Director’s Update

It has been 3 years since the inception of the UT One Health Initiative, and through that time, we have experienced much success. Along with our partners NIMBioS, Tennessee RiverLine, Smith International Center, Center for Global Engagement, Humanities Center, and the College of Veterinary Medicine, we have provided $600,000 in seed funding for 12 transdisciplinary research teams, which have thus far generated nearly $4 million in external funding, for a total of well over $10 million in OHI-supported external funding. We instituted a One Health minor, which includes courses representing the colleges across UT, and we partnered with UT Extension, UT Gardens, Tennessee Department of Health, Tennessee Department of Agriculture, Biology in a Box, Nashville Zoo, and Lincoln Memorial University to develop K-12 education materials. We also lead continuing education training workshops and sponsored a student leadership summit. We continue to host monthly lunch-and-learn seminars and expand our One Health podcast series. In addition, we hosted a week-long One Health rally event and organized annual celebrations recognizing One Health Day (November 3rd). To top it all off, we are leading a book on using the One Health approach to tackle the United Nations Sustainable Development Goals.

In these pages, we highlight several OHI supported projects. First, we take a look at the work of Heather Sedges and her efforts with the Southern Ag Exchange Network, which focuses on stress in rural communities, especially stress experienced by farmers and ranchers. Next, we highlight efforts being taken by Michael McKinney’s group to improve the health of and along the Tennessee River by transitioning riprap to a living shoreline. This seems such a simple transition yet will prove so important to reduce erosion and secure this rich environment. We also highlight the work being done by Matt Gray’s group to explore development of a ‘clean trade’ system for wildlife. It is hard to believe that such a system does not currently exist but is very much needed if we are to fight the spread of pathogens that can decimate native species and/or contribute to the spread of zoonotic pathogens. Another study we highlight is Jennifer Retherford’s group focused on training the next global One Health workforce. This group’s efforts in Panama will serve as a model to apply to other regions across the globe. Finally, we will highlight the work being conducted by Nina Fefferman’s group, which tackles the mystery of how infectious disease turns into a pandemic. Is it a result of the quantity of factors, the quality of factors, or a combination?

We continue to join forces to tackle local, national, and global wicked problems, including emerging pathogens, food insecurity, changing climate, biodiversity loss, antimicrobial resistance, and so many others. Despite these daunting challenges, we are empowered through consilience and interdisciplinary collaborations. Indeed, all that we have accomplished these past three years is a testament to our amazing UT faculty, staff, and students. It emphasizes that there is nothing we cannot achieve when we believe in something and work together to make it happen. So, let us continue to inspire one another locally, nationally, and globally as we continue uniting disciplines to protect and promote the health of all life on Earth!

Osha Lee Miller
OHI Team

Deb Miller
Interim Director

Nina Fefferman
Associate Director

Kimberlyn Roosa
Post-Doctoral Researcher

Alyssa Merka
Administrative Specialist

One Health Scholars

Brad Collett
Assistant Professor, Dept. of Plant Sciences
Associate Professor, School of Landscape Architecture
Director, Tennessee RiverLine

Jennifer DeBruyn
Professor, Dept. of Biosystems Engineering and Soil Science

Michelle Dennis
Associate Professor, Dept. of Biomedical and Diagnostic Sciences

Shigetoshi Eda
Professor, School of Natural Resources

Jeanine Fletcher
Professor, Agriculture and Veterinary Medicine Librarian

Matt Gray
Professor, School of Natural Resources

Dan Grove
Extension Assistant Professor, School of Natural Resources

Denita Hadziabdic-Guerry
Associate Professor, Dept. of Entomology and Plant Pathology
### Year Three Accomplishments

#### Research

- **One Health Research Seed Grant Program**
  - Funded six new transdisciplinary research projects across UT in the 2022-23 academic year

- **Extramural Funds Generated**
  - Of the 25 new proposals submitted by the One Health community in the 2022-23 academic year, 11 have been funded, totaling $3.9M

- **Peer-reviewed Publications**
  - The UT One Health community had 70+ health-related publications published in the 2022-23 academic year

#### Outreach

- **One Health Minor**
  - 33 students have declared the minor since it became available in 2021; additional courses are being added each year

- **Leadership Summit**
  - 15 graduate and professional students participated in the first One Health Student Leadership Summit,

- **K-12 Materials**
  - The K-12 working group continues to add new partners and produce valuable resources for educators

- **Monthly Seminar Series**
  - Features local and international speakers discussing their One Health approach to current global challenges

- **One Health Rally**
  - Week-long event featuring research talks, expert panels, and creative presentations, as well as games, door prizes, a free yoga class, and an evening social

- **One Health Day**
  - The 2022 annual celebration took place at locations across campus and included a keynote speaker and community service project

#### Education

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  - The K-12 working group continues to add new partners and produce valuable resources for educators

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### Deliverables by 2024

- **Formation of the Tennessee Center for Global One Health**
  - >1.2M annual operating budget supported by state and federal funds and private industry
  - Expected >8 proposal submissions per year by One Health-associated faculty

- **Peer-reviewed publications**
  - Increased by 10-20 above 2023

- **Train >100 students and post-docs in One Health**

- **Provide diagnostic support for research/surveillance activities**
  - >20 UT faculty per year

- **Organize 12+ public seminars and 4 One Health Day celebrations**

- **Become nationally recognized as one of the premier One Health programs and partners**
SAgE employs the One Health lens to interpret information gleaned from farmers and agricultural stakeholders about their strengths, needs, fears, and barriers to service. Peer-reviewed publications communicating tangible and relevant advice is translated into Spanish and made publicly accessible to enable quick and early adoption of efficacious stress reduction methods across a variety of disciplines and audiences. The One Health perspective is of great value when untangling the complexity of farm stress. This is crucial given the challenges facing farmers across commodities, scale, markets, and regions. Our teams of researchers, Extension agents, and community organizations continue to grow as we provide a warm, well-informed space for every farmer in need.

- The Southern Ag Exchange (SAgE) network was created in 2020 through a three-year, $7.2 million USDA grant to provide reliable tools to alleviate stressors in the agricultural community. The SAgE network, coordinated by a UT team, spans 13 states and two U.S. territories.

- In 2022-23, SAgE directly reached over 258,000 people with farm stress mitigation efforts through various avenues, including: a 24-hour, text-enabled response line for those seeking support; a user-friendly website housing 500+ assets organized by topic; and certification in suicide prevention and stress management tactics of nearly 350 Farm Service Agency loan officers in Tennessee alone, another example of SAgE’s integrated, One Health approach.

- SAgE was awarded an extension and $2.6 million to carry the initiative into August 2024.

Heather Sedges
Principal Investigator
Associate Professor, Human Development Specialist
Dept. of Family and Consumer Sciences
Erosion is a major contributor to sedimentation, a primary pollutant within water bodies. 11,000 miles of Tennessee reservoir shorelines are at risk of an accelerated rate of erosion due to watershed urbanization, increasing rainfall intensity, and increased boat traffic.

The typical bank stabilization solution to prevent erosion is riprap. This project tests the strength and effectiveness of brush mattresses, a bioengineering technique that will be applied as a form of shoreline stabilization.

Bioengineering techniques use native plants and biodegradable materials to assist in engineering designs. They also provide food sources and habitat for wildlife, improve water quality, increase biodiversity, and often have lower carbon footprints compared to hard armoring techniques.

True sustainability requires a holistic approach that addresses all aspects of our environmental and social problems. A great example of this is the increasing use of green infrastructure, which replaces the costly, temporary, and often ugly approaches of traditional engineering solutions with nature-based methods that are less expensive, longer-lasting, and have many more social benefits.

Our goal is to grow this experimental project along the length of the Tennessee River to improve the health of the whole ecosystem, including the people who live along its shores.
The US pet amphibian industry supports the creation of a healthy trade certification program, where traded amphibians are certified as pathogen-free. Annually, US businesses lose around $140 million per year due to amphibian pathogens. Pathogens in captive trade also can spillover to the wild and negatively impact native species. The UT School of Natural Resources with support of the UT One Health Initiative is leading development of a US healthy trade program for amphibians that is scientifically credible and market driven. Ultimately, our efforts will help grow this industry and protect our native biodiversity.

- Decline in wild populations of amphibians worldwide has been linked to the growth in global wildlife trade. The risk of pathogen spillover from domestic to wild amphibians is very high.

- Three federal agencies awarded a $2.75 million grant to a team of UT-led, interdisciplinary researchers to identify disease mitigation strategies that will minimize the risk of amphibian pathogens spreading from captive pet populations to wild populations and negatively impacting biodiversity.

- Through a partnership with national stakeholders in the pet industry, this project utilized cutting-edge pathogen testing technology and social science methods to study pathogen spread in amphibian trade networks, as well as the values, perception, and behavior of stakeholders.

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Matt Gray
Principal Investigator
Professor
School of Natural Resources
The One Health Initiative and related concepts allowed us to apply a multi-disciplinary framework in a ‘clean water’ theme in rural Panama. Our UT students used their diverse specializations in a collaborative effort to understand the needs and opportunities at hand.

When students are asked to address technical questions in a new space, they start to think like problem-solvers. They rely less on finding an example that a class or textbook offered them and move toward their fundamentals. And when they realize those fundamentals are universal, they can solve problems of different complexities when they return and rethink what’s possible in any professional or personal situation they face.

- Rural, indigenous Panama is experiencing emerging community health issues related to water quality and access.
- In January 2023, UT faculty and students from various disciplines traveled to Panama where they worked with local stakeholders to test and improve water quality and sanitation, which required a One Health approach.
- Through concepts related to nursing, agriculture, civil engineering, and policy, they sought to better understand current conditions and articulate technical needs that support viable, clean water solutions, and thereby, improved health outcomes.
- This experience allowed the students to engage with several UN Sustainable Development Goals and explore how multiple disciplines can work together to achieve those goals.
One of the most exciting things in science is when you aren’t just discovering new knowledge, but designing a new way to discover new knowledge.

It’s already difficult to understand single disciplinary questions, but it’s much harder to know how partial answers fit together. For example, how a news story that tells people to wash their hands combines with installing copper doorknobs (a metal known to kill some viruses) to reduce how many people get sick.

In August of 2022, a UT-led team received a $1 million grant to try a new way of forming multidisciplinary teams to ask these complicated, mixed-answer questions relating to understanding what changes a small outbreak into a global pandemic.

Our team is bringing together 21 researchers from 16 different disciplines of study, ranging from sociology to public health to biology to engineering and information science to mathematics. We’re designing a new framework for communicating with each other to ask questions we couldn’t know to ask without each other. Building on our shared One Health perspective, we’re taking on the challenge of trying to anticipate and prevent the next pandemic.
We partnered with the Howard H. Baker Jr. Center for Public Policy, UT Gardens, and Tennessee RiverLine to celebrate the 7th Annual Word One Health Day on November 3, 2022.

The day began with a picnic in the UT Gardens and a presentation on UT’s horticultural therapy program by Dr. Derrick Stowell.

A recording of Dr. Bayham’s address, “Economics and Epidemiology: Beyond Dollars and Cents,” is available at tiny.utk.edu/JudeBayhamEE.

That afternoon, the Tennessee RiverLine team led a group of volunteers on a guided kayak excursion and river cleanup at Third Creek. In less than two hours, we removed 10+ bags of trash from the creek!

Dr. Jude Bayham, Assistant Professor of Agricultural and Resource Economics at Colorado State University, gave the keynote address in the Baker Center as part of their Energy and Environment Forum.

This year, we’re partnering with the UT Humanities Center to produce One Health and Humanities Days on October 25-27, 2023.

One Health and Humanities Days is a three-day series of events, including interdisciplinary lectures, speaker panels, and interactive activities. These free, public events will showcase the critical role that arts and humanities play in understanding and exploring sustainability and global wellbeing, including human, animal, plant, and environment health.

October 25-27, 2023

One Health + Humanities Days

Arts + Humanities Interventions

What do the arts and humanities have to do with health? Join us this fall to find out!
In April of 2023, we celebrated the important One Health work underway at UT with a week-long One Health Rally. The week included research talks, expert panels, and interactive presentations given by faculty and graduate students from across the UT system, as well as an address by UT System President Randy Boyd.

Events were held at a different campus location each day to allow us to connect with new audiences. In addition to the informative sessions, the week was filled with fun activities like a free yoga class in the UT Gardens, as well as a Science on Tap social event at Albright Grove Brewing Company, which included two mini-presentations on One Health issues by UT and Lincoln Memorial University faculty, live music, and trivia.

We also participated in the Earth Day Festival, sponsored by the UT Office of Sustainability, and had the opportunity to interact with hundreds of students who stopped by our booth to play One Health Jenga and get connected to the UT One Health community.

This event was quite the undertaking! We are so thankful to the community of faculty, researchers, and graduate students who shared their time and expertise with us throughout the week!

Special thanks to the presenters and panelists who participated in our One Health Rally!

