

School of Animal & Comparative Biomedical Sciences

Feature

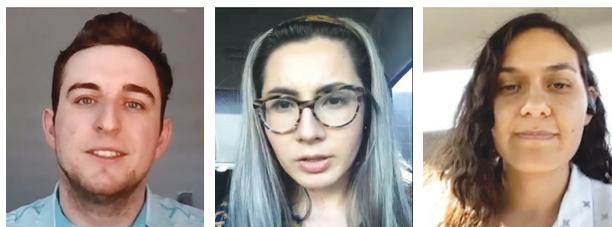
Virtual 2020 Food Safety Conference

Bringing together food safety researchers from around the world.



The annual Food Safety Conference, hosted by the UArizona Food Safety Consortium (FSC), went virtual for 2020. While everyone missed being able to network in-person, the virtual format expanded attendance of the two-day conference to include participants from across the nation and internationally.

Held October 21-22 and organized by FSC Chair, Dr. Sadhana Ravishankar, the conference encompassed a wide array of speakers including Max Teplitski from the Produce Marketing Association, Patricia Millner with the USDA, Norbert Chirase from GTX Technologies, Juanfra DeVillena with Wayne Farms, and Kelli Shallal, food safety influencer.



Student Poster winners (l-r): Jacob Robishaw-Denton, Stephanie Arellano, and Jocelyn Rossete. For the virtual poster presentation format students submitted a video of their poster presentation for judges to view ahead of time and then answered questions individually from the judges live during the event.

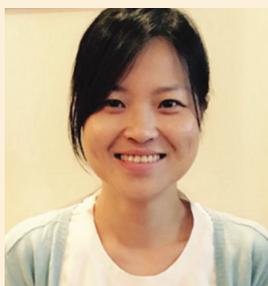
Virtual Poster Sessions for both students and staff were held on day two of the conference. Student award winners included Jacob Robishaw-Denton, 1st Place (\$600) & Dr. Dan Englejohn Crowd Favorite Award (\$150) for his poster on comparative genomics of *Campylobacter jejuni* strains; Stephanie Arellano, 2nd Place (\$450) & YCEDA Award (\$100) for her poster on plant-based microemulsions against *Salmonella* Newport on iceberg lettuce; and Jocelyn Rossete, 3rd Place (\$350) for her poster on microbial quality and foodborne pathogens on melons. The student poster awards were generously provided by the Yuma Center of Excellence for Desert

Agriculture (YCEDA), the School of Animal & Comparative Biomedical Sciences (ACBS), and JV Smith Companies through the Food Safety Endowment. A special thank you to Dr. Margarethe Cooper for organizing

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ISSUE HIGHLIGHTS

Research



Dr. Chi Zhou joins the ACBS faculty. Zhou's research aims to reveal the mechanisms controlling the complicated pregnancy-induced fetal sex-specific endothelial dysfunction in female and male fetal endothelial cells.

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Teaching



Instructors of the Introduction to Animal Sciences Lab employed creative solutions to teaching their "hands-on" lab sections in a "hands-off" remote modality.

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Extension



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From the Director

Dear Faculty, Staff, Students, Alumni and Supporters of ACBS,

Happy 2021! I hope everyone had a good start of this new year and managed to enjoy a healthy and relaxing holiday season. Despite the hardships we faced in 2020, it is important we start this new semester with renewed hope for the future. Our School continues to innovate and respond rapidly to a changing world. It makes me very proud to see how students, faculty and staff continue to excel during these non-normal circumstances. This newsletter reflects the great accomplishments made by the ACBS' team.

We successfully hired four new faculty members and a new Business Manager. Please visit page 4 in this newsletter to view the profiles of some of our recent hires. We are in the process of interviewing candidates for the replacement of the Racetrack industry Chair and Professor of Practice position. We expect to have the new faculty on board before the end of the Spring semester. We will soon have our Livestock Extension Specialist on site. We will reveal the identity and profile of the selected candidate in our next newsletter, stay tuned!

As we navigate this new year, both challenges and opportunities will come our way. Please mask up, social distance, socialize smartly, and learn the symptoms of COVID-19. Living in a pandemic has made us all have a greater awareness that life is precious. We are all in this together and we will get through this by working together and keeping each other safe.

I look forward to a successful completion of another semester which will bring us closer to the goal of being back in person on campus soon.

Be well!

S. Patricia Stock

ACBS Director and Professor
Weiler Endowed Chair for Excellence in
Agriculture and Life Sciences

Support ACBS
Finding Tomorrow's Solutions, Together.

Gifts of any size help to propel ACBS closer to its goals and have an immediate and lasting impact on our programs and students. Gifts may be made online at the University of Arizona Foundation website or contact us to discuss more personalized options.

LEARN MORE AT ACBS.ARIZONA.EDU

Updates from the Stock Lab

Ayako Kusakabe successfully defended her PhD dissertation project which focused on the Identification of secondary metabolites of the entomopathogenic bacterium *Photorhabdus I sonorensis* (Enterobacteriaceae: Gammaproteobacteria) and their nematocidal activity. Dr. Kusakabe will continue work in the lab as a postdoctoral associate to further pursue the activity of the se bacterial metabolites. Congratulations to Dr. Kusakabe!



We also welcome Dr. Satyendra Pothula, who has joined the lab as a postdoctoral associate. His research will center on the study of the diversity of nematode and microbial communities in forest soils exposed to different fire regimes. Dr. Pothula is a graduate from the University of Tennessee. Knoxville where he obtained his doctoral degree in Organismal Ecology.



ACBS Staff Appreciation Awards

On October 26, 2020 ACBS held a virtual award ceremony and presented several ACBS staff members for their above and beyond efforts during the COVID-19 Pandemic.

Shardai Bonnas & Constance (Connie) Carter
Developing educational resources for the ACBS Microbiology Program

Samantha Biffar
Assisting with the management of the Al-Marah Equine Center Program

Jasmine Millabas
Maintaining the safety and quality of the Aquaculture Pathology Laboratory

Richard Park & Libin Zhu
Maintaining the safety and quality of the research in Dr. Ravishankar's Food Safety Laboratory

Rylee Rocca
Assisting the ACBS' Business Office

Deborah Reed
Assisting with the extension activities and ACBS' newsletter during the COVID

Aurora Plascencia
Class scheduling and assistance with various academic program activities

Introduction to Animal Sciences Lab

Making a hands-on course interactive, even when it's virtual.

How can you teach “hands-on” laboratories in a virtual environment? Six ACBS instructors were given that challenge when Covid-19 forced ACBS 102L (Introduction to Animal Sciences Laboratory) to be taught online. Designed to expose students to various production practices and procedures in the animal industry, Crista Coppola (course coordinator), and her colleagues, Sam Garcia, Will Milashoski, Amber Hubbell, Netzin Steklis, and H. Dieter Steklis, employed creative solutions for teaching their “hands-on” lab sections in a “hands-off” remote modality. Netzin and Dieter Steklis provided some insight into how they overcame the challenges they faced with converting their lab sections to virtual.

Equine Lab

For Netzin Steklis, who teaches the Equine Lab #1 and #2 of this course, adapting her lab to the “remote” teaching modality was a challenge. While part 1 lent itself quite well to the transition, part 2 was previously held at Al-Marah Equine Center where students could observe the horses and interact

with the facility manager.

Working with her creative and dedicated university colleagues, Netzin was able to develop a ‘remote lab’ by using videos of the Al-Marah Equine Center horses and interviews with the manager.

Through peer-to-peer collaboration via Zoom, students learned about horse domestication, gained an understanding of the importance of the Al-Marah Arabian horse and how it compares to other equine athletes such as the Thoroughbred horse, and were able to evaluate the Equine Center’s animal welfare practices.

Vet Science Lab

The focus of the Veterinary Science Lab, taught by Dieter Steklis, was for students to learn about the evolution and development of the mammalian circulatory system and to understand differences in mammalian heart function. Normally, this lab would give students the opportunity to examine and dissect cardiovascular tissue as a vital hands-on experience. For the virtual format, students instead watched several recorded lecture segments on the evolution, development, and adaptive function of the cardiovascular system, followed by a video demonstration of the instructor dissecting a sheep heart. The dissection video tied together the details presented in the previous lectures, to help students connect the anatomical concepts and terminology. The heart dissection video also showed a demonstration of basic suture technique. As homework, students were asked to gather the necessary materials for suturing and to practice this basic suture technique, either on chicken skin, or banana skin which is similar to animal skin in texture. Based on student feedback, the majority of students particularly enjoyed the suturing practice.



Part 3. Comparison of the Arabian & Thoroughbred Horse



Video lectures created at the Al-Marah Equine Center helped students gain a better understanding of the differences between horse breeds.

(Continued from 1)

Food Safety Conference

the poster sessions and to the judging team, Vicki Scott of the Yuma Fresh Produce Council, Jeremy Vanderzyl of Duncan Family Farms, Dr. Dan Engeljohn, Tedley Pihl, and Dr. Duane Wulf.

The goal of the Food Safety Consortium (FSC) is to address food safety issues in Arizona using a multidisciplinary collaborative approach. The FSC consists of members from across the University of Arizona, as well as, the Arizona Department of Agriculture, State Health Agencies, and the food safety industry. Areas of research range from fundamental aspects of microbiology, to field-based applications that directly affect the safety of the food supply. The group also connects extension agents out in the counties to the research teams as an integral part of the information pipeline.

For recordings from the 2020 Food Safety Conference and to learn more about the Food Safety Consortium go to <https://safefood.arizona.edu>.

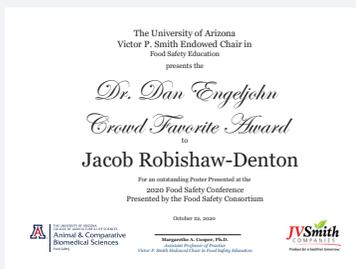
Dr. Dan Engeljohn Honored for His Efforts

Dr. Engeljohn joined the School of Animal & Comparative Biomedical Sciences (ACBS) faculty as a full time Assistant Professor of Practice in 2018 after 40 years at the USDA. In his two years full-time at UArizona, Dr. Engeljohn developed 6 courses in food safety and animal science and 4 Food Safety certificates. Between the coursework and certificates, he set a strong educational and credentialing foundation for students to jump start their careers in Food Safety.



In recognition and gratitude for his extraordinary service and

contribution to UArizona Food Safety Education, Dr. Engeljohn was presented with a plaque on behalf of the Food Safety program during the 2020 UArizona Food Safety Conference. In honor of his enthusiasm and dedication to students, the UArizona Food Safety Conference “Crowd Favorite” award was renamed the “Dr. Dan Engeljohn Crowd Favorite” award and a Food Safety Stipend for students has been dedicated in his honor. ACBS wishes Dr. Engeljohn the very best in his retirement!



Students in the vet Sci Lab practiced a basic suture technique on either chicken or banana skin.

Welcome New ACBS Faculty and Staff Members

Dr. Margie Michelle Sánchez-Vega **Professor of Practice, Animal and Food Sciences**

Dr. Sánchez is teaching several ACBS courses including, ACBS 220: Introduction to Dairy Science, ACBS 405/505: Principles of Livestock Health Management, and ACBS 471/571: Risk Assessment. She began her position in Jan 2021 and is excited to be back in the classroom, though virtual for now, and connecting with students.

Dr. Sánchez was born and raised in Puerto Rico, mostly in Bayamón, near the capital city San Juan. She holds a BS in Animal, Dairy, and Poultry Science with a concentration in Science and Technology from Louisiana State University, a Master's of Public Health from the University of Puerto Rico, Medical Sciences Campus, and a PhD in Food Science, with a concentration in Dairy Foods technology from Louisiana State University.

Prior to her ACBS position, she was the Academic Director of Universidad Ana G. Méndez, Capital Area Campus in Silver Spring, Maryland. She has also served as the food technology and hygiene academic program coordinator, a full time professor and a USDA/NIFA grant primary administrator at Universidad Ana G. Méndez, Gurabo Campus in Puerto Rico. Prior to that, she was the CEO of Viandharina, LLC, a frozen food processing plant with its own farm that provided the main raw materials (plantains and breadfruit) for their main products: frozen tostones. This company was located in Salinas, Puerto Rico.

Dr. Sánchez is enjoying her time in Arizona and says, "Arizona has proven to be a place like nowhere I have ever been. It is beautiful and I am enjoying the views of the desert, the diversity in plants, and enjoying the wildlife. Especially those parading through my backyard!"

Corrina "Corrie" K. Gil **Finance and Operations Manager**

Corrie Gil was Born in Galveston, Texas and spent her youth on farms and ranches in Texas, Montana, and Wyoming. She received both her BA in Political Science and her Master's of Public Administration with a concentration in Public Finance & Economic Development from the University of Texas, Arlington. She has most recently worked in finance and development positions with the Regional Transportation Authority, the Town of Marana, and the City of Tucson.

In her new position, as ACBS Finance and Operations Manager, she is responsible for the financial management and oversight of ACBS human resource activities and facilities, as well as, conducting financial strategic planning, cost-benefit analysis, and feasibility studies. Corrie is excited to be a part of the UArizona and being able to support scientific endeavors that prepare the world for the future challenges ahead.



