

CURRICULUM VITAE

Kanya Claudine Long, PhD, MHS

CONTACT INFORMATION

Address: Atkinson Hall, Room 6304, University of California San Diego, La Jolla, CA 92093; Phone (cell): 858-285-0128; Phone (office): 858-246-5248; Email: kclong@eng.ucsd.edu; Website: kanyalong.org; Twitter: [@kanyalong](https://twitter.com/kanyalong)

EDUCATION

- December 2012 Postdoctoral training in vector biology
Department of Entomology and Nematology, University of California, Davis, Davis, California
- May 2011 Doctor of Philosophy in Microbiology and Immunology
University of Texas Medical Branch, Galveston, Texas
Dissertation: *Assessing the Urbanization Potential of Mayaro Virus: Human host capacity and Aedes aegypti vector competence for a tropical alphavirus*
- May 2001 Master of Health Science in International Health, Health Systems Management
Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland
- May 1997 Bachelor of Science in Biology, Bachelor of Arts in English; Spanish/history minors, *cum laude*
Atlantic Union College, South Lancaster, Massachusetts

PROFESSIONAL EXPERIENCE

Positions held

- 2020 – present Assistant Adjunct Professor, Herbert Wertheim School of Public Health and Human Longevity Science, University of California, San Diego, California
Policy-directed research to develop consensus among a broad coalition of gene drive researchers on how to move responsibly toward field trials of gene drive organisms; development of a conceptual framework to apply stakeholder engagement to gene drive policy decisions
- 2019 – 2020 Research Data Analyst IV and Assistant Adjunct Professor, Division of Health Policy, Department of Family Medicine and Public Health, University of California San Diego, San Diego, California
Qualitative research on community and stakeholder engagement needs for development and testing of gene drive mosquitoes
- 2018 – 2019 Consultant, World Bank, Washington, DC (San Diego-based)
Health, Nutrition, and Population Global Practice, preparation of country case studies (Senegal, Ghana, India, Thailand, Vietnam, Denmark) and contributions to a report on investments in the human health, agriculture, and environmental sectors to reduce antimicrobial resistance
- 2017 – 2018 AAAS Roger Revelle Fellow in Global Stewardship and Health Specialist in the Agriculture Global Practice at the World Bank, Washington, DC
Program support for the Regional Disease Surveillance Systems Enhancement Program in West Africa; analytical work on Rift Valley and Crimean-Congo hemorrhagic fevers in the Sahel and on plague in Madagascar

2013 – 2016	Assistant Professor of Biology, Andrews University, Berrien Springs, Michigan Undergraduate/graduate level teaching and research mentoring
2010 – 2012	Postdoctoral Scholar, University of California, Davis, Iquitos, Peru/Davis, California, and Naval Medical Research Unit Six, Iquitos, Peru Epidemiological and entomological studies on the transmission of dengue virus and enzootic alphaviruses
2004 – 2010	Graduate Assistant, University of Texas Medical Branch, Galveston, Texas Laboratory and field research on Mayaro virus transmission
2003 – 2004	Research Associate, Johns Hopkins Bloomberg School of Public Health, Yaoundé, Cameroon/Baltimore, Maryland Project development; program administration
2002 – 2003	Program Assistant, Johns Hopkins Cameroon Program, Yaoundé, Cameroon Study management; proposal and budget preparation
2001 – 2002	Management Consultant, Adventist Health International, Cameroon Health institution management and capacity assessment
1997 – 1998	Foreign Expert (English Teacher), Chinese Academy of Sciences, Changchun, China Graduate-level English language course preparation, delivery and assessment

Fellowships and awards

2017 – 2018	AAAS Science and Technology Policy Fellowship
2013	The American Association of Immunologists, Undergraduate Science Faculty Program award, deferred to and accepted in 2014
2007 – 2008	National Security Education Program David L. Boren Fellowship
2004 – 2007	National Science Foundation Graduate Research Fellowship
2004	Graduate School of Biomedical Sciences Associates Recruitment Scholarship, University of Texas Medical Branch
2004	Travel Award, McLaughlin Symposium, “Infectious Diseases from Nature: Mechanisms of Viral Emergence and Persistence,” University of Texas Medical Branch

Short courses and other training

Current	CITI Human Subjects Research Education
2014	Advanced Immunology, The American Association of Immunologists
2014	Multilevel Models, Graduate Summer Institute of Epidemiology and Biostatistics, Johns Hopkins Bloomberg School of Public Health
2013	VectorBase Workshop, Arthropod Genomics Symposium
2012	Strategies and Techniques for Analyzing Microbial Population Structures, Woods Hole Marine Biological Laboratories
2012	Workshop on Molecular Evolution, Woods Hole Marine Biological Laboratories
2012	Visiting Scientist, University of Texas Medical Branch

