

Mark D. Stenglein, PhD

Assistant Professor

Department of Microbiology, Immunology, and Pathology
College of Veterinary Medicine and Biomedical Sciences
Colorado State University
StengleinLab.org

EDUCATION and TRAINING

Postdoctoral Researcher	2010 – 2014
University of California, San Francisco Mentors: Dr. Joe DeRisi, Dr. Don Ganem Research focus: The development and application of high throughput unbiased next generation sequencing-based techniques to the study of infectious disease, with a focus on identifying and characterizing pathogens causing infectious human and animal diseases of unknown etiology.	
Ph.D. in Biochemistry, Molecular Biology, and Biophysics University of Minnesota, Minneapolis, MN Advisor: Dr. Reuben Harris Thesis title: “ <i>APOBEC3 Proteins Restrict Mobile and Foreign DNA</i> ”	2004 – 2009
B.A. with Honors in Mathematics and French, Washington University in Saint Louis, MO	1993 – 1997

AWARDS

Fredrick J. Bollum Excellence in Research Award University of Minnesota	2009
Dr. Marvin and Hadassah Bacaner Research Award University of Minnesota	2009
Travel Award 6 th International Conference on Transposition and Animal Biotechnology	2008
Young Investigator Award 15 th Conference on Retroviruses and Opportunistic Infections	2008
Cancer Biology Training Grant Predoctoral Fellowship, University of Minnesota	2007 – 2009
3M Graduate Science and Technology Fellowship, University of Minnesota	2004 – 2009
Roberta J. Leury Award for Study in France, Washington University in Saint Louis, MO	1995