Dr. Chi Zhou **Assistant Professor**

Dr. Zhou's lab focuses on the molecular mechanisms underlying the fetal sex-specific dysregulation of fetal endothelial function in complicated pregnancies-associated fetal endothelial dysfunction and future health risks of the offspring. Her research utilizes multiple model systems including human tissues, human cell models, and in vivo animal models.

Endothelial cells are a thin single layer of cells that line the interior surface of blood vessels and lymphatic vessels. Dysregulation of endothelial cell function is associated with many cardiovascular and metabolic diseases. Children born to complicated pregnancies (such as preeclampsia and gestational diabetes) have increased risks of adult-onset cardiovascular disorders later in life, suggesting there is programming of fetal vascular/endothelial systems before birth.

Dr. Zhou was born in Jiujiang, China, a city with more than 2,000 years of history, located right next to the Mount Lushan UNESCO Global Geopark. She obtained her PhD degree from the University of Alberta, Edmonton, Canada, where she learned how to ski and regularly visited the Canadian Rocky Mountains. Her PhD research focused on 1) defining the "normal" transcriptomic profile of early porcine embryos, and 2) characterizing the impact of in-vitro manipulations on embryonic quality and the potential pregnancy outcomes.

After completing her PhD, Dr. Zhou, joined the Perinatal Research Lab, Department of Ob/Gyn, at the University of Wisconsin-Madison as a postdoctoral fellow, and later as an Assistant Scientist (Research Assistant Professor). Her research focused on fetoplacental vascular growth and development, particularly those relevant to pregnancy complications.

At UArizona, Dr. Zhou's research aims to reveal the mechanisms controlling the complicated pregnancy-induced fetal sex-specific endothelial dysfunction in female and male fetal endothelial cells. Specifically, she is interested in 1) studying the sexual dimorphisms of complicated pregnancies-associated fetal endothelial dysfunction, 2) exploring the role of microRNAs in complicated pregnancies-induced fetal endothelial dysfunction, and 3) examining the effect of maternal obesity on fetal endothelial function and future cardiovascular risks of the offspring. Results from these studies will contribute to the identification of novel biomarkers or therapeutic targets for adult-onset cardiovascular disease in children born to complicated pregnancies.

About coming to the UArizona she says "I am amazed by the highly collaborative, multidisciplinary, and supportive research environment, as well as the infrastructure and institutional resources available to students, educators, and researchers at the University of Arizona. I am very excited to join this great community. Also, after living in the north for 12 years, I am very much looking forward to the warm winters in Tucson."



RTIP Director, Wendy Davis, Retires After 30 Years of Service

Beloved and respected by faculty, staff, and students alike.

As the workhorse and backbone of the University of Arizona Race Track Industry Program (RTIP) for 30 years, many of Wendy Davis' achievements are best demonstrated through the success of the students who have passed through the program and went on to excel in prominent national and international positions in the racing industry. She was integral in bringing in the cream of the crop professionals from all aspects of the racing industry to guest lecture and interact one-on-one with students right here at the University of Arizona. Her talent at making the right connections between students and industry members to facilitate internships, often led to permanent job offers.

In the early 90's, Wendy brought to fruition a student suggestion to create a lunch event that allowed one-on-one interaction with the top trainers, racetrack CEOs, and award winning announcers at the annual RTIP Symposium. Graduates have often described the Mentor Lunch, as it came to be called, as a defining moment in the beginning of their careers.

Wendy continuously demonstrated a commitment to service on College and University committees, including the CALS Scholarship and the Undergraduate Council. She worked tirelessly to ensure that ACBS curriculum, particularly the Animal Science major, prepared students to enter the industry with the skills needed to succeed, and served as academic advisor for the RTIP students.

She had a long relationship with Mrs. Tankersley, known as Mrs. T, owner of Al-Marah Arabians and Jerry Hamilton, Al-Marah Farm Manager, having shown many of the Al-Marah horses at National and International Arabian championship shows. In fact, several of the World Champion trophies in the new Al-Marah trophy room (which she designed and created), were won by Wendy and Al-Marah horses. Finally, she went above and beyond during the transition of the Al-Marah property and Arabian horses to the University of Arizona animal science/equine program, including authoring the Arabian horse agreement terms with Mrs. T's son, (Mark) to arranging for multiple trailers to move the horse herd from the Campbell Farm to Al-Marah.

Although COVID altered opportunities to celebrate Wendy's retirement as it should have been, several of her colleagues contributed to her retirement gift and shared their thoughts:

"You have been a mentor, ally and example of dedication to the students the entire time I have known you"

"After 3 decades of unwavering and selfless commitment to the UA RTIP, you clearly made your mark and made the program what it is today."

"Your impacts and "can do" attitude and abilities will be missed greatly at the University of Arizona. Many won't know until things "just don't happen", since you saw what was needed and got it done."

We wish Wendy the very best in retirement.



Wendy Davis shows off her retirement gift, oil painting "Mountain Cowboys" by Heather Burton.



Wendy presents Able Zander with the RTIP 2019 Distinguished Student award.



Students presented their work directly to top industry members during the Annual RTIP Symposium.



Wendy made opportunities for students to interact with top trainers, including RTIP alums Todd Pletcher (right) and 2-time Triple Crown winner Bob Baffert, at the Annual RTIP Symposium.



Trophies on display in the Al-Marah trophy room some of which were won by Wendy and Al-Marah horses.

Fall 2020 ACBS Outstanding Seniors

Cole Puetz

Outstanding Senior | Microbiology

As far back as high school, Cole Puetz, has been fascinated with infectious diseases and their effects on populations. As he learned more about the topic, he became determined to pursue a career in health care where he could help control and eradicate disease. To grow his knowledge of microorganisms and get him a step closer to his goal, he decided the UArizona was the perfect choice for obtaining his Bachelor of Science degree in Microbiology.

The UArizona provided Cole with access to an amazing array of opportunities beyond course work including lab work, study abroad, clubs, courses, volunteer events, and more. One of the most beneficial options he took advantage of was working in Dr. Viswanathan's laboratory where he started at the end of his freshman year and worked up until graduation. Working in the lab helped to supplement in-course work with hands-on experience allowing him to become proficient in laboratory procedures. Dr. Vishwanathan has been an inspiration to Cole who says, "I don't think my undergraduate experience at the UArizona would have been as impactful as it was if I hadn't worked for Dr. Vish, and I am truly grateful for all he has done for me."



Cole Puetz, ACBS Microbiology Outstanding Senior - Fall 2020

Cole has been fortunate to receive several scholarships from CALS Donors - the Margaret Bilson Microbiology Scholarship and the E. Ray Cowden Scholarship. In addition to the CALS scholarships, he received the Wildcat Excellence Scholarship and the Mayo Clinic Scholarship. All of these have helped alleviate the financial stress of attending university and allowed him to focus more on continuing his education.