2007	Phlebotomy Certification, Medtexx Medical Corporation
2006	Training in field collection techniques for arbo- and hantaviruses, Instituto Evandro Chagas, Belém, Brazil
2005 – 2010	Biosafety Level 3 laboratory training and experience, University of Texas Medical Branch
2005	US CDC-FBI clearance for work with Select Agents
2004	Mosquito collection and identification, Organisation de Coordination pour la lutte contre les Endémies en Afrique Centrale (OCEAC), Yaoundé, Cameroon
2003	Clinical Vaccine Trials: Planning and Implementation, Johns Hopkins Bloomberg School of Public Health
1999	Tropical Medicine and Public Health (ASTMH certification course), Johns Hopkins Bloomberg School of Public Health

LABORATORY AND FIELD RESEARCH METHODS

Management of mid-scale studies on HIV, alpha- and dengue viruses with international teams, including academic, governmental, and pharmaceutical partners

Point person in facilitating data collection and sharing for Gates Foundation funded measles research for the Johns Hopkins Cameroon Program in Yaoundé, Cameroon; country lead in a 7-country study by Merck Research Laboratories to determine adenovirus prevalence in preparation for use as an HIV vaccine vector and to determine cross-clade protection from sera of HIV-infected volunteers (in Cameroon: 5 clinics, >350 participants, maintenance of case report forms, working with in-country academic and Ministry of Health partners, and shipment of laboratory samples to the US, with resulting 100% follow-up in study participants and 98% viability of blood cells shipped); supportive role in the management of community-based longitudinal cohorts to monitor transmission of dengue virus in Iquitos, Peru; management of one site in a multi-national study to prepare for an application for FDA approval of a rapid diagnostic test for dengue; substantive participation in grant proposal development with research groups at Johns Hopkins University and University of California, Davis, resulting in >\$10 million in funding

Human subjects protocol preparation and maintenance through continuing reviews

Pre-doctoral work, Johns Hopkins Cameroon Program, all human subjects research; doctoral work, amendments on existing protocols for work with human subjects' samples; post-doctoral work, IRB applications and maintenance of pilot study and R03 follow-up to explore experimental methods for field infection of *Ae. aegypti* with dengue virus under UC Davis, and continuing review for all alphavirus-related study by NAMRU-6 Virology

Cell culture and virus propagation technique, BSL-2 and BSL-3

Doctoral research, laboratory of Dr. Robert Tesh, work mammalian and insect cell lines, and with alphaviruses (Mayaro and Sindbis), flaviviruses (West Nile and St. Louis encephalitis), bunyaviruses (Upolu, Sunday Canyon, and Aransas Bay), and rhabdoviruses (Maraba, Carajas and Harlingen)

Serological assays, including enzyme linked immunofluorescence assay (ELISA), immunofluorescence assay (IFA), complement fixation (CF), hemagglutination inhibition assay (HAI)

Doctoral research, laboratory of Dr. Robert Tesh, IFA for the detection of flaviviruses and rhabdoviruses in field-collected *Cx. quinquefasciatus* and *Aedes* species mosquitoes; CF and HAI as a trainee under Dr. Amelia Travassos da Rosa at UTMB

Plaque assay (PA) and plaque reduction neutralization test (PRNT)

Doctoral research, laboratory of Dr. Robert Tesh, PA as primary method for virus quantitation, PRNT as method to determine seroprevalence of neutralizing antibody against Mayaro virus in rural and urban communities in Peru

PCR and quantitative RT-PCR viral genetic amplification, primer/probe design, Sanger sequencing, and phylogenetic analyses (PAUP* and MrBayes)

Doctoral research, laboratory of Dr. Robert Tesh, design of primers and probe for quantitation of Mayaro virus RNA, PCR for exercise in determining rhabdovirus phylogeny; and post-doctoral work, laboratory of NAMRU-6 in Iquitos, Peru, PCR for DENV detection and laboratory of Dr. Scott Weaver at UTMB, PCR and Sanger sequencing to determine Mayaro virus phylogeny from full-length sequences

Experimental mosquito infection and saliva collection technique

Doctoral research laboratory of Dr. Robert Tesh, BSL-2 and BSL-3 infection of *Aedes aegypti* mosquitoes with Mayaro virus; and post-doctoral work, field station of Dr. Tom Scott and Dr. Amy Morrison, comparative (direct and indirect) infection of *Ae. aegypti* mosquitoes with dengue viruses

Field collection and identification of *Aedes*, *Culex*, *Ochlorotatus*, *Haemagogus*, and *Sabethes* species of mosquito

Training, Organisation de Coordination pour la lutte contre les Endémies en Afrique Centrale (OCEAC) in Yaoundé, Cameroon and UC Davis Proyecto Dengue field team in Iquitos, Peru; supporting role with Instituto Evandro Chagas at field stations near Carajas, Para, Brazil; manual and light trap collections of mosquitoes for alphavirus surveillance

