

# Mitigating Zoonotic Threats

The Second Annual Scialog Conference  
September 15-18, 2022

**scialog2022**<sup>®</sup>



## Objectives

Engage in dialogue with the goal of accelerating high-risk/high-reward research.

Enhance partnerships between USDA and academic scientists to build deeper ties that will expand the research base, knowledge sharing and expertise required to tackle critical scientific questions relating to zoonotic diseases that impact human and animal health and our society as a whole.

Build a creative, better-networked, collegial community that is more likely to produce breakthroughs.

Form teams to write proposals to seed novel projects based on highly innovative ideas that emerge at the conference.

Most importantly, enjoy the discussions about where this field should go and how we can work together to get there.

## Process

Brainstorming is welcome; don't be afraid to say what comes to mind.

Consider the possibility of unorthodox or unusual ideas without immediately dismissing them.

Discuss, build upon and constructively criticize each other's ideas – in a spirit of cooperative give and take.

Make comments concise to avoid monopolizing the dialogue.

## Diversity, Inclusion and No Harassment

Research Corporation for Science Advancement fosters an environment for listening and considering new ideas from a diverse group, with respect for all participants without regard to gender, race, ethnicity, sexual orientation, age or any other aspect of how we identify ourselves other than as fellow scientists.

RCSA does not tolerate any form of harassment, which could include verbal or physical conduct that has the purpose or effect of substantially interfering with anyone else's participation or performance at this conference, or of creating an intimidating, hostile, or offensive environment; any such harassment may result in dismissal from the conference.

## Read RCSA's Code of Conduct



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# Scialog: Mitigating Zoonotic Threats

## From the President

Welcome to the 2022 *Scialog: Mitigating Zoonotic Threats* meeting, organized by Research Corporation for Science Advancement and supported by funding from the USDA under award #58-3022-0-005 with additional support from the Walder Foundation. This is the second of three Scialog meetings on this theme. It is wonderful to see so many people returning, and we are thrilled that we can meet face-to-face this year after having to meet virtually during the pandemic. Take the opportunity to catch up with colleagues you met last year, and to welcome the new Scialog Fellows who are joining us for the first time this year.



The goal of this Scialog is to think deeply about ways scientists can use their training from across a diverse set of disciplines and methodologies to collaborate on new and innovative projects to accelerate fundamental science addressing zoonotic diseases. We challenge you to think about science that would identify potential zoonotic outbreaks earlier (preferably before spillover occurs) and allow us to respond more quickly and effectively – not if but when the next incident occurs.

Scialog's overarching purpose is to advance cutting-edge science of great significance to humanity by catalyzing innovative, basic research leading to fundamental discoveries. Our focus is on scientists in the early years of their independent careers. Through the unique Scialog process, we seek to lay the foundation for an ongoing, highly creative, cross-disciplinary community of scientists that will prove adept at identifying exciting areas for research advances for decades to come.

To that end, under the guidance of RCSA Program Directors **Andrew Feig**, **Richard Wiener**, and **Silvia Ronco** and USDA administrators **Jeff Silverstein**, **Elizabeth Lautner** and **Roxann Motroni**, we hope you will be engaged in passionate discussions with colleagues, many of whom you will have met for the first time at Scialog. We also welcome a new partnership with the **Walder Foundation** (represented by **Sandra Laney** and **Antonio Abeyta**) which is providing additional support across all of the biologically related Scialog initiatives this year. The Scialog process may push you out of your comfort zone with the goal of stimulating new and better ideas. The result, we expect, will be a meeting unlike others that you attend. We are confident that you will find the next few days to be extremely worthwhile.

This is your opportunity to air that wild idea you have been reluctant to share, or to discuss a nagging hunch that does not yet have sufficient supporting data, or to take a leap on a high-impact/high-risk project instead of concentrating all your effort on somewhat more "incremental" studies. This is the time to come up with, and be open to, completely new ideas that may truly change the world and to find new colleagues and collaborators with whom to pursue them.

We hope this meeting yields a crop of outstanding team proposals, which will make our job of determining who receives funding very challenging. I wish you every success in exploring new and compelling ideas over the next few days.

Have a terrific meeting!

**Daniel Linzer**

President

Research Corporation for Science Advancement

## From the Program Director

Research Corporation's highly interactive Scialog meetings aim to catalyze new collaborations based on blue-sky ideas among Scialog Fellows who constitute a highly select group of exemplary early career scientists from the United States and Canada. The emphasis is on dialogue, networking, and building new collaborations to pursue novel, high-risk discovery research. We are pleased to be holding Scialog: MZT in person this year after having to be virtual in 2021. We hope you are as excited as we are to be physically together in Tucson for year two of this event.



Research Corporation and the USDA launched Mitigating Zoonotic Threats because we believe this critical area of science requires major breakthroughs in fundamental understanding of zoonosis. While we began planning for this initiative one year prior to the outbreak of SARS-CoV2, the current pandemic has exemplified why this topic is so important. Because spillover events will occur again, we need to muster the combined expertise of chemists and life scientists, human, animal and public health experts, computational biologists and disease modelers, wildlife biologists, and experts in how climate change will impact human and animal migration. Through this effort we also wish to enhance partnerships between USDA and academic scientists to build the deeper ties that will expand the research base, knowledge sharing and expertise required to tackle critical scientific questions that impact human and animal health and our society as a whole.