About his time at the UArizona, Cole says, "The UArizona is truly an amazing place to receive an education and I am forever grateful for all of the experiences

and opportunities that the university has provided me. I encourage any students still working on their undergrad to seek out new and enriching opportunities in whatever field they are excited and passionate about".

Cole will begin a Master of Public Health program in the Fall of 2021.

Natasha Marie George Pérez

Outstanding Senior | Veterinary Science

Natasha "Naty" Pérez believes in the value of hard work and getting her hands dirty to make the world a better place. Helping animals has always been a passion and a calling for her. In fact, from the age of 5 she was watching surgery videos on spays/neuters, eye removals, and removal of limbs. She strives to help as many animals as she can and hopes to one day specialize

in different techniques, like thermo x-rays to determine where an animal's pain is located, as well as create new techniques, medicines, and technology to better benefit animals.

About her time at the UArizona, Naty says, "What I enjoyed most about attending the University of Arizona, is the family that I have made within the College of Agriculture and Life Sciences (CALs). They helped me become a mentor, a Dean's Entrepreneurial Leadership Member, a student researcher, and so much more. They have helped me become who I am today, and helped me stay on the path of becoming a veterinarian. Though life can sometimes be rough, CALs was always the light at the end of the tunnel."

Following completion of her BS in Veterinary Science, Naty will continue to work as a veterinary technician at a spay and neuter clinic and a general practice while she applies to DVM programs. Naty would like to thank her friends and family for their support and the invaluable mentorship provided by ACBS and the College of Veterinary Science faculty throughout her time at the UArizona. She goes on to thank Dean Burgess, "As a previous veterinarian, he has provided insight into the field. He has made me more assured that this is my calling. He provided his assistance in helping me write my essays to veterinary school and not once gave up on me. Attending veterinary school would not only be an honor for me, but it would be an honor for Dean Burgess to see that his guidance has gotten me to where I need to be. I appreciate all that he has done for me."



Natasha Marie George Pérez, ACBS Veterinary Science Outstanding Senior - Fall 2020

ACBS Associate Director of Academic Programs

ACBS is pleased to announce the appointment of Dr. Scott Wilbur as the ACBS Associate Director for Academic Programs. Dr. Wilbur is an outstanding instructor and awardee of the Bart Cardon Early Career Teaching Award. He is a key instructor in many ACBS courses and is well respected by students and peers. He has also been a strong advocate for the advancement of ACBS' academic programs.



"We are excited about the passion, energy, and vision that Dr. Wilbur will bring to this role and are thrilled that our Academic Programs will be under his skilled leadership moving forward", says ACBS Director, Patricia Stock.

Dr. Wilbur began his duties as Associate Director for Academic Programs in January 2021. In this new role he will work with Director Stock, faculty, staff, students and stakeholders to advance all aspects of ACBS' academic programs with the goal of increasing student credit hours, and numbers of degree-seeking students.

Please join us in congratulating Dr. Wilbur on this new position.

5th Annual Southern Arizona Equine Health Symposium

Attendees adjusted to virtual format and learned valuable information on caring for horses.

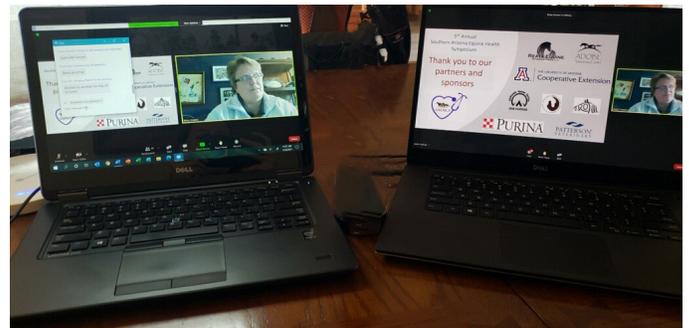
The 5th annual Southern Arizona Equine Health Symposium (1st virtual) was held on January 23-24, 2021. As in the first four years, the topics focused on horse health management and care, and were presented by industry experts, including specialists and veterinarians, with great information for experienced and new horse owners and enthusiasts alike.

The adapted format included a total of 8 webinars over Saturday and Sunday including:

- Does Your Horse Need to Social Distance?
- Those Pesky Flies! Pigeon Fever and Habronema
- Melanoma: Harmless Bump or Ticking Time Bomb
- Eyes Wide Open: Equine Eye Problems
- It's All About Those Bugs!! How the equine biome affects digestion and health
- Horse Health: What's a 5-way Anyway?
- Viewing a Horse Through the Eyes of a Farrier
- Colic: The #1 Killer of Horses

While all of us may have become a little bit “zoomed out” because of the pandemic, based on attendance and the evaluations, attendees enjoyed the topics and found information that they can apply to their equine situation.

We hope to be able to be in-person for next year so be sure to mark your calendars and plan to join us Jan 22, 2022!



Ashley Wright, area extension agent needs multiple screens to “question wrangle” and manage participants during UArizona horse specialist Dr. Betsy Greene’s presentation during the Southern Arizona Equine Health Symposium.

Extension Horses Meeting

The annual gathering of state horse extension specialists was able to go on with some social distancing adaptations in Louisville, KY in early January. This group has been working together to bring new research-based material to their horse audiences at the local, state, and national level.

This year the group held several trainings to build skills including running large webinars and using Doodly. Dr. Greene put that new skill to practice for Arizona horse owners by creating a Doodly to walk SAZEHs participants through registration.



Ravishankar Lab Updates

Awards & Recognition

Dr. Ravishankar was selected for the Indian Association of Applied Microbiologists – 2020 Lifetime Achievement Award.

Outreach Activities

Dr. Ravishankar was interviewed for a 60 min Daily Wildcat Podcast regarding her interest, career and research in food safety. She also provided specific messages for students about selecting a career in food safety and talked about the new UArizona Food Safety Major.

Link to the Daily Wildcat Podcast: https://open.spotify.com/episode/Ob9qXEvGrsJbKcmxbIDUya?si=AwwPTk84TM6RkqLc7E_t3w.

A student majoring in journalism interviewed Dr. Ravishankar regarding food safety practices and precautions to take while handling food during the pandemic including the possibility of contracting SARS-COV-2 through food and food containers/packages. She also discussed her recently funded USDA project to investigate high touch surfaces in farmer’s markets and community food banks for virus transmission, efficacy of interventions in decontamination of high tough surfaces, and how often surfaces need to be sanitized.

Watch your water!