Maggie Albro, UT Libraries, Agriculture and Natural Resources Librarian
Jamie Armitage, UT Institute of Agriculture, Dept. of Biosystems Engineering and Soil Science
Karen Armsey, UT College of Veterinary Medicine, Dept. of Biomedical and Diagnostic Sciences, Human Animal Bond in Tennessee
Randy Boyd, UT System President
Niki Cobb, UT Libraries, Health Sciences Librarian
Paul Dalhaimer, Tickle College of Engineering, Dept. of Civil and Environmental Engineering
Madhu Dhar, UT College of Veterinary Medicine, Dept. of Biomedical and Diagnostic Sciences
Melanie Dixon, UT Libraries, Health Sciences Librarian
Brianne Dosch, UT Libraries, Psychology Librarian
Nina Fefferman, College of Arts and Sciences, Dept. of Mathematics, Dept. of Ecology and Evolutionary Biology; National Institute for Mathematical and Biological Synthesis
Garrett Ferry, UT Facilities Services
T’ Fisher, College of Social Work, Center for Behavioral Health Research, Program for Pet Health Equity
Jeanine Fletcher, UT Libraries, Veterinary Medicine Librarian
Tom Gill, UT Institute of Agriculture, Smith Center for International Sustainable Agriculture
Louis Gross, College of Arts and Sciences, Dept. of Mathematics, Dept. of Ecology and Evolutionary Biology; National Institute for Mathematical and Biological Synthesis; Institute for Environmental Modeling
Jian Huang, Tickle College of Engineering, Min H. Kao Dept. of Electrical Engineering and Computer Science
Sharon Jean-Philippe, UT Institute of Agriculture, School of Natural Resources
Ozlem Kilic, College of Emerging and Collaborative Studies
Matt Kolp, Lincoln Memorial University, College of Veterinary Medicine
Jun Lin, Herbert College of Agriculture, Dept. of Animal Science
Andrea Ludwig, UT Institute of Agriculture, Dept. of Biosystems Engineering and Soil Science
Michael McKinney, College of Arts and Sciences, Dept. of Planetary Sciences
Kristen Mecke, National Institute for Mathematical and Biological Synthesis
Steven Milewski, UT Libraries, Social Work Librarian
Deb Miller, UT Institute of Agriculture, School of Natural Resources; UT College of Veterinary Medicine
Jay Ramos, UT Institute of Agriculture, School of Natural Resources
Jenny Retherford, Tickle College of Engineering, Dept. of Civil and Environmental Engineering
Jessie Richards, UT College of Veterinary Medicine, Dept. of Biomedical and Diagnostic Sciences
Heather Sedges, UT Extension, Dept. of Family and Consumer Sciences
Jeronimo Silva, UT College of Veterinary Medicine, Dept. of Biomedical and Diagnostic Sciences
Charles Sims, Baker School of Public Policy and Public Affairs; Haslam College of Business, Dept. of Economics
Derrick Stowell, UT Gardens, Education and Horticultural Therapy Program
Chunlei Su, College of Arts and Sciences, Dept. of Microbiology
Amy Webb, UT College of Veterinary Medicine, Dept. of Biomedical and Diagnostic Sciences
Lauren Wisnieski, Lincoln Memorial University, College of Veterinary Medicine
On January 7, 2023, 15 graduate and professional-level students checked into the Howard J. Baker Center to engage in UT’s first-ever One Health Student Leadership Summit. Involved in the event were 6 volunteers, 8 facilitators, and 11 in-person speakers. This marked the beginning of an initiative on the UT campus which will continue to shed more light on One Health issues as well as highlight key competencies for building and sustaining One Health and other cross-disciplinary projects.

Throughout the summit, there were activities like the Root Cause Activity, where participants were challenged to think backwards from a present day One Health issue. Participants chose to dissect out a phenomenon called colony collapse disorder, which is associated with dwindling bee populations.

Participants also engaged in activities that challenged them to work in teams. For example, students were tasked to build a car out of cardboard, wooden wheels, dowels, various papers, and other materials that they thought would make their car great. Each item was given a value, a cost... but instead of having a monetary value attached to these items, they each represented something that might be an important aspect of planning a One Health project (a needs assessment, sustainable materials, etc.).

The summit culminated in a community service project that allowed participants to have an impact in an area that embodied One Health. Here, Alexis Niceley from the Companion Animal Initiative of Tennessee (CAIT) explained the importance of taking care of people experiencing homelessness in Tennessee and the free-roaming cat populations, both of which share a large commonality. Oftentimes, especially during the winter months, conditions can become dangerous and life-threatening.

With that in mind, students were responsible for building ~17 cat shelters as well as 25 warm packs, which included reusable items like warm clothing, water bottles, hygiene products, and snacks. Each warm pack also included a handwritten card written by a participant, facilitator, or volunteer. All supplies were intentionally selected based on consultation from CAIT and the Volunteer Ministry Center, as well as the Sustainability Coordinator of UT.

This portion of the summit really resonated with the audience, according to our initial results from our post-event survey. Students were excited to see a One Health project in action and thus passionately contributed to what were called “I will...” statements, written and shared at the closing ceremony. In this final activity, students were challenged to share what they plan to do differently following their experience at the One Health Student Leadership Summit. Participants proudly announced their renewed interest in advocacy, One Health, and community service—all of which were important goals for this project.
Seed Grant Program

With the support of partnering organizations, OHI has awarded $600,000 in seed funding to 12 teams of UT researchers since its launch in 2020. The goal of the program is to create transdisciplinary synergies among faculty, staff, students, and external collaborators that embrace a One Health approach to investigations. More information about these projects, including abstracts and updates, is available on our website at www.onehealth.tennessee.edu/seed-grant-program/.

