A Message from the Interim Director

Dear Students, Faculty and Staff,

Welcome to what is sure to be another exciting year in our School. I hope you have all enjoyed your summer and are excited to start the 2018-2019 academic year. In particular, I would like to welcome our new and returning students. The School of Animal and Comparative Biomedical Sciences is a diverse and outstanding place that offers countless opportunities and experiences that will aid your intellectual and personal growth. I wish you all a very successful fall semester and academic year ahead!

This has been a very busy summer and it has come and gone very fast! It is hard to believe I have been in my role of interim director for three months already. I have enjoyed my interactions with everyone and want to thank all staff members for the support they have provided me to make sure the transition into this position was a smooth one. I also want to thank the faculty members who, in spite of being on ‘vacation mode’, have not hesitated to meet with me during the summer to brief me on valuable information and take action on time-sensitive issues.

Our faculty pool continues to grow. We have completed the hires of three professors of practice (POP) and one tenure-track faculty who are joining us this fall at full speed with their teaching and research programs. Please join me in welcoming our Associate Professor, Ravi Goyal and our three POP, Katherine Broneck, Netzin Steklis and Rebecca McQuade. More hires are underway and competitive searches for these new faculty positions will start soon.

Join me also in extending best wishes to Dan Faulkner who as of July 31 has retired. Dan joined the former Animal Sciences Department in July 2012 and prior to joining the University of Arizona he was a faculty member at the University of Illinois. His research and extension activities emphasized proper nutrition and management of beef cattle. Dr. Faulkner brought a wealth of knowledge and prominence to our School, CALS and our community. On behalf of all ACBS members, I want to express my appreciation for his valuable contributions.

I am pleased to announce that construction on Bldg. 90 is moving along, and that we are on schedule to move into our renovated spaces next December. I am particularly thankful to Dennis Dugan and his family for their generous monetary contribution to help renovate the Student Advising Center and Business Office.

Support ACBS

There are many ways you can support the School of Animal and Comparative Biomedical Sciences. Gifts of any size help to propel ACBS closer to its goals and have an immediate and lasting impact on our programs. Your generosity provides outstanding educational opportunities for our students and helps to attract and retain the brightest faculty. With your support, ACBS research gives back to the state of Arizona community through our extension programs, as well as the nation and the world, through the discoveries we make and the products we develop.

Gifts may be made online at the University of Arizona Foundation website: www.uafoundation.org/give/cals Be sure to designate the funds by selecting other and typing in ACBS.

Or contact our school business office to discuss specific ways your contribution can be made or dispersed. Whether you choose to give to a specific project or program, or simply donate to the school overall, we thank you.
Congratulations ACBS Outstanding Seniors!
Undergraduate students in Animal Science, Microbiology, and Veterinary Science honored for their exceptional work.

The 2018 Spring Semester Outstanding Seniors for ACBS were:
Lance Nez - Animal Science, Equine Science Concentration
Christine Bradshaw - Microbiology
Meghan Marner - Veterinary Science

Meghan Marner was born in Washington State but was raised in the Tanque Verde Valley of Tucson, AZ. Growing up she found every opportunity she could to interact with animals, and began riding and training horses. In high school she worked with the Pima JTED FFA and Veterinary Assistant programs, which ultimately led her to pursue a Veterinary Science degree through the University of Arizona.

During her time at the UA, Meghan most enjoyed the hands-on, active learning she was able to participate in. From drawing blood from horses, to delivering calves, and dissecting a variety of species of animals, she has gained the skills she will need to excel in her DVM program. About receiving this award Meghan says, “I feel incredibly humbled to receive this award. My peers in the veterinary major are some of the most intelligent, impressive people I have met, and being named the Outstanding Senior in Veterinary Science is a true honor.”

Meghan will begin pursuing her Doctorate of Veterinary Medicine this fall at Iowa State University, where she has received a scholarship to continue on the next step of pursuing her dream of becoming a board-certified veterinary surgeon.

As she prepares to depart on her next big adventure, Meghan advises any incoming ACBS students to jump at every learning opportunity that comes their way. “This is a very special program and you will receive so many opportunities to succeed and learn what you want to do for the rest of your life.”