PUBLICATIONS

1. Hoon-Hanks LL, McGrath S, Tyler KL, Owen C, **Stenglein MD** (2017) *Metagenomic investigation of canine meningoencephalomyelitis of unknown origin*. **J Vet Intern Med**, In Review.
2. Schmitt K, Mohan Kumar D, Curlin J, Remling-Mulder L, **Stenglein MD**, O'Connor S, Marx P, Akkina R. (2017). *Modeling the evolution of SIV sooty mangabey progenitor virus towards HIV-2 using humanized mice*. **Virology** 510:175-184. PMID: 28750321
3. **Stenglein MD**, Sanchez-Migallon Guzman D, Garcia VE, Layton ML, Hoon-Hanks LL, Boback SM, Keel MK, Drazenovich T, Hawkins MG, DeRisi JL. (2017) *Differential disease susceptibility in experimentally reptarenavirus infected boa constrictors and ball pythons*. **J Virol**. pii: JVI.00451-17. PMID: 28515291
4. Chang L, Fu D, **Stenglein MD**, Hernandez JA, DeRisi JL, Jacobson ER (2016) *Detection and prevalence of boid inclusion body disease in collections of boas and pythons using immunological assays*. **Vet J**. 218:13-18. PMID: 27938703.
5. Fauver J, Grubaugh N., Krajacich B, Weger-Lucarelli J, Lakin S, Fakolli III L, Bolay F, Diclaro J, Dabiré, K, Foy B, Brackney D, Ebel G, and **Stenglein, MD** (2016) *West African Anopheles Gambiae Mosquitoes Harbor a Taxonomically Diverse Virome Including New Insect-Specific Flaviviruses, Mononegaviruses, and Totiviruses*. **Virology**, 498:288-99. PMID: 27639161
 - Article highlighted by editors and in Virology Highlights blog.
6. Weger-Lucarelli J, Duggal NK, Bullard-Feibelman K, Veselinovic M, Romo H, Nguyen C, Rückert C, Brault AC, Bowen RA, **Stenglein MD**, Geiss BJ, Ebel GD. *Development and Characterization of Recombinant Virus Generated from a New World Zika Virus Infectious Clone*. **J Virol**. 91(1). pii: e01765-16. PubMed PMID: 27795432.
7. Postler TS, Clawson AN, Amarasinghe GK, Basler CF, Bavari S, Benkő M, Blasdel KR, Briesse T, Buchmeier MJ, Bukreyev A, Calisher CH, Chandran K, Charrel R, Clegg CS, Collins PL, Juan Carlos T, Derisi JL, Dietzgen RG, Dolnik O, Dürrwald R, Dye JM, Easton AJ, Emonet S, Formenty P, Fouchier RA, Ghedin E, Gonzalez JP, Harrach B, Hewson R, Horie M, Jiāng D, Kobinger G, Kondo H, Kropinski AM, Krupovic M, Kurath G, Lamb RA, Leroy EM, Lukashevich IS, Maisner A, Mushegian AR, Netesov SV, Nowotny N, Patterson JL, Payne SL, PaWeska JT, Peters CJ, Radoshitzky SR, Rima BK, Romanowski V, Rubbenstroth D, Sabanadzovic S, Sanfaçon H, Salvato MS, Schwemmle M, Smither SJ, **Stenglein MD**, Stone DM, Takada A, Tesh RB, Tomonaga K, Tordo N, Towner JS, Vasilakis N, Volchkov VE, Wahl-Jensen V, Walker PJ, Wang LF, Varsani A, Whitfield AE, Zerbini FM, Kuhn JH. (2016) *Possibility and Challenges of Conversion of Current Virus Species Names to Linnaean Binomials*. **Syst Biol**. pii: syw096. PMID: 27798405.
8. Afonso CL, Amarasinghe GK, Bányai K, Bào Y, Basler CF, Bavari S, Bejerman N, Blasdel KR, Briand FX, Briesse T, Bukreyev A, Calisher CH, Chandran K, Chéng J, Clawson AN, Collins PL, Dietzgen RG, Dolnik O, Domier LL, Dürrwald R, Dye JM, Easton AJ, Ebihara H, Farkas SL, Freitas-Astúa J, Formenty P, Fouchier RA, Fù Y, Ghedin E, Goodin MM, Hewson R, Horie M, Hyndman TH, Jiāng D, Kitajima EW, Kobinger GP, Kondo H, Kurath G, Lamb RA, Lenardon S, Leroy EM, Li CX, Lin XD, Liú L, Longdon B, Marton S, Maisner A, Mühlberger E, Netesov SV, Nowotny N, Patterson JL, Payne SL, Paweska JT, Randall RE, Rima BK, Rota P, Rubbenstroth D, Schwemmle M, Shi M, Smither SJ, **Stenglein MD**, Stone DM, Takada A, Terregino C, Tesh RB, Tian JH, Tomonaga K, Tordo N, Towner JS, Vasilakis N, Verbeek M, Volchkov VE, Wahl-Jensen V, Walsh JA, Walker PJ, Wang D, Wang LF, Wetzl T, Whitfield AE, Xiè JT, Yuen KY, Zhang YZ, Kuhn JH. (2016)

Taxonomy of the order Mononegavirales: update 2016. Arch Virol. 161(8):2351-60. doi: 10.1007/s00705-016-2880-1. PMID: 27216929; PMCID: PMC4947412.

9. Wilson MR, Fedewa G, **Stenglein MD**, Olejnik J, Rennick LJ, Nambulli S, Feldmann F, Duprex WP, Connor JH, Mühlberger E, DeRisi JL (2016) *Multiplexed Metagenomic Deep Sequencing To Analyze the Composition of High-Priority Pathogen Reagents. mSystems.* 1(4). pii: e00058-16. PMID: 27822544; PMCID: PMC5069959.
10. Grubaugh ND, Massey A, Shives KD, **Stenglein MD**, Ebel GD, Beckham JD (2015) *West Nile virus population structure, injury, and interferon-stimulated gene expression in the brain from a fatal case of encephalitis. Open Forum Infect Dis.* 20;3(1). PMID: 26730392; PMCID: PMC4697916.
11. Seaman JA, Alout H, Meyers JI, **Stenglein MD**, Dabiré RK, Lozano-Fuentes S, Burton TA, Kuklinski WS, Black WC 4th, Foy BD. (2015) *Age and prior blood feeding of Anopheles gambiae influences their susceptibility and gene expression patterns to ivermectin-containing blood meals. BMC Genomics.* 16(1):797. PMID: 26471037; PMCID: PMC4608139.
12. **Stenglein MD***, Jacobson ER, Chang LW, Sanders C, Hawkins MG, Guzman D, Drazenovich T, Dunker F, Kamaka EK, Fisher D, Reavill DR, Meola LF, Levens G, DeRisi JL* (2015) *Widespread recombination, reassortment, and transmission of unbalanced compound viral genotypes in natural arenavirus infections. PLoS Pathogens,* 11(5):e1004900. (* corresponding authors).
13. Radoshitzky SR, Bào Y, Buchmeier MJ, Charrel RN, Clawson AN, Clegg CS, DeRisi JL, Emonet S, Gonzalez JP, Kuhn JH, Lukashevich IS, Peters CJ, Romanowski V, Salvato MS, **Stenglein MD**, de la Torre JC. (2015) *Past, present, and future of arenavirus taxonomy. Arch Virol.* 160(7):1851-74. PMID: 25935216.
14. **Stenglein MD***, Jacobson ER*, Wozniak EJ, Wellehan JF, Kincaid A, Gordon M, Porter BF, Baumgartner W, Stahl S, Kelley K, Towner JS, DeRisi JL. (2014) *Ball Python Nidovirus: a Candidate Etiologic Agent for Severe Respiratory Disease in Python regius. mBio.* 5(5). pii: e01484-14. (* equal contributions).
15. Kuhn JH, Dürrwald R, Bào Y, Briese T, Carbone K, Clawson AN, DeRisi JL, Garten W, Jahrling PB, Kolodziejek J, Rubbenstroth D, Schwemmle M, **Stenglein MD**, Tomonaga K, Weissenböck H, Nowotny N. (2014) *Taxonomic reorganization of the family Bornaviridae. Arch Virol.* 160(2):621-32 PMID: 25449305.
16. **Stenglein MD***, Leavitt EB*, Abramovitch MA*, McGuire JA, DeRisi JL. (2014) *Genome Sequence of a Bornavirus Recovered from an African Garter Snake (Elapsoidea loveridgei). Genome Announc.;*2(5). pii: e00779-14. PMCID: PMC4192372. (* equal contributions)
17. Szentiks CA, Tsangaras K, Abendroth B, Scheuch M, **Stenglein MD**, Wohlsein P, Heeger F, Höveler R, Chen W, Sun W, Damiani A, Nikolin V, Gruber AD, Grobbel M, Kalthoff D, Höper D, Cziráj GÁ, Derisi J, Mazzoni CJ, Schüle A, Aue A, East ML, Hofer H, Beer M, Osterrieder N, Greenwood AD (2014) *Polar bear encephalitis: establishment of a comprehensive next-generation pathogen analysis pipeline for captive and free-living wildlife. J Comp Pathol.* 150(4):474-88.
18. Koellhoffer J, Dai Z, Malashkevich VN, **Stenglein MD**, Liu Y, Toro R, Harrison J, Chandran K, DeRisi JL, Almo SC, and Lai JR. (2013) *Structural Characterization of the glycoprotein GP2 Core Domain from the CAS Virus, a Novel Arenavirus-like Species. J. Mol. Biol,* 426(7):1452-68.
19. Ali S, Karki N, Bhattacharya C, Zhu R, Macduff DA, **Stenglein MD**, Schumacher AJ, Demorest

ZL, Harris RS, Matin A, Aggarwal S. (2013) *APOBEC3 inhibits DEAD-END function to regulate microRNA activity*. **BMC Mol Biol.** 14(1):16.

20. Mayer J, Tsangaras K, Heeger F, Avila-Arcos M, **Stenglein MD**, Chen W, Sun W, Mazzoni CJ, Osterrieder N, Greenwood AD. (2013) *A novel endogenous betaretrovirus group characterized from polar bears (*Ursus maritimus*) and giant pandas (*Ailuropoda melanoleuca*)*. **Virology**. 443(1):1-10.

