ISSUE HIGHLIGHTS

Research

The Aquaculture Pathology Laboratory at the University of Arizona, led by Dr. Arun K. Dhar, has been busy with speaking engagements, workshops, and visiting scholars.
- Page 9

Teaching

A two course series in primate behavior and captive management gives students the opportunity to learn primate behavior principles and promote captive primate welfare.
- Page 3

Extension

Youth from all over Arizona had the opportunity to participate and learn about STEM research in several 4-H summer camp programs.
- Page 4 and 6

Big Move for Equine Programming at the University of Arizona

The summer of 2019 brought great changes and new opportunities to the equine programming at the University of Arizona. The Equine Center – formally located at the Campus Agricultural Center on Campbell Avenue – moved to its new home at the Al-Marah Arabians property on Bear Canyon Road in northeast Tucson. Now known as the University of Arizona Al-Marah Equine Center, the name pays tribute to the farm’s great tradition of breeding and raising champion Arabian horses.

More than 80 horses along with all the equine program equipment, educational resources and library, made the move across town over the summer break and were back up and running in time to welcome students for the first day of the fall semester classes. The 80+ acre property features a number of different barns and pastures, both an indoor and covered arena, as well as an educational building that houses classrooms, offices and a small historical museum featuring the Al-Marah Arabian horses.

A reception for the neighbors who live around the farm was standing room only with the most heard comment being, “We love to see horses back here again.”

Donated to the University by Mrs. Bazy Tankersley, this fully-equipped equine operation opens a world of opportunity for the growth of both student and extension-related programming. Additionally, the Ruth McCormick Tankersley Charitable Trust is funding ongoing renovations to the property.

Neighbors of the University of Arizona Al-Marah Equine Center gather to learn more about planned programming and meet the faculty and staff that will be working on the property.
Greetings,

As we commence a new academic year, I want to extend a hearty welcome to all students, faculty, and staff, both returning and new. In addition to welcoming you back to campus, I want to share some updates. This year promises to be another exciting one, especially now that the renovation of the ACBS building is complete and work is underway on the landscape and beautification of the main entrance. We will be holding an open house celebration later this semester, so please stay tuned.

We had a very busy summer planning and completing the move of our equine program to the Al Marah Equine Center. With renovated stables, barns, and classrooms, we are excited for students to begin utilizing these beautiful facilities. This amazing center will also offer faculty the ability to expand their research and extension programs. I want to thank in particular, the Tankersley Trust, for their generous donation that made all the renovations at the equine center possible. We are also planning to have a picnic day at the Al Marah Center in early November, so watch for an invitation in the mail.

We have been working on curricular updates of our undergraduate programs, beginning with the Animal Sciences Program. Our goal, with these updates, is to develop an undergraduate curriculum that will provide students with the courses and hands-on experiences necessary to build the knowledge and skills they will need to be competitive in their future employment.

This summer, I began my tour around the state with the goal of meeting stakeholders from the government, private, and public sectors. I enjoyed visiting with them on-site and learning about their needs and concerns. I also appreciated their candid input which I consider extremely valuable for setting the research, teaching, and extension priorities of our school. I am excited for what the future holds and the ability to positively impact our community.

I would like to close by saying that as always, ACBS is focused on providing a quality educational experience to students, resources for innovative researchers, and opportunities for everyone to pursue their academic passions.

I wish all of you a fulfilling and productive year,

Patricia Stock

ACBS Director and Professor
Weiler Endowed Chair for Excellence in Agriculture and Life Sciences
ACBS Animal Sciences Alum Promotes Ranchers and Beef in Arizona

University of Arizona, ACBS alum, Tiffany Selchow, née Hayes, graduated with a Bachelor of Science in Animal Science in 2011. We asked her to tell us a little bit about her background, career and anything she would like to pass on to our current students.

Tiffany has been working for the Arizona Beef Council sharing facts about Arizona beef in our state for the past 8 years. As Director of Social Marketing and Consumer Outreach, her job is to execute the marketing plan set by their 9-member producer board with an overall goal of educating and promoting Arizona beef. This work includes, but is not limited to, ranch tours, social media content development and management, influencer outreach, educational opportunities with high school teachers and students, development of blog content to tell Arizona beef stories, and so much more.

When asked what she loves about her job Tiffany says, “Telling the stories of ranchers and farmers who work so hard to raise healthy, delicious food and who are always looking for ways to continuously improve their practices.”