Preparation of wild-caught mosquito specimens for virus detection; harvesting and processing of organs from birds for arbovirus detection

Doctoral research, laboratory of Dr. Robert Tesh, as part of Tesh-Harris County arbovirus surveillance study

Field collection of birds (mist net collections) and rodents (Sherman live animal trapping)

Supporting role (two weeks), Instituto Evandro Chagas at field stations near Carajás, Pará, Brazil

Electron microscopy

Trainee experience, laboratory of Dr. Vsevolod Popov (UTMB), identification of unclassified tick-borne viruses

SCHOLARSHIP**Peer-reviewed publications in print**

- 1 **Long KC**, Alphey L, Annas GJ, Bloss CS, Campbell KJ, Champer J, Chen C-H, Choudhary A, Church GM, Collins JP, Cooper KL, Delborne JA, Edwards OR, Emerson CI, Esvelt K, Evans SW, Friedman, RM, Gantz VM, Gould F, Hartley S, Heitman E, Hemingway J, Kanuka H, Kuzma J, Lavery JV, Lee Y, Lorenzen M, Lunshof JE, Marshall JM, Messer PW, Montell C, Oye KA, Palmer MG, Papathanos PA, Paradkar PA, Piaggio AJ, Rasgon JL, Rašić G, Rudenko L, Saah JR, Scott MJ, Sutton JT, Vorsino AE, Akbari OS. Core commitments for field trials of gene drive organisms. In Press (Science).
- 2 **Long KC**, Sulca J, Bazan I, Astete H, Jaba H, Siles C, Kocher C, Vilcarromero S, Schwarz J, Escobedo K, Castro F, Angulo L, Flores G, Ramal C, Halsey ES, Hontz R, Paz-Soldan V, Scott TW, Lambrechts L, and Morrison AC. Feasibility of feeding *Aedes aegypti* mosquitoes on dengue virus-infected human volunteers for vector competence studies in Iquitos, Peru. PLoS Negl Trop Dis. 2019 Feb 12;13(2):e0007116.
- 3 Morrison AC, Schwarz J, **Long KC**, Cordova J, Rios JE, Quiroz WL, Vizcarra SA, Lambrechts L, and Paz-Soldan VA. Acceptability of feeding *Aedes aegypti* mosquitoes on dengue virus-infected human volunteers for vector competence studies in Iquitos, Peru. PLoS Negl Trop Dis. 2019 Feb 11;13(2):e0007090.
- 4 Perkins TA, Paz-Soldan VA, Stoddard ST, Morrison AC, Forshey BM, **Long KC**, Halsey ES, Kochel TJ, Elder JP, Kitron U, Scott TW, Vazquez-Prokopec GM. Calling in sick: impacts of fever on intra-urban human mobility. Proc R Soc B. 2016 Jul 13;283(1834).
- 5 Forshey BM, Reiner RC, Olkowski SM, Morrison AC, Espinoza A, **Long KC**, Vilcarromero S, Wearing HJ, Halsey ES, Kochel TJ, Scott TW, Stoddard ST. Homologous re-infection by dengue virus type 2 in Peru. PLoS Negl Trop Dis. 2016 Feb 5;10(2):e0004398.
- 6 Duong V, Lambrechts L, Paul R, Ly S, Lay SR, **Long KC**, Ngan C, Tarantola A, Scott TW, Sakuntabhai A, Buchy P. Asymptomatic humans transmit dengue virus to mosquitoes. Proc Natl Acad Sci USA. 2015 Nov 24;112(47):14688-93.
- 7 Auguste AJ, Liria J, Forrester NL, Giambalvo D, Moncada M, **Long KC**, Moron D, de Manzione N, Tesh RB, Halsey ES, Kochel TJ, Hernandez R, Navarro JC, Weaver SC. Evolutionary and ecological characterization of Mayaro virus strains isolated from the first reported outbreak in Venezuela, 2010. Emerg Infect Dis. 2015 Oct;21(10):1742-50.