During her time at the University of Arizona Christine Bradshaw was a member of Dr. Patricia Stock’s research team. Christine’s research project focused on the development of mutant Xenorhabdus bovienii strains to investigate the role of one of this bacterium’s secretion systems, Type VI. She has been instrumental in the development of mutant strains as well as in conducting bioassays aimed at assessing what phenotypes correlate with this secretion system. Specifically, she investigated insect virulence and intrabacterial competition. Christine was an extraordinarily hard-working and self-motivated student. She gained confidence and experience in her scientific communication by presenting at various UA meetings as well as national and international venues. In the summer of 2017 she conducted a poster presentation at the Society for Invertebrate Pathology, an international society of approximately 500 members, and was awarded the first prize for the best poster presentation. Christine is continuing her graduate education as a PhD Candidate at the University of Arizona in the Arizona Biological and Biomedical Sciences (ABBs) Program.

Lance Nez grew up around horses on Coal Mine Mesa, outside of Tuba City, AZ, where he used them for ranch work and pleasure riding. He has successfully competed in and won several Endurance Relay Races with teams of either three (36 miles) or six (72 miles) horses in AZ, NM and UT. He chose the University of Arizona to reach his career goals of becoming a tribal police officer, while expanding his experiential learning by focusing on equine science.

Animal Science with a concentration in Equine Science was a natural choice, since Lance was born into a culture which considers the horse as a sacred animal which must be respected and honored. Lance came to the University of Arizona after spending four years serving his country (2010-2014), including two deployments in Japan and Afghanistan. His first deployment to Japan (2010), began as a training mission in Thailand and Indonesia, but turned into a humanitarian effort during the major Tsunami. He finished his tour of duty as a Marine Corporal.

When asked about the important things that he would take away from his education at the UA, Lance spoke of valuable and applicable concepts from the classroom as well as his interactions with his peers. He very much valued seeing perspectives of different students who came from many states and horse disciplines. He combined his new knowledge about the scientific aspects of horse management with the perspectives of “how other people go about their horses”, incorporating positive methods that would benefit his own management and training processes. Lance also shared, “While concepts from class stood out, the university is such a melting pot, people with different ideas and backgrounds. Everyone comes in with ideas, dreams and passion for their future, and it is exciting to work with everybody’s ideas...and we all come out better for it...”

Best regards,
S. Patricia Stock, Ph.D.
Cows in Caves

European cave paintings reveal remarkable observational skills of prehistoric peoples.

An important aspect of the field of animal sciences is an understanding of the long temporal relationship between humans and other animals, both wild and domesticated. Animals used for meat and milk production were domesticated by humans thousands of years ago which changed their anatomy, physiology and behavior from their wild ancestors. But domestication would not have been possible if prehistoric peoples were not already skilled observers of the domesticates’ wild ancestors. These were animals they hunted, with survival requiring intimate familiarity with animal behavior. Fortunately, the earliest evidence of these remarkable observational skills and the profound importance of particular animals to prehistoric hunter-gatherers persists today in the form of European cave paintings and carved figurines. After lecturing about this topic in our ACBS classes for the past few years, we had the opportunity this summer to visit several of these prehistoric caves (dating from 40,000 to 15,000 B.P.) and to experience first hand the full range of this ‘animal art’ and ponder its meaning.

We had seen images and other published materials on some of the best-known prehistoric caves, such as Lascaux in southern France and Altamira in northern Spain, but our visit nevertheless yielded several surprises. Here are five of them:

1 - Of all the animals decorating the cave walls at Lascaux (20,000 BP), only the auroch (the prehistoric ancestor of modern cattle, including our milking cows) was painted life-sized in dramatic shades of red, brown and black. The prehistoric artists used the natural contours of the cave’s interior and sophisticated shading techniques to give the aurochs three-dimensional shape, making their power and massive bulk all the more palpable. This powerful animal ignited our ancestors’ imagination and likely had symbolic significance, much like bulls did for later Mediterranean civilizations. (image 1).

2 - At several of the prehistoric sites the bony archaeological evidence shows that the animals depicted in the art were not those most often hunted. For example, the auroch, horse, and stag were the dominant painted animals, but the bony remains show that reindeer were hunted primarily. Again, this underscores the symbolic significance of the prehistoric animals they encountered.