Tiffany was born on Davis-Monthan Airforce Base and was fortunate to remain in Tucson for the entirety of her childhood. Being a Tucson native, she was indoctrinated into the Wildcat family at a young age. She also became obsessed with horses and was able to work in trade for riding lessons at a local horse training facility. Through this work, she met Trish Nelson of Nelson Farms who gave her incredible opportunities to not just work and obtain riding lessons, but to show national caliber horses at the local, state, and national level.

At the University of Arizona, in addition to her course work, Tiffany was also able to intern with the Arizona Cattle Growers’ Association twice at their annual convention, which provided her with a better understanding of what she wanted to do with her career and lots of great connections. She originally entered college with the goal of becoming a large animal veterinarian, however, through her internships and working with the Collegiate Cattle Growers’ Association (now the Collegiate Livestock Growers’ Association), she found that agriculture communication, sharing with others what farmers and ranchers are doing to raise our food, was her true passion.

For current students, Tiffany recommends meeting as many people as you can and being involved. She says, “Studying and doing well in your classes says a lot but knowing someone and making a personal connection really does say so much more. Without the internships, connections and farm experience I had, there is a real chance I wouldn’t be doing what I love today!”

Class Series Promotes Captive Primate Welfare

A two course series in primate behavior and captive management, taught by Dieter and Netzin Steklis, gives undergraduate students the opportunity to learn primate behavior principles, put them into action, and meet professionals currently working in the field. In part one (ACBS 483), students learn basic primate behavior and biology, learn about different captive settings and challenges, and principles of captive management to promote welfare. No background in primatology is necessary for this course offered during the Fall semester.

In part two (ACBS 484), the class visits locations in Arizona with captive primates, with transportation to 4 captive primate sites in AZ provided in previous classes by a University of Arizona Student-Faculty Interaction Grant. Additionally, students are able to meet with experts from all over the world who are working with captive primates via Zoom. For example, students were able to interact with the coordinator of a gorilla sanctuary in West Africa, a renowned research scientist who studies the social brain in laboratory monkeys, the editor of the journal “Animal Sentience”, and one of the most prominent figures in animal behavior and welfare in zoos. For this Spring semester course, students need to have attended ACBS 483 or have prior bio-behavior background that is approved by the professors.

Students watch the response of marmosets as a primate keeper introduces an enrichment object during a visit to Out of Africa, a wildlife park in Camp Verde, Arizona.
ACBS Welcomes New Veterinary Science Advisor

ACBS is excited to introduce Jose Miguel Rodas, our new academic advisor for veterinary science. Jose began his position in May and has been spending the summer getting ready to welcome back students and assist them with their advising needs. In his new position, Jose is looking forward to being able to assist students and seeing their progress from an incoming freshman to a graduating senior. As an academic advisor, his main focus will be making sure each student within the veterinary science major is progressing through their academic journey by guiding them in their course selection and helping with any academic resources they may need to propel them forward in the pursuit of their degree and beyond.

Jose was born in Long Branch, New Jersey where he lived two blocks from the Atlantic Ocean, which he loved. He also spent quite a bit of time in El Salvador, where his parents are originally from. He received his Bachelor of Arts in Family and Child Studies with a concentration in Family Services at Montclair State University. He then moved to Tucson to pursue his Master of Science in Family Studies and Human Development in the Norton School of Family and Consumer Sciences at the University of Arizona.

Prior to working with ACBS, Jose gained experience with undergraduate students teaching courses within the social sciences, such as Life-Span Human Development and Human Sexuality. As a teaching assistant, he also taught Social Gerontology, Adolescent Development, and Family Theories.

Outside of the office Jose loves reading books. If he is not reading Russian literature or Agatha Christie novels, he will delve into history and sociology books. His other hobbies include traveling and binge-watching British tv-shows.

His office is located in the ACBS Building Room 220C. Contact him at jmrodas@email.arizona.edu or (520)-621-2658.

SaferFoodCats

Arizona high school students learn about food safety and gain valuable laboratory experience.

This past June, 13 high school students participated in the inaugural SaferFoodCats summer program at the University of Arizona to learn all about Food Safety. Participants in the two-week program included students from all around Arizona: six students from the Yuma/El Centro area, five students from the Navajo Nation, one student from Bagdad and one student from Tucson. The SaferFoodCats learned about Food Safety from farm to fork and engaged in laboratory techniques and designed their own collaborative laboratory project. Activities included Food Safety-related field trips and guest speakers who shared their career stories. SaferFoodCats concluded with a poster ceremony where students showcased their collaborative project findings and received a certificate of completion. 4-H Extension team members Jerry Lopez and Daniela Cabrera helped in the planning and realization of SaferFoodCats, as well as simultaneously running two other 4-H programs for youth (see page 6 referencing their 4-H camps).