We have two outstanding speakers to set the stage for breakout discussions: **Amy Vincent** (USDA/ARS) and **Michael Wimberly** (University of Oklahoma).

We have a team of terrific discussion facilitators: **Sara Cherry** (University of Pennsylvania), **Linda Detwiler** (USDA/APHIS), **Peter Dorhout** (Iowa State University), **Matt Erdman** (USDA/APHIS), **Zac Schultz** (Ohio State University), **Amy Vincent** (USDA/ARS), **Wilfred van der Donk** (University of Illinois at Urbana-Champaign), **William Wilson** (USDA/ARS) and **Michael Wimberly** (University of Oklahoma).

Scialog meetings focus on dialogue and team building with the goal of creating novel strategies and collaborative approaches to tackle important scientific challenges. An important feature is the opportunity for Scialog Fellows to form teams and write proposals to pursue particularly creative ideas that emerge through the dialogue. We hope this competition is exciting, but regardless of which proposals are funded, the primary purpose is to catalyze a deeper and more meaningful exchange of ideas than ordinarily occurs at scientific conferences. Our intent is for this process to help participants gain new insights and connections that significantly advance fundamental science to protect our society from future zoonotic outbreaks, and to be better able to respond to them quickly and effectively.

We hope each participant finds the Scialog experience of great value. Please do not hesitate to provide feedback on how to make the conference better. My fellow Program Directors, **Richard Wiener** and **Silvia Ronco**, the RCSA staff, and I are here to help make the meeting a great experience!

### **Andrew Feig**

Senior Program Director  
Research Corporation for Science Advancement

# Scialog: Mitigating Zoonotic Threats

## Conference Agenda September 15–18, 2022

### Thursday, September 15

2:00 pm	<b>Registration Opens</b>	Sonoran Foyer
2:00 – 5:00 pm	<b>Snacks and Informal Discussions</b>	Sonoran Foyer
5:00 – 6:30 pm	<b>Poster Session and Reception</b>	Murphey
6:00 – 6:30 pm	<b>Meeting for Discussion Facilitators</b>	Sonoran
6:30 – 7:30 pm	<b>Dinner</b>	Murphey/Murphey Patio
7:30 – 8:30 pm	<b>Welcome</b> Dan Linzer, President, RCSA Jeff Silverstein, Deputy Administrator, USDA/ARS Suelee Robbe-Austerman, Director, NVSL, USDA/APHIS	Sonoran
	<b>Conference Overview, Outcomes and Proposal Guidelines</b> Andrew Feig, Senior Program Director, RCSA	
	<b>Introductions/Ice Breakers</b>	
8:30 – 11:00 pm	<b>Starlight Cafe</b>	Murphey/Murphey Patio

### Friday, September 16

7:00 – 8:00 am	<b>Breakfast</b>	Murphey/Murphey Patio
8:00 – 8:45 am	<b>Keynote Presentation</b> <i>Zoonotic Threats: Influenza A Virus at the Human and Swine Interface</i> Amy Vincent, USDA/ARS	Sonoran
8:45 – 9:00 am	<b>Breakout Session Overview and Instructions</b>	Sonoran
9:00– 10:15 am	<b>Breakout Session I</b>	Sonoran, Sunsatations, Finger Rock I, II and III
10:15 – 10:35 am	<b>Report Out</b>	Sonoran
10:35 – 11:15 am	<b>Morning Break</b>	Sonoran Foyer
11:15 – 11:45 am	<b>Mini Breakout Session I</b> (Fellows)	All Spaces
	<b>Facilitator Debrief</b> (Facilitators)	Sunsatations
11:45 am – 1:00 pm	<b>Lunch</b>	Murphey/Murphey Patio
1:00 – 1:45 pm	<b>2021 Team Award Panel Discussion</b>	Sonoran
1:45 – 3:00 pm	<b>Breakout Session II</b>	Sonoran, Sunsatations, Finger Rock I, II and III
3:00 – 3:20 pm	<b>Report Out</b>	Sonoran
3:20 – 3:50 pm	<b>Mini Breakout Session II</b> (Fellows)	All Spaces
3:50 – 5:15 pm	<b>Conference Photo and Afternoon Break</b>	Stairs near the Main Lobby
5:15 – 6:45 pm	<b>Poster Session and Reception</b>	Murphey
6:45 – 7:45 pm	<b>Dinner</b>	Murphey/Murphey Patio
7:45 – 8:30 pm	<b>Keynote Presentation</b> <i>Mitigating Zoonotic Threats at the Nexus of Global Health and Global Environmental Change</i> Michael Wimberly, University of Oklahoma	Sonoran
8:30 – 11:00 pm	<b>Starlight Cafe</b>	Murphey/Murphey Patio

**Saturday, September 17**

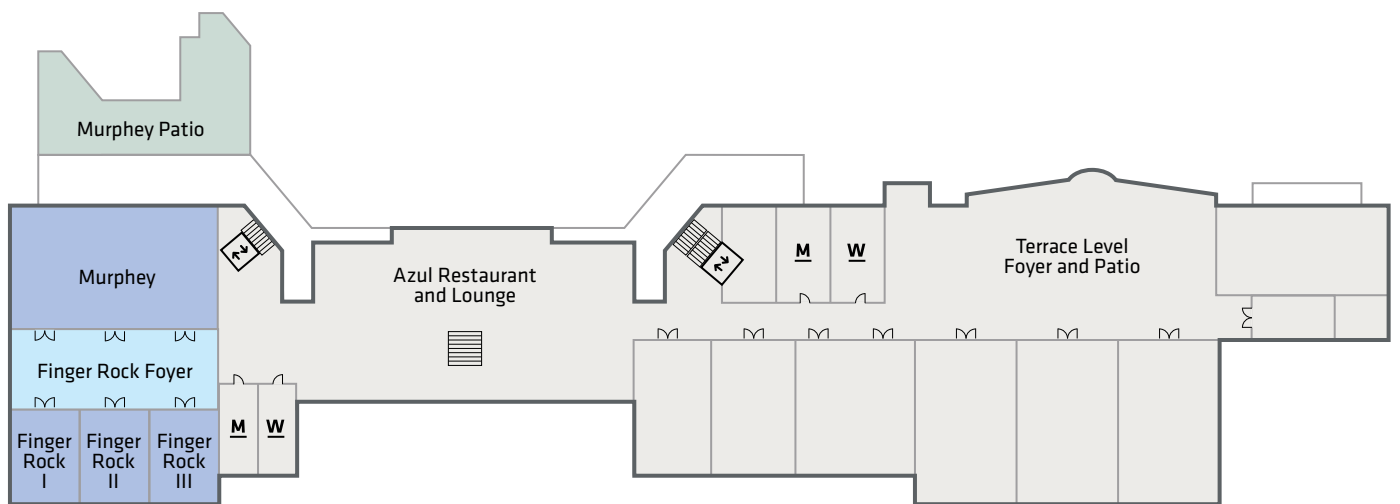
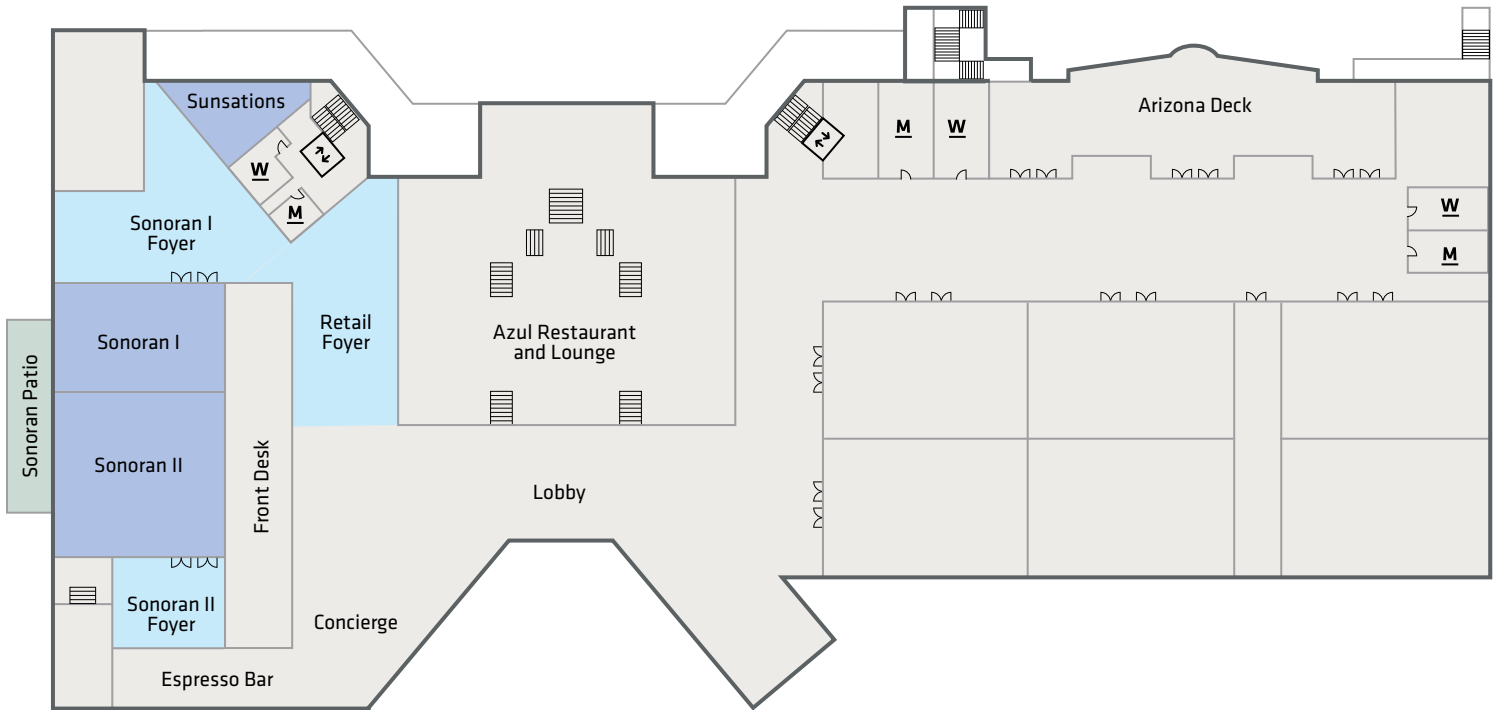
7:00 – 8:00 am	<b>Breakfast</b>	Murphey/Murphey Patio
8:00 – 8:45 am	<b>2021 Team Award Panel Discussion</b>	Sonoran
8:45 – 9:15 am	<b>Mini Breakout Session III (Fellows)</b>	All spaces
9:15 – 9:45 am	<b>Morning Break</b>	Sonoran Foyer
9:45 – 11:00 am	<b>Breakout Session III</b>	Sonoran, Sunsations, Finger Rock I, II and III
11:00 – 11:20 am	<b>Report Out</b>	Sonoran
11:20 – 11:50 am	<b>Mini Breakout Session IV (Fellows)</b>	All Spaces
	<b>Facilitator and Funding Partners Discussion</b>	Sunsations
11:50 – 1:00 pm	<b>Lunch</b>	Murphey/Murphey Patio
1:00 – 5:45 pm	<b>Team Formation, Informal Discussions and Proposal Writing</b>	All spaces
5:45 – 6:30 pm	<b>Reception</b>	Murphey
6:30 – 7:30 pm	<b>Dinner</b>	Murphey/Murphey Patio
7:30 – 11:00 pm	<b>Starlight Cafe</b>	Murphey/Murphey Patio