3 - At Altamira (36,000 BP), bison are the predominant theme, rendered in three dimensional form by using the natural contours of the cave ceiling. Remarkably, too, the artists painted the bison in mixed-sex herds, with a large dominant male at the center—suggested by its massive musculature and elevated tail—all evidence of the artists’ keen observational skills. We can be sure that no bison was led into the dark depths of the cave to then patiently pose for the artist! Rather, the bison, auroch and indeed all of the large, dangerous animals—cave lion, cave bear, mammoth—decorating the caves’ interior had to have been painted from the artists’ superbly detailed visual memory built from years of observation and study. We can be sure, too, that the auroch could not have been domesticated, been transformed into a cow, without this intimate knowledge of its ecology, morphology, temperament and habits. It seems just to consider these prehistoric artists as the early forerunners of Darwin, Lorenz, and Tinbergen—as the first ethologists!

4 - Among the most stunning paintings in the caves are prehistoric horses—the wild stock that gave rise to the modern domesticated horse. They are painted in rich detail (image 2), often running in herds, and depicted with the short stubby manes more typical of zebras, donkeys, and the Przewalski horse (the last remaining truly wild horse), and with different coat colors and stripes, information we could never get from their preserved bones. The oldest artistic rendering of a horse—about 40,000 B.P.—is a finely carved figurine from mammoth tusk (image 3) found in the Vogelherd cave, Germany. Thousands of years before horses were domesticated, they, too, were well-studied by our ice age ancestors.

5 - Surprising also is the absence of paintings or drawings of people—of the hunters/artists themselves. The only unquestionable human image found in several caves consists of multiple hand prints on the walls near the animal art—likely produced by blowing paint through a hollow bone over a hand placed on the wall to make a negative image. Perhaps they represent the artists’ signature. It seems to us that the absence of human figures in the cave art suggests the artists purpose was not to celebrate the prowess of human hunters but rather to symbolize the special significance other animals had in the lives of our ancestors.

There is so much more to show and tell from our summer’s cave expedition, of our 4,000 miles drive though Germany, France and Spain, visiting 9 sites. We are still in awe, pondering the art’s significance, and excited to share our adventure. But it will have to wait until we return to our classes this Fall.

- Dieter Steklis, Ph.D., Professor of Practice, ACBS
- Netzin Steklis, Ph.D., Assistant Professor of Practice, ACBS
On May 13, 2018, 57 students from 14 different states assembled at the Kings Inn in Clovis, New Mexico, and slowly began mingling, introducing themselves to many, and reconnecting with a few. Why? Eleven years ago, as the dairy science programs at several universities began to decline, Dr. Michael Tomaszewski from Texas A&M, Dr. Bob Collier from the University of Arizona, and Dr. Robert Hagevoort from New Mexico State University, had a vision for restoring the ability of students in the southwest to gain an education in dairy science.

Realizing that it was easier to bring the students to the dairies than vice versa, the foundation for the US Dairy Education and Training Consortium (USDETC) was developed. Facing many challenges, these individuals worked with companies, producers, and universities to create a program that allowed for students passionate about the dairy industry to receive access to hands-on experiences on dairies, knowledge from renowned dairy science professors, and professional connections within the industry. Since its founding, the USDETC has graduated 480 students, growing from 18 students in 2008 to this year’s class of 57, and spreading far beyond the reaches of the southwestern states.

In addition to the USDETC providing an incredible educational experience for students, it also allows members of the dairy industry to invest in the future. Students have access to presentations, professional connections, and potential internships and job opportunities as they interact with sponsoring companies. These opportunities allow the companies to share their industry knowledge, forecasts for the future, and connect with students planning on returning to the dairy industry, which is a direct investment into future producers, industry leaders, and educators. Census research from USDETC graduates has revealed that 4 out of 5 students remain in the agriculture industry overall, with 2 out of 3 students working within the dairy and allied industries, and the other 1 out of 3 working directly on a dairy. USDETC also provides the opportunity for students to hear from the Beef Council, receive Beef Quality Assurance certification, attend the Dairy Producers of New Mexico annual meeting and trade show, and additional unique occasions for networking and education.

