

Kathryn Alyce Hanley
Curriculum Vitae

Department of Biology
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Education

1994 Ph.D. University of California, San Diego, La Jolla, CA (Biology)
1989 B.A. Amherst College, Amherst, MA (Biology, magna cum laude)
1987 Semester Abroad University of Edinburgh, Scotland

Academic Positions

| | | |
|----------------|----------------------------------|----------------------------------|
| 2016 – present | Professor, Biology | New Mexico State University |
| 2010- 2016 | Associate Professor of Biology | New Mexico State University |
| 2011 | Visiting Researcher (sabbatical) | Dept. Entomology, UC Davis |
| 2007 - present | Adjunct Professor | Biological Sciences, UTEP |
| 2004 - 2010 | Assistant Professor of Biology | New Mexico State University |
| 1999- 04 | Research Associate | Lab. of Infectious Diseases, NIH |
| 1997- 99 | Postdoctoral Fellow | Biology Dept, Univ. Maryland |
| 1996 - 97 | Visiting Assistant Professor | Biology Dept, Pomona College |
| 1994 - 96 | Postdoctoral Fellow | Evolution&Ecology, UC Davis |
| 1989 - 94 | Ph.D. Candidate | Biology Dept, UC San Diego |

Publications

Peer-reviewed journal articles (h-index = 27)

Google scholar page: <https://scholar.google.com/citations?user=BgvluVkAAAAJ&hl=en&oi=ao>

61. Tsujimoto, H., **K.A. Hanley**, A. Sundararajan, N.P. Devitt, F.D. Schilkey, I.A. Hansen. 2016, submitted. Dengue infection alters midgut and carcass gene expression in the Asian tiger mosquito *Ae. albopictus*. Submitted to *PLoS Neglected Tropical Diseases*.
60. Richman, R.L., M. Diallo, D.Diallo, A.A. Sall, O. Faye, C.T. Diagne, I. Dia, S.C. Weaver, **K.A. Hanley**, M. Buenemann. 2016, in submission. Ecological niche modeling of *Aedes* mosquito vectors of chikungunya virus in Senegal. Submitted to *International Journal of Health Geographics* 10/28/2016
59. Roundy, C.M., S.R. Azar, S.L. Rossi, J.H. Huang, G. Leal, R. Yun, I.A.D. Paploski, U. Kitron, G.S. Ribeiro, **K.A. Hanley**, S.C. Weaver, N. Vasilakis. 2016, submitted. Variation in *Aedes aegypti* competence for Zika virus transmission as a function of viral strain and mosquito geographic origin. submitted to *Emerging Infectious Diseases*.
58. Althouse, B.M., N. Vasilakis, A.A. Sall, M. Diallo, S.C. Weaver, **K.A. Hanley**. 2016, in press. Potential for Zika virus to establish a sylvatic transmission cycle in the Americas. *PLoS Neglected Tropical Diseases*.
57. Andrade, C.C., K.I.Young, W.L. Johnson, M. Villa, C. Buraczyk, W.B. Messer, **K.A.Hanley**. 2016. Rise and fall of mosquito infectivity during sequential strain displacements by mosquito-borne dengue virus. *Journal of Evolutionary Biology*. Epub ahead of print.