This fall, we are offering four, $40,000 awards through partnerships with the UT College of Veterinary Medicine Center of Excellence, UT Humanities Center, National Institute for Mathematical and Biological Synthesis (NIMBioS), and the Tennessee RiverLine. Recipients will be announced in October 2023.

Developing a Model of Chronic Inflammation to Elucidate its Effects on Reproduction
- PI: Dr. Brian Whitlock (College of Veterinary Medicine, Large Animal Clinical Sciences)
- Co-PI: Bhavya Sharma (College of Arts and Sciences, Department of Chemistry)
- Co-PI: Allison Renwick (College of Veterinary Medicine, Comparative and Experimental Medicine Program)

Developing a System for Molecular Detection and Identification of Zoonotic Pathogens of Most Concern in the USA
- PI: Chunlei Su (College of Arts and Sciences, Department of Microbiology)
- Co-PI: Richard Gerhold (College of Veterinary Medicine, Biomedical and Diagnostic Sciences)
- Co-PI: Michelle Dennis (College of Veterinary Medicine, Biomedical and Diagnostic Sciences)
- Co-PI: See Rajeev (College of Veterinary Medicine, Biomedical and Diagnostic Sciences)

Effectiveness of a “Living Shoreline” on Environmental and Human Health on the Tennessee River
- PI: Michael McKinney (College of Arts and Sciences, Department of Earth and Planetary Sciences)
- Co-PI: Andrea Ludwig (Herbert College of Agriculture, Department of Biosystems Engineering and Soil Sciences)
- Co-PI: John Schwartz (Tickle College of Engineering, Department of Civil and Environmental Engineering)
- Co-PI: Michael Ross (Herbert College of Agriculture, Department of Plant Sciences)
- Co-PI: Garrett Ferry (Facilities Services)

Impact Assessment of Climate Change on Cotton Production via Computational Simulation
- PI: Xinhua Yin (Herbert College of Agriculture, Department of Plant Sciences)
- Co-PI: Joshua Fu (Tickle College of Engineering, Department of Civil and Environmental Engineering)
- Co-PI: Sangeeta Bansal (Herbert College of Agriculture, Department of Plant Sciences)

Integration of Molecular Biology, Electrochemistry, and Electrical Engineering for the Development of a Rapid On-site Detection Platform for Zoonotic RNA Viruses
- PI: Shigetoshi Eda (Herbert College of Agriculture, Department of Forestry, Wildlife, and Fisheries)
- Co-PI: Doris D’Souza (Herbert College of Agriculture, Department of Food Science)
- Co-PI: Jayne Wu (Tickle College of Engineering, Department of Electrical Engineering and Computer Science)

Multiscale, Poly-topographic Platforms for Complex, Multifunctional Tissue Regeneration Using Precision Engineering: A Prelude to Organogenesis
- PI: Madhu Dhar (College of Veterinary Medicine, Large Animal Clinical Sciences)
- Co-PI: Dayakar Penumadu (Tickle College of Engineering, Department of Civil and Environmental Engineering)

One Health Approach to Controlling Escherichia albertii, the Emerging Human Pathogen
- PI: Jun Lin (Herbert College of Agriculture, Department of Animal Science)
- Co-PI: Qiang He (Tickle College of Engineering, Department of Civil and Environmental Engineering)

Physics-Based and Machine-Learning Models for Goat Tibia Fracture
- PI: Timothy Truster (Tickle College of Engineering, Department of Civil and Environmental Engineering)
- Co-PI: Pierre-Yves Mulon (College of Veterinary Medicine, Large Animal Clinical Sciences)
- Co-PI: David Anderson (College of Veterinary Medicine, Large Animal Clinical Sciences)

Socio-Economic Epidemiology of Disease Risk in Wildlife Trade Networks
- PI: Matthew Gray (Herbert College of Agriculture, Dept. of Forestry, Wildlife, and Fisheries)
- Co-PI: Neelam Poudyal (Herbert College of Agriculture, Dept. of Forestry, Wildlife, and Fisheries)
- Co-PI: Nina Fefferman (College of Arts and Sciences, Dept. of Ecology and Evolutionary Biology, Dept. of Mathematics)

Towards a Biogeochemical Coupling of Machine Learning and Process-based Modeling for Improved Prediction of Soil's Climate Mitigation Potential
- PI: Debashis Saha (Herbert College of Agriculture, Department of Biosystems Engineering and Soil Sciences)
- Co-PI: Subhadeep Chakraborty (Tickle College of Engineering, Department of Mechanical, Aerospace, and Biomedical Engineering)