21. **Stenglein MD***, Sanders C, Kistler AL, Ruby JG, Franco JY, Reavill DR, Dunker F, DeRisi JL* (2012) *Identification, characterization, and in vitro culture of highly divergent arenaviruses from boa constrictors and annulated tree boas: a candidate etiological agent for snake inclusion body disease (IBD)*. **mBio** 3(4), e00180-12 (*corresponding)

- mBio “editors’ pick 2012”. Article highlighted on NPR, the BBC, and the This Week in Virology (TWiV) podcast.

22. **Stenglein MD**, Velazquez E, Greenacre C, Wilkes RP, Ruby JG, Lankton JS, Ganem D, Kennedy MA, DeRisi JL (2012) *Complete Genome Sequence of an Astrovirus Identified in a Colony of Domestic Rabbits (*Oryctolagus cuniculus*) Experiencing an Outbreak of Gastroenteritis*. **Virology J**, 9(1):216.

23. Yozwiak N*, Skewes-Cox P*, **Stenglein MD***, Balmaseda A, Harris E, DeRisi J (2012) *Virus Identification in Unknown Tropical Febrile Illness Cases Using Deep Sequencing*. **PLoS Neglected Tropical Diseases**. 6(2):e1485 (* Equal Contributions)

24. **Stenglein MD**, Burns MB, Li M, Lengyel J, and Harris RS (2010) *APOBEC3 proteins mediate the clearance of foreign DNA from human cells*. **Nature Struct Mol Biol.** 17(2):222-9.

- Article highlighted in: Flintoft L (2010) Research Highlight: Cellular defence: Human cells clear foreign DNA. *Nature Rev Gen.* 11:172.

25. Refsland EW*, **Stenglein MD***, Shindo K, Albin JS, Brown WL, and Harris RS (2010) *Quantitative Profiling of the Full APOBEC3 mRNA Repertoire in Lymphocytes and Tissues: Implications for HIV-1 Restriction*. **Nucleic Acids Research** 38(13):4274-84. (* Equal Contributions)

26. Sadler AH, **Stenglein MD**, Harris RS, and Mansky LM (2010). *APOBEC3G Contributes to HIV-1 Variation Through Sublethal Mutagenesis*. **J. Virol.** 84(14):7396-404.

- Article designated as being “of significant interest” by the editors in the issue’s “Spotlight”.

27. **Stenglein MD**, Mastuo H, and Harris RS (2008) *Two regions within the amino-terminal half of APOBEC3G cooperate to determine cytoplasmic localization*. **J. Virol.** 82: 9591-9.

28. Jónsson SR, LaRue RS, **Stenglein MD**, Fahrenkrug SC, Andrésdóttir A, and Harris RS (2007) *The restriction of zoonotic PERV transmission by human APOBEC3G*. **PLoS One**, 2: e893.

29. **Stenglein MD**, and Harris RS. *APOBEC3B and APOBEC3F inhibit L1 retrotransposition by a DNA deamination-independent mechanism* (2006) **J. Biol. Chem.**, 281: 16837-41.

30. Jónsson SR, Haché G, **Stenglein MD**, Fahrenkrug SC, Andresdottir V, and Harris RS. *Evolutionarily conserved and non-conserved retrovirus restriction activities of artiodactyl APOBEC3F proteins* (2006) **Nucleic Acids Research**, 34: 5683-94.

Book Chapters

1. Johnson A, Origgi F, **Stenglein MD**, and Wellehan JFX Jr. (2018) *Molecular diagnostics*. In: **Infectious Diseases and Pathology of Reptiles**. E. Jacobson and M. Garner, eds., CRC Press.
2. Jacobson E, Marschang R, Origgi F, **Stenglein MD**, and Wellehan JFX Jr. (2018) *Viruses and viral diseases of reptiles*. In: **Infectious Diseases and Pathology of Reptiles**. E. Jacobson and M. Garner, eds., CRC Press.
3. **Stenglein MD**, Schumacher AJ, LaRue RS, and Harris RS. *Host factors that restrict retrovirus replication* (2009) In **Viral Genome Replication**, C. Cameron, M. Götte, and K. Raney, eds., Springer, 297-336.