USDETC has inflicted powerful impacts on students from a wide variety of backgrounds. John Vander Hulst is responsible for the breeding program at his family dairy, West Point Farms, in Wendell, Idaho. While at USDETC, John said, “Through the consortium I am able to develop a stronger knowledge base on how the different breeding protocols work, learning the science behind what I have been doing my whole life.”

Owen Feenstra from Feenstra Dairies in Stanfield, Arizona commented, “The quality of professors and content throughout this whole program is phenomenal. Expanding my knowledge of the industry has helped me gain an outside perspective and I am excited to get back home and put it in to practice.”

Alex Te Velde from Lone Oak Farms in Hanford, California, also has a strong appreciation for USDETC, “I think one of the greatest things we learn is perspective. A lot of us grow up on our families’ farms doing things one certain way, and seeing the variety of dairies and practices here opens our eyes to other methods and ideas.”

USDETC has two sessions, allowing students who have attended before or come from an extensive dairy background to take the advanced session, while students who have less experience are able to start with the basics and build a strong foundation for improved comprehension. In both sessions, there are a variety of students interested in different aspects of the dairy industry including veterinary science, nutrition, reproduction, academia, dairy business, and more. These students benefit from interacting not only with students from dairy backgrounds who can share their experience and knowledge, but also from the unique ability to visit over 30 different dairies in New Mexico and Texas.

Students receive a comprehensive view of the industry and how different operations adjust their practices to match their specific needs, as well as the cycles of the dairy industry. No matter what background a student has, or what their goals for the future are, USDETC provides the opportunity to develop professionally, academically, and personally. It is a life changing opportunity for college students passionate about advancing their knowledge of the dairy industry to connect with other students from across the country and learn from nationally recognized professors. Additionally, interacting with professionals allows for first hand experiences in every aspect of the dairy industry including advancements and career opportunities. Numerous students walk away at the end of the summer with an internship or career in the dairy industry secured.

As a student at the USDETC, it is impossible to imagine a program more life changing and beneficial for preparing for the future.
Speaking for all 57 of us, the number one factor for coming to Clovis, New Mexico, is gaining a clearer focus on the desired path ahead, as well as receiving the experience, connections, and knowledge to make that dream a reality.

There are countless personal testimonies, including how coming to USDETC changed majors to pathways leading into dairy science, opened new possibilities for growth and advancements for students desiring to run their family dairy, and every individual story in between. This experience is one of the most incredible opportunities for any passionate animal science student in the United States, and we are immeasurably grateful to every dairy producer, company, university, organization, and community who has supported USDETC over the past eleven years, and all who will continue to invest in this powerful program, and the future of the dairy industry. From all 480 of us USDETC graduates, “Thank you!”

- Nicole Van Eerd
Undergraduate, ACBS
The University of Arizona

The University of Arizona had two undergraduate students, Nicole Van Eerd and Andrew Miles participate in the 2018 US Dairy Education and Training Consortium in Clovis, New Mexico.
Congratulations Recent ACBS Graduates!

25 Graduate and 119 Undergraduate Degrees awarded across four majors.

Fall 2017

**Animal Sciences**
Autumn Dew Charley, BS  
Keith Warren Doleshel, BS  
Erin Ann Doty-McQuaid, BS  
Kaitlin Emily Faires, BS  
Elizabeth Jane Haluska, BS  
Frances Elise Jackson, BS  
Marisela Moreno Quiroz, BS  
Morghan Elan Sonderer, BS

**Microbiology**
Gustavo Fernando Pinoargote, PhD  
Aishwarya Pradeep Rao, MS  
Alexandra Catherine Roder, MS  
Ana Victoria Campos-Alvarez, BS  
Istrefia Isakiya Ilango, BS  
Samantha Just, BS  
Jazmin Sadako Kuwahara-Eder, BS  
Kevin Ryan Nay, BS  
Shea’la Marie Paul, BS  
Michael Isaac Redwine, BS  
Erika Rose Stark, BS  
Taylor Douglas Stevens, BS

**Veterinary Science**
Alexis Danielle Bagby, BS

**Spring 2018**

**Animal & Biomedical Industries**
Christina Agosto, MS  
Carianne Brei, MS  
Morgan Leigh Butler, MS  
Hannah Elisabeth Carbonneau, MS  
Elisabeth Rene Carranza, MS  
Michael Shawn Dunn, MS  
Samuel Colt Farley, MS  
Bailey A Gibson, MS  
Katie Marie Larson, MS  
Sarah Marie Lindquist, MS  
Shivanna Shireen Moriarty, MS  
Meisha Mychajlonka, MS  
Megan Rochelle Nelson, MS  
Santana Arviso Nez, MS  
Alyssa K Pires, MS  
Caleb Adam Sutton, MS  
Sydney Elizabeth Swinsick, MS  
Alexisandra Travis, MS  
Janelle A Uriba Aguilar, MS  
Joseph Thomas Weaver, MS  
Andrew Thomas Winkler, MS  
Kaitlyn Ann Dirkschneider, BS  
Aimee Renee Hall, BS  
Ashley Nicole Hentges, BS  
Jordan Paige Hudgel, BS  
Nicolle Joann Johnson, BS  
Marlena Madelyn Long, BS  
Evelyn Teresa Martinez, BS  
Kali Miller, BS  
Kendra May Muldbakken, BS  
Lance H Nez, BS  
Nina Hali Nez, BS  
Koral Anne Preiss, BS  
Aileen Bridget Quezada, BS  
Jade Cleason Reimer, BS  
Bethany Nicole Saltz, BS  
Patricia Ai Dui Scholle, BS  
Jessica Dianne Stricker, BS  
Melanie Marie Tesh, BS  
Siena Rochelle Wolverton, BS  
Madalyn Rose Zambrano, BS

**Microbiology**
Ross Calvin Monasky, MS  
Mohammed Jamal Alhaddad, BS  
Exene Erin Anderson, BS  
Marie Tyne Anderson, BS  
Danae Nicole Barker, BS  
Eve Therese Beauchemin, BS  
Melissa Hope Bergeman, BS  
Sharidae Clark Bonnas, BS  
Christine M Bradshaw, BS  
Timothy Faine Chan, BS  
Brinn Leigh Donnelly, BS  
Haley Michael Evans, BS  
Matthew Jose Flores, BS  
Madison Kate Gallagher, BS  
Olivia Nicole Gorushi, BS  
Courtney Joy Leglidon, BS  
Rylee Lauren Lewis, BS  
Samantha Jean McMasters, BS  
Sammantha Aspen Meyer, BS  
Fatima Faith Molina, BS  
Alexandra L Morano, BS  
Richard Park, BS  
Marissa Kathleen Paz, BS  
Wesley Chase Pfeifer, BS  
Elijah Joshua Ramirez, BS  
Carly Rose Roberts, BS  
Madison Elizabeth Schrunk, BS  
Mary Olivia Shannon, BS  
Alexander James Valles, BS  
Miguel Antonio Vazquez, BS  
Megan Nicole Waddell, BS

**Animal Sciences**
Austen Allen Derma, BS  
Autumn Dew Charley, BS  
Keith Warren Doleshel, BS  
Erie Ann Doty-McQuaid, BS  
Kaitlin Emily Faires, BS  
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Frances Elise Jackson, BS  
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Fatima Faith Molina, BS  
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Richard Park, BS  
Marissa Kathleen Paz, BS  
Wesley Chase Pfeifer, BS  
Elijah Joshua Ramirez, BS