If you would like to be part of the SaferFoodCats 2020 team, apply to be an intern for spring 2020 by contacting Margarethe Cooper at cooperma@email.arizona.edu. As a SaferFoodCats intern, you will design and implement a food safety lesson and qualify to be a mentor for SaferFoodCats students, while learning about career options and making valuable connections with experts and professionals in Food Safety.

Thank you to our generous sponsors for making the SaferFoodCats program possible!
Recent ACBS Graduates

Summer 2018

**Microbiology**
Kevin Philip Ackman, BS
Rose Marie Cronin, BS
Tristan Paige Eddy, BS
Stephanie Gomez, BS
Brianna Mckenzie Leija, BS
Brandon Michael McDowell, BS
Jaimin Patel, BS
Marisol Valdivia-Mier, BS

**Veterinary Science**
Sean B Anderson, BS
Alexandra Rane Barber-Verdick, BS
Jaclyn Alexandria Cubillas, BS
Courtney Lee Durfee, BS
Ariana Leah Free, BS
Garrett Robert Notte, BS
Franklin James Sharples, BS
Robin Anne Smith, BS
Linhui Ye, BS

Fall 2018

**Animal Sciences**
Montana Lyn Arnold, BS
Delaney Dru Dougherty, BS
Jade Alexandra Eisenzimer, BS
Amy Elizabeth Euler, BS
Karin Victoria Floyd, BS
Fallyn Breann Markosian, BS
Shaye Marie Riera, BS
Aaron Arnoldo Valdez, BS
Stevi Nicole Zozaya, BS

**Microbiology**
Elisa Burdett, BS
Michelle Han Do, BS
Perla Alexis Gonzalez, BS
Adam Jason Karsten, BS
Fallyn Breann Markosian, BS
Alicia Maria Rodriguez, BS
David Joseph Rowlands, BS

**Veterinary Science**
Megan Anna Bowman, BS
Michael Alan Ciminski, BS
Rachel Marie Clark, BS
Janae L Conde, BS
Pablo Cesar Grijalva, BS
Nicholas Vincent Heckman, BS
Hameed Zackaria Mayahi, BS
Halle Janet Murray, BS
Janay Lissette Powell, BS
Kelsey Nicole Purdy, BS
Jasmin Arlene Siordia, BS
Nicole Marie Stenerson, BS
Tressa Lynne Teetsel, BS
Katia Larissa Valenzuela, BS

Spring 2019

**Animal & Biomedical Industries**
Brandon Aki-Jackson, MS
Sawyer Hannah Butterfield, MS
Michelle Marie Felix I, MS
Rochele Nicole Landymore, MS
Riley Sierra Nash, MS
Stephanie Park, MS
Makenzee Maria Perez, MS
Miranda Rose Rivera, MS
Matthew Jonathon Vander Poel, MS

**Animal Sciences**
Jasmine Acosta, BS
Marin Gabrielle Barros, BS
Ashlyn Celeste Charley, BS
Hugh Drexler, BS
Kietzecume Theodore Garcia, BS
Megan Isabelle Hanson, BS
Chandler Harel, BS
Shauni Lynne Jarvis, BS
Breeze Alexsis Kelley, BS
Emma Irene Koprowski, BS
Lindsey Nicole Lang, BS
Danielle Rene Lawrence, BS
Joshua Matthew Lin, BS
Megan Michael McCauley, BS
Kennedi Anese McCormick, BS
Clarissa Ann Pacheco, BS
Casey Arizona Parker, BS
Daniella Peinovich, BS
Leticia Cunha Ottero Ribeiro, BS
Jacqueline Burton Schumacher, BS
Kelsey Taylor Stearns, BS
Jacob Scott Tyler, BS
Nico Marie Van Eerd, BS
Bryanne Elizabeth Waller, BS
Hayley Alexa Waronker, BS
Norielle Elizabeth Ziemann, BS