- 8 Pal S, Dauner AL, Valks A, Forshey BM, **Long KC**, Sierra G, Picos V, Wilson S, Morrison AC, Halsey ES, Comach G, Yasuda C, Loeffelholz M, Jarman RG, Fernandez S, Kochel TJ, Wu SL. Multi-country prospective clinical evaluation of two ELISAs and two rapid diagnostic tests for diagnosing dengue fever. *J Clin Microbiol*. 2015 Apr;53(4):1092-102.
- 9 Williams M, Chen R, Volkova E, Vilcarromero S, Mayer SV, Widen S, Wood T, Suarez-Ognio L, **Long KC**, Hanley KA, Morrison AC, Vasilakis N, Halsey ES. Lineage II of Southeast Asian/American DENV-2 is associated with a severe dengue outbreak in the Peruvian Amazon. *Am J Trop Med Hyg*. 2014 Sep;91(3):611-620.
- 10 Reiner RC, Stoddard ST, Forshey BM, King AA, Ellis AM, Lloyd AL, **Long KC**, Rocha C, Vilcarromero S, Astete H, Bazan I, Lenhart A, Vazquez-Prokopec GM, Paz-Soldan VA, McCall PJ, Kitron U, Elder JP, Halsey ES, Morrison AC, Kochel TJ, Scott TW. Time-varying, serotype-specific force of infection of dengue virus. *Proc Natl Acad Sci U S A*. 2014 Jul 1;111(26):e2694-2702.
- 11 Juarez D, **Long KC**, Aguilar PV, Kochel T, Halsey ES. Assessment of plaque assay methods for alphaviruses. *J Virol Methods*. 2013 Jan;187(1):185-9.
- 12 Castillo Oré RM, Forshey BM, Huaman A, Villaran M, **Long KC**, Kochel TJ, Guevara C, Montgomery J, Alvarez CA, Vilcarromero S, Morrison AC, Halsey ES. Serologic evidence for human hantavirus infection in Peru. *Vector Borne Zoonotic Dis*. 2012 Aug;12(8):683-9.
- 13 **Long KC**, Ziegler SA, Thangamani S, Hausser NL, Kochel TJ, Higgs S, Tesh RB. Experimental transmission of Mayaro virus by *Aedes aegypti*. *Am J Trop Med Hyg*. 2011 Oct;85(4):750-757.
- 14 Cummings DA, Moss WJ, **Long K**, Wiysonge CS, Muluh TJ, Kollo B, Nomo E, Wolfe ND, Burke DS. Improved measles surveillance in Cameroon reveals two major dynamic patterns of incidence. *Int J Inf Dis*. 2006 Mar;10(2):148-55.
- 15 Waters HR, Dougherty L, Tegang SP, Tran N, Wiysonge CS, **Long K**, Wolfe ND, Burke DS. The coverage and costs of childhood immunizations in Cameroon. *Bull of the WHO*. 2004 Sep;82(9):668-75.

Manuscripts in submission and in preparation

- 1 Gunn RA, Bellettiere J, Garfein RS, **Long KC**, Binkin NJ, Anderson CAM. COVID-19 cases and contacts at high risk of transmission: a strategy to reduce community spread. In Revision (Public Health Reports).
- 2 Carlin EP, Machalaba C, Berthe FCJ, **Long KC**, Morens DM, Karesh WB. Unmet needs in health security lead to pandemics. In Submission (Health Affairs).
- 3 Morrison AC, Paz Soldan VA, Vasquez-Prokopec BM, Lambrechts L, Elson WHD, Barrera P, Armijos V, Leguia M, Jenkins S, **Long KC**, Kawecki A, Reiner, Jr. RC, Perkins TA, Lloyd AL, Waller LA, Hontz RD, Stoddard ST, Barker CM, Kitron U, Elder JP, Rothman AL, and Scott TW. Quantifying heterogeneities in virus transmission in Iquitos, Peru: rationale and methodology for a prospective longitudinal study of dengue and Zika viruses from July 2014 to April 2019. In Preparation.
- 4 **Long KC**, Akbari OS, Bier E, James T, Lanzaro G, Marshall JM, Bloss CS. Engagement to action: perspectives on the utility of focus group findings by gene drive developers. In Preparation.
- 5 **Long KC**, Forshey BM, Morrison AC, Huaman A, Guevara C, Watts D, Halsey ES, Travassos da Rosa AP, Montgomery J, Kochel T, Tesh RB. Cross-sectional study comparing Mayaro virus antibody prevalence in urban and rural communities of Maynas Province, Peru. In Preparation.

Reports and white papers

- 1 World Bank. Pulling together to beat superbugs: knowledge and implementation gaps in addressing antimicrobial resistance. World Bank, Washington. DC. 2019. <https://openknowledge.worldbank.org/handle/10986/32552>. (consulting role)

- 2 Carlin EP, Machalaba C, Berthe F, **Long KC**, Karesh WB. Building resilience to biothreats: an assessment of core unmet global health security needs. EcoHealth Alliance, November 2018.
- 3 **K Long** and F Berthe. Mitigation and control of plague in Madagascar: a review of World Bank investments, 2018 (internal).

Invited talks

The migration, climate change, and vector-borne disease nexus, for *The Drivers of Emerging Zoonotic Diseases (Science and Policy Interface session)* at the *5th International One Health Congress*, Saskatoon, Canada, June 23, 2018.