**Veterinary Science**
Ciara Spring Aguilar-Beaucage, BS  
Danae Nicole Barker, BS  
Alexandria Lee Brown, BS  
Hannah Jean Cain, BS  
Clay Lofton Cashman, BS  
Cynthia Eleanor Chon, BS  
Michelle Renee Contreras, BS  
Mary Katherine DeGraffenreid, BS  
Madison Sierra Contreras, BS  
Hayley Kathleen Duncan, BS  
Tanner James Feuerstein, BS  
Michelle Lynn Flanagan, BS  
Alexa Michelle Germano, BS  
Cierra J Geyer, BS  
Joseph Alfonso Guerrero III, BS  
Madison Rae Harrison, BS  
Braelyn Dawn Henry, BS  
Kelsea Kathleen Hill, BS  
Margaux Renee Howard, BS  
Kaitlin Kim Huynh, BS  
Devin Anthony James, BS  
Esmeralda Del Carmen Jimenez, BS  
Adam Thomas Kazanecki, BS  
Leigh Farren Kendall-Wallace, BS  
Hayley Rose Kowalski, BS  
Meghan Elaine Marner, BS  
Megan Suzanne Meardi, BS  
Emma Katherine Paunil, BS  
Paulo Gabriel Pena, BS  
Shannon Rachelle Prowett, BS  
Xia Nickole Quamahongnewa, BS  
Ashley Lauren Reuter, BS  
Miranda Rose Rivera, BS  
Destiny Jane Sampley, BS  
Jordan Michele Sanchez, BS  
David Lee Sanders Jr, BS  
Molly Kathleen Satterwhite, BS  
Hannah Jane Schaefer, BS  
Miriam Elizabeth Solinsky, BS  
Giuliana Simeao Spina, BS  
Meaghan Suzanne Stec, BS  
Carmen Rose Thurber, BS  
Demetrios Anthony Vlachos, BS  
Tegan Wambold, BS  
Mollie Elizabeth Wiegand, BS
Dr. Gayatri Vedantam Named 2018 Research Faculty of Year

We are pleased to announce that Dr. Gayatri Vedantam has been honored with the 2018 College of Agriculture and Life Sciences Research Faculty of the Year Award. This annual award recognizes and honors outstanding achievements and contributions in research by a faculty member in CALS. Dr. Vedantam was appointed as an Assistant Professor in the UA’s Department of Veterinary Science and Microbiology in 2009, has joint appointments in the BIO5 Institute and the Department of Immunology and serves as a research scientist with the US Department of Veterans Affairs. During her time as a University of Arizona faculty member, she has developed a nationally recognized research program while serving on multiple University of Arizona committees, NIH grant review panels, editorial boards and professional organizations. She has demonstrated sustained excellence in research, teaching mentoring, and service.

Congratulations, Dr. Vedantam, on this well deserved award!

Equine Extension Horse Health Workshops

Susan Sekaquaptewa, Betsy Greene, and several Hopi ranchers planned a series of 3 Horse Health Workshops for this Summer and Fall. Ranchers will get continuing education credit required for their land permits, while also uniting and exciting potential 4-H horse leaders and members for future 4-H activities. Our first workshop was held July 23, 2018 near Kykotsmovi, AZ on the Hopi Reservation and was a great success. Potential future 4-H youth and Hopi ranchers participated in hands-on-learning about body condition scoring, dentistry, nutrition and more. The next workshop is scheduled for August 10, 2018.

Arizona Agriculture Extension Association (AAEA)
The Arizona Agriculture Extension Association (AAEA) held their Summer Meeting at the Historic Hat Ranch in Williams, AZ on July 25-26, 2018. Educational trainings and presentations included Evaluation and Results Based Accountability (Kara Tanoue and Dee Dee Avery-CALS Evaluation team), Strategic Planning for Cooperative Extension Ag Programs (Paul Brown), SARE: Benefits, Opportunities, and Information (Rick Gibson), Historic Northern Arizona Agriculture (Jeff Schalau), and a President’s Message focusing on agents/specialists supporting, collaborating, and working towards success together to bring positive change forward from our level of the organization (Betsy Greene).

Dr. Betsy Greene discusses body condition scoring with attendees at the Horse Health Workshop.

Horse Health Workshop participants learn about equine dentistry and the importance of routine oral care for horses.

Dr. Betsy Greene Photo

Betsy Greene Photo
New arrivals in the Aquaculture Pathology Laboratory

Drs. Hung N. Mai and Roberto Cruz joined the Aquaculture Pathology Laboratory as Postdoctoral Fellows in Spring-2018. Dr. Mai received his PhD from Tokyo University, Japan where he worked with world renowned fish and shellfish diseases specialist Prof. A. Hirono to complete his doctoral thesis on shrimp immunology.