**Microbiology**
Alessandro Damiano Ali, BS
Lauren Elizabeth Batchelor, BS
Justin Timothy Clark, BS
Gregory Hunter Cole, BS
Emily Meredith Day, BS
Mackenzie Leigh Derrick, BS
Meredythe Dureckel, BS
Jesseca Emery, BS
Molly Jo Fleury, BS
Jayme Corinne Jackson, BS
Shobitha Jillela, BS
Cristina Maria Johnson, BS
Celia Marie LaCross, BS
Jacqueline Alexandra Larremore, BS
Victoria Noelle Latorre, BS
Brycen Matthew Lauer, BS
Celisa Renea Martinez, BS
Dieter Mohammad Mohty, BS
Niels Mohty, BS

Andrew Eric Moore, BS
Marisa Obregon, BS
Neftali Ortega Alarcon Jr, BS
Angelica Nicole Padilla, BS
Jinette Sun Park, BS
Shikha P Patel, BS
Nisha Sharma Puri, BS
Jorge Juan Ramos, BS
Dalaena Emily Rivera, BS
Zoe Gabrielle Rosenthal, BS
Nicole Alexandra Sandoval, BS
Kendra Allyson Thomas, BS
Michael David Trial, BS
Anusha V Vishnubhotla, BS
Brandon Connor White, BS
Evelyn R, Wicklund BS
Ryan Kau, Yamauchi BS
Jaeseok Yoon, BS

**Veterinary Science**
Taylor Kenzi Barnes, BS
Kaitlyn Ashley Benals, BS
Annie Elizabeth Benscoter, BS
Kiana Fawn Carroll, BS
Talaya Del-Rae Chavez, BS
Meredythe Durckel, BS
Samantha Marie Ellsworth, BS
Cassandra Lee Flores, BS
Felicity Victoria Gesina, BS
Amanda Sue Gilliland, BS
Ariella Rachel Gonzales, BS
Gabriella Gonzalez, BS
Luna Flor Gonzalez, BS
Hannah Marie Grumbling, BS
Joshua Adam Petronilo Henkel, BS
Yazmin Anahi Herrera, BS
Myles Manuel W Colon Holloway, BS
Elisha Ashly Hostetler, BS
Jordyn Makaye Johnson, BS
Shelby Klijian, BS
Alexandra Catherine Kochanowsky, BS
Jasmin Marie Kondori, BS
Claudia Dora LaBianca, BS
Klarissa Federico Mercado, BS
Sarah Gabriela Morales, BS
Darian Najafpour, BS
Emily Napoles, BS
Karen Yesenia Nevarrr, BS
Rochelle Elizabeth Olstad, BS
Caroline Lynn Parot, BS
Yash Parvesh Patel, BS
Raven Taryn Rodrick, BS
Matthew Christopher Salerno, BS
Marshall Scoppetone, BS
Jessica Juleen Shinkle, BS
Danielle Dawn Souder, BS
Larissa Yazmin Suarez, BS
Courtney Renee Wahlgren, BS
Sienna Marie Willis, BS
Joanna Wu, BS
Ag Discovery Program

Each year, USDA’s Animal and Plant Health Inspection Service (APHIS) partners with the University of Arizona College of Agricultural and Life Sciences (CALS), to deliver the AgDiscovery program. This year 16 high school students from around the country and Arizona participated in the 2-week program co-sponsored by APHIS’ Plant Protection and Quarantine and Veterinary Services. The first week was held at UA-Yuma and the second week was held at the UA-Main campus. Daniela Cabrera, research specialist/4-H program coordinator, and other lab members in Dr. Jerry Lopez’s environmental microbiology and food safety laboratory, engaged students in Gram staining activities and learning about the network of agencies and careers involved in addressing foodborne outbreak investigations.

BLAISER Program

Olga V. Munoz and Laura Zelis, participated in the University of Arizona Health Sciences (UAHS); Border Latino & American Indian Summer Exposure to Research (BLAISER) program, where Dr. Gerardo (Jerry) Lopez was a faculty research mentor. This program is designed to empower undergraduates majoring in the biomedical fields to participate in cutting-edge research while preparing for a translational career in medicine or biomedical research. Both students worked with Daniela Cabrera, research specialist senior/4-H program coordinator, and Monique Torres, research specialist, on their projects. Munoz’s project was entitled “Occurrence of Cyclospora cayetanensis in Southwestern irrigation waters” and Zelis’, “Occurrence of E. coli 0157:H7, L. monocytogenes and Salmonella in Southern U.S. Surface Waters”. After the completion of their summer long research experience, the students presented their posters at the Undergraduate Research Opportunities Consortium (UROC) Research Conference.

