Spring 2024 Meeting of the Board on Animal Health Sciences, Conservation, and Research

WEDNESDAY, MAY 1, 2024

OPEN SESSION

1:00pm–3:00pm EDT

Protecting the Health of Wild Animals

This discussion focuses on critical issues in assessing and addressing health risks in wild populations of terrestrial and marine animals. Health challenges in wild animals caused by infectious diseases, including zoonotic diseases, changes in climate, environmental contaminants, and proximity to human systems can have significant negative effects including on biodiversity, ecosystems that are vital to agriculture and the environment, local economies, and human health. Given these, and possibly other, challenges and consequences, what research and knowledge is needed to assess, prevent, and/or mitigate health risks from various exposures? Through case studies, this discussion will explore critical knowledge gaps, research and data needs, and opportunities for engaging professional and non-professional scientists toward understanding and identifying actions for reducing risks to wild animal health.

Moderator
Suzan Murray, Smithsonian Conservation Biology Institute

Speakers

H5N1 Avian Influenza in Marine Mammals
Marcela Uhart, University of California Davis

The Missing Piece to Conservation
Deborah McCauley, Veterinary Initiative for Endangered Wildlife

Direct and Indirect Effects of Environmental Contaminants on Wildlife Health
Karyn Bischoff, Cornell University

Effects of Climate Change on Wildlife Health
Erik Hofmeister, National Wildlife Health Center

3:00pm–3:15pm EDT **Break**

3:15pm–5:00pm EDT

Caring for our Companion Pets: Critical Research for Improving Companion Animal Health

This discussion focuses on research initiatives that inform the health of companion animals, including our understanding of their risk of disease, vaccines and medications safety and efficacy, preventative care, and zoonotic disease. This discussion will cover topics of comparative medicine and research for animal health, specifically focusing on

companion animals. Through examples, this discussion explore current research pathways, gaps, and needs for ensuring the welfare of companion animals.

Moderator
Sonnet S. Jonker, Oregon Health and Sciences University

Speakers

Interconnectedness of Human and Companion Animal Health
Dori Borjesson, Washington State University

Advances in Animal Health through Comparative Medicine
Mark Mamula, Yale University

Case Study: New insights into the Immunopathogenesis of Feline Infectious Peritonitis
Amir Kol, University of California, Davis

Case Study: Insights from a Decade of Studying Autoimmune Diseases in Dogs
Steven Friedenberg, University of Minnesota

5:00pm EDT **END OF DAY 1**

ADVANCE READING

Protecting the Health of Wild Animals

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Caring for our Companion Pets: Critical Research for Improving Companion Animal Health

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Overgaauw PAM, Vinke CM, Hagen MAEV, Lipman LJA. A One Health Perspective on the Human-Companion Animal Relationship with Emphasis on Zoonotic Aspects. Int J Environ Res Public Health. 2020 May 27;17(11):3789. doi: 10.3390/ijerph17113789.

SPEAKER BIOGRAPHIES

Protecting the Health of Wild Animals

Dr. Karyn Bischoff is a veterinary specialist in Toxicology. She has been the diagnostic toxicologist at the New York State Animal Health Diagnostic Center for 20 years. Karyn teaches Toxicology and Public Health as an associate professor of practice at Cornell University College of Veterinary Medicine in the Departments of Population Medicine and Diagnostic Sciences and Public and Ecosystem Health. Karyn is the incoming president of the American Board of Veterinary Toxicologists, she is active in the American Veterinary Medical Association serving on various committees and councils including Environmental Issues and Public Health, and she is a faculty fellow with the Cornell Atkinson Center for Sustainability.

Dr. Erik Hofmeister is a research virologist at the USGS National Wildlife Health Center in Madison, WI. His work at the Center has focused on avian disease caused by West Nile Virus, avipox viruses, and avian malaria. He is involved in the development and deployment of isothermal DNA detection assays for detection of Asian fish tapeworm in domestic fresh-water fish and *Mycoplasma ovipneumoniae* in Bighorn sheep. His current work using zebra finches seeks to determine the effect of exposure of breeding birds to neonicotinoid insecticides on the health and success of nestling birds. Hofmeister received a D.V.M. from Cornell University and, following several years in private large animal practice, a Ph.D. in immunology and infectious diseases from the Johns Hopkins University Bloomberg School of Public Health.