**Sunday, September 18**

6:30 – 7:30 am	<b>Breakfast</b>	Murphey/Murphey Patio
7:30 – 11:00 am	<b>Presentation of Proposals</b>	Sonoran
	<b>Assessment Survey and Wrap-up</b>	
11:00 – 12:00 pm	<b>Lunch</b> (available to go)	Sonoran Foyer

# Scialog: Mitigating Zoonotic Threats

## The Westin La Paloma Resort





## Keynote Speakers

# Zoonotic Threats: Influenza A Virus at the Human and Swine Interface

## Amy Vincent

*USDA/ ARS, National Animal Disease Center*



**Abstract:** Influenza A viruses (IAV) are the causative agents of one of the most important viral respiratory diseases in pigs and humans. Human and swine IAV are prone to interspecies transmission, leading to regular incursions from human to pig and vice versa. This bidirectional transmission of IAV represents a model for emerging viral diseases under the umbrella of One Health, and it has heavily influenced the evolutionary history of IAV in both species. Transmission of distinct human seasonal lineages to pigs, followed by sustained within-host transmission and rapid adaptation and evolution, represent a considerable challenge for pig health and production. Although only subtypes of H1N1, H1N2, and H3N2 are endemic in swine around the world, extensive diversity can be found in the hemagglutinin (HA) and neuraminidase (NA) genes, as well as the remaining six genes. This represents the known viral diversity, but IAV in swine is vastly under surveilled in many regions. The complicated global epidemiology of IAV in swine and the implications for public health and influenza pandemic planning are inextricably entangled, and the 2009 H1N1 influenza pandemic highlighted the importance of swine as reservoirs for pandemic viruses. Our lack of understanding of the genetic diversity of IAV in swine globally and the processes driving evolution remains a major gap in pandemic preparedness. Many surface and internal genes of swine IAV are derived from human seasonal strains and maintain mammalian adaptation properties. Yet, antigenic divergence of IAV in the swine host from currently or recently circulating IAV in humans generates diverse IAV to which humans lack immunity, presenting a continual pandemic threat. These dynamics at the human-swine interface present a considerable challenge to prevention of influenza disease and/or pandemic preparedness through vaccines in both species.

# Scialog: Mitigating Zoonotic Threats

**Keynote Speakers** Continued

## Mitigating Zoonotic Threats at the Nexus of Global Health and Global Environmental Change

**Michael Wimberly**

*University of Oklahoma*



**Abstract:** To understand zoonotic disease threats in a global context, it is necessary to consider the myriad environmental changes that are occurring along with their implications for human and animal health. Human-caused climate change has multifarious direct and indirect effects on infectious disease transmission, and the resulting impacts on public health are receiving considerable attention. However, there are many other aspects of global change related to growing human populations, greater demands on water resources, increased harvesting of natural resources, changing agricultural practices, expanding cities, and development of transportation networks. All of these factors will interact with climate change to influence the potential for zoonotic disease spillover and spread in human populations. Many of these changes will be particularly acute in tropical regions where there is a high diversity of domestic animals and wildlife species combined with vulnerable human populations. This presentation will present information about historical and projected global environmental changes and discuss their implications for the transmission of infectious diseases and the emergence of novel pathogens.