Training the Next Global One Health Workforce: An Educational Pilot Program for Cross-Sectoral Engagement in Darien, Panamá
- PI: Jennifer Retherford (Tickle College of Engineering, Department of Civil and Environmental Engineering)
- Co-PI: Nan Gaylord (College of Nursing)
- Co-PI: Sara Mulville (Smith Center for International Sustainable Agriculture)
- Co-PI: David Ader (Smith Center for International Sustainable Agriculture)

Transdisciplinary Diagnostic Investigation of Freshwater Mussel Mortality in the Clinch River
- PI: Michelle Dennis (College of Veterinary Medicine, Biomedical and Diagnostic Sciences)
- Co-PI: Nina Fefferman (College of Arts and Sciences, Department of Ecology and Evolutionary Biology, Department of Mathematics)
- Co-PI: Gerald Dinkins (McClung Museum of Natural History and Culture)
Proposals submitted by UT’s One Health community of One Health Scholars and leadership; alphabetical by funding organization.

FUNDED

Intelligence Advanced Research Projects Activity
Bio-Inspired Robustness and Resilience in Dynamic Supply Chain Distribution Networks
Awarded: $575,332
PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics)

Morris Animal Foundation Wildlife Pilot Study
Initial Assessment of Hemolymph Analytes as Disease Biomarkers in Freshwater Mussels
Awarded: $10,433
PI: Michelle Dennis (College of Veterinary Medicine, Dept. of Biomedical and Diagnostic Sciences)
Co-PI: Rebecca Hardman (Florida Fish and Wildlife Conservation Commission), Gerald Dinkins (McClung Museum of Natural History and Culture), Michael Fry (College of Veterinary Medicine, Dept. of Biomedical and Diagnostic Sciences)

National Science Foundation
Awarded: $1,132,178 (continued from 2020)
PI: Xueping Li (Tickle College of Engineering, Dept. of Industrial and Systems Engineering)
Co-PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics), Qiang He (Tickle College of Engineering, Dept. of Civil and Environmental Engineering), Ming Jin (Tickle College of Engineering, Dept. of Industrial and Systems Engineering), Jindong Tan (Tickle College of Engineering, Dept. of Mechanical, Aerospace and Biomedical Engineering)

National Science Foundation
PIPP Phase I: Predicting Emergence in Multidisciplinary Pandemic Tipping-points (PREEMPT)
Awarded: $997,265
PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics)

National Science Foundation
Predicting the Evolution of Vector-borne Disease Dynamics in a Changing World
Awarded: $2,498,876 (continued from 2017)
Co-PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics)

National Science Foundation
Socioeconomic and Epidemiological Drivers of Pathogen Dynamics in Wildlife Trade Networks
Awarded: $2,999,695 (continued from 2022)
PI: Matt Gray (Herbert College of Agriculture, School of Natural Resources)
Co-PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics), Neelam Poudyal (Herbert College of Agriculture, School of Natural Resources)

USDA Animal and Plant Health Inspection Service
Surveillance of SARS-CoV-2 and Coronaviruses in Free-ranging Wildlife
Awarded: $1,357,281
PI: Chunlei Su (College of Arts and Sciences, Dept. of Microbiology)
Co-PI: Richard Gerhold (College of Veterinary Medicine, Dept. of Biomedical and Diagnostic Sciences), Tim Sparer (College of Arts and Sciences, Dept. of Microbiology), Emma Willcox (Herbert College of Agriculture, School of Natural Resources)

USDA-NIFA Crop Protection and Pest Management Development, Validation, and Evaluation of Computer Imaging for Tick Detection on Cattle
Awarded: $293,834
PI: Becky Trout Fryxell (Herbert College of Agriculture, Dept. of Entomology and Plant Pathology)
Co-PI: Hao Gan (Herbert College of Agriculture, Dept. of Biosystems Engineering and Soil Sciences)

U.S. Army Corps of Engineers
Arthropod Study at Arnold Air Force Base
Awarded: $220,000
PI: Jerome Grant (Herbert College of Agriculture, Dept. of Entomology and Plant Pathology)
Co-PI: Bernardard, Becky Trout Fryxell (Herbert College of Agriculture, Dept. of Entomology and Plant Pathology)

U.S. Department of the Interior
Vertical Environments Shared by Humans and Bats Through Input from Climbers Visiting National Parks
Awarded: $50,350 (continued from 2022)
PI: Adam Willcox (Herbert College of Agriculture, School of Natural Resources)

PENDING

National Science Foundation
Collaborative Research: Advancing Theory for Disease Dynamics in Marine Protected Areas
Requested: $231,234
PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics)

National Science Foundation
Collaborative Research: Applications of Deterministic and Stochastic Impulsive Modeling in Immunology with Implications for Epidemiology
Requested: $70,282
PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics)