ACBS Hosts Project Puente Student

Dr. Jerry Lopez’s environmental microbiology and food safety laboratory hosted Celestina Marinez, a recent Pueblo High School graduate, who participated in Project Puente a USDA-NIFA grant through the Central Arizona College. Marinez worked for eight weeks this summer with Daniela Cabrera, research specialist/4-H program coordinator, Monique Torres, research specialist, and Shaira Perez, an undergraduate student in molecular and cellular biology on hosting the SBAR 4-H Biofuels summer camp and learning about molecular techniques in detecting the foodborne parasitic pathogen Cyclospora cayetanensis.
The SCRUB (Science Creates Real Understanding of Biosecurity) Kit is a hands-on curriculum in the final stages of development, and designed for use in agriculture classrooms or with youth groups such as 4-H. The laboratory activities are designed to be very adaptable to any environment, whether in a classroom, at a livestock facility, or somewhere in between.

The kits cover important concepts and aspects of biosecurity education that emphasize and reinforce:

- principles of disease transfer and routes of transmission.
- proper methods of cleaning and disinfecting.
- the importance of vaccine handling.
- how to design biosecure farms.

This summer, Agricultural teachers from all over New England got a chance to “play student”, and try out several of the activities at the 2019 New England Agricultural Teachers Conference (NEAT) in Stockbridge, Massachusetts. Additionally, Agriculture Teachers and Future Farmers of America advisors in Oklahoma got 3 days of professional improvement time with the activities while their youth competed in the Big 3 Field Days in Stillwater, Oklahoma. In one activity, the teachers were given small samples of facility surfaces (tile, floor matting, rough wood, and smooth wood) that were “contaminated” with pseudo-manure from a diseased animal. An imaginary truck broke a main waterline for their facility, so they had limited resources with which to work, and had to use them wisely to clean and disinfect each surface. Ultraviolet light exposed any disease on the surfaces that had not been completely removed.

For more information listen to the podcast at: https://youtu.be/oJyWb2Vd8TU

Arizona Equine Extension Featured in Horse Magazine

Results of a study on shade use by horses in a desert environment, presented by Dr. Betsy Greene at the Equine Science Society Symposium in Asheville, North Carolina, June 3-6, were featured in a recent Horse Magazine article. The study found that horses in hot, sunny conditions that had access to a shade structure were not as dependent on the shelter as horse owners would think. For the full article and more information on horses and their use of shade, go to https://thehorse.com/178038/dont-restrict-horses-to-shelters-in-hot-conditions/.

In addition to her shade research, Horse Magazine also interviewed Dr. Greene for their article “The Scary Thing About Rabies” published April 25, 2019. To learn more about rabies in horses go to https://thehorse.com/170420/the-scary-thing-about-rabies/.

Podcasts and Podcast Workshops


Workshops for Native American Horse Owners

Dr. Betsy Greene provided talks for horse owners and enthusiasts on Safety Guidelines, Equine Health Evaluation, and Estimating your Horse’s Weight Using a Measuring Tape in Tuba City, Arizona on June 7-9 at the Song of the Horse Camp. (Above) Youth participate in the Equine Health Evaluation workshop. She also presented talks on Knowing What’s Normal: Hands on lessons for evaluating horse vital signs and Horse/Cattle Body Condition Scoring in San Carlos, Arizona on June 20th. These talks were part of the Indian Outreach Resources Project: Making Resources Available for Livestock/Equine Owners and Community Members which was made possible by an FRTEP grant.
Robert Collier PhD, Professor Emeritus, Receives Distinguished National Awards

ASAS Fellow Award for Research from the American Society of Animal Science

Dr. Robert J. Collier is the recipient of the 2019 ASAS Fellow Award for Research, presented to him during the Opening Ceremony at the 2019 ASAS-CSAS Annual Meeting held in Austin, Texas.

Dr. Robert J. Collier is among the few animal scientists who has impacted development of animal agriculture world-wide. He attended Eastern Illinois University (BS, MS), University Illinois (PhD) and Michigan State University (NIH Post-Doc) and has been employed by US Army (Medical Technician), Monsanto (Director of Research) and Universities of Florida and Arizona (Faculty). Collier’s research addressed two of the pressing problems of human society – the increased demands for food production caused by increases in global population and the problems in meeting that demand caused by global climate change. Collier and coworkers characterized the cellular and molecular changes in the mammary gland and the alterations in metabolic endocrinology caused by heat stress, devised innovative systems to estimate the magnitude of heat stress effect on cattle, and identified management systems and feeding strategies to reduce or mitigate the impact of heat stress.