56. Rossi, S.L., R.B. Tesh, S.R. Azar, A. Muruato, **K.A. Hanley**, A.J. Auguste, R.M. Langsjoen, N. Vasilakis, S.C. Weaver. 2016. Characterization of a novel murine model to study Zika virus. *American Journal of Tropical Medicine and Hygiene*. 94:1362-9
55. Althouse, B.M., **K.A. Hanley**. The Tortoise or the Hare? Impacts of within-host dynamics on transmission success of arthropod-borne viruses. 2015. *Philosophical Transactions of the Royal Society B: Biological Sciences* (Theme Issue on *Within-Host Dynamics of Infection: From Ecological Insights to Evolutionary Predictions*) 1675: 20140299. PMID: 26150665; PMCID in process.
54. D.E. Brackney, E.E. Schirtzinger, T. Harrison, G.D. Ebel, **K.A. Hanley**. 2015. Modulation of flavivirus population diversity by RNA interference. *Journal of Virology* 89:4035-9 (Spotlight publication). PMID: 25631077; PMC4403385 [Available on 2015-10-01]
53. Schirtzinger, E.E., C.C. Andrade, N. Devitt, T. Ramaraj, J.L. Jacobi, F. Schilkey, **K.A. Hanley**. 2015. Repertoire of virus-derived small RNAs produced by mosquito and mammalian cells in response to dengue virus infection. *Virology* 476:54-60. PMID:25528416; PMCID: in process
52. Althouse, B.M., **K.A. Hanley**, D. Diallo, M. Diallo, A.A. Sall, D.M. Watts, S.C. Weaver, D.A.T. Cummings. 2015. Impact of climate and mosquito vector abundance on sylvatic arbovirus circulation dynamics in Senegal. *American Journal of Tropical Medicine and Hygiene* 92(1):88-97. PMID:25404071; PMCID: in process
51. Diallo, D. A.A. Sall, C.T. Diagne, O. Faye, O. Faye, Y. Ba, **K.A. Hanley**, M. Buenemann, S.C. Weaver, M. Diallo. 2014. Zika virus emergence in mosquitoes in southeastern Senegal, 2011. *PLoS One* 9(10):e109442. PMID:25310102; PMCID:PMC4195678
50. Williams, M., R. Chen, E. Volkova, S. Vilcarrromero, S.V.Mayer, S. Widen, T. Wood, L. Suarez-Ognio, K.C. Long, W. L. Johnson, **K.A. Hanley**, A.C. Morrison, N. Vasilakis, E.S. Halsey. 2014. Introduction of a new lineage of dengue virus type 2 to Peru results in an exceptionally severe dengue disease outbreak. *American Journal of Tropical Medicine and Hygiene* 91:611-20. PMID:25002298; PMCID:PMC4155568[Available on 2015/9/3]
49. **Hanley, K.A.**, M. Guerbois, T. Kautz, M. Brown, S.S. Whitehead S.C. Weaver, N. Vasilakis, P. Marx. 2014. Infection dynamics of sylvatic dengue virus serotype 2 in a natural primate host, the African green monkey. *American Journal of Tropical Medicine and Hygiene* 91:672-6. PMID: 25092823; PMCID:PMC4183386
48. Diallo, D., A.A. Sall, C.T. Diagne, O. Faye, **K.A. Hanley**, M. Buenemann, Y. Ba, O. Faye, S.C. Weaver, M. Diallo. 2014. Patterns of a sylvatic yellow fever virus amplification in southeastern Senegal, 2010. *American Journal of Tropical Medicine and Hygiene* 90:1003-13. PMID:24615140; PMCID: PMC4047721
47. Althouse, B.M., A.P. Durbin, **K.A. Hanley**, S.B. Halstead, S. C. Weaver, D.A.T. Cummings. 2014. Viral kinetics of primate dengue infection in non-human primates: A systematic review and individual pooled analysis. *Virology* 452-453: 237-46. PMID: 24606701; PMCID in process
46. **Hanley, K.A.**, T.M. Monath, S.C. Weaver, S. L. Rossi, R.L. Richman, N. Vasilakis. 2013. Fever versus Fever: the role of host and vector susceptibility and interspecific competition in shaping the current and future distribution of the sylvatic cycles of dengue virus and yellow fever virus. *Infection, Genetics and Evolution* 19:292-311. PMID:23523817; PMCID:PMC3749261
45. Tumban, E., N. Maes, K. Young, E.E. Schirtzinger, C.T. Hanson, S.S. Whitehead, and **K.A. Hanley**. 2013. Replacement of conserved or variable sequences of the mosquito-borne dengue virus 3' untranslated region with homologous sequences from directly-transmitted Modoc virus: no impact on infectivity for mosquitoes. *Journal of General Virology* 94:783-8. PMID: 23255623; PMCID: PMC3709684
44. Diallo, D., C.T. Diagne, **K.A. Hanley**, A.A. Sall, M. Buenemann, Y. Ba, I. Dia, S.C. Weaver, M. Diallo. 2012. Larval ecology of mosquito vectors of dengue-2 and chikungunya virus in southeastern Senegal. *Parasites and Vectors* 5:286 PMID: 23216815; PMCID: PMC3543325
43. Althouse, B.M., J. Lessler, A.A. Sall, M. Diallo, **K.A. Hanley**, D.W. Watts, S.C. Weaver, D.A.T. Cummings. 2012. Synchrony of sylvatic dengue isolations: A multi-host, multi-vector SIR model

- of dengue virus transmission in Senegal. *PLoS Neglected Tropical Diseases* 6:e1928. PMID: 23209867; PMCID: PMC3510077
42. Diallo, D., A.A. Sall, M. Buenemann, O. Faye, R. Chen, C. Diagne, Y. Ba, I. Dia, D. Watts, S.C. Weaver, **K.A. Hanley**, M. Diallo. 2012. Landscape ecology of sylvatic chikungunya virus and mosquito vectors in southeastern Senegal. *PLoS Neglected Tropical Diseases* 6: e1649 PMCID: PMC3373654
 41. Antolin, M.F., K. Jenkins, C.T. Bergstrom, B. Crespi, S. De, A. Moreno-Estrada, A.Hancock, **K.A. Hanley**, R. Nesse, G.S. Omenn, S.C. Stearns. 2012. Evolutionary medicine in undergraduate education: a prescription for all biology students. *Evolution* 66:1991-2006
 40. Rossi, S.R., F. Nasar, J. Cardoso, S.V. Mayer, R.B. Tesh, **K.A. Hanley**, S.C. Weaver, N. Vasilakis. 2012. Genetic and phenotypic characterization of sylvatic dengue virus type 4 strains. *Virology* 423:58-67. PMCID: PMC3253985
 39. **Hanley, K.A.** 2011. The double-edged sword: How evolution can make or break a live-attenuated virus vaccine. *Evolution: Education and Outreach* 4: 635-643.
 38. Mu, R., T.A. Romero, **K.A. Hanley**, A.L. Dawe. 2011. Conserved and variable structural elements in the 5' untranslated region of two hypoviruses from the filamentous fungus *Cryphonectria parasitica*. *Virus Research* 161:203-8. PMCID: PMC3837689
 37. Vasilakis, N., J. Cardoso, **K.A. Hanley**, E.C. Holmes, and S.C. Weaver. 2011. The fever from the forest: Prospects for continued emergence of sylvatic dengue virus and impact on public health. *Nature Reviews Microbiology* 9:532-41. PMCID: PMC3321645
 36. Tumban, E., D.N. Mitzel, N.E. Maes, C.T. Hanson, S.S. Whitehead, **K.A. Hanley**. 2011. Replacement of the 3' untranslated variable region of mosquito-borne dengue virus with that of tick-borne Langkat virus does not alter vector specificity. *Journal of General Virology* 92:841-8. PMCID: PMC3133702
 35. McDowell, M., S.R. Gonzalez, S.C. Kumarapperuma, M. Jeselnik, J.B. Arterburn, **K.A. Hanley**. 2010. A novel nucleoside analog, 1- β -D-ribofuranosyl-3-ethynyl-[1,2,4]triazole (ETAR), exhibits efficacy against a broad range of flaviviruses *in vitro*. *Antiviral Research* 87:78-80 PMCID: PMC2892036
 34. Mukherjee, S., **K.A. Hanley**. 2010. RNA interference modulates dengue virus infection in *Drosophila melanogaster* cells. *BMC Microbiology* 10:127 PMCID: PMC2874549
 33. Vasilakis, N., J. Cardoso, M. Diallo, A.A. Sall, E.C. Holmes, **K.A. Hanley** S.C. Weaver. 2010. Sylvatic dengue viruses share the pathogenic potential of urban/ endemic dengue viruses. *Journal of Virology* 84:3726-7 [letter to the editor] PMCID: PMC2838117
 32. Vasilakis, N., E. Deardoff, J.L. Kenney, S.R. Rossi, **K.A. Hanley**, S.C. Weaver. 2009. Mosquitoes put the brake on evolution: experimental evolution reveals slower mutation accumulation in mosquito cells than vertebrate cells. *PLoS Pathogens* 5:e100467
 31. Joseph, S.B., **K.A. Hanley**, L. Chao, and C.L. Burch. 2009. Coinfection rates in ϕ 6 bacteriophage are enhanced by virus-induced changes in host cells. *Evolutionary Applications*. 2:24-31.
 30. Pepin, K.M., **K.A. Hanley**. 2008. Density-dependent competitive suppression of sylvatic dengue virus by endemic dengue virus in cultured mosquito cells. *Vector Borne and Zoonotic Diseases* 8:821-8.
 29. **Hanley, K.A.**, J.T. Nelson, E. E. Schirtzinger, S.S. Whitehead, and C.T. Hanson. 2008. Superior infectivity for mosquito vectors contributes to competitive displacement among strains of dengue virus. *Biomed Central Ecology* 8:1.
 28. Pepin, K.M., K. Lambeth, **K.A. Hanley**. 2008. Asymmetric competitive suppression between strains of dengue virus. *Biomed Central Microbiology* 8:28.
 27. Blaney, J.E., Jr., N. Sathe, C.T. Hanson. L. Goddard, T.A. Romero, **K.A. Hanley**, B.R. Murphy, S.S. Whitehead. 2008. Dengue virus type 3 vaccine candidates generated by introduction of deletions in the 3' untranslated region (UTR) or exchange of the DENV3 3' UTR with that of DENV4. *Vaccine* 26:817-28. PMID: 18191005; PMCID: PMC2246307