## 2021 Team Awards

### *Darwin's Naturalization Conundrum Predicts Inter-species Pathogen Transmission Potential*

**Cheryl Andam**, University at Albany, State University of New York, Biological Sciences

**Tavis Anderson**, USDA/ARS, National Animal Disease Center, Virus and Prion Research Unit

**Nicole Eikmeier**, Grinnell College, Computer Science

### *Enabling Comprehensive Immunoprofiling in Animals through a Combination of Xenosurveillance and Highly-multiplexed Serology*

**Paola Boggiatto**, USDA/ARS, National Animal Disease Center, Infectious Bacterial Diseases Research Unit

**Jason Ladner**, Northern Arizona University, Biology/Pathogen and Microbiome Institute

**Bethany McGregor**, USDA/ARS, Arthropod-Borne Animal Diseases Research Unit

### *Employing Color-Changing Nanomaterials to Improve Vector-borne Disease Surveillance*

**Bethany McGregor**, USDA/ARS, Arthropod-Borne Animal Diseases Research Unit

**Laurene Tetard**, University of Central Florida, Physics/NanoScience Technology Center

### *Invasion Ecology and Genomics of Emerging Tick Borne Arboviruses: Predicting Niche Expansion of Heartland Virus Following the Invasion of Asian Longhorned Ticks in the U.S.*

**Tavis Anderson**, USDA/ARS, National Animal Disease Center, Virus and Prion Research Unit

**Gonzalo Vazquez Prokopec**, Emory University, Environmental Sciences

### *Host Adaptation of Mycobacterium bovis: A Comparative Transcriptomics Study of M. bovis Infection in a Multi-host System*

**Paola Boggiatto**, USDA/ARS, National Animal Disease Center, Infectious Bacterial Diseases Research Unit

**Liliana Salvador**, University of Georgia, Infectious Diseases & Institute of Bioinformatics

### *Characterizing the Socio-ecological Spillover Interface by Xenosurveillance of Pathogen Metacommunities Using a Novel Insect Group*

**Pilar Fernandez**, Washington State University, Paul G. Allen for Global Animal Health

**Matthew Hopken**, USDA/APHIS, National Wildlife Research Center

### *Estimating Aedes aegypti Spillover Potential and Evaluation of Current Mitigation Strategies*

**Crystal Hepp**, Translational Genomics Research Institute, Pathogen Genomics Division

**Silvie Huijben**, Arizona State University, School of Life Sciences

**Kezia Manlove**, Utah State University, Wildland Resources and Ecology Center

### *Discovering How RNA Epigenomic Modifications Impact Flavivirus Replication Speed and Fidelity*

**Joyce Jose**, Pennsylvania State University, Biochemistry and Molecular Biology

**Kristin Koutmou**, University of Michigan, Chemistry

### *Zoonotic Implications of Host Genetics, Immunity, and Virome in Bats*

**Daniel Becker**, University of Oklahoma, Biology

**Hannah Frank**, Tulane University, Ecology and Evolutionary Biology

**Jason Ladner**, Northern Arizona University, Biology

**Efrem Lim**, Arizona State University, School of Life Sciences

### *Understanding Viral Factors Responsible for Vector Adaptation and Spillover for Surveillance and Mitigation of Zoonotic Flaviviruses with Pandemic Potential*

**Joyce Jose**, Pennsylvania State University, Biochemistry and Molecular Biology

**Dana Mitzel**, USDA/ARS, Foreign Arthropod-Borne Animal Diseases Research Unit

# Scialog: Mitigating Zoonotic Threats

## 2022 Proposal Guidelines

### Scialog: Mitigating Zoonotic Threats

1. Awards are intended to provide seed funding for teams of two to three Scialog Fellows formed at this conference for high-risk, high-impact projects. Teams may include up to two USDA scientists so long as they are from different agencies and must also include at least one non-USDA member.
2. The application package should be submitted as a single PDF file. Pages one and two should describe the project and role of each team member. A third page may be used for references. No budget is necessary.
3. Awards will be in the amount of \$50K direct funding per team member, plus indirect costs. The indirect cost rate for a given awardee will be dependent upon the awardee institution type, since these will be processed as subawards from USDA prime award #58-3022-0-005. Grant duration will be one year.
4. We encourage USDA scientists to join teams that initiate collaborations with academic scientists. APHIS and ARS have set aside USDA funds to cover the agency side of collaborations initiated through the Scialog proposal competition.
5. No Scialog Fellow may be a member of more than two teams. If a Scialog Fellow is a member of two teams, other members of the teams must be different. No team may submit more than one proposal.
6. No Scialog Fellow who previously has won a Scialog MZT Collaborative Award may be a member of more than one team. The other team members must be different from the members of the previously awarded team. (Applies to Years 2 & 3.)
7. Teams may not include members who have previously collaborated with one another. If you are unsure of your status (e.g., prospective team members were part of a large collaboration but did not significantly interact), please check for clarification with an RCSA program director.
8. Teams are encouraged (but not required) to:
  - a. Include members with different research approaches and methods.
  - b. Include members from different disciplines.
  - c. Include collaborators from USDA and academic laboratories.
9. Proposals must be submitted electronically by **6:30 a.m. PST Sunday, September 18, 2022**. Instructions for submission will be provided at the meeting.
10. Awards are anticipated to start around **December 15, 2022**.