Western Extension Directors Association (WEDA) Award of Excellence

The U.S. Dairy Education and Training Consortium was awarded the Western Extension Directors Association (WEDA) Award of Excellence for their work in training the next generation of dairy professionals. The U.S. Dairy Education and Training Consortium, created in 2008 in response to declining academic resources in dairy, formed an alliance between New Mexico State University, Texas A&M University, and the University of Arizona, with the objective of training the next generation of dairy professionals. Students and nationally recognized faculty gather for the 6-week capstone program. The class lectures are alternated with experiential learning at a modern dairy operation. Key successes of the program include linking research to application and utilizing area dairy producers and allied industry representatives to train the next generation of dairy production.

Consortium team members include:

- Robert Hagevoort PhD, Associate Professor, Clovis, NMSU Ag Science Center
- Michael Tomaszewski PhD, Visiting Professor and Professor Emeritus Dairy Science, Texas A&M University
- Robert Collier PhD, Professor Emeritus, University of Arizona
- Shelly Spears, Program Coordinator, NMSU Ag Science Center
- Armando Garcia Buitrago, Ag Research Scientist, NMSU Ag Science Center
- Jason White, Southwest Dairy Specialist, Ourina Animal Nutrition

Ravishankar Lab Outreach Activities

Dr. Ravishankar and her team discussed and demonstrated the use of natural antimicrobials as produce washes to around 25 academic and industry professionals as well as investors at the I-squared awards night. This event was sponsored by Tech Launch Arizona and showcased the top 10 promising technologies at the UA. An article titled “6th Annual I-Squared Awards Honor Researchers and Technology Champions” is available on the Tech Launch Arizona website at the following link: https://techlaunch.arizona.edu/news/6th-annual-i-squared-awards-honor-researchers-and-technology-champions

Food safety members from Dr. Ravishankar’s lab exhibited the different antimicrobials and projects in the lab to around 15 food science professionals at the Cactus-IFT Suppliers’ Night Food Safety Booth held in Phoenix on the 9th of April, 2019. This event was organized by the Cactus Institute of Food Technologists section, with a goal to represent all areas of the food industry and to promote all aspects of food technology. Dr. Ravishankar’s team members demonstrated their food safety work to a group of around 15 high school students from local schools and their mentors when they toured Dr. Ravishankar’s lab as a part of the SaferFoodCats High School Students visit on June 12, 2019. This event was focused on helping students understand the importance of food safety.

Members from Dr. Ravishankar’s lab demonstrated the food safety aspects of various projects to a group of 30 high school students and their mentors from various regions throughout the state of Arizona as a part of the USDA-Ag Discovery Camp on June 25, 2019. This event was organized by the USDA-APHIS and UA-Yuma Campus, mainly focused on agriculture related research and helping students understand the importance of agriculture and safe food production in our lives.
The 29th Summer Shrimp Pathology Short Course, June 10-15, 2019 Tucson, Arizona. This annual workshop brought together 24 participants and six guest speakers from eleven countries including the US, Mexico, Ecuador, Chile, Brazil, Egypt, Saudi Arabia, Thailand, Vietnam, India, and Australia attended the course.

The APL hosted guest researchers from Brazil, Vietnam and Saudi Arabia to work on several collaborative projects upon completion of the Shrimp Pathology Short Course in June. Mr. Faris Mohammed S. Alghamdi and Mr. Saif Mayudh Algethami from the Ministry of Environment, Water & Agriculture, Mr. Yousef Amer Alrehaili, and Mr. Anwer Abed Alazwari from Fish Health & Safety Laboratory (FHSL), Jeddah, Kingdom of Saudi Arabia worked on a OIE-funded Collaborative Project between Aquaculture Pathology Laboratory and Jeddah Fisheries Research Institute, Jeddah, Saudi Arabia.

Dr. Arun K. Dhar attended The Society of Invertebrate Pathologists’ Annual Meeting in Valencia, Spain July 29-August 1, 2019 and presented a talk during the Diseases of Beneficial Invertebrates session. In the photograph (Left to right) Dr. Patricia Stock, Dr. Arun Dhar and Dr. Max Bergoin, University of Montpellier, France. Dr. Bergoin was awarded SIP Founder Lecturer for his contribution on invertebrate Virology. Dr. Dhar and Dr. Bergoin were the first to sequence the genome of a shrimp virus that laid the foundation of molecular virology research in shrimp.