SELECTED RESEARCH PRESENTATIONS

- Arizona State University Center for Evolution & Medicine seminar series. Nov 2017, Tempe, AZ. Invited talk.
- Colorado State University Animal Reproduction and Biotechnology Laboratories Seminar Series, Sept 2017, Fort Collins, CO. Invited talk.
- Colorado State University Laboratory Animal Resources Staff Seminar Series, Aug 2017, Fort Collins, CO. Invited talk.
- American Society for Virology 2017 Annual Meeting, June 2017, Madison, WI. Talk.
- Colorado State University Biomedical Research Awareness Day, April 2017, Fort Collins, CO. Invited talk.
- American Society for Tropical Medicine & Hygiene annual meeting, American Committee on Arthropod-borne Viruses pre-meeting workshop, Nov 2016, Atlanta, GA. Invited talk.
- Positive-Strand RNA Viruses Meeting, May 2016, Austin, TX. Poster.
- Rocky Mountain Virology Meeting, September 2015, Pingree Park, CO. Talk.
- Rocky Mountain Virology Meeting, October 2014, Pingree Park, CO. Talk.
- American Society of Virology Annual Meeting. July 2014. Fort Collins, CO. Talk.
- University of Minnesota, Department of Microbiology. February 2014. Minneapolis, MN. Invited talk.
- University of Michigan, Department of Microbiology and Immunology. January 2014. Ann Arbor, MI. Invited talk.
- Colorado State University, Department of Microbiology, Immunology, and Pathology, October 2013. Fort Collins, CO. Invited talk.
- NIAID National RCE meeting, April 2013. Seattle, WA. Talk.
- UC Davis Avian and Exotics Medicine Club Symposium, March 2013. Davis, CA. Talk.
- The Association of Reptile and Amphibian Veterinarians Annual Conf., Oct. 2012. Oakland, CA. Talk.
- Bay Area Virology Symposium. May 2012. Berkeley, CA. Poster.
- University of Minnesota, Department of Veterinary & Biomedical Sciences, University of MN, May 2012. Invited talk.
- Howard Hughes Medical Institute Scientific Meeting. April 2012. Ashburn, VA. Poster.

- The American Society for Virology Annual Meeting, July 2011. Minneapolis, MN. Talk.
- The Institute for Molecular Virology Symposium, May 2009. University of Minnesota, Minneapolis, MN. Talk.
- Keystone Pattern Recognition Molecules and Immune Sensors of Pathogens Symposium, March 2009. Banff, Alberta, Canada. Poster.
- The 6th International Conference on Transposition and Animal Biotechnology, June 2008. Berlin, Germany. Talk.
- The Fifteenth Conference on Retroviruses and Opportunistic Infections, February 2008. Boston, MA. Talk and poster.
- Cold Spring Harbor Laboratory Meeting on Retroviruses, May 2007, Cold Spring Harbor, NY. Poster.
- Cold Spring Harbor Laboratory Meeting on Retroviruses, May 2006, Cold Spring Harbor, NY. Talk.
- The National Cancer Institute's HIV Drug Resistance Program's 6th Annual Symposium on Antiviral Drug Resistance, November 2005. Chantilly, VA. Poster.

TEACHING and MENTORING EXPERIENCE

Colorado State University

Teaching

- | | |
|--|-------------------|
| • Co-lead, Genomics of Disease in Wildlife workshop | 2017 |
| • Guest instructor, MIP 636, Mechanisms of Viral Infection and Disease | Spring 2015, 2017 |
| • Co-instructor, MIP 565, Next Gen Sequencing Platforms and Libraries | Fall 2015-2017 |
| • Guest instructor, VM 603, Research in Veterinary Medicine | Fall 2015 |
| • Guest instructor, MIP 570, Functional Genomics | Fall 2015-2017 |
| • Guest instructor, MIP 530, Advanced Molecular Virology | Spring 2016 |
| • Co-instructor, CM 700, Critical Analysis of the Literature | Spring 2016 |
| • Guest instructor, MIP 150, Introduction to Research Methods | Fall 2016-2017 |

Postdocs mentored

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| • Justin Lee, DVM, PhD | 2016- |
| • Joseph Allison, PhD [currently at Somalogic, Boulder, CO] | 2015-2016 |

Students mentored

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| • Laura Hoon-Hanks, DVM. PhD candidate in MIP residency program. | 2015- |
| • Marylee Layton, M.S. student | 2015- |
| • Meredith Voyles, undergraduate student | 2015-2016 |
| • Jacqueline Hunter, DVM student | 2016 |
| • Shaun Cross, PhD candidate | 2016- |

Students for whom I served on thesis committee

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| • Shanna Williams, MIP PhD candidate | 2015-2016 |
| • Reyes Murrieta, MIP PhD candidate | 2015- |
| • Laura Hoon-Hanks, MIP resident/PhD candidate [chair] | 2015- |
| • Anna Fagre, MIP PhD candidate | 2016- |
| • James Curlin, CMB PhD candidate | 2016- |

University of California, San Francisco

- Guest instructor, BioPhys205, Dynamical Systems 2013
 - Taught graduate level module on bioinformatics and sequencing analysis
- Guest instructor, BioPhys205, Dynamical Systems 2012
 - Taught graduate level module on next generation sequencing
- Mentor, Kristoffer Leon, HHMI Extraordinary Research Opportunities Program 2013
- Mentor, Eli Leavitt, undergraduate research volunteer 2013
- Mentor, Michael Abramovich, summer high school research volunteer 2013
- Mentor, Kelly Crotty, Tetrad Graduate Program 2012
- Mentor, Peter Fellowes, Integrative Program in Quantitative Biology Graduate Program 2012
- Mentor, Jessica Franco, HHMI Extraordinary Research Opportunities Program 2011
- Mentor, Eric Velazquez, HHMI Extraordinary Research Opportunities Program 2010

University of Minnesota

- Teaching assistant, BioChem 8002 2007
 - Graduate level Molecular Biology and Regulation of Biological Processes course
 - Responsibilities included leading lecture on occasion
- Teaching assistant, Biol 1009, General Biology 2006
 - Led laboratory section

ACADEMIC SERVICE

- Director, CSU Next Generation Sequencing Facility 2016-
- CSU Bioinformatics Liaison, Colorado Clinical & Translational Sciences Institute 2016-
- Co-chair faculty advisory committee, CSU NextGen Sequencing Core 2015-2016
- Member, unofficial search committee for hire of Zaid Abdo 2015
- University of Minnesota Institute for Molecular Virology 2008-2009
 - Student representative to Advisory committee

COMMUNITY OUTREACH

- Guest, This Week in Virology Podcast Aug, 2012
- Guest, The Reptile Living Room Podcast Aug, 2012
- Speaker, Bay Area Amphibian and Reptile Society, Palo Alto, CA Feb, 2012
- Speaker, Avian and Exotic Medicine Club, UC Davis March, 2013
- Speaker, CSU Biomedical Research Awareness Day April, 2017
- Speaker, LAR Staff seminar series, CSU August, 2017

ADDITIONAL PROFESSIONAL EXPERIENCE

- Computer and Project Engineer, Cenco, Inc, Minneapolis, MN 1997 - 2004
- As a Project Engineer, I managed budget and scheduling and led a group of software engineers working on several successful multimillion dollar, high profile projects.
- As a Computer Engineer, I developed data acquisition, analysis and control software for jet engines
- I installed and validated data analysis and acquisition systems during the commissioning of jet engine test facilities worldwide (in Thailand, Mexico, Scotland, Sweden, Canada, and the USA).

SOCIETY MEMBERSHIP

- American Society for Virology 2013-
- American Society for Microbiology. 2012-
- Member, International Committee on Taxonomy of Viruses *Arenaviridae* Study Group 2014-
- Member, International Committee on Taxonomy of Viruses *Bornaviridae* Study Group 2014-

CONTACT INFORMATION

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Pubs on PubMed: <http://www.ncbi.nlm.nih.gov/pubmed/?term=Stenglein+MD>

Twitter: @markstenglein