26. Vasilakis, N., E.B. Fokam, C.T. Hanson, E. Weinberg, A.A. Sall, S. S. Whitehead, **K.A. Hanley**, S.C. Weaver. 2008. Genetic and phenotypic characterization of sylvatic dengue strains. *Virology* 377:296-307.
25. Vasilakis, N., E. J. Shell, E.B. Fokam, P.W. Mason, **K.A. Hanley**, D.M. Estes, S.C. Weaver. 2007. Potential of ancestral sylvatic dengue-2 viruses to re-emerge. *Virology* 358:402-12.
24. Romero, T.A., E. Tumban, J. Jun, W.B. Lott, **K.A. Hanley**. 2006. Secondary structure of dengue virus type 4 3' untranslated region: Impact of deletion and substitution mutations. *Journal of General Virology* 87:3291-3296.
23. **Hanley, K.A.**, L.B. Goddard, L.E. Gilmore, T.W. Scott, J. Speicher, B.R. Murphy, A. G. Pletnev. 2005. Infectivity of West Nile/Dengue chimeric viruses for West Nile and Dengue mosquito vectors. *Vector-Borne and Zoonotic Diseases* 5: 1-10.
22. Blaney, Jr., J.E., C.T. Hanson, C. Y. Firestone, **K.A. Hanley**, B.R. Murphy, S.S. Whitehead. 2004. Genetically modified, live attenuated dengue virus type 3 vaccine candidates. *American Journal of Tropical Medicine and Hygiene* 71: 811-821.
21. Blaney, J.E., Jr., C.T. Hanson, **K.A. Hanley**, B.R. Murphy S. S. Whitehead. 2004. Vaccine candidates derived from a novel infectious cDNA clone of an American genotype dengue virus type 2. *Biomed Central Infectious Diseases* 4: 39-49.
20. **Hanley, K.A.**, L.R. Manlucu, G.G. Manipon, C.T. Hanson, S.S. Whitehead, B.R. Murphy, J.E. Blaney Jr. 2004. Introduction of mutations into the non-structural genes or 3' untranslated region of an attenuated dengue virus type 4 vaccine candidate further decreases replication in rhesus monkeys while retaining protective immunity. *Vaccine* 22:3440-3448.
19. Burch, C.L., P.E. Turner, **K.A. Hanley**. 2003. Patterns of epistasis in RNA viruses: a review of the evidence from vaccine design. *Journal of Evolutionary Biology* 16:1223-1235.
18. Whitehead, S.S., **K.A. Hanley**, J.E. Blaney Jr., L.E. Gilmore, W.R. Elkins, B.R. Murphy. 2003. Substitution of the structural genes of dengue virus type 4 with those of type 2 results in chimeric vaccine candidates which are attenuated for mosquitoes, mice and rhesus monkeys. *Vaccine* 21:4307-4316
17. **Hanley, K.A.**, L.R. Manlucu, L.E. Gilmore, J.E. Blaney Jr., C. T. Hanson, B.R. Murphy, S.S. Whitehead. 2003. A trade-off in replication in mosquito versus mammalian systems conferred by a point mutation in the NS4B protein of dengue virus type 4. *Virology* 312: 222-232.
16. Whitehead, S.S., B. Falgout, **K.A. Hanley**, J.E. Blaney Jr., L. Markoff, B.R. Murphy. 2003. A live attenuated dengue virus type 1 vaccine candidate with a 30 nucleotide deletion in the 3' untranslated region is highly attenuated and immunogenic in monkeys. *Journal of Virology* 77:1653-1657.
15. **Hanley, K.A.**, J.J. Lee, J.E. Blaney, Jr., B.R. Murphy, S.S. Whitehead. 2002. Paired charge-to-alanine mutagenesis of dengue virus type 4 NS5 confers temperature-sensitive, host-range and mouse attenuation phenotypes. *Journal of Virology* 76: 525-531
14. **Hanley, K.A.** J.A. Stamps. 2002. Does corticosterone mediate bidirectional interactions between social behaviour and blood parasites in juvenile black iguanas, *Ctenosaura similis*? *Animal Behaviour* 63: 311-322
13. Troyer, J. M. ¹, **K.A. Hanley**¹, S.S. Whitehead, D. Strickman, R.A. Karron, A. P. Durbin, B. R. Murphy. 2001. A live attenuated recombinant dengue-4 virus vaccine candidate with restricted capacity for dissemination in mosquitoes and lack of transmission from vaccinees to mosquitoes. *American Journal of Tropical Medicine and Hygiene* 65:414-419. ¹**Equal contribution by first two authors.**
12. Pletnev, A.G., M. Bray, **K.A. Hanley**, J. Speicher R. Elkins. 2001. Tick-borne Langkat/mosquito-borne dengue flavivirus chimera, a candidate live-attenuated vaccine for protection against disease caused by members of the tick-borne encephalitis virus complex: evaluation in rhesus monkeys and mosquitoes. *Journal of Virology* 75: 8259-8267.