### Conference Evaluation Survey

An online conference survey will be available on **Sunday, September 18, 2022**. To access and complete the survey, please go to: [https://www.surveymonkey.com/r/Scialog\\_MZT\\_2022\\_post-conf\\_survey](https://www.surveymonkey.com/r/Scialog_MZT_2022_post-conf_survey)



## Scialog Fellows

**Cheryl P. Andam** [candam@albany.edu](mailto:candam@albany.edu)

University at Albany, State University of New York,  
Biological Sciences

*I am interested in microbial population genomics and evolution as they apply to infectious diseases and public health.*

**Tavis Anderson** [tavis.anderson@usda.gov](mailto:tavis.anderson@usda.gov)

USDA/ARS, National Animal Disease Center,  
Virus and Prion Research Unit

*How are pathogens transmitted and how do they evolve among hosts, across the landscape, and over time? My goal is to discover generalized mechanisms that govern pathogen transmission, evolution, and emergence, to improve the health and well-being of animals and humans.*

**Guillaume Bastille-Rousseau** [gbr@siu.edu](mailto:gbr@siu.edu)

Southern Illinois University,  
Cooperative Wildlife Research Lab

*My research focuses on spatial wildlife ecology, most specifically animal movement, resource use, social behavior and the potential impacts these can have on other processes such as disease transmission.*

**Christopher Cleveland** [ccleve@uga.edu](mailto:ccleve@uga.edu)

University of Georgia, Population Health

*To mitigate zoonotic pathogen risks, an understanding of the basic biological principles of pathogens coupled with ecological approaches that span scales (local, regional, landscape etc.), facilitate or suppress transmission, and communicate effective responses is needed.*

**Nicholas DeFelice** [nicholas.defelice@mssm.edu](mailto:nicholas.defelice@mssm.edu)

Icahn School of Medicine at Mount Sinai,  
Environmental Medicine and Public Health

*I study environmental determinants of infectious disease transmission and develop mathematical models that quantify the burden of disease attributable to poor infrastructure and other environmental exposures, along with systems to forecast infectious disease outbreaks.*

**Nicole Eikmeier** [eikmeier@grinnell.edu](mailto:eikmeier@grinnell.edu)

Grinnell College, Computer Science

*I study networks from a computational and mathematical perspective.*

**Pilar Fernandez** [pilar.fernandez@wsu.edu](mailto:pilar.fernandez@wsu.edu)

Washington State University,  
Paul G. Allen for Global Animal Health

*I am a disease ecologist focusing on zoonotic diseases as complex socio-ecological systems. I combine methods from epidemiology and ecology to identify critical factors and leverage points to design sustainable strategies for disease control.*

**Hannah Frank** [hkfrank@tulane.edu](mailto:hkfrank@tulane.edu)

Tulane University, Ecology and Evolutionary Biology

*I am interested in how environment and host ecology impacts host-pathogen coevolution and how coevolutionary histories impact zoonotic risk. I work in the field and the lab, using disease ecology, genomics, molecular evolution and immunology to answer questions.*

**Hayden Hamby** [hayden.hamby@usda.gov](mailto:hayden.hamby@usda.gov)

USDA/APHIS, National Wildlife Research Center

*My interests align with the WS mission to protect people, agriculture, and wildlife by applying cutting edge techniques to solve complex problems. In my work I apply principles of formulation science, chemical synthesis, and analytical chemistry to complete research objectives.*

**Barbara A. Han** [hanb@caryinstitute.org](mailto:hanb@caryinstitute.org)

Cary Institute of Ecosystem Studies

*Disease ecology and the predictive analytics of zoonotic pathogens, outbreaks, and processes underpinning spillover transmission using machine learning, AI, and data science to cross disciplines and biological scales.*

**Crystal Hepp** [chepp@tgen.org](mailto:chepp@tgen.org)

Translational Genomics Research Institute,  
Pathogen Genomics Division

*My research team is broadly interested in outbreak mitigation through ongoing environmental surveillance activities. We are involved in viral discovery and sequencing from many sources, including urban wastewater, bats, mosquitoes, and birds.*

# Scialog: Mitigating Zoonotic Threats

## Scialog Fellows Continued

**Claudia Herrera** [cherrera@tulane.edu](mailto:cherrera@tulane.edu)

Tulane University, Tropical Medicine

*I am interested in developing new serological tests for diagnosing *T. cruzi* infection and understanding parasite transmission dynamics and disease epidemiology to design novel interventions to reduce disease spread and cross over from zoonotic cycles to humans.*

**Matthew Hopken** [matt.w.hopken@usda.gov](mailto:matt.w.hopken@usda.gov)

USDA/APHIS, National Wildlife Research Center

*Molecular ecology of wildlife pathogens, vectors, and hosts.*

**Diego Huet** [diego.huet@uga.edu](mailto:diego.huet@uga.edu)

University of Georgia,

Pharmaceutical and Biomedical Sciences

*My group uses genetic, biochemical and cellular approaches combined with proteomics to study the highly divergent metabolic adaptations of apicomplexan parasites, a group of single-celled eukaryotes that include the causative agents of malaria.*

**Silvie Huijben** [shuijben@asu.edu](mailto:shuijben@asu.edu)

Arizona State University, School of Life Sciences

*I use experimental evolution, field observations and mathematical modeling to study the evolution of drug-resistant malaria parasites and insecticide-resistant mosquitoes in order to slow the evolution of resistance with improved resistance management strategies.*