Dr. Arun K. Dhar was invited as a resource speaker to give a talk on “Acute hepatopancreatic necrosis disease and Enterocytozoon hepatopenaei - Threats to Sustainable Shrimp Aquaculture” in a Workshop on the Promotion of Sustainable Aquaculture, Aquatic Animal Health and Resource Enhancement in Southeast Asia, June 25-27, 2019 in Iloilo City, Philippines. The workshop was organized by The Southeast Asian Fisheries Development Center (SEAFDEC), Iloilo, Philippines and attended by representatives of eleven southeast Asian countries.

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Dr. Arun K. Dhar attended the Asia Pacific Conference of the World Aquaculture Society to give a keynote address on “Diseases in Shrimp Aquaculture: Possible Remedial Pathways”, in a session organized by the Society of Aquaculture Professionals (SAP) in Chennai, India, June 19-21, 2019. In the conference, he also gave a talk on “Can white spot disease control be achieved using CRISPR-Cas9 driven genome editing in live shrimp?” in the Disease Diagnosis and Management session. Photo: Dr. Arun K. Dhar with Prof. S. Felix, President of Asian Pacific Chapter of World Aquaculture Society.

Dr. Arun K. Dhar was invited to give a talk on “Emerging diseases in shrimp aquaculture” at the School of Aquatic and Fisheries Sciences, University of Washington, Seattle, WA on May 30, 2019. During his visit, he also gave a talk to the graduate students enrolled in the Sustainable Aquaculture class. Dr. Dhar with Prof. Carolyn Freidman (left) and with Prof. Friedman and some of the graduate students in the class (right).

Dr. Luis Fernando Aranguren Caro visited India in connection with a collaborative project with Society of Aquaculture Professionals, Chennai, India, to visit southern and western states in the country to collect shrimp samples affected by an emerging disease called AHPND (Left). He was also able to visit the National Quarantine in Rajiv Gandhi Centre for Aquaculture RGCI which was inaugurated by Dr. Donald Lightner in 2013.

In August, Dr. Luis Fernando Aranguren Caro visited the Central institute of Brackishwater Aquaculture CIBA in Chennai and gave a talk about a shrimp disease called AHPND (Left). He was also able to visit the National Quarantine in Rajiv Gandhi Centre for Aquaculture RGCI which was inaugurated by Dr. Donald Lightner in 2013.

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Members of the Stock lab had a very busy summer conducting research and presenting at national and international meetings. Isabel Forlaastro, senior Vet Sciences and Microbiology majors, and Danny Duong, Junior Physiology and Molecular and Cellular Biology, received the Honors College Spirit of Inquiry Award for their thesis research.

Ayako Kusakabe, PhD student in the Entomology and Insect Science Graduate Interdisciplinary Program (GIDP), received the Nematode Division Travel Award for her work on the “Isolation, characterization and nematicidal activity of Photorhabdus secondary metabolites “. The award was presented at the joint Society of Invertebrate Pathology and International Organization for Biological Control meeting held in Valencia, Spain (July 28-August 1st, 2019). Ayako also presented results of her research at the Annual Meeting of the Society of Nematologists in Raleigh, NC this past July.

“Nema and the Xenos,” is a beautifully illustrated children’s book that provides a scientifically accurate glimpse into the complex structure and living networks of insect pathogenic Steinernema nematodes and their Xenorhabdus bacteria symbionts. This three-year writing project was published by CSIRO Publishing, Australia in August. The book is a collaboration between Gregory Crocetti and Bryoni Barr from Scale Free Network, who had started making a series of picture books about symbiotic partnerships between microbes and larger life forms (Small Friends Books). The book can be order online at: http://www.publish.csiro.au/book/7908/

We also welcome our newest members! Rebecca Howes, who is a MS candidate in the Entomology and Insect Science GIDP. Rebecca comes from Cornell University and will be conducting research on Arizona native entomopathogenic fungi in alfalfa.

Dr. Ratnasri Mallipedi who graduated from University of Tennessee, also joins the lab as a postdoctoral associate, she will be studying type 6 secretion systems in entomopathogenic Xenorhabdus bacteria.

**ACBS Faculty Grants**

**PI: Frank Duca**

“The Role of Short-Chain Fatty Acid Sensing in Regulating Hepatic Glucose Production” (National Institute of Diabetes and Digestive and Kidney Diseases) $1.85M.