National Science Foundation
Collaborative Research: Seasonal and Spatiotemporal Heterogeneity in Deterministic and Stochastic Epidemiological Frameworks
Requested: $61,175
PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics)

National Science Foundation
Developing Healthy Behavioral Choices to Promote Illness Prevention in Preschool Children
Requested: $1,103,927
Co-PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics)

National Science Foundation
IHBEH: Modeling the Coupled Spatial-Temporal Dynamics of Socio-Economics, Health Understanding and Behavior, and Infectious Outbreaks among Neighborhoods in US Cities
Requested: $973,340
PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics)
NOT FUNDED

National Science Foundation
Decomposing the Drivers of Pathogen Persistence Across Ecological Scales
Requested: $608,188
PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics)
Co-PI: Deb Miller (College of Veterinary Medicine, Dept. of Biomedical and Diagnostic Sciences; Herbert College of Agriculture, School of Natural Resources)

National Science Foundation
NSF Convergence Accelerator Track J: Shelf Stable Nutrition-Security for the Most Vulnerable
Requested: $750,000
PI: Deb Miller (College of Veterinary Medicine, Dept. of Biomedical and Diagnostic Sciences; Herbert College of Agriculture, School of Natural Resources)
Co-PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics)

National Science Foundation
RAISE: HBBEM Modeling the Coupled Spatial-Temporal Dynamics of Socio-Economics, Health Understanding and Behavior, and Infectious Outbreaks among Neighborhoods in US Cities
Requested: $993,053
PI: Nina Fefferman (College of Arts and Sciences, Depts. of Ecology and Evolutionary Biology, Mathematics)

South East Climate Adaptation Science Centers
Linking Health with Hydrology to Inform Management of Imperiled Freshwater Mussels Affected by Mass-mortality Events
Requested: $208,130
PI: Gus Engman (Herbert College of Agriculture, School of Natural Resources)
Co-PI: Michelle Dennis (College of Veterinary Medicine, Dept. of Biomedical and Diagnostic Sciences)

USDA Animal and Plant Health Inspection Service
Regional Surveillance and Education for Theileria Orientalis Ikeda Genotype and Haemaphysalis Longicornis in Tennessee
Requested: $649,999
PI: Becky Trout Fryxell (Herbert College of Agriculture, Dept. of Entomology and Plant Pathology)

USDA National Institute of Food and Agriculture
Development of a One Health Entomology Training Program for Current and Aspiring Veterinarians and Associated Health Professionals
Requested: $231,868
PI: Becky Trout Fryxell (Herbert College of Agriculture, Dept. of Entomology and Plant Pathology)
Publications by UT’s One Health community of One Health Scholars and leadership: alphabetical by author.


One Health Minor

Since its launch in 2021, the One Health minor program has continued to attract students from across the UT system. Twenty-three students declared the One Health minor in the 2023-24 academic year from a wide range of disciplines (noted below).

AGNR 101, the Introduction to One Health class taught by One Health Scholar Adam Willcox, has outgrown its classroom each year.

K-12 Working Group

The K-12 Working Group is a robust partnership of OHI, UT Gardens, UT Extension, TN Department of Health, TN Department of Agriculture, Nashville Zoo, Lincoln Memorial University, and CAC AmeriCorps. They have continued to gain momentum each year and produce valuable One Health resources for educators. Their noteworthy achievements include:

- Creating a One Health Jenga game and lesson plan, which they've presented at local schools and outreach events.
- Creating a 2023 edition of the Jr. One Health Scholars Activity Book, with a special focus on "One Health in your backyard"
- Creating a list of children's books related to One Health for bookmarks made freely available to the public
- Creating a repository of One Health-related lesson plans, activities, and resources
- Partnering with the UT Gardens and UT Extension to create backpacks that children and families can check-out while in the gardens; they contain laminated activity books and dry erase markers with the purpose of guiding exploration through the gardens, with a One Health focus
- Continuing partnership with Nashville Zoo, which has resulted in incorporating One Health messaging and graphics throughout the zoo, One Health themes and activities incorporated into summer camp programs, and a One Health Day celebration
Chief among OHI’s outreach efforts is its monthly seminar series. The series has attracted excellent speakers from across UT, the nation, and world to discuss their work, how they tackle current global challenges, and how solutions can be achieved with a One Health approach. Seminars are held on the last Thursday of each month, and all past seminars are available on demand on the OHI website and YouTube channel.