11. Chao, L., **K.A. Hanley**, C. L. Burch, C. Dahlberg, P.E. Turner. 2000. Kin selection and the evolution of virulence in parasites: Making hard and soft choices. *Quarterly Review of Biology* 75:261-275.
10. Schall, J.J., H. R. Prendiville, **K.A. Hanley**. 2000. Prevalence of the tick, *Ixodes pacificus*, on western fence lizards, *Sceloporus occidentalis*: Trends by gender, size, season, site and mite infestation. *Journal of Herpetology* 34:160-163.
9. **Hanley, K.A.**, M.L. Elliott, J.A. Stamps. 1999. Chemical recognition of familiar versus unfamiliar conspecifics by juvenile black iguanas, *Ctenosaura similis*. *Ethology* 105: 641-650.
8. Turner, P.E., C. L. Burch, **K.A. Hanley**, L. Chao. 1999. Hybrid frequencies confirm limit to coinfection in the RNA bacteriophage Phi 6. *Journal of Virology* 73: 2420-2424.
7. **Hanley, K.A.**, K.R. Petren, T.J. Case. 1998. An experimental investigation of the competitive displacement of a native gecko by an invading gecko: no role for parasites. *Oecologia* 115: 196-205.
6. **Hanley, K.A.**, R.N. Fisher, T.J. Case. 1995. Higher mite infestations in sexual geckos than their asexual congeners. *Evolution* 49(3): 418-436.
5. **Hanley, K.A.**, D.M. Vollmer, T.J. Case. 1995. The distribution and prevalence of helminths, coccidia and blood parasites in two competing species of gecko: implications for apparent competition. *Oecologia* 102: 220-229.
4. Radtkey, R.R., S. Donnellan, R.N. Fisher, C. Moritz, **K.A. Hanley**, T.J. Case. 1995. When species collide: the origin and spread of an asexual gecko species. *Proceedings of the Royal Society of London (Biology)* 259:145-152.
3. Upton, S.J., **K.A. Hanley**, T.J. Case. 1994. *Eimeria frenatus* sp. n. and *Eimeria rochalimai* (Apicomplexa: Eimeriidae) from *Hemidactylus frenatus* (Sauria: Gekkonidae) in Hawaii. *Transactions of the American Microscopical Society* 113(3): 390-394.
2. **Hanley, K.A.**, D.T. Bolger, T.J. Case. 1994. Comparative ecology of sexual and asexual gecko congeners (*Lepidodactylus*) in French Polynesia. *Evolutionary Ecology* 8: 438-454.
1. Upton, S.J., **K.A. Hanley**, T.J. Case, C.T. McCallister. 1991. Description of *Isospora schlegeli* (Apicomplexa: Eimeriidae) from gekkonid lizards in the South Pacific. *Canadian Journal of Zoology* 69: 3108-3110.

Books

Hanley, K.A. and S.C. Weaver, editors. 2009. Frontiers in Dengue Virus Research. Caister Academic Press. Hethersett, UK. <http://www.horizonpress.com/dengue>

Book chapters

- K.A. Hanley** and C.C. Andrade. 2016. RNA interference: a pathway to arbovirus control. In Arboviruses. N. Vasilakis and D. Gubler (eds). Caister Academic Press. Hethersett, UK.
- T.P. Endy, S.C. Weaver, and **K.A. Hanley**. 2009. Dengue virus – Past, present and future. In Frontiers in Dengue Virus Research. K.A. Hanley and S.C. Weaver (eds.). Caister Academic Press. Hethersett, UK.
- N. Vasilakis, K. A. Hanley and S.C. Weaver. 2009. Dengue virus emergence from its sylvatic cycle. In Frontiers in Dengue Virus Research. K.A. Hanley and S.C. Weaver (eds.). Caister Academic Press. Hethersett, UK.
- Hanley, K.A.** and S.C. Weaver. 2008. Arbovirus Evolution, pp 351-392. In Origin and Evolution of Viruses (second edition). E. Domingo, C. Parrish and J. F. Holland (eds.). Elsevier, St. Louis, MO. <http://www.elsevier.com/wps/find/bookdescription.cwshome/714974/description#description>

Invited

- Hanley, K.A.** 2012. A Planet of Viruses (Book Review). *Quarterly Rev. of Biology* 87:401-402
- Hanley, K.A.** 1997. Infection, Polymorphism and Evolution (Book Review). *Parasitology*

Today 13: 278

Hanley, K.A., J.E. Biardi, C.M. Greene, T.M. Markowitz, C.E. O'Connell, and J. Hornberger. 1996. The behavioral ecology of host-parasite interactions: An interdisciplinary challenge. *Parasitology Today* 12:371-373.