Quick tips to prevent disease transmission through water sources



Check out Dr. Greene’s Doodly product for the Southern Arizona Equine Health Symposium: <https://fb.watch/4oJonnK1Lc/> and her first Doodly on preventing disease transmission through water sources: <https://www.facebook.com/UAEquineExtension/videos/3847070975350287>

Aquaculture Pathology Laboratory Updates

New APL Employees

Dr. Rod Russel Ryes Alenton - Postdoctoral Fellow (below left)

Quinn Powers - Research Technician (below center)

Allyson Redcay - Research Technician (below right)



AZ 4-H Virtual State Horse Show

Every Arizona 4-Her with active horse projects has experienced some level of “lemons” due to the ongoing issue with COVID-19 across the state. Whether it was closed barns, missed lessons, missed shows or fairs, it has not been fun for anyone! While we were not able to hold an “in-person” 4-H State Horse Show this year, we partnered with the American Paint Horse Association to hold a Virtual State 4-H Horse Show. Participants had a few extra hoops to jump through but were able to submit the videos of their best runs for judging by a carded national judge. We had participants from several counties across Arizona who were each awarded a surprise bonus when they received their ribbons for going the extra mile, an insulated cup with the Informed Arizona Equestrian logo. We hope to be in person next year but commend those youth and their helpers for stepping up and participating.



Faith Williamson on TipToe N Zippo in her Arizona 4-H Virtual State Horse Show submission.

AZ Equine Extension Webinars

Virtual Youth Biosecurity Education Series

- 10/1/20 Community Conversation #1
- 10/8/20 Community Conversation #2
- 10/15/20 Community Conversation #3
- 10/22/20 Community Conversation #4
- 11/12/20 Biosecurity and Zoonotic Disease Prevention

Find links to webinar recordings

<https://extension.arizona.edu/events-horse-extension>

Informed Arizona Equestrian Webinar Series

- 2/3/21 Parasites in the Horse

Find link to webinar recording

<https://extension.arizona.edu/horse-publications-videos>



While COVID restrictions have delayed the delivery of first aid kits and hands on horse health workshops to our Tribal Extension Agents and their youth and adult stakeholders with horses, we look forward to the time when we are back to face to face activities.

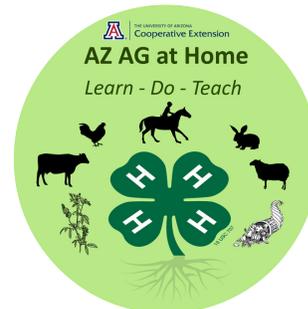
Arizona 4-H Ag at Home: Animal Projects Webinar Series

Beginning in November 2020, AZ 4-H Ag at Home (created by Dr. Betsy Greene and Ashley Wright) added a live webinar series focusing on 4-H animal projects to further engage AZ 4-H youth. They designed each webinar to focus on providing solid, science-based educational information, from experts in the field on a variety of animals. Each webinar ends with an AZ 4-H agent or volunteer describing the 4-H opportunities available for youth in that animal species. Topics include health, nutrition,

well-being, disease prevention and more.

To increase the excitement for participants anyone attending 5 or more webinars in the series is eligible to receive a “webinar warrior” t-shirt. While targeting 4-H participants, these webinars are appropriate for anyone with an interest in animals. Registration for upcoming webinars along with videos of past editions can be found on our website

<https://extension.arizona.edu/az-4-h-ag-home>.



AZ 4-H Ag at Home: Animal Projects

Past Webinars

- Rabbits with Dr. Peter Mundschenk (AZ State Veterinarian)
- Swine Basics with Dr. Colt Knight (State Livestock Specialist and Assistant Extension Professor for the University of Maine)
- Horses with Dr. Betsy Greene (UArizona Horse Extension Specialist)
- EGGcellent Eggs with Ashley Wright (Area Assistant Agent, Livestock)
- Beef in the Desert with Ashley Wright (Area Assistant Agent, Livestock)
- Physical Evaluation of Hay and Reducing with Dr. Krishona Martinson (University of Minnesota)
- From Sheep to Sweater with Dr. Joselyn Beard (University of Nebraska)



Upcoming Webinars

- March 18, 2021 6:00 pm MST
Turkeys with Dr. David Frame (Utah State University)
- March 25, 2021 6:00 pm MST - Goats
- April 8, 2021 6:00 pm MST - Cavies
- April 22, 2021 6:00 pm MST - TBA
- May 6, 2021 6:00 pm MST - TBA

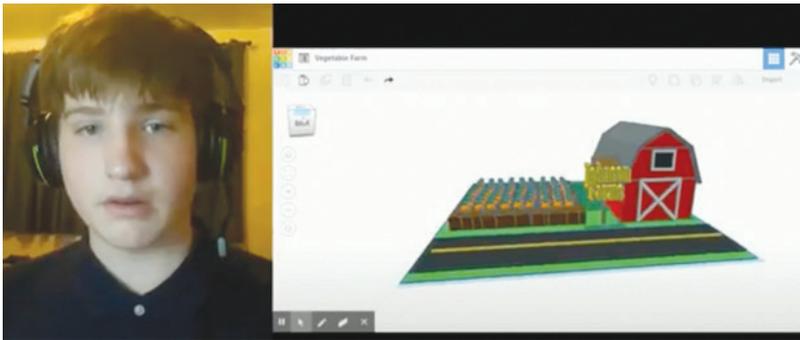
Dr. Betsy Greene Receives National Association of County Ag Agents Awards

- National Finalist: Search for Excellence in Livestock Programming (Southern AZ Equine Health Symposium)
- National Finalist: Publication (Preventing Sand Colic)
- Regional Finalist: Program Promotional Package

4-H STEM YOUiversity: Engaging Future STEM Leaders with Coding

AR Floating Farm Virtual Camp

AZ 4-H STEM YOUiversity rolled up their sleeves and went virtual this summer to deliver the 2nd Annual Augmented Reality (AR) Floating Farm Camp. Youth and Adult 4-H Staff/Volunteers rose to the challenge of learning how to use online software to build their Creative Floating Farms during a two-week train-the-trainer workshop becoming STEM counselors. They then applied their AR knowledge by giving virtual demonstrations and leading zoom breakout rooms for AZ youth participants from several counties on Saturdays for 8 weeks. Participants learned how to use the free software which included Vuforia, TINKERCAD and Unity, to build their virtual 3D farm using their creativity. This experience helps to build confidence, critical thinking, collaboration, and team building skills which are essential for pursuing STEM careers and successfully completing higher education degrees. <https://sites.google.com/email.arizona.edu/4-h-stem-youiversity-ar-float/home>



4-H youth participant, Jonas Johnson of the Mighty Mountain 4-H Team in Greenlee County, displays is floating farm.

Robotics 101 Virtual Camp

The Fall 2020 Robotics 101 Virtual Camp was a great success with 106 youth participating statewide. We had three counties and one Federally Recognized Tribal Extension Program (FRTEP) represented including Santa Cruz with two teams, Yavapai with three teams, Maricopa with one team and the Hopi Tribe with one team. The 5-week robotics camp follows the CoderZ curriculum and teaches students the basics of coding and robotics. Each team is hosted by community youth and adult STEM Counselors who complete a two-week Train-the-Trainer course prior to the first day of camp. The program concluded with a closing ceremony and student recognition on December 18, 2020. This program was made possible by support from the AZ 4-H Youth Foundation, who provided the funding for the purchase of the CoderZ licenses, and the commitment and dedication of the planning team and community volunteers. Way to go Team!