Diabetes has reached epidemic levels in the United States, underscoring the critical need for safe, effective treatment options. Prebiotics, non-viable food components that modulate the microbiota, can improve glucose homeostasis, but the mechanism of action is unclear. The current work will unravel the mechanisms upon which prebiotics improve glucose homeostasis via increases in short chain fatty acid production in the distal intestine. The current grant aims to understand how short-chain fatty acids impact hepatic glucose production, directly, via epigenetic regulations, and indirectly, via a neuronal gut-brain-liver axis. A better understanding of how prebiotics and SCFAs improve glucose homeostasis could lead to targeted therapies that reduce chronically elevated blood glucose levels during diabetes.

**PI: VK Viswanathan**

“Host-cell Mitochondrial Alterations Play a Central Role in EPEC Pathogenesis” (National Institute of Allergy and Infectious Disease) $1.83M.

How do microscopic bacteria cause disease and misery in humans, who are well over a million times their size? They do this by ‘understanding’ the detailed workings of human cells and exploiting this ‘knowledge’ to facilitate bacterial survival and spread. Our cellular powerhouse, the mitochondria, are an attractive target for pathogens. Many bacteria produce proteins and toxins that alter our mitochondrial function and thereby facilitate bacterial growth and colonization. Enteropathogenic Escherichia coli (EPEC) cause significant diarrheal disease and death, particularly in children in developing countries. EPEC produces multiple proteins to take control of host cells in the gut. The goal of this project is to uncover how two EPEC proteins take control of mitochondria in human cells, and how this contributes to disease. If we understand this, the hope is that we can devise drugs to block the effect of these bacterial proteins and, in effect, take back control of our mitochondria. This would be a novel strategy to prevent the disease caused by EPEC and related bacteria.

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**Summer Research Opportunity**

Patricia Stock (PI) and Gayatri Vedantam (coPI) received a National Science Foundation Award to host a Research Experience for Undergraduate (REU) Site on Microbial Symbioses and Biodiversity. This REU-site will host a summer program from the first week of June to the end of July and will recruit 12 undergraduates per year. The program will recruit undergraduate students from 2-year colleges from across the nation to participate in active and cutting-edge research in a wide range of disciplines, including microbial biodiversity, plant/animal microbe interactions, environmental microbiology, plant pathology, entomology, microbial bioprospecting, microbial evolution, genetics, genomics and bioinformatics.

Please visit our website for further details and upcoming application deadlines: [https://acbs.cals.arizona.edu/nsf](https://acbs.cals.arizona.edu/nsf)
Presentations and Symposia


Publications


Provisional Patents


Awards

Dr. Arun K. Dhar received an award for his “Outstanding Contribution in Teaching” in the AQUAVET® Program, Cornell University, Ithaca, New York on June 08, 2019. Dr. Dhar has been teaching in this summer program for the past 10 years. He taught classes on infectious diseases of shrimp and the classes were attended by graduate students from Europe, America, Asia and Australia.

Dr. Betsy Greene was awarded the 2019 Western Section of the American Society of Animal Science Extension Award. This award recognizes an individual in the western region institutions for outstanding achievements in animal science extension programs. The award was presented at the Western Section Meeting in Boise, Idaho June 11-13.
Dr. Stock Out and About in Arizona

ACBS Director, Patricia Stock, attended the 2019 Gila County Cattle Growers (GCCGA) Annual Meeting and Steak Fry, that was held at Little Green Valley, in Payson, AZ, on September 14, 2019. The meeting provided members with updates on current issues in the overall cattle industry as well as the Gila County ranching community. Dr. Stock met Vice President, Frank Dal Molin, and other officers and members of the GCCGA, and provided a summary of current ACBS activities including curriculum updates, faculty hires and other ongoing activities.

Upcoming Events

October 17
Food Safety Conference
Presented by the UA Food Safety Consortium
9:30am - 6:00pm
Tucson, Arizona
cals.arizona.edu/fsc

November 1 - 2
Homecoming
The University of Arizona
Tucson, Arizona
arizonaalumni.com/homecoming

December 9 - 11
46th Annual Global Symposium on Racing
The University of Arizona RTIP
Tucson, Arizona
ua-rtip.org/symposium/

December 20 - 21
December Commencement Ceremonies
The University of Arizona
Tucson, Arizona
commencement.arizona.edu/ceremonies/fall

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