Dr. Cruz worked on mollusk diseases with Dr. Jorge Caceres Martinez, Principal Researcher, Aquaculture Department, Centro de Investigacion de Educacion Superior de Ensenada, Ensenada, Baja California, Mexico. “Drs. Mai and Cruz’s experience working on invertebrate immunology and infectious diseases will greatly expand our capabilities working on shrimp diseases” said Dr. Dhar, Director, Aquaculture Pathology laboratory.

Undergraduate Interns

The Aquaculture Pathology Laboratory employed five undergraduate student interns during the summer of 2018. The students learned and performed different aspects of infectious disease detection in shrimp.

Shrimp Pathology Short Course- 2018

The 28th session of “Shrimp Pathology Short Course” was conducted on June 18-23, 2018. Altogether 15 participants from eight countries including Norway, Brazil, Mexico, Peru, Honduras, Saudi Arabia, Indonesia, and the US attended the course. Participants included researchers and professionals from universities, government institutions and industries worldwide. Dr. Shane Burgess, Dean, College of Agriculture & Life Sciences, gave the opening remarks and Dr. Patricia Stock, Interim Director, ACBS, introduced the Aquaculture Pathology Laboratory and its role in shrimp aquaculture worldwide to the participants. Dr. Loc Tran, Assistant Professor, Department of Aquaculture Pathology, College of Fisheries, Nong Lam University at Ho Chi Minh City and Founder- Director, ShrimpVet Laboratory in Vietnam, Dr. Thales Passos de Andrade, International Relations, Head, Founder and Coordinator of the Brazilian Diagnostic Laboratory for Crustacean Diseases, State University of Maranhão – UEMA, São Luís, Maranhão, Brazil, and Dr. Jeffrey Hoffman, Emergency Coordinator, District 6 SPRS, AZ/NM, USDA- APHIS, Veterinary Services, Phoenix, AZ were the invited speakers. Current staff, as well as a former staff member, Dr. Carlos Pantoja of the Aquaculture Pathology Laboratory (APL), conducted the workshop. The training course fosters collaborations of APL with researchers working on shrimp diseases from around the world.

Aquaculture Conference in Guatemala - 2018.

Dr. Arun K. Dhar was invited to give a talk at the Aquaculture Conference - Guatemala, held in the City of Antigua, Guatemala on June 6-7, 2018. During the opening session,
Dr. Dhar spoke about recent developments related to diagnostics and management of two major diseases in shrimp aquaculture, Acute Hepatopancreatic Necrosis Disease (AHPND), a bacterial disease of shrimp and *Entercytozoon hepatopenaei* (EHP), a microsporidium that are now threatening shrimp aquaculture worldwide.

**OIE twinning project between the Kingdom of Saudi Arabia and the University of Arizona**

The Aquaculture Pathology Laboratory was awarded funding from the World Organization for Animal Health (OIE, Paris, France), for a twinning project between the Ministry of Environment, Water and Agriculture (MEWA) of the Kingdom of Saudi Arabia (KSA), and The University of Arizona-Aquaculture Pathology Laboratory to enhance capabilities of shrimp disease diagnostics in the KSA. Under the umbrella of this project, four staff members of the MEWA were trained by Dr. Luis Fernando Aranguren, P.I. of the project.

**International Scientists Visiting the UA Aquaculture Pathology Lab**

Mr. Bambong Hanggono, Research Scientist, at the Brackishwater Aquaculture Development Center (BADC), Situbundo, Indonesia, visited the Aquaculture Pathology Laboratory in connection with a training on shrimp disease diagnostics. The training was a part of a collaborative project between the Aquaculture Pathology Laboratory and BADC, Indonesia, a National Reference Diagnostic Laboratories for Aquaculture in Indonesia, and funded by the World Organization for Animal Health (OIE, Paris, France). While in Tucson, Mr. Hanggono also attended the Shrimp Pathology Short Course-2018. Mr. Hanggono’s visit strengthens our relation with BADC, Indonesia and fosters further collaborations.

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**News from the Ravishankar Laboratory**

**Presentations:**

Dr. Ravishankar and Aishwarya Rao gave a presentation entitled “Analyzing Non-traditional Water Sources for Foodborne Pathogenic Bacteria and Indicator Microorganisms & Evaluation of Treatment Technologies” at the CONSERVE Annual Meeting in College Park, MD on July 31, 2018.