Team Talwiipiki, the Hopi 4H CoderZ Team, was led by 3 Student-Teachers and 1 Adult Project Leader. They had 7 Hopi students from several areas in the state join in and they had so much fun learning from each other. Their team name, Talwiipiki (Dal-wee-pik-y), means 'lightning' in the Hopi language, (it was the only form of electrical current our ancestors encountered a long time ago, so this is what we call electricity!).

Building the next generation of STEM Professionals

Microbiology seniors (graduating May 2021), Cesily Cirerol, Sophia Quick and Rachel Whitman, as well as Biology junior, Amber Notah, conducted *Cyclospora cayetanensis* and Norovirus research in Dr. Gerardo Lopez's Food Safety and Environmental Microbiology Laboratory this past fall. The students collaborated on research projects, prepared reports and research posters for their specific programs and gave presentations to the Lopez Lab. The students were part of several programs that aim in providing research experiences, mentoring, and preparation in applying to graduate school. These programs included the Western Alliance to Expand Student Opportunities (WAESO) program (an Arizona State University grant funded by the Louis Stokes Alliance for Minority Participation (LSAMP) program of the National Science Foundation (Award number:1101728)), the College of Agriculture and Life Sciences (CALs) Arizona Science, Engineering, and Mathematics Scholars (ASEMS) Program, and the Ronald E. McNair Achievement Program (McNair).

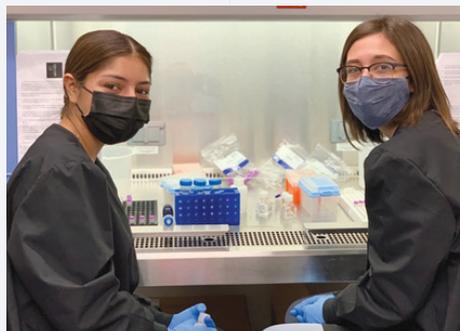


Biology junior, Amber Notah.

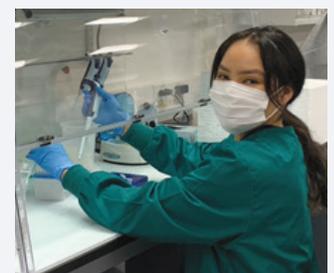
- Steve (right):
 - Adult Volunteer
 - Current Assistant Teacher
- Emilio (left):
 - 4-H Youth STEM Counselor
 - Future Biologist
- Ben:
 - Student
 - Future Computer Scientist
- Neeraj (left):
 - Adult Volunteer
 - Current Software engineer
- Tripti (right):
 - Adult Volunteer
 - Current Researcher
- Caleb:
 - Student
 - Future Businessman

Team Favorites:

Team Discovery Coders, the Maricopa 4H CoderZ Team.



Microbiology seniors, Cecily Cirerol (l) and Sophia Quick.



Microbiology senior, Rachel Whitman processes samples in Dr. Gerardo Lopez's laboratory.

Grants

Sponsor: NIH-NIAID

Title: Optimization of Lead Bumped Kinase Inhibitors for Cryptosporidiosis Therapy

Role: **Riggs MW**, Site PI for the University of Arizona project.

Project period and amount: 01/01/2021 - 12/31/2024. **\$921,000**

total for the University of Arizona project, all years. This is a new multi-institutional R01 consortium grant. W. Van Voorhis is PI for the consortium and the project at the University of Washington (prime). A. Hemphill is Site PI for the Universität Bern, Switzerland project.

Sponsor: Native American Agricultural Fund

Title: Empowering Tribal Ranches by Educating Adults/Youth on Methods to Improve Animal/Human Health and Enhancing Economic Stability by Using Proven Animal Health and Food Safety Programming.

Role: **Greene EA**, PI

Project period and amount: 11/01/2020 - 09/30/2022. **\$199,871**

Sponsor: Arizona Department of Agriculture

Title: Arizona Livestock Incident Response Team (ALIRT)

Role: **Greene EA**, PI

Project period and amount: 07/01/2020 - continuous, renews annually. Up to **\$68,000 annually.**

Sponsor: Camara Nacional de Acuicultura (CAN) Ecuador

Title: Infection with Infectious Hypodermal and Haematopoietic Necrosis Virus (IHHNV) in the Ecuadorian Shrimp Industry

Role: **Aranguren LF**, PI

Presentations and Symposia

Aranguren LF. 2020. "Interaction of Microsporidium, Enterocytozoon hepatopenaei (EHP) and White Feces Syndrome (WFS) in Shrimp (*Penaeus vannamei*)". Webinar WA2020:World Aquaculture 2020. Singapore, December 15, 2020.

Aranguren LF. 2020. "Shrimp pathogen detection, interpretation and implications: Cases studies: AHPND, IHHNV and WSSV". Aqua Expo, Guayaquil, Ecuador 2020. November 24, 2020.

Arellano S. 2020. "Green Sanitizers: Improved Safety and Shelf-life of Iceberg Lettuce Washed with Plant-based Antimicrobial Microemulsions" Applied BioSciences Professional Science Master's Program Defense. UArizona ACBS. Tucson, AZ. October 20, 2020.

Arellano S, Law B, and Ravishankar S. 2020. "Green Sanitizers: Improved Safety and Shelf-life of Iceberg Lettuce Washed with Plant-based Antimicrobial Microemulsions". Virtual Food Safety Conference. Tucson, Arizona. October 21, 2020.

Arellano S, Law B, and Ravishankar S. 2020. "Green Sanitizers: Improved Safety and Shelf-life of Iceberg Lettuce Washed with Plant-based Antimicrobial Microemulsions". Annual Meeting of the International Association for Food Protection. Virtual. October 26-28, 2020.

Cruz Flores R. 2020. "Development of novel methodologies for the study of pathogens of aquatic organisms". 3rd Congress of Nutrigenomics and Aquatic Biotechnology, Nayarit, Mexico 2020. November 6, 2020.

Cruz Flores R. 2020. "Emerging Pathogens of Shrimp: Enterocytozoon hepatopenaei and Decapod iridescent virus 1. Seminar of Aquatic Animal Health". Ensenada, Mexico. December 14, 2020.

Dhar AK. 2020. "Expediting Pathogen Discovery by Combining Histopathology & Genomics". Webinar on Aquatic Animal Health, Indian Council of Agricultural Research & Central Institute of Fisheries Education, Mumbai, India, November 24, 2020.