Zika virus developments, for Andrews University, Berrien Springs, Michigan, March 29, 2016.

Urban arboviruses: from the forest to you, for Westminster College, New Wilmington, Pennsylvania, March 4, 2016.

Feasting at a larger table: Community and the appreciation of “other,” for *J. N. Andrews Honors Program Agape Feast*, Andrews University, Berrien Springs, Michigan, September 19, 2014.

From mosquito blood meals to public health priorities: why vector competence matters, for *E. O. Grundset Lecture Series*, Southern Adventist University, Collegedale, Tennessee, January 10, 2013.

Otros arbovirosis de importancia: encefalitis equina venezolana y Mayaro en el Peru, for *Curso Internacional de Enfermedades Tropicales e Infecciosas*, Iquitos, Peru, October 7, 2011.

Mayaro and Oropouche: enzootic arboviruses in Loreto, Peru, for *Actualización en Enfermedades y Infecciosas Tropicales*, Iquitos, Peru, December 4, 2010.

New context of dengue in Iquitos, for *Curso Internacional de Terapéutica Médica*, Iquitos, Peru, November 20, 2010.

Symposium moderation and other conference contributions

Carlin E, Machalaba C, **Long KC**, Berthe FCJ, Carroll D, and Karesh WB. Prevention through recovery: Multisectoral core global health security preparedness needs. *Global Health Security 2019* (Sydney, Australia), 2019.

Long KC (moderator), Seifman R, and Berthe F. Migration, health, and diplomacy. *AAAS Science Diplomacy 2018* (Washington, DC, USA), 2018.

Lambrechts L, Duong V, Paul R, Ly S, Lay SR, **Long KC**, Ngan C, Tarantola A, Scott TW, Sakuntabhai A and Buchy P. Asymptomatic humans transmit dengue virus to mosquitoes. *American Society of Tropical Medicine and Hygiene* (Philadelphia, Pennsylvania, USA), 2015.

Astete H, Morrison AC, Halsey ES, Vasquez R and **Long K**. Mosquito species diversity and abundance in neighborhoods with previous arbovirus activity in Iquitos, Peru, 2010-2013. *American Society of Tropical Medicine and Hygiene* (Philadelphia, Pennsylvania, USA), 2015.

Kolpacoff V, Trine C and **Long K**. Spatial analysis of Mayaro virus antibody prevalence outside of Iquitos, Peru. *Michigan Academy of Science, Arts, and Letters Conference* (Berrien Springs, Michigan, USA), 2015.

Sulca J, **Long KC**, Scott TW, Guevara C, Silva M, Castillo E and Morrison AC. Comparing fluorescent focus assays (FFAs) with plaque assays (PAs) in dengue confirmed cases. *American Society of Tropical Medicine and Hygiene Annual Meeting* (New Orleans, Louisiana, USA), 2014.

Morrison AC, **Long KC**, Paz-Soldan V, Astete H, Bazan I, Jaba H, Hontz R, Scott TW and Lambrechts L. Methods for measuring natural dengue transmission from humans to mosquitoes. *4th Pan-American Dengue Research Network Meeting* (Belem, Brazil), 2014.

Pal S, Valks A, Kochel TJ, Halsey ES, Comach G, Yasuda C, Loeffelholz M, Forshey BM, **Long KC**, Morrison AC, Jarman RG, Fernandez S, Jasper LE and Wu SL. Multicenter clinical evaluation of four dengue diagnostic devices. Military Health System Research Symposium (Fort Lauderdale, Florida, USA), 2014.

Wesson DM, Morrison AC, Paz Soldan VA, Moudy RM, **Long K**, Ponnusamy L, Davis JK, Astete H, Kennedy L, Halsey ES, Schal C, Scott TW and Apperson CS. Update on evaluation of an attractive lethal ovitrap (ALOT) against *Aedes aegypti* for dengue control in Iquitos, Peru. American Society of Tropical Medicine and Hygiene Annual Meeting (Washington, DC, USA), 2013.

Olkowski S, Forshey BM, Stoddard ST, Morrison AC, Vilcarromero S, **Long KC**, Halsey ES, Maldonado MS, Alvarez C, Kochel TJ and Scott TW. Attenuated disease in post-secondary DENV-3 and DENV-4 infection in Iquitos, Peru. American Society of Tropical Medicine and Hygiene Annual Meeting (Atlanta, Georgia, USA), 2012.

Vasquez G, Astete H, Goodson D, Vizcaino L, Chuquipiondo N, **Long K**, Morrison A, McCall P and Lenhart A. Evidence of highly focal patterns of pyrethroid resistance in *Aedes aegypti* in Iquitos, Peru. American Society of Tropical Medicine and Hygiene Annual Meeting (Atlanta, Georgia, USA), 2012.