**Joyce Jose** [jxj321@psu.edu](mailto:jxj321@psu.edu)

Pennsylvania State University,

Biochemistry and Molecular Biology

*We combine molecular virology, structural biology, biochemistry, and microscopy approaches to study the replication and assembly of positive-strand RNA viruses such as flaviviruses, alphaviruses, and coronaviruses.*

**Kristin S. Koutmou** [kkoutmou@umich.edu](mailto:kkoutmou@umich.edu)

University of Michigan, Chemistry

*Cells face the daunting challenge of having to maintain the correct number of proteins at the right time. We study how the programmed chemical modification of RNAs, biomolecules central to protein synthesis, impact their function to help control cellular gene expression.*

**Jason Ladner** [jason.ladner@nau.edu](mailto:jason.ladner@nau.edu)

Northern Arizona University,

Biology/Pathogen and Microbiome Institute

*My research utilizes genomic technologies and bioinformatics to study the emergence, spread and evolution of infectious diseases. This includes the development of a novel technology for highly multiplexed characterization of antibody reactivities with epitope-level resolution.*

**Steven M. Lakin** [steven.lakin@usda.gov](mailto:steven.lakin@usda.gov)

USDA/APHIS, National Bio and Agro-Defense Facility

*I use big data to solve big problems in public health and infectious disease. My work applies statistics/machine learning to genomic data to enhance pathogen detection, viral discovery, and epidemiological surveillance.*

**Kimberly A. Lehman** [Kimberly.Lehman@usda.gov](mailto:Kimberly.Lehman@usda.gov)

USDA/APHIS, VS, Diagnostics and Biologics

*I'm new to research, but I am a veterinary diagnostician and laboratorian, so my interests relate to diagnostics – how to improve, create and find alternative ways to better diagnose disease. I'm also interested in genome sequencing methods and its application for epidemiology.*

**Efrem Lim** [efrem.lim@asu.edu](mailto:efrem.lim@asu.edu)

Arizona State University, School of Life Sciences

*Virome in health and disease.*

**Muzafar Makhdoomi** [muzafar.makhdoomi@usda.gov](mailto:muzafar.makhdoomi@usda.gov)

USDA/APHIS,

Foreign Animal Disease Diagnostic Laboratory

*Development of molecular and serological assays of rapid diagnosis of high consequence transboundary and zoonotic diseases and the foreign animal diseases affecting humans and animals respectively.*

**Jenny Maloney** [jenny.maloney@usda.gov](mailto:jenny.maloney@usda.gov)

USDA/ARS,

Environmental Microbial and Food Safety Laboratory

*My research centers on the detection and molecular characterization of zoonotic and emerging protist parasites with roles in public health and food safety.*

**Bethany L. McGregor** [Bethany.McGregor@usda.gov](mailto:Bethany.McGregor@usda.gov)

USDA/ARS,

Arthropod-Borne Animal Diseases Research Unit

*My research focuses on the ecology of vectors and vector-borne diseases, especially interactions between insects, hosts, and the environment. My ultimate goal is to identify ways in which ecological interactions can be used to control vectors and prevent disease outbreaks.*

Scialog Fellows Continued**Gisselle Medina** [gisselle.medina@usda.gov](mailto:gisselle.medina@usda.gov)

USDA/ARS, National Bio and Agro-Defense Facility  
*Virology, virus-host interactions, vaccines, biotherapeutics, innate immunity, RNA viruses, DNA viruses, foreign animal diseases.*

**Angad Mehta** [apm8@illinois.edu](mailto:apm8@illinois.edu)

University of Illinois at Urbana-Champaign, Chemistry  
*We use synthetic biology to study fundamental viral and bacterial chemistry to develop novel therapeutic strategies.*

**Dana Mitzel** [dana.mitzel@usda.gov](mailto:dana.mitzel@usda.gov)

USDA/ARS,  
Foreign Arthropod-Borne Animal Diseases Research Unit  
*Understanding virus-vector interactions important for the replication, pathogenesis and transmission of arthropod-borne viruses and to identify possible factors that will inform prevention and mitigation strategies.*

**Sen Pei** [sp3449@cumc.columbia.edu](mailto:sp3449@cumc.columbia.edu)

Columbia University, Environmental Health Sciences  
*I develop mathematical models and computational tools to improve infectious disease surveillance, forecasting and control.*

**Lars Plate** [lars.plate@vanderbilt.edu](mailto:lars.plate@vanderbilt.edu)

Vanderbilt University, Chemistry and Biological Sciences  
*Developing mass spectrometry and chemical biology tools to study dynamic protein interactions. We aim to understand and target protein folding processes at the host-virus interface and in protein misfolding diseases.*

**Liliana Salvador** [salvador@uga.edu](mailto:salvador@uga.edu)

University of Georgia,  
Infectious Diseases/Bioinformatics  
*Quantitative analyses of bacterial zoonotic diseases.*

**Stephanie Seifert** [stephanie.seifert@wsu.edu](mailto:stephanie.seifert@wsu.edu)

Washington State University,  
Paul G. Allen School for Global Health  
*My research program focuses on the molecular ecology of zoonotic and animal pathogens, especially viruses of bats at the human-animal interface.*