Dr. Deborah McCauley. In 2012, Dr. McCauley co-founded VIEW (Veterinary Initiative for Endangered Wildlife) in response to the growing threat of disease to endangered wildlife populations transmitted from domestic animals and humans. VIEW is helping government agencies, National Parks, University research, and local NGOs to include wildlife health in their conservation efforts. VIEW builds capacity with local professional stakeholders to establish sustainable disease surveillance and wildlife health programs emphasizing saving endangered wildlife. VIEW's projects are in Asia, Africa, and North America.

Dr. McCauley is the Executive Director of VIEW and is skilled in wildlife disease surveillance, capture and immobilization, field surgery, field research, and disease prevention and response. She has worked with wildlife organizations, including the Wildlife Conservation Society, Montana's Fish Wildlife and Parks, and ZooMontana, and received her veterinary degree from the Royal Veterinary College, University of London. She has served on the board of the Yellowstone Park Foundation and won the Ashoka Fellowship of Social Entrepreneurs in 2017 and the Emily Couric Women's Leadership Award in 2019.

VIEW's mission is to protect endangered wildlife by tackling the health threats they face in their native habitats. VIEW envisions a world where all countries have the commitment and local capacity to support wildlife health as a cornerstone of conservation.

Dr. Suzan Murray is a board-certified zoo veterinarian at the Smithsonian Conservation Biology Institute (SCBI) and serves as both the program director of the Global Health Program and as the SCBI's Chief Wildlife Veterinary Medical Officer. She leads an interdisciplinary team engaged in worldwide efforts to address health issues in endangered wildlife and combat emerging infectious diseases of global significance, including zoonotic diseases. Dr. Murray also acts as the Smithsonian liaison to the Foreign Animal Disease Threat and Pandemic Preparedness subcommittees of the White House's Office of Science and Technology. Dr. Murray's work focuses on providing clinical care to free-ranging wildlife, pathogen detection, advanced diagnostics, training of international veterinarians and other health professionals, capacity building, and collaboration in infectious disease research at the human-wildlife-domestic animal interface. She previously served as chief veterinarian for the Smithsonian's National Zoo and has a wealth of clinical knowledge and experience with wildlife and zoo animals both free ranging and in human care. Dr. Murray earned a bachelor's degree from Amherst College in 1984 and completed her veterinary degree in 1991 from Tufts University. After a surgical internship, she completed a residency in zoological medicine at the Smithsonian's National Zoo in 1995 and became a Diplomate of the American College of Zoological Medicine (DACZM) in 2000. Dr. Murray has been either the principal investigator or co principal investigator on several research grants, including Morris Animal Foundation, Smithsonian Endowment, Smithsonian Women's Committee, and James Bond Funds.

Dr. Marcela Uhart is Director Latin America Program, Karen C. Drayer Wildlife Health Center, School of Veterinary Medicine, University of California, Davis. Dr. Uhart is a wildlife veterinarian from Argentina, with 30 years of experience in marine mammal and seabird conservation and health research. Dr. Uhart is currently investigating and addressing a deadly Avian Influenza outbreak affecting marine species in South America. In addition to conducting on-site research,

she currently serves on the steering committee for OFFLU, the Network of Expertise on Animal Influenza from the World Organization for Animal Health (WOAH) and FAO. She is also an appointed member of the WOAH Working Group on Wildlife since 2018.

Caring for our Companion Pets: Critical Research for Improving Companion Animal Health

Dr. Dori Borjesson joined the College of Veterinary Medicine at Washington State University (WSU) as the Dean in 2020. Prior to joining WSU, she served as a Professor and Department Chair in the School of Veterinary Medicine at the University of California, Davis. She was the inaugural Director of the Veterinary Institute for Regenerative Cures and the Veterinary Clinical Regenerative Medicine Laboratory. She earned her DVM, MPVM and PhD (Comparative Pathology) all at UC Davis, where she also completed her residency. During her career she has taught professional veterinary and graduate students, engaged in clinical service and leadership for academic teaching hospitals, and led a graduate program in integrative pathobiology. Her research focused on mesenchymal stem cells and immunomodulation, where she holds two provisional patents, one of which is licensed by a cellular therapeutics company that is conducting a pivotal clinical trial in cats under a Minor Use and Minor Species (MUMS) designation. She has over 115 peer-reviewed publications and was the recipient of the Zoetis Research Award. Her team defined and developed naturally-occurring animal models of disease to test cell therapies to improve animal health and inform human medical practice.