Wesson DM, Morrison AC, Paz Soldan VA, Moudy RM, **Long K**, Ponnusamy L, Mohler JP, Astete H, Kennedy L, Halsey ES, Schal C, Scott TW and Apperson. Evaluation of an attractive lethal ovitrap (ALOT) against *Aedes aegypti* for dengue control in Iquitos, Peru. American Society of Tropical Medicine and Hygiene Annual Meeting (Atlanta, Georgia, USA), 2012.

Espinoza A, Forshey BM, Rios Z, Morrison AC, Stoddard ST, **Long KC**, Vilcarromero S, Sihuinchu M, Alvarez C, Scott TW, Kochel TJ and Halsey ES. Failure of high titer DENV-2 neutralizing antibodies to protect against symptomatic America/Asian DENV-2 infection. American Society of Tropical Medicine and Hygiene Annual Meeting (Philadelphia, Pennsylvania, USA), 2011.

Olkowski SM, Forshey BM, Stoddard ST, Morrison AC, Vilcarromero S, **Long KC**, Halsey ES, Sihuinchu Maldonado M, Alvarez C, Kochel TJ and Scott TW. Association between pre-existing DENV antibody and the occurrence of symptomatic illness due to DENV-4 infection, Iquitos, Peru. American Society of Tropical Medicine and Hygiene Annual Meeting (Philadelphia, Pennsylvania, USA), 2011.

Williams M, Halsey ES, Volkova E, Vilcarromero S, Mayer SA, Tsetsarkin K, Suarez-Ognio L, **Long KC**, Morrison AC and Vasilakis N. Emergence of a new lineage of dengue-2 virus with increased pathogenesis in Peru. American Society of Tropical Medicine and Hygiene Annual Meeting (Philadelphia, Pennsylvania, USA), 2011.

Juarez D, **Long K**, Aguilar P, Kochel T and Halsey E. Assessment of plaque assay methods for alphaviruses. American Society of Tropical Medicine and Hygiene Annual Meeting (Atlanta, Georgia, USA), 2010.

Long K, Ziegler SA, Hausser N, Higgs S and Tesh RB. *Aedes aegypti* infection barrier may limit urban transmission of Mayaro virus in Iquitos, Peru. American Society of Tropical Medicine and Hygiene Annual Meeting (Atlanta, Georgia, USA), 2010.

Long K, McGee CE, Tsetsarkin KA, Higgs S and Tesh RB. Susceptibility of *Aedes aegypti* to oral infection with Mayaro virus. American Society of Tropical Medicine and Hygiene Annual Meeting (Washington, DC, USA), 2009.

Long K, Morrison AC, Forshey BM, Huaman A, Rocha C, Carrion R, Carey C, Montgomery JM, Tesh RB and Kochel T. Seroprevalence rates of Mayaro virus antibody in urban and rural areas of Maynas Province, Peru. American Society of Tropical Medicine and Hygiene Annual Meeting (New Orleans, Louisiana, USA), 2008.

Other research productions

Estudio piloto para evaluar la transmission del virus del dengue de personas infectadas a zancudos sanos, 2011 (role: creative direction). Video presentation of study purpose and methods as a component of the informed consent process produced by Alan Lozano Freitas.

Grant support – current

1R01TR003514-01 (Bloss)
NIH/NCATS

9/1/2020–08/31/2024
Annual: \$450,744/Total: \$1,860,859

Public Engagement for Gene Drive Technology

The goal of this study is to develop a robust conceptual framework for public engagement to guide the development of gene drives and other emerging technologies from early proof of concept through field trials to deployment.

Role Co-Investigator, 2.4 calendar

HR0011-17-2-0047 (Akbari)

07/01/2017–06/30/2021

DARPA vis subcontract from UCR

Annual \$1,200,000 (UCSD Sub)

Safely Engineering Various Classes of Gene Drives to Control a Major Invasive Disease Vector, *Aedes aegypti*

Goal: This project explores the efficacy and safety of numerous gene drive systems for population suppression or replacement strategies for the control of *Aedes aegypti*

Role: Researcher, 5.7 calendar

Grant support – in review

NIH R21

(B Colman and KC Long, co-PIs)

\$275,000 (direct)

Comparing SARS-CoV-2 Population Structures in Binational Healthcare Settings using Genomic Surveillance

In this project, we will utilize viral genomics and Bayesian models to examine introduction events and transmission dynamics of SARS-CoV-2 in healthcare workers from binational healthcare systems and compare these patterns to the dynamics seen in the surrounding community.

Grant support – completed

NIH P01

(TW Scott, PI)

05/01/14 – 04/30/20 (NCE)

Quantifying Heterogeneities in Dengue Virus Transmission Dynamics

\$7,300,000

This program will explore the contributions of dengue virus infected people with varying disease manifestations, through experimental entomologic, social-clinical and modeling methods.