Hanley, K.A. 1996. Comportamiento social de los garrobos. *Rothschildia* 3: 10.

In Preparation

Young, K.I., S. Mundis, S.G. Widen, T.G. Wood, J. Cardoso, N. Vasikakis, D. Perera, **K.A. Hanley**. Land cover type affects the abundance and distribution of sylvatic dengue virus vectors at a local scale in Malaysian Borneo. For submission to *Parasites and Vectors*

Mayer, S.V., M. Moore, **K.A. Hanley**, N. Vasilakis. Vector competence of *Ae. aegypti* and *Ae. albopictus* mosquitoes for DENV-5, a newly-emerged dengue virus serotype. For submission to *American Journal of Tropical Medicine and Hygiene*.

Patents

• *Dengue tetravalent vaccine containing a common 30 nucleotide deletion in the 3' UTR of dengue types 1, 2, 3, and 4 or antigenic chimeric viruses 1, 2, 3, and 4.*

US Patent No. 7,517,531, Issued 14 Apr 2009.

• *Development of mutations useful for attenuating dengue viruses and chimeric dengue viruses.*

US Patent No. 7,560,118, Issued 14 Jul 2009.

Selected Awards, Honors, Society Positions, and Fellowships

- 2016 • Dalrymple-Young award from the American Committee on Arthropod-borne Viruses
- 2015 • NMSU Research Discovery Award
 - Chair, American Committee on Arthropod-borne Viruses (ACAV)
 - * Standing Member, NIH Study Section on Genetic Variation and Evolution (GVE)
- 2014 • Chair-Elect, American Committee on Arthropod-borne Viruses (ACAV)
- 2013 • President, Rio Grande Branch of the American Society for Microbiology (RG-ASM) [2013-15]
 - First Place for Research Presentations, NMSU University Research Council Fair
- 2011 • Distinguished Career Award from the NMSU University Research Council for Exceptional Achievements in Creative Scholarly Activity
 - Plaque of Appreciation for Teaching Excellence at NMSU
 - Woods Hole Oceanographic Institute. Karush Scholar Award for Library Studies
- 2001-3 • NIAID Staff Recognition Award, \$1,500 each year
- 1997-9 • NSF Postdoctoral Fellowship; Training Grant in Biology of Small Populations, U. Maryland. *The effects of population bottlenecks and selection on genetic variation in natural populations of the RNA virus Phi 6.*
- 1996 • NSF NATO Postdoc Fellowship in Science and Engineering, University of British Columbia (declined by awardee)
The role of nuclear polyhedral virus in population cycles of the tent caterpillar.
- 1994-6 • NSF Postdoc Fellowship; Training Grant in Integrative Approaches to Animal Behavior, UC Davis
The effect of social status and hormones on parasitism in the black iguana

Grants & Contracts

- 2016 • NIH R21 (**PENDING**)
Characterization of the vector-host network for sylvatic Zika virus in Borneo
K.A. Hanley PI \$275,000 09/01/2016 - 08/30/2018

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| | <ul style="list-style-type: none"> • New Mexico Department of Health Contract <i>Mapping the distribution of Aedes aegypti and Aedes albopictus in New Mexico</i> K.A. Hanley PI \$90,000 05/15/2016 – 05/14/2017 • NIH ICIDR 1U01AI115577-01 <i>Mechanisms and public health impact of sylvatic dengue virus emergence in Borneo</i> N. Vasilakis (UTMB), PI \$3,166,711 07/01/2016 - 06/30/2020 K.A. Hanley co-investigator |
| 2014 | <ul style="list-style-type: none"> • NIH 1R15AI113628-01 <i>Mechanisms of competitive displacement by lineages of mosquito-borne dengue virus</i> K.A. Hanley PI \$300,000 09/01/2014 – 08/31/2017 • NIH Science Education Partnership Award <i>Science Tools in the Classroom: Bioinformatics, Genomics and More!</i> M. Shuster PI; \$1,045,371 05/01/2015 - 02/28/2019 K.A. Hanley advisory board member |
| 2013 | <ul style="list-style-type: none"> • NSF Research Coordination Network <i>Infectious Disease Evolution Across Scales</i> A. Graham PI; \$499,916 07/01/2014 – 06/30/2019 K.A. Hanley steering committee member • NIH RISE R25GM061222. <i>RISE to the Postdoctorate Option III</i> E. Serrano MPI, K.A. Hanley co-investigator \$4,273,114 09/15/2013 - 07/31/2018 • NMSU Interdisciplinary Research Grant <i>Impact of deforestation on sylvatic arbovirus spillover in Borneo</i> K.A. Hanley & B. Benefit, co-PIs \$8,656 08/01/2013 – 12/31/2013 |
| 2012 | <ul style="list-style-type: none"> • NIH RO1 AI067380 <i>Quasispecies dynamics in arbovirus emergence persistence and fitness</i> G.Ebel PI, K.A. Hanley collaborator \$149,999 09/27/2012 – 08/31/2016 • AAAS Women's Internat'l Research Collab. Grant <i>Impacts of deforestation on risks of sylvatic dengue virus spillover in Malaysia</i> K.A. Hanley PI \$19,912 01/01/2012 - 12/31/2012 • NCGR NMINBRE_A4_July2012 <i>Comparing mammalian and mosquito RNAi responses to flavivirus infection</i> K.A. Hanley & E.E. Schirtzinger, co-PIs \$10,450 07/01/2012 - 12/31/2012 |
| 2011 | <ul style="list-style-type: none"> • NIH 1R21AI092041-02 <i>A new synergy for flavivirus therapy: RNAi enhancement and viral mutagens</i> K.A. Hanley & J. Arterburn, co-PIs \$275,000 06/01/2011 - 05/31/2013 • Tulane National Primate Research Center Pilot Study <i>Replication of sylvatic dengue virus in a natural primate host</i> K.A. Hanley PI \$35,000 01/01/2011 - 12/31/2011 |
| 2009 | <ul style="list-style-type: none"> • NIH 1R21AI082399-01 <i>Does dengue virus suppress RNA interference in its mosquito vector?</i> K.A. Hanley PI \$250,000 06/11/2009 - 05/31/2011 |
| 2008 | <ul style="list-style-type: none"> • NIH RO1 1R01AI069145-01A2 <i>Mechanisms of sylvatic dengue emergence</i> S.C. Weaver PI, K.A. Hanley co-investigator \$1,892,850 09/22/2008 – 09/21/2012 |