**Rebecca Smith** [rlsdvm@illinois.edu](mailto:rlsdvm@illinois.edu)

University of Illinois at Urbana-Champaign, Pathobiology  
*I try to understand how data can (and can't) be used to answer questions and set policy.*

**Laurene Tetard** [laurene.tetard@ucf.edu](mailto:laurene.tetard@ucf.edu)

University of Central Florida,  
Physics/NanoScience Technology Center  
*My group focuses on the development of nanoscale imaging and spectroscopy methods to tackle problems relevant to sustainability.*

**Christoph Thaiss** [thaiss@penncmedicine.upenn.edu](mailto:thaiss@penncmedicine.upenn.edu)

University of Pennsylvania, Microbiology  
*We are interested in environmental and lifestyle factors that regulate an individual's susceptibility to pathogenic infection.*

**Gonzalo Vazquez Prokopec** [gm vazqu@emory.edu](mailto:gm vazqu@emory.edu)

Emory University, Environmental Sciences  
*My primary research areas are Disease Ecology, Medical Entomology and Global Health.*

**Xiaohu Xia** [Xiaohu.Xia@ucf.edu](mailto:Xiaohu.Xia@ucf.edu)

University of Central Florida, Chemistry  
*My research focuses on developing advanced nanoscale materials for applications in diagnostics, bio/chemical sensing, and food and agriculture.*

# Scialog: Mitigating Zoonotic Threats

## Discussion Facilitators

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University of Pennsylvania,  
Pathology and Laboratory Medicine  
*Since starting my lab at Penn, I have focused on discovering how emerging viral pathogens infect humans and cause disease. I have uncovered antivirals active through distinct mechanisms and identified synergies between antivirals that may be leveraged for treatment.*

**Linda Detwiler** [linda.detwiler@usda.gov](mailto:linda.detwiler@usda.gov)

USDA/APHIS, Veterinary Services,  
Ruminant Health Center  
*Much of my career has been spent working in the field of prion diseases. I have been involved in conducting field research and developing policy for prevention and control of these diseases.*

**Peter Dorhout** [dorhout@iastate.edu](mailto:dorhout@iastate.edu)

Iowa State University, Chemistry  
Vice President for Research, RCSA Board of Directors  
*What fundamental chemistry/physics problem, if solved, will change the game for MZT?*

**Matt Erdman** [matthew.m.erdman@usda.gov](mailto:matthew.m.erdman@usda.gov)

USDA/APHIS, Center for Veterinary Biologics  
*Veterinary diagnostics and vaccines.*

**Zachary 'Zac' Schultz** [schultz.133@osu.edu](mailto:schultz.133@osu.edu)

Ohio State University, Chemistry and Biochemistry  
*My research focusses on developing chemically selective and sensitive detection methods.*

**Wilfred van der Donk** [vddonk@illinois.edu](mailto:vddonk@illinois.edu)

University of Illinois at Urbana-Champaign  
Howard Hughes Medical Institute, Chemistry  
*Discovery of new natural products by genome mining and elucidation of their biological activity and mode of action, including new antibiotics. We then study their biosynthetic pathways and enzymes, and engineer their structures and activities using synthetic biology.*

**Amy Vincent Baker** [amy.vincent@usda.gov](mailto:amy.vincent@usda.gov)

USDA/ARS, National Animal Disease Center,  
Virus and Prion Research Unit  
*The NADC Flu Crew studies influenza A viruses affecting swine health and at the human-swine interface.*

**William 'Bill' Wilson** [william.wilson2@usda.gov](mailto:william.wilson2@usda.gov)

USDA/ARS, National Bio and Agro-Defense Facility  
*Addressing vector-borne animal diseases through virus-host-vector interaction, diagnosis and vaccine research.*

**Michael Wimberly** [mcwimberly@ou.edu](mailto:mcwimberly@ou.edu)

University of Oklahoma,  
Geography and Environmental Sustainability  
*An ecologist studying the effects of climate and land use change on vector-borne and zoonotic disease transmission. I work with mathematical models and satellite Earth observations to map disease risk and forecast outbreaks. Develop tools for public health decision making.*

## Guests

**Andrew Golnar** [agolnar@sciphil.org](mailto:agolnar@sciphil.org)

Science Philanthropy Alliance  
*I'm interested in hacking host-pathogen interactions and their relationship to diverse environments, community interactions, and evolution.*

**Sue Merrilees** [smerrilees@sciphil.org](mailto:smerrilees@sciphil.org)

Science Philanthropy Alliance  
*Philanthropic advising, fundraising consulting, strategic planning.*

**Suelee Robbe-Austerman**

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USDA/APHIS, National Veterinary Services Laboratories  
*Collaborative, reproducible, applied research focusing on diagnostics that improve the lives of animals, humans and the sustainability of animal agriculture.*

**Jeffrey 'Jeff' Silverstein** [jeff.silverstein@usda.gov](mailto:jeff.silverstein@usda.gov)

USDA/ARS, Office of National Programs  
*The connections between animal and public health. Use of technology to anticipate and prevent disease.*



## Notes

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