Role: Consultant (Project 1: Dengue virus transmission from viremic people to mosquitoes)

Bill and Melinda Gates Foundation

(KC Long, lead)

04/15/18 – 12/31/18

Climate Change, Transhumance, and Enzootic Vector-Borne Viruses in Four Countries of the Sahel

\$100,000

This spatial and machine learning analysis of the risk of Rift Valley fever virus and Crimean-Congo hemorrhagic fever in the Sahel under various climate change scenarios will contribute to planning for health and development in the ecologically, economically, and socially fragile region. (Project discontinued 9/2018 with end of fellowship)

Role: Lead author

AU Faculty Research Grant

(KC Long, PI)

05/01/14 – 04/30/16

Complementary Local and International Research Opportunities for Undergraduates in the Arbovirus Ecology

Laboratory

\$4,000

This grant supported the establishment of a local insectary for work with *Ae. japonicus*, an invasive mosquito in Michigan, and an existing collaboration on dengue virus-*Ae. aegypti* dynamics in Iquitos, Peru.

Role: Principal Investigator

AU Faculty Research Grant

(D Murray, PI)

05/01/14 – 04/30/16

Hybrid Heterocyclic Boronic Acids as Potential Inhibitors against Alphaviruses

\$5,000

This project was conducted in collaboration with the Department of Chemistry and in support of a master's project, with the goal of developing novel compounds targeting glycoproteins to inhibit alphaviruses in mammalian cell culture.

Role: Co-Investigator

NIH R03

(AC Morrison and L Lambrechts, co-PIs)

04/01/13 – 03/31/15

Methods for Measuring Natural Dengue Transmission from Humans to Mosquitoes

\$126,000

The goal of this project was to develop the methodology for mosquito feeding experiments on viremic people and their blood to quantify the epidemiological contribution of dengue virus infected people across the full spectrum of disease.

Role: Co-Investigator

AU Faculty Research Grant

(KC Long, PI)

05/01/13 – 04/30/14

Spatial Risk of Exposure to Alphaviruses in Northeastern Peru

\$4,840

The goal of this project was to conduct a multi-level examination of risk and to characterize landscape ecologies associated with serological evidence of infection with Venezuelan equine encephalitis and Mayaro viruses in residents of rural villages in Maynas Province, Peru.

Role: Principal Investigator

DOD Global Emerging Infections Surveillance (ES Halsey, PI) 11/01/11 – 10/31/12
 Surveillance of Enzootic Alphaviruses in the Peruvian Amazon \$134,000
 The goal of this project was to refine our understanding of the transmission cycles of these viruses within and outside of the city of Iquitos through serological and molecular methods.
 Role: Co-Investigator

NIH N01-A1-25489 (RB Tesh, PI) 09/30/02 – 09/29/09
 U.S.-Based Collaboration in Emerging Viral and Prion Diseases
 The goal of this project was to investigate viruses and prions that are of increasing public health concern or that have the potential to emerge as human pathogens.
 Role: Graduate student researcher

TEACHING

Courses and guest lectures

Health Policy, Technology, and Public Health, Winter 2021 (students in UCSD-SDSU Joint Doctoral Program in Public Health) at University of California San Diego

Health Policy, Technology, and Public Health (course co-direction with Cinnamon Bloss), Winter 2020 (students in UCSD-SDSU Joint Doctoral Program in Public Health) at University of California San Diego

Guest lecture: “*Biological modifications to control vector-borne diseases*,” Climate change and global health (undergraduates), Winter 2020 (March 3) at Scripps Institution of Oceanography, University of California San Diego

Guest lecture: “*Urbanization, expansion of mosquito-borne disease, and control of vectors*,” Environmental and Occupational Health (BSPH students), Winter 2020 (January 30) at University of California San Diego

Virology, taught biennially (with lab), Fall 2013 to 2015 (primarily 3rd and 4th year biology majors; master’s students in biology) at Andrews University

Immunology (with lab), Fall 2014 to 2015 (primarily 3rd and 4th year biology majors; independent study with senior student focusing on the immunology of dengue virus) at Andrews University

Research Methods and Biology Seminar II, Spring 2016 (master’s students in biology) at Andrews University

Scientific Communication, taught annually, Spring 2015 to 2016 (3rd and 4th year biology majors) at Andrews University

Environmental Science (with lab), taught Fall 2013 and Spring 2014, then annually thereafter (general education course) at Andrews University

Topics: Vector Biology and Disease, taught Spring 2014 and Spring 2016 (2nd through 4th year biology majors; master’s students in biology and in international development) at Andrews University

Topics: Surveillance Systems in Global Health, taught Spring 2015 (biology and international development majors; master’s students in biology) at Andrews University