- Los Alamos National Labs-NMSU MOU
A GPS telemetry animal tracking system: filling the critical knowledge gap in avian migration and avian influenza distribution
K.A. Hanley co-PI \$134,524 08/01/2008 – 09/30/2010
 - NMSU Interdisciplinary Research Grant
Development of novel antiviral therapies for flaviviruses
K.A. Hanley & J. Arterburn, co-PIs \$50,000 05/15/2008 – 05/14/2009
 - NIH 2P20RR016480-09 NIH NM-INBRE
Impact of RNA interference on quasispecies evolution in vector-borne flaviviruses
J. Arterburn PI, **K.A. Hanley sub-project investigator** \$375,000 04/01/2006 - 03/31/2009
 - NMSU ASRC mini-grant
Adaptation of dengue virus to a novel arthropod host
K.A. Hanley PI \$1,911 03/09/2008 – 03/08/2009
- 2007 • NMSU ASRC mini-grant
Investigation of the ability of dengue virus to suppress RNA interference
K.A. Hanley PI \$2,000 12/31/2007 – 12/30/2008
- 2005 • NIH Research Scholar Award K22 A164193
Vector-driven selection in dengue virus
K.A. Hanley PI \$250,000 09/01/2005 – 07/31/2008
- NIH 2P20RR016480-06 NIH NM Ideas Network for Biomedical Research
Evolutionary consequences of dengue virus emergence.
J. Arterburn PI, **K.A. Hanley sub-project investigator** \$105,000 04/01/2006 – 03/31/2009
 - NSF ADVANCE IT grant.
Genetic determinants of transmission mode in flaviviruses
K.A. Hanley PI \$14,663 08/15/2005 – 12/31/2005
- 1993 • NSF Dissertation Improvement Grant; \$8,000
Parasites of sexual and asexual gecko congeners: Does differential parasitism explain the evolutionary maintenance of sexual reproduction?

Teaching (2011-present)

- 2004-present Assistant > Associate Professor of Biology, NMSU
- FA 2016 *Biology of Emerging Infectious Diseases* (BIOL469)
 - SP 2016 *Virology* (BIOL 475)
 - FA 2015 *Behavioral and Evolutionary Ecology* (BIOL 587)
 - SP 2015 *Virology* (BIOL 475)
 - Science and Ethics* (BIOL450/540)
 - Microbiology Research* (BIOL450/550)
 - FA 2014 *Biology of Emerging Infectious Diseases* (BIOL469)
 - SU 2014 *RISE Workshop on Advances in Biomedical Research*
 - SP 2014 *Human Biology* (BIOL 101)
 - Science and Ethics* (BIOL450/540)
 - Microbiology Research* (BIOL450/550)
 - FA 2013 *Behavioral and Evolutionary Ecology* (BIOL 587)
 - Research in Microbiology* (BIOL 450/550)
 - SU 2013 *RISE Workshop on Global Health*

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| SP 2013 | <i>Virology</i> (BIOL 475) |
| | <i>Tropical Field Ecology of Belize</i> (BIOL 450) |
| FA 2012 | <i>Biology of Emerging Infectious Diseases</i> (BIOL469) |
| SU 2012 | RISE Workshop on <i>Health Disparities due to Infectious Disease</i> |
| SP 2012 | <i>Human Biology</i> (BIOL 101) |
| SP 2011 | <i>Virology</i> (BIOL 475) |

Graduate Students & Post-Doctoral Fellows

| <u>Student</u> | <u>Degree and Program</u> | <u>Year Graduated</u> |
|---------------------------|--------------------------------|-----------------------|
| Christy Andrade, Ph.D. | Post-doctoral Fellow | 2012 - 2014 |
| Meredith Brown, DVM/Ph.D. | Post-doctoral Fellow | 2010 - 2011 |
| Anthony Clemons, Ph.D. | Post-doctoral Fellow | 2014 - 2015 |
| William Johnson | M.S. Biology | 2014 |
| Tiffany Kautz | non-thesis M.S., Biotechnology | 2012 |
| Kalli Lambeth | M.S. Biology | 2010 |
| Nyree Maes | M.S. Molecular Biology | 2008 |
| Michael McDowell | M.S. Biology | 2010 |
| Joseph Medwid | M.S. Biology | 2019, anticipated |
| Swati Mukherjee | Ph.D. Molecular Biology | 2010 |
| Stephanie Mundis | M.S. joint Biology & Geography | 2018, anticipated |
| Kimberly Pepin, Ph.D. | Post-Doctoral Fellow | 2006 - 2007 |
| Rebecca Richman | M.S. joint Biology & Geography | 2013 |
| Tammy Romero | M.S. Molecular Biology | 2006 |
| Erin Schirtzinger, Ph.D. | Post-doctoral Fellow | 2011 – 2013 |
| Stacey Scroggs | Ph.D. Biology | 2018, anticipated |
| Ebenezer Tumban | Ph.D. Molecular Biology | 2007 |
| Katherine Young | M.S. Biology | 2015 |
| Katherine Young | Ph.D. Biology | 2019, anticipated |