One Health Lunch & Learn Series

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<tr>
<th>Date</th>
<th>Title</th>
<th>Speaker</th>
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<tr>
<td>Thursday, May 26, 2022</td>
<td>Conserving Mountain Gorillas through the One Health Approach</td>
<td>Dr. Gladys Kalema-Zikusoka</td>
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<td>Friday, June 30, 2022</td>
<td>Chronic Wasting Disease in Deer in Tennessee</td>
<td>Dr. Dan Grove</td>
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<td>Thursday, August 25, 2022</td>
<td>Peace, War, and Science: Embracing Forest Pathology as a Global Citizen</td>
<td>Dr. Danita Hadladal Guerry</td>
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<td>Thursday, October 27, 2022</td>
<td>The Chicago Rat Project: A One Health Approach to a Global Urban Pest</td>
<td>Dr. Maureen Murray</td>
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<td>Thursday, January 26, 2023</td>
<td>Exploring the Religious Dimensions of Environmental Challenges</td>
<td>Dr. Joseph Witt</td>
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<td>Thursday, February 23, 2023</td>
<td>One Health Research Prospects in South Africa</td>
<td>Dr. Fortunate Phuka</td>
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<td>Thursday, March 30, 2023</td>
<td>Unhealthy Food: Chocolate Production, Slavery, and Unfree Food Systems</td>
<td>Dr. Chris Magra</td>
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<td>Thursday, April 27, 2023</td>
<td>Green Spaces and Childhood Development</td>
<td>Ashley Kite-Rowland</td>
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<td>Thursday, May 25, 2023</td>
<td>Rabies Research in Ethiopia: A Systematic Review</td>
<td>Dr. Aga Gelig</td>
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Presentations (conferences)

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<td>May 2022</td>
<td>Use of implants for terbinafine administration to prevent chytridiomycosis in greater sirens</td>
<td>Global Amphibian and Reptile Disease Conference</td>
<td>Miller</td>
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<td>June 2022</td>
<td>Enhanced survival in Eastern Newts after a second exposure to Batrachochytrium salamandrivorans</td>
<td>North American Comparative Immunology Workshop</td>
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<td>June 2022</td>
<td>Widespread Hepatozoon sp. infection in southeastern coyotes</td>
<td>70th International Wildlife Disease Association Conference</td>
<td>Miller</td>
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<td>June 2022</td>
<td>Finding normal in a warming world: Baseline PCV and TS data and its relation to incubation temperature in leatherback sea turtle hatchlings and post hatchlings</td>
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<td>Miller</td>
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<td>July 2022</td>
<td>Risk of bacteremia associated with probiotic treatment of Batrachochytrium salamandrivorans</td>
<td>70th International Wildlife Disease Association Conference</td>
<td>Miller</td>
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<td>July 2022</td>
<td>Broad host susceptibility of North American amphibian species to Batrachochytrium salamandrivorans suggests high invasion potential and extinction risk</td>
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<td>ExoticsCon</td>
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<td>August 2022</td>
<td>From the early stages of infection to the grave: how does batrachochytrium salamandrivorans transmission probability shift throughout infection?</td>
<td>Global Amphibian and Reptile Disease Conference</td>
<td>Miller</td>
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<td>August 2022</td>
<td>Parasites in wild-caught Notopthalmus viridescens experimentally infected with batrachochytrium salamandrivorans</td>
<td>Boehringer-Ingelheim Veterinary Scholars Symposium</td>
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<td>August 2022</td>
<td>Electrolyte imbalances and dehydration play a key role in Batrachochytrium salamandrivorans chytridiomycosis</td>
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<td>Are hatchlings emerging dehydrated? Preliminary packed cell volume and total solids data in leatherback (Dermochelys coriacea) sea turtle hatchlings and post hatchlings and their relation to incubation temperature</td>
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<td>August 2022</td>
<td>Serum Protein Electrophoresis in Leatherback Sea Turtle Hatchlings</td>
<td>Florida Keys Annual Sea Turtle Workshop</td>
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Parasites in wild-caught Notophthalmus viridescens experimentally infected with batrachochytrium salamandrivorans
UT College of Veterinary Medicine Research Day
Date: Sept 2022 Staff: Miller

The topology of interdependent multi-domain behavioral systems
Air Force Office of Scientific Research Trust and Influence Program Review
Date: Sept 2022 Staff: Fefferman

Risk of bacteremia associated with probiotic treatment of Batrachochytrium salamandrivorans
American Association of Zoo Veterinarians Conference
Date: Sept 2022 Staff: Miller

Gopher tortoise health assessment
UT College of Veterinary Medicine Research Day
Date: Sept 2022 Staff: Miller

Use of implants for terbinafine administration to prevent chytridiomycosis in greater sirens
American Association of Zoo Veterinarians Conference
Date: Sept 2022 Staff: Miller

Predicting emergence in multidisciplinary pandemic tipping-points
National Science Foundation PIPP Program Kickoff
Date: Nov 2022 Staff: Fefferman

A template for responsive translational pandemic science
PanCommunity Conference
Date: Feb 2023 Staff: Fefferman