Epidemiology (module in *Principles of Infectious Disease: Understanding the Global Impact*), course contributor (distance education, allied health students), Spring Quarter 2006 at Loma Linda University

Research mentoring

Meschelle Weaver, Summer 2020, Promoting accountability and transparency in field trials of gene drive organisms: exploring the feasibility and value of a global registry; current position: MPH student, University of California San Diego

Viktoria Kolpacoff, biology major (biomedical science), Spring 2014 – Spring 2015, Undergraduate Research Scholar award: spatial epidemiologic analysis of risk for alphavirus exposure; current position: Biostatistics Research Assistant, Duke University Cancer Institute

Marc Nelson Starkey, biology (biomedical science) major, Spring 2014 – Spring 2015, comparison of *Culex* spp. mosquito gut biota between habitat types (undergraduate honors thesis); current position: Loma Linda University School of Medicine (MD student, beginning Fall 2015)

Rachel Gray, biology (biomedical science) major, Fall 2013 – Spring 2014, literature review of dengue virus serotype distinctions by host type

William Tritch, mathematics and physics majors, Fall 2013 – Spring 2014, exploratory research in modeling arbovirus emergence and limited chains of transmission; current position: Department of Mathematics and Statistics (PhD student), Texas Tech University

John Zdor, biology major, Fall 2013 – Spring 2014, Undergraduate Research Scholar award: assessing the predicted phylogenies of dengue and other RNA viruses (in collaboration with Jeet Sukumaran, Duke University); current position: DPT program in physical therapy (student), Andrews University

Kayla Burt, biology (zoology) major, Spring 2013, Independent Study: Research in Biology, spatial epidemiologic analysis of risk for alphavirus exposure; current position: Research Assistant, McGill University Health Centre, and MSc in Public Health (distance) student, London School of Tropical Medicine and Hygiene

SERVICE

Committee participation

2013 – 2016	Professional Recommendations Committee (pre-professional advisor representative), Andrews University
2013 – 2016	Academic Policies and Curriculum Committee (faculty representative, Department of Biology) College of Arts and Sciences, Andrews University
2006 – 2007	Basic Biomedical Sciences curriculum committee (student representative) University of Texas Medical Branch
1999 – 2000	Academic planning committee (student representative) Johns Hopkins Bloomberg School of Public Health
1996 – 1997	Honors Core curriculum committee (student representative) Atlantic Union College

Academic advising

32 advisees (biology majors and pre-health professional students of any major), 2015–2016
 23 advisees (biology majors and pre-health professional students of any major), 2014–2015
 14 advisees (biology majors and pre-health professional students of any major), 2013–2014

Ad-hoc journal peer review

American Journal of Tropical Medicine and Hygiene, PLoS Neglected Tropical Diseases, Vector Borne and Zoonotic Diseases, Medical and Veterinary Entomology, Archives of Virology, Emerging Infectious Diseases, Epidemiology and Infection, Bulletin of the WHO, Epidemiology and Infection

Professional society participation

American Society of Tropical Medicine and Hygiene, member since 2005 (current)

Subcommittee: American Committee on Arthropod-Borne Viruses

American Association for the Advancement of Science, member 2004–2009, 2011, 2017–2018 (current)

Community participation

- 2020 – present Advisory group member, Herbert Wertheim School of Public Health and Human Longevity
Science contract tracing; co-lead (with John Bellettiere) in developing the UCSD Return to Learn
contact tracing program and providing support for County of San Diego contact tracing support
- 2018 – 2020 Editor, Sci on the Fly (AAAS Fellows blog)
- 2017 – 2018 Mentor, Boren Scholarship program
- 2017 Regional Director (volunteer), recruited and managed volunteers (two tiers: managed 23
volunteers who headed teams totaling > 400 volunteers) in seven counties for a successful ballot
question initiative to change the method for congressional redistricting in Michigan
Voters Not Politicians, Michigan
- 2013 – 2015 Volunteer, participated in special events outreach and fundraising
Kalamazoo Loaves & Fishes, Kalamazoo, Michigan
- 2000 Volunteer, mapped locations of proposed building projects in relation to protected species
for impact assessment
Nature Conservancy/Maryland Department of Natural Resources, Annapolis, Maryland
- 2000 Intern, prepared policy position responses to print media and participated in constituency
outreach
Gore-Lieberman 2000, Nashville, Tennessee
- 2000 Intern, conducted programmatic research on assuring the human right to intellectual property
for scientific discovery
American Association for the Advancement of Science; Directorate for Science and Policy
Programs, Washington, D.C.

EXTRACURRICULAR ACCOMPLISHMENTS**Languages and foreign experiences**

English, native

Spanish, estimated at advanced in 2012

Peru: three years of residence

French, estimated at intermediate in 2004

Cameroon: three years of residence

China: one year of residence

Portuguese, beginning language skills