Graduate Committees

| <u>Student</u> | <u>Degree, University, Yr. Graduated</u> | <u>Major advisor</u> |
|---------------------------|--|----------------------|
| Alejandro Camacho-Davila* | Ph.D. Chemistry, NMSU 2006 | J. Herndon |
| Gonzalo Castillo | M.S. Biology, NMSU 2008 | G. Unguez |
| Cody Champion | Ph.D. Biology, NMSU | J. Xu |
| Christine Dahlin | Ph.D. Biology, NMSU 2010 | T. Wright |
| Sean Dolan* | M.S. Anthropology, NMSU 2011 | M. McCrossin |
| Lisa Drake | M.S., Biology, NMSU 2011 | I. Hansen |
| Lisa Drake | Ph.D. Biology, NMSU, 2015 | I. Hansen |
| Alejandro Delgado | M.S. Biology, NMSU 2006 | J. Gustafson |
| R. Govindaraju | Ph.D. Biology, NMSU 2010 | C. D. Bailey |
| Kristina Gonzalez | Ph.D. Biology, NMSU | I. Hansen |
| Lalo Gonzalez | Ph.D. Biology, NMSU, 2013 | J. Curtiss |
| Chinh Hoang | M.S. Biology, NMSU 2006 | G. B. Smith |
| S. Kumarapperuma* | Ph.D. Chemistry, NMSU 2008 | J. Arterburn |
| Douglas Miller | M.S. (non-thesis), Biology, NMSU | M. Nishiguchi |
| Stephen Peinado | M.S., EPPWS, NMSU 2013 | R. Creamer |
| David Price | Ph.D. Biology, NMSU, 2015 | I. Hansen |
| Vanessa Macias | M.S. Biology, NMSU 2010 | J. Xu |

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|-----------------|-------------------------------|---------------|
| Rong Mu | Ph.D. Mol Biol, NMSU 2011 | A. Dawe |
| Kendra Pesko | Ph.D. SOM Pathology, UNM 2011 | G. Ebel |
| Dong Pei | Ph.D. Biology, NMSU | J. Xu |
| David Price | Ph.D. Molecular Biology, NMSU | I. Hansen |
| John Rosskopf | M.S. Pathobiology, UTEP 2010 | K. Johnson |
| William Soto | Ph.D. Biology, NMSU 2009 | M. Nishiguchi |
| John Upton | M.S. Pathobiology, UTEP 2008 | K. Johnson |
| Federico Valdez | Ph.D. Pathobiology, UTEP | M. Llano |
| Nikos Vasilakis | Ph.D. Virology, UTMB 2008 | S. Weaver |
| Holly Vuong | M.S. Fish&Wildlf, NMSU 2006 | D. Caccamise |
| Anna Young | Ph.D. Biology, NMSU 2011 | T. Wright |

* Dean's representative

Selected, Invited Presentations (2007-present)

- 2016
- NMSU Biomedical Research Symposium
Dengue and Chikungunya and Zika: Science in a Time of Public Health Emergency (October 2016)
 - Global Resilience Network
Zika and Other Emerging Mosquito-Borne Diseases: Update and Potential Risk Mitigation Strategies (Live WebForum, April 2016)
 - Waksman Institute of Microbiology, Rutgers University (New Jersey, April 2016)
Waiting in the Wings: Evolution, Emergence and Control of Arthropod-Borne Viruses
- 2015
- NIH IDeA Western Regional Meeting. (Idaho, Oct 2015)
Waiting in the Wings: Circulation and Spillover of Sylvatic Dengue Virus
 - Symposium on “Contributions of Naturalists to the Fight Against Dengue in Brazil and Beyond”, American Society of Naturalists Meeting.
Waiting in the Wings: Circulation and Spillover of Sylvatic Dengue Virus (Brazil, June 2015)
 - Distinguished Lecture in Life Sciences, Pennsylvania State University
Waiting in the Wings: Emergence and Evolution of Mosquito-Borne Viruses
- 2013
- College of Veterinary Medicine at Illinois, Pathobiology Seminar Series.
Mosquitoes and monkeys and man, oh my! Sylvatic cycles and spillover of mosquito-borne viruses
 - Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak.
Prospects for emergence of sylvatic dengue virus.
 - University of Illinois, Urbana/Champaign.
Fuel for the fever: Mechanisms of emergence and invasion of mosquito-borne viruses
 - Meeting of the Entomological Society of America, Southwestern Branch. *Viral determinants of vector competence among species and strains of flaviviruses.*
- 2012
- Center of Excellence for Infectious Diseases, Texas Tech Health Sciences Center
Prospects for emergence of sylvatic dengue virus
 - Department of Ecology and Evolutionary Biology, Yale University
When mosquitoes monkey around: prospects for emergence of sylvatic dengue virus
 - Department of Biology, New Mexico State University
When mosquitoes monkey around: sylvatic dengue virus in wild and captive primates
- 2011
- Department of Entomology, University of California, Davis
Fevers from the forest: Dynamics of sylvatic dengue virus and chikungunya virus in their primate hosts and mosquito vectors in southeastern Senegal.
 - Laboratory of Zoonotic Pathogens Rocky Mountain Laboratories, NIAID, NIH
Fevers from the forest: Dynamics of dengue and chikungunya viruses in their sylvatic transmission cycles in southeastern Senegal

