awarded. This year, research teams in our department received six new grants. Research grants are peer reviewed, so when one is funded it represents the ultimate validation of our research by the scientific community. We are grateful for our scholarship to be perceived this way and it is exciting to be able to launch these new research projects.



Burnap

Dr. Robert Burnap was awarded a grant from the **US Department of Energy (DOE), Division of Basic Energy Sciences**, entitled “**Structure, Function, and Regulation of**

the NDH-1 Complexes in Cyanobacteria”. Burnap seeks to understand the specialized mechanisms used by photosynthetic organisms to extract CO₂ from the atmosphere and concentrate it in the cellular environment of the major carbon fixing enzyme, which has a notoriously poor affinity for CO₂. Such knowledge is critical for optimizing bioenergy and agricultural production and for the development of the next generation CO₂ scrubbing materials.

Dr. Burnap also received a grant from the **National Science Foundation (NSF)** entitled, “**Assembly and Function of the Photosystem II Complex**”. Photosystem II is the key enzyme of photosynthesis, natural solar energy production, and needs to be understood for food production and for carbon neutral production of energy and chemical feedstocks. Burnap and coworkers seek to understand the catalytic properties of the basic redox enzymology of this crucial enzyme.

Dr. Tyrrell Conway was awarded a grant from the National Institute of General **Medical Sciences (NIH, NIGMS)** entitled “**Mechanisms of Nutrient Competition in the Intestine**” (RO1 parent grant). The major goal of this project is to determine mechanisms of nutrient competition between *E. coli* strains in a mouse model of intestinal colonization. Conway seeks to understand the underlying ecological principles that act to shape the microbial community known as the microbiome. There is a diversity supplement to this parent grant to support the postdoctoral training of **Dr. Jerreme Jackson** in accordance with the **NIGMS Diversity Supplement Program** goal to promote diversity in the scientific research workforce.

Drs. Mostafa Elshahed and Noha Youssef received a grant from the NSF entitled, “**EAGER: Elucidation of the structure of glomalin protein produced by root-associated soil fungi**”. The goal of the project is to identify the chemical structure of glomalin, a complex molecule produced in large quantities by members of a special group of fungi that grow on plant roots in soil. Glomalin exhibits physical properties and carbon content that have a profound impact on fertility and long-term carbon storage potential of soil. The project will yield potentially transformative results in the fields of fungal biology and soil science.

Drs. Marianna A. Patrauchan and Erika Lutter received a grant from **NIGMS** entitled, “**Ca²⁺-binding protein EfhP mediates Ca²⁺ regulation of *Pseudomonas aeruginosa* virulence and host-pathogen interactions**”. To gain control over currently untreatable *Pseudomonas* infections, it is critically important to generate new knowledge of the regulatory circuits coordinating the pathogen virulence in response to host factors. Calcium is an essential intracellular messenger in eukaryotes, and its abnormalities cause multiple human diseases, including pulmonary and heart diseases that are commonly associated with bacterial infections. The proposed research will generate new knowledge about the mechanisms by which calcium regulates virulence via calcium-binding protein EfhP and characterize its role in *P. aeruginosa*-host interactions.



Patrauchan

Dr. Marianna A. Patrauchan was awarded a grant from the **NIH funded Oklahoma Center for Respiratory Disease** (a Center of Biological Research Excellence) entitled, “**Two pathways for calcium signaling and virulence regulation in *P. aeruginosa***”. The goal of the research is to identify and characterize two calcium signaling pathways that regulate virulence of this pathogen. The new knowledge will enable experimental confirmation of the signaling role of calcium in bacteria and will advance our understanding of infectious diseases associated with Ca²⁺ imbalance.



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Our alumni and friends have the unique opportunity to partner with us in the important work we are doing in Microbiology & Molecular Genetics. As one of the region's best Microbiology programs, we impact the world through our students and our research.

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