Dr. Steven Friedenberg is an Associate Professor in the Department of Veterinary Clinical Sciences at the University of Minnesota. At the University of Minnesota, he is a core member of the Canine Genetics Laboratory and a member of the renowned Center for Immunology. He also holds faculty appointments in the Comparative Biomedical Sciences, Veterinary Sciences, and Bioinformatics & Computational Biology graduate programs. Dr. Friedenberg earned a BS in chemistry from Yale University, and graduated from veterinary school at Cornell University. He completed a rotating internship in Small Animal Medicine & Surgery and a residency in Emergency & Critical Care medicine at The Ohio State University. After finishing his residency program, he earned a PhD in genetics at North Carolina State University. His research focuses on studying inherited autoimmune disorders in dogs which can also serve as models for the analogous diseases in humans. He has a particular interest in Addison's disease (primary hypoadrenocorticism) and autoimmune hemolytic anemia, which are highly overrepresented in certain dog breeds. Dr. Friedenberg also holds a deep interest in bioinformatics and using big data approaches to improve animal health. He lives in St. Paul, Minnesota with his husband, a journalist and author, and rescue dog Hugo from Rio de Janeiro, Brazil.

Dr. Sonnet S. Jonker is an Associate Professor at Oregon Health & Science University (OHSU), where she leads a lab studying the developing cardiovascular system in a translational large animal model. She has published extensively on the proliferation and terminal differentiation of cardiac myocytes in the perinatal period, as well as coronary growth and function in the fetal and neonatal heart. The goal of her research is to discover how prenatal stress influences the structure and function of the heart for life, and to develop therapeutic approaches for infants with undergrown hearts and those with congenital defects. Dr. Jonker has served on the OHSU IACUC since 2009, now serving as Vice Chair. She has also been involved with the American Physiological Society's Animal Care and Experimentation Committee since 2013, and is now serving as Chair. She has served AAALAC as an ad hoc consultant since 2016 to help research institutions provide excellent animal care, and is now the Member Organization Delegate to AAALAC from the American Physiological Society. Dr. Jonker is also concerned with how structural racism impairs the careers of minoritized scientists, and has published on how the IACUC can contribute to an anti-racist institution.

Dr. Amil Kol is an Associate Professor and Chief of the Clinical Pathology service at the Veterinary Medical Teaching Hospital, UC Davis School of Veterinary Medicine. Amir is a graduate of the Koret School of Veterinary Medicine (2006), Israel and had completed the residency training program in clinical pathology at the School of Veterinary Medicine, UC Davis (2011). After the completion of his residency, Amir completed a PhD research training in the field of stem cell biology and regenerative medicine under the mentorship of Dr. Dori Borjesson (2015). Dr. Kol accepted a position of Assistant Professor at the Department of Pathology, Microbiology and Immunology, UC Davis in 2016 and was promoted to Associate Professor in 2022. His research focus is comparative stem cell biology and its application to regenerative medicine and disease modeling. Moreover, he is a strong advocate of a translational biomedical research approach that capitalizes on naturally occurring diseases in domestic animals as platforms to conduct high-level and meaningful translational research that benefits human patients, pets, and pet owners. Specifically, his lab focuses on mesenchymal

stem/stromal cell therapy for lymphoid tissue regeneration in chronic viral infections, canine induced pluripotent stem cells and intestinal organoids. Dr. Kol has published more than 40 manuscripts in peer reviewed journals and has an H index of 18. Finally, Dr. Kol is the Chair of the Board of Directors of the North American Veterinary Regenerative Medicine Association (NAVRMA). NAVRMA is a leading international organization that encourages professional improvement and

the exchange of knowledge and ideas among people interested in veterinary regenerative medicine.

Dr. Mark Mamula received his undergraduate degree from UCLA, a Master's degree from the University of Notre Dame and doctorate from the University of Oklahoma Health Sciences Center. Dr. Mamula is presently Professor of Medicine,

Department of Medicine at the Yale University School of Medicine and member of the Immunology Program of the Yale Cancer Center. Dr. Mamula is an immunologist by training with research interests both in cancer immunotherapies and in understanding the origins and progression of autoimmune diseases. Dr. Mamula's recent studies have defined a potentially novel approach to cancer therapy in utilizing a tumor neoantigen to trigger immune responses directed at tumor surface proteins, specifically EGFR and HER2. The studies have now been translated in to treating companion animals with osteosarcoma, hemangiosarcoma, and transitional cell carcinoma. The studies continue at 11 clinical trial sites around the country and in Canada. USDA conditional licensing is being sought to allow wider distribution of the neoantigen therapy and to investigate other canine tumor types. Dr. Mamula has established a recent collaboration with Merck, Inc. that will utilize a novel PD1 checkpoint inhibitor developed for canine cancers in combination with EGFR/HER2 neoantigen immunotherapy.