- Society for the Study of Evolution, Evolutionary Medicine Symposium in Honor of George Williams (Norman, OK, 6/18/11-6/20/11)
The Taming of the Flu: How evolution enables and undermines live vaccines
- National Evolutionary Synthesis Center (NESCent) catalysis meeting on the evolution of infectious diseases: Integrating empirical and modeling approaches (Durham, NC, 3/22/11-3/25/11)
Intra-Host Virus Dynamics
- 2010 • American Society of Microbiology 2010 Meeting (San Diego, CA). Symposium on the Evolution of Vector-Borne Diseases.
Empty Niche Syndrome: Why we are unlikely to eradicate dengue virus
- International Conference on Emerging Infectious Diseases (Atlanta, GA).
The role of inter-strain competition in the emergence and resurgence of dengue virus
- German-American Frontiers of Science (Potsdam, Germany) Evolution of Infectious Disease Symposium.
Evolution of Infectious Diseases
- 2008 • University of New Mexico. *Rational design of a dengue virus vaccine*
- Penn State University. *The fever from the forest: Emergence & control of dengue virus* Ecology and Evolution of Infectious Diseases Meeting (Colo. State Univ.).
Design of a live-attenuated vaccine for dengue virus: a meeting of the minds for medicine and evolutionary ecology
- 2007 • Institute for Ecosystem Studies. *The fever from the forest: emergence and evolutionary ecology of dengue virus.*
- Rutgers University, New Brunswick. *The country mosquito and the city mosquito: the role of vectors in the emergence and evolutionary ecology of dengue virus*
- University of Texas Medical Branch. *The role of competition in the epidemiology and control of dengue virus.*
- University of Texas, El Paso: *The fever from the forest: emergence and control of dengue virus.*
- University of Louisville. *The fever from the forest: emergence and evolutionary ecology of dengue virus.*
- International Symposium on Positive Strand RNA viruses. Plenary talk:
Potential for emergence of sylvatic dengue virus.

Symposium Organizer and Chair

- 2016 **K.A. Hanley** and N. Vasilakis (co-chairs). Business symposium for the American Committee and Arthropod-Borne Viruses (ACAV). American Society of Tropical Medicine and Hygiene, Atlanta, GA
- 2009 N. Vasilakis and **K.A. Hanley** (co-chairs). *The fever from the forest: Fifty years of research on sylvatic dengue virus.* American Society of Tropical Medicine and Hygiene, Washington, DC,

Professional Service (2004 – Present)

Ad hoc reviewer for the following peer-reviewed journals

American Journal of Tropical Medicine and Hygiene
 Biology Letters
 BMC Evolutionary Biology
 Current Molecular Medicine
 Current Opinion in Virology
 Ecology
 Emerging Infectious Diseases
 Evolution

Evolutionary Applications
Journal of Biomedicine and Biotechnology
Journal of Herpetology
Journal of Infectious Diseases
Journal of General Virology
Journal of Molecular Evolution
Journal of Virology
Nature Scientific Reports
PLoS Biology
PLoS Neglected Tropical Diseases
PLoS One
PLoS Pathogens
Proceedings of the National Academy of Sciences
Vector-Borne and Zoonotic Diseases
Virology Journal

NIH Study Section Member

Genetic Variation and Evolution (GVE) study section: 2015-2020

Ad hoc reviewer for the following funding agencies

British Medical Council
French National Research Agency
National Medical Research Council of Singapore
Norwegian Research Council
Netherlands Organization for Scientific Research
U.S.A. Defense Threat Reduction Agency (DTRA)
U.S.A. Department of Defense Peer Reviewed Medical Research Program
U.S.A. NIH; National Institute for Allergy and Infectious Diseases:
 AREA special emphasis panel (ZRG1 IDM-S)
 Drug Discovery and Mechanisms of Antimicrobial Resistance (DDR) study section
 Genetic Variation and Evolution (GVE) study section
 Partnerships for Biodefense Viral Pathogens Review Committee
 Recovery Act Limited Competition: NIH Director's Opportunity for Research in Five
 Thematic Areas (RC4)
 Rapid Assessment of Zika Virus (ZIKV) Complications (R21)
 Small Business: Non-HIV diagnostics, food safety, sterilization/disinfection, and
 bioremediation special emphasis panel (ZRG1 IDM-V)
 Virology B (VIRB) study section
U.K. Vaccine Network

References

Dr. Scott C. Weaver (mentor and collaborator)
John Sealy Distinguished University Chair in Human Infections
Center for Biodefense and Emerging Infectious Diseases and Department of Pathology University of
Texas Medical Branch
Galveston, TX 77555-0609
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Dr. Jeffrey B. Arterburn (mentor and collaborator)
Regents Professor
Department of Chemistry and Biochemistry
New Mexico State University
Las Cruces, NM 88003
(575) 646-2738
jarterbu@nmsu.edu

Dr. Stephen S. Whitehead (mentor and collaborator)
Staff Scientist
Laboratory of Infectious Diseases
National Institute of Allergy and Infectious Diseases
National Institutes of Health
33 North Drive, Room 3W10A,
Bethesda, MD 20892
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Dr. Nikos Vasilakis (collaborator)
Assistant Professor
Center for Biodefense and Emerging Infectious Diseases
Center for Tropical Diseases
Institute for Human Infections and Immunity
6.324 Galveston National Laboratory
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409.266.6919 (office)
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Dr. Ebenezer Tumban (former mentee, now faculty member)
Assistant Professor
Department of Biological Sciences
Michigan Tech University
1400 Townsend Drive
Houghton, MI 49931
906-487-2256
etumban@mtu.edu