Dhar AK. 2020. "Diseases & Disease Management in Shrimp Aquaculture". National Fisheries School, Washington DC, Nov 16-20, 2020.

Dhar AK. 2020. "Expediting Pathogen Discovery by Combining Conventional Pathology and Genomics". Virtual Conference on Aquaculture Techniques and Disease Management, Sathyabama Institute of Science & Technology, University, Chennai, India, September 14, 2020.

Funkhouser-Jones LJ, Akey ME, Wilke G, VanDussen KL, **Schaefer DA, Ackman K, Riggs MW**, Stappenbeck TS and Sibley LD. "Gut metabolites influence susceptibility to *Cryptosporidium* infection". Presented virtually at the 31st 2020 Annual Woods Hole Molecular Parasitology Meeting.

Hein W, Gunderson R, Wilkins R, Bailey E, and **Greene EA.** (2020) "Don't Fence Me In: ExtensionHorses.org, Your connection to new resources". Round Table Discussion. National Association of Extension 4-H Youth Development Programs. Boise, ID: October 2020.

Hotopp A, Silverband S, Ishaq S, McRae J, **Stock SP**, and Groden E. 2020. "Can a necromenic nematode serve as a biological Trojan horse for an invasive ant?". Entomological Society of America. Virtual Meeting. November 16-19, 2020.

Kusakabe A, Molnar I, and **Stock SP.** 2020. "Assessment of combined effect of secondary metabolites produced by the entomopathogenic bacterium *Photorhabdus l. sonorensis* (Enterobacteriaceae) on the root knot nematode, *Meloidogyne incognita*". 59th Annual Meeting Society of Nematologists. Virtual. December 15-16, 2020.

Nguyen M. 2020. "Alternative Irrigation Water Sources: A Potential Harbor for Antibiotic-Resistant Bacteria". ACBS Fall 2020 Seminar Series. November 9, 2020.

Oliveras V. 2020. "Washing Away the Contamination: Ozone Against *Salmonella* Newport in Recycled and Non-Recycled Spinach Wash Water". ACBS Fall 2020 Seminar Series. November 9, 2020.

Oliveras V, Park R, and Ravishankar S. 2020. "Efficacy of ozone against *Salmonella* Newport in recycled and non-recycled spinach wash water". Virtual Food Safety Conference. Tucson, Arizona. October 21, 2020.

Oliveras V, Park R, and Ravishankar S. 2020. "Efficacy of ozone against *Salmonella* Newport in recycled and non-recycled spinach wash water". Annual Meeting of the International Association for Food Protection. Virtual. October 26-28, 2020.

Park R. 2020. "Why We Peel Melons: A Peek into the Prevalence of Foodborne Pathogens Among Field-Grown Melons in Arizona and Environmental Risk Factors for Cross-Contamination". ACBS Fall 2020 Seminar Series. October 26, 2020.

Park R, Rowlands D, Porchas M, Brierley P, Patil B, and Ravishankar S. 2020. "Understanding the Cross-contamination of Melons Via Environmental Matrices Under Field Conditions and Prevalence of Foodborne Pathogens". Virtual Food Safety Conference. Tucson, Arizona. October 21, 2020.

Park R, Rowlands D, Porchas M, Brierley P, Patil B, and Ravishankar S. 2020. "Understanding the Cross-contamination of Melons Via Environmental Matrices Under Field Conditions and Prevalence of Foodborne Pathogens". Annual Meeting of the International Association for Food Protection. Virtual. October 26-28, 2020.

Ravishankar S. 2020. "Is UV exposure of irrigation water a trigger for the formation of VBNC *Salmonella*?" Arizona Iceberg Lettuce Research Council. August 11, 2020.

Ravishankar S. 2020. "Natural sanitizers: A quick and effective method to control Fusarium and Downy Mildew in seeds and

crops of iceberg lettuce” Arizona Iceberg Lettuce Research Council. August 11, 2020.

Ravishankar S. 2020. titled “Natural sanitizers: A quick and effective method to control Thrips and Aphids on iceberg lettuce” Arizona Iceberg Lettuce Research Council. August 11, 2020.

Ravishankar S. 2020. Symposium talk “Adoption of Emerging Technologies by the Food Industry Worldwide: Issues and Challenges”. Annual Meeting of the International Association for Food Protection. Symposium Session ‘A Global Perspective on New Generation of Food Processing/Preservation Techniques for Food Safety: Riding the Tides of Clean Labels’. Virtual. October 28, 2020.

Ravishankar S. 2020. International webinar “Current Trends in Food Safety and Food Production”. Webinar series “Novel Strategies in Drug Development”. Hindustan College of Arts & Sciences, Coimbatore, Tamil Nadu, India. December 3, 2020.

Ravishankar S. 2020. “Benefits of Asset Development Funding to Our Research and Beyond”. Tech Launch Arizona Commercialization Conversations: Asset Development. December 9, 2020.

Rossete J, Rao A, Porchas M, Patil B, Brierley P, and Ravishankar S. 2020. “Determination of the Shelf-Life and Keeping Quality of Melons Grown in Different Regions with Respect to Background Microflora, Prevalence of Foodborne Pathogens and Variances in Netting Densities”. Virtual Food Safety Conference. Tucson, Arizona. October 21, 2020.

Stock SP. 2020. “Entomopathogenic nematodes and their symbiotic symbionts: Over 90 years of discoveries and applications”. Invited Speaker. Entomopathogens: roles and opportunities in the integrated management of pests and beneficial insects Workshop. Mar del Plata, Argentina. November 6, 2020.

Zhu L, Wei Q, Brierley P, Porchas M, Patil B, and Ravishankar S. 2020. “Plant-based Antimicrobials Inactivate *Salmonella enterica* and *Listeria monocytogenes* on Melon Rinds”. Virtual Food Safety Conference. Tucson, Arizona. October 21, 2020.

Zhu L, Wei Q, Brierley P, Porchas M, Patil B, and Ravishankar S. 2020. “Plant-based Antimicrobials Inactivate *Salmonella enterica* and *Listeria monocytogenes* on Melon Rinds”. Annual Meeting of the International Association for Food Protection. Virtual. October 26-28, 2020.

Publications

Agnew MV, Friedman CS, Langdon C, Divilov K, Schoolfield B, Morga B, Degremont L, **Dhar AK**, Kirkland P, Dumbauld B, Burge CA. 2020. Differential mortality and high viral load in naive Pacific oyster families exposed to OsHV-1 suggests tolerance rather than resistance to infection. *Pathogens* 2020, 9(12), 1057.

Aranguren Caro LF, Mai HN, Kanrar S, Cruz-Flores R, and Dhar AK. 2020. Isolation of a novel mutant of *Vibrio parahaemolyticus* *pirAB_{vp}* (+) that carries binary toxin genes but does not cause acute hepatopancreatic necrosis disease (AHPND) in Pacific white shrimp (*Penaeus vannamei*). *Microorganisms* 8, 1549.

Aranguren Caro LF, Mai HN, Picardo O, Cruz-Flores R, Hanggono B, and Dhar AK. 2020. Evidences supporting *Enterocytozoon hepatopenaei* association with White Feces Syndrome in farmed *Penaeus vannamei* in Venezuela and Indonesia. *Disease of Aquatic Organisms*, 141: 71-78.

Choi R, Hulverson MA, Wang W, Vidadala RS, Whitman GR, Barrett LK, **Schaefer DA, Betzer DP, Riggs MW, Doggett JS, Hemphill A, Ortega-Mora LM, McCloskey MC, Arnold SL, Hackman RC, Marsh KC, Lynch JJ, Freiberg GM, Leroy BE, Kempff DJ, Choy RK, deHostos EL, Maly DJ, Fan E, Ojo KK and Van Voorhis WC.** 2020.

Bumped Kinase Inhibitors as therapy for apicomplexan parasitic diseases: lessons learned. *International Journal for Parasitology*, 50: 413-422. doi.org/10.1016/j.ijpara.2020.01.006.

Cruz-Flores R, Mai HN, and Dhar AK. 2021. Complete genome reconstruction and genetic analysis of Taura syndrome virus of shrimp from archival Davidson’s-fixed paraffin embedded tissue. *Virology*. 553: 117-121.

Cruz-Flores R, Hung NM, Siddhartha K, Aranguren Caro LF and Dhar AK. 2020. Genome reconstruction of White Spot Syndrome Virus (WSSV) from archival Davidson-fixed paraffin embedded shrimp (*Penaeus vannamei*) tissue. *Scientific Reports*, 10: 13425. Fonseca J, **Ravishankar S**, Sanchez C, Park E, and Nolte KD. (2020). Assessing the Food Safety Risk Posed by Birds Entering Leafy Greens Fields in the US Southwest. *International Journal of Environmental Research and Public Health*. 17, 8711; doi:10.3390/ijerph17238711.

Grifaldo-Alcantara PF, Alatorre-Rosas R, Silva-Rojas HV, **Stock SP**, Hernandez-Rosas F, Vargas-Madriz H, Azuara-Dominguez A, and Durán-Trujillo Y. 2020. Molecular and morphometric characterization of *Heterorhabditis indica* (strain cp13ja) isolated in the cultivation sugarcane. *Tropical and Subtropical Agroecosystems*, 23(2).

Kochanowsky RM, Bradshaw C, Forlastro I, and **Stock SP.** 2020. *Xenorhabdus bovienii* strain jolietti uses a type 6 secretion system to kill closely related *Xenorhabdus* strains. *FEMS microbiology ecology*, 96(8), p.fiaa073.

Ochoa LM, Cruz-Flores R, and Dhar AK. 2020. Detection and phylogenetic analyses of Taura syndrome virus from archived Davidson’s-fixed paraffin embedded shrimp tissue. *Viruses*, 12, 1030.

Ramírez B, Guevara M, Alfaro R, Montoya V, **Mai HN, Serna M, Dhar AK, and Aranguren Caro LF.** 2020. A cross sectional study of shrimp pathogens in wild shrimp, *Penaeus vannamei* and *Penaeus stylirostris* in Tumbes, Peru. *Aquaculture Research*, In Press.

Schofield PJ, Noble B, Aranguren Caro LF, Mai HN, Padilla TJ, Millabas J, and Dhar AK. 2020. Impact of Acute Hepatopancreatic Necrosis Disease (AHPND) on the freshwater prawn (*Macrobrachium rosenbergii*) and Pacific white shrimp (*Penaeus vannamei*) at various salinities. *Aquaculture Research*, 00: 1-10.

Singh J, Metrani R, Jayaprakasha GK, Crosby KM, **Ravishankar S, and Patil BS.** (2020). Multivariate Analysis of Amino Acids and Health Beneficial Properties of Cantaloupe Varieties Grown in Six Locations in the United States. *Plants*. 9, 1058; doi:10.3390/plants9091058.

Thappeta KRV, Ciezki K, Morales-Soto N, Wesener S, Goodrich-Blair H, **Stock SP**, and Forst S. 2020. R-type bacteriocins of *Xenorhabdus bovienii* determine the outcome of interspecies competition in a natural host environment. *Microbiology*, 166, 1074-1087.

VanDussen KL, Funkhouser-Jones LJ, Akey ME, **Schaefer DA, Ackman K, Riggs MW, Stappenbeck TS and Sibley LD.** 2020. Gut metabolites influence susceptibility of neonatal mice to cryptosporidiosis. *mBio*, 11:1-16. doi.org/10.1128/mBio.02582-20.

Van Voorhis WC, Hulverson MA, Choi R, Wang W, Arnold SL, **Schaefer DA, Betzer DP, Vidadala RS, Lee S, Whitman GR, Barrett LK, Maly DJ, Riggs MW, Fan E, Kennedy TJ, Tzipori S, Doggett JS, Winzer P, Anghel N, Imhoff D, Muller J, Hemphill A, Ferre I, Sanchez R, Ortega-Mora LM and Ojo KK.** 2020. One Health Therapeutics: Target-Based Drug Development for Cryptosporidiosis and Other Apicomplexa Diseases. *Veterinary Parasitology*. Available online 15 December 2020. doi.org/10.1016/j.vetpar.2020.109336.

In Memoriam

It is with terrible grief that we share the news that we've lost one of our own. Betty Prewitt, longtime administrative assistant for the Race Track Industry Program, passed away on Saturday, January 9, 2021. Betty served the UArizona for over 45 years, and very much enjoyed her day-to-day interaction with the RTIP students. She was beloved by many and will be missed.



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Page 3 - Netzin Steklis, ACBS 102L course photos
Page 4 - Student headshots provided by individuals
Page 5 - Betsy Greene, top right photo
All others UArizona RTIP
Page 6 - Headshots provided by individuals
Page 7 - Betsy Greene, extension photos
Aquaculture Path Lab, APL photos
Page 8 - Betsy Greene, all photos
Page 9 - Jerry Lopez, all photos
Page 12 - UArizona RTIP, Betty Prewitt
UArizona College of Public Health, vaccine graphic

University of Arizona COVID-19 Vaccine POD



The University of Arizona is transitioning to a high-capacity state vaccination site that will eventually operate 24/7 and serve up to 6,000 people per day. It is located on the University of Arizona Mall.

Beginning Wednesday, March 24, at 8 a.m., any Arizonan age 16 or older will be able to register for a vaccination appointment at state sites, including the UArizona POD.

New appointments at the state PODs will be released every Friday for the following week. For more information and registration links go to <https://covid19.arizona.edu/vaccine>

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