



Tracey Goldstein, PhD, is Research Faculty at the University of California Davis where she developed and oversees the One Health Institute Laboratory and the Marine Ecosystem Health Diagnostic and Surveillance Laboratory. She is also the Laboratory and Surveillance Capacity Coordinator for the new viral emergence early warning project, named PREDICT, developed with the US Agency for International Development's Emerging Pandemic Threats (EPT) Program. Her background is in Wildlife Molecular Epidemiology and in developing disease diagnostics to detect novel pathogens in wildlife. She focuses on solving global health problems using research, training, and capacity building. She provides service to government agencies and the public faced with emerging infectious disease challenges, including U.S. Agency for International Development, U.S. Fish and Wildlife Service, U.S. Geological Survey, National Oceanic and Atmospheric Administration, California Department of Fish and Game, National Marine Fisheries Service, and the U.S. Marine Mammal Commission.

Dr. Goldstein founded the Marine Ecosystem Health Diagnostic and Surveillance Laboratory, with the goal to provide timely, accurate diagnostic services to assess health and the impact of disease on marine wildlife and to identify the role of various pathogens in contributing to wildlife losses. Working with the academic and scientific community she performs high quality marine and terrestrial wildlife research, and partners with state, federal, profit and not for profit organizations to accomplish this goal; working to disseminate information to promote science-based decisions affecting living resources and their habitat. As a co-investigator of PREDICT projects she leads the effort to build laboratory testing capacity within the participating countries collaborating laboratories to perform diagnostic testing for priority viral families.

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# USING A CONVENTIONAL STRATEGY

to Develop a New Paradigm for  
Novel Virus Detection and Building Capacity  
to Implement Globally

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**R**apid identification of pandemic threats has recently become more feasible due to implementation of One Health approaches. Most genomic approaches for viral discovery are extremely expensive and available only in sophisticated laboratories with teams of diagnosticians and bioinformaticians. Therefore, more economical and technologically simple approaches were sorely needed to forecast novel pathogen emergence. Broadly reactive consensus polymerase chain reaction (PCR) assays have been used extensively for decades in research laboratories to detect and characterize novel pathogens. Through the Emerging Pandemic Threats PREDICT Project, this strategy for viral identification and pathogen detection has been newly initiated in diagnostic laboratories globally to detect both known and novel pathogens in tandem rather than sequentially. Consensus (genus/family level) PCR is a powerful tool that produces specific, high-resolution data and allows for quicker detection of potential pathogens, especially important for the diagnosis of mystery illnesses in medical hospitals and veterinary labs and in the event of an outbreak to respond appropriately to minimize both effect and spread. Because the PREDICT Project has focused on viral emergence from wildlife in remote areas, we have been working with laboratories in some of the most resource-constrained countries to develop local capacity to use consensus PCR. Testing of targeted samples based on the circumstances that promote disease and the potential route of exposure has already been implemented in 15 of 27 partner laboratories, and in less than two years the project has detected more than 200 novel viruses from wildlife that are related to those that cause illness, epidemics, and pandemics in people including SARS-like coronaviruses, novel human adenoviruses, and a new clade of Ebola. Not only have animal viruses shared by multiple animal hosts been detected, but also human viruses in animals and vice versa. Combining cutting-edge surveillance techniques with practical implementation of holistic, One Health approaches, the global health community has now contributed significantly to inexpensive diagnostic improvement for the individual, while realizing the original goal of step-wise improvement of pandemic prevention.