Mai Nguyen, a summer intern in the Ravishankar Lab, gave a webinar presentation “CONSERVE Internship Experience in the Ravishankar Lab” for the CONSERVE Summer Internship Program on August 2, 2018.

**Outreach Activities:**

Dr. Ravishankar and her team gave a tour of her labs and demonstrated the food safety projects in her lab to a group of high school students participating in the USDA-Ag Discovery Camp on June 25, 2018. This event was organized by Dustin Sandberg and Tanya Hodges.

**Ravishankar Lab in the News Media:**

The Ravishankar lab’s research on melons and plant-based antimicrobials for food applications were featured in the following public media:


**New additions to the Ravishankar Lab:**

Qi Wei, a food scientist from the Fujian Agricultural and Forestry University in Fuzhou, China, joined the Ravishankar Lab as a Visiting Scholar in August 2018 for a collaborative effort. He will be part of the Ravishankar Lab team for a year and will work on various food safety projects.

Marilyn Mews joined the Ravishankar Lab as an Accelerated Masters Program student.
News from the Stock Laboratory

Congratulations to undergraduate students Christine Bradshaw (Microbiology) and Joshua Allen (Business, Eller College), who graduated this past Spring semester. Christine was recognized with the Outstanding Senior Award in Microbiology for her dedicated work, and excellent research performance, reflected in the many student competitions she won at national and international meetings over the past two years.

Dalaena Rivera and Isabel Forlastro were accepted into the summer UROC (Undergraduate Research Opportunities Consortium) program and will be participating in this graduate college preparation program through their senior year.

We bid farewell to Alexandra Roder, research assistant and former MS student in the Stock lab. Alex has begun a Nursing Program at ASU. Alex was an exceptional student and team member and we are very grateful for her many contributions.

Congratulations are also in order for Dr. Brittany Peterson, PERT postdoctoral associate, who will be joining Southern Illinois University Edwardsville (SIUE), as an Assistant Professor in the Department of Biological Sciences.

Dr. An Duy Duong, PERT postdoctoral associate, joined the Stock lab. She received her doctoral degree from Virginia Polytechnic Institute and State University (Virginia Tech). Her research focused on virulence of the corn pathogen *Pantoea stewartii* subsp. *stewartii* (Pnss), with a focus on transcription regulators controlled by quorum sensing (using RNA-Seq) and identification of new virulence factors (using Tn-Seq). She will be studying secondary metabolites of entomopathogenic *Photorhabdus* bacteria.

We also welcome Carolina Noriega from Douglas High School (KEYs Program), Jacob Bowdon and Khoa Truong from Pima Community College, and Luis Ruiz UA Microbiology Sophomore (WAESO Program), who joined the lab this past summer.

Craig Lab Receives Recognition at the 51st Annual Meeting of The Society for the Study of Reproduction in New Orleans July 10-13, 2018

Franchesca Nunez, first year Physiological Sciences PhD student, received the Lalor Foundation Merit Award and was a SSR Trainee Research Finalist.

Dr. Estela Jauregui, ACBS postdoctoral fellow, received the Burroughs Wellcome Travel Award.

(L-R) Dr. Estela Jauregui, Lindsay Rasmussen, Franchesca Nunez, and Dr. Zelieann Craig at the Society for the Study of Reproduction conference.

Dr. Zelieann Craig received the Janice Bahr Junior Scientist Award.
Grants

Arizona Biomedical Research Commission Investigator Award
Benjamin Renquist, PhD, assistant professor, animal and comparative biomedical sciences, UA College of Agriculture and Life Sciences, $749,933, for “Targeting the Cause of Type 2 Diabetes.”

Arizona Biomedical Research Commission New Investigator Award
Frank Duca, PhD, assistant professor, gastrointestinal microbiology, School of Animal and Comparative Biomedical Sciences, UA College of Agriculture and Life Sciences, and member of the UA BIOS Institute, $223,258, for “Role of the Small Intestine in the Prebiotic Treatment for Obesity.”

Presentations and Symposia


Publications


Dr. Patricia Stock and Dr. Sadhana Ravishankar were interviewed on ACBS’s new Food Safety Major. The interview was featured on Tucson TV channel KGUN9.