



CURRICULUM VITAE

Dr. Sarah Renee Phillips


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Bio

I am a primatologist studying immunity and infectious diseases in contexts that range from ecology and evolutionary biology to One Health and translational medicine. I am interested in host-pathogen coevolution, pathogen evolution as a consequence of host immune landscape at multiple scales, interactions between host and pathogens associated with both gene and gene function, and intrinsic and extrinsic host traits (demography, ecology, coinfection, and sociality) that contribute to variation in host immunity (ecoimmunology) and the evolution and epidemiology of infecting viruses and macroparasites (protozoans and helminths).

I was raised in a rural farming community in Illinois, am a first-generation college graduate, and identify with several underrepresented communities in science. I am a strong advocate for mentoring and the cultivation of early career scientists as our highest priority in the academe.

Current Collaborations & Projects

Within-Patient Evolution of SARS-CoV-2 in a Coinfection Landscape

Keywords: Virology, Genomics, Evolution, Eco/Evo of Infectious Disease, One Health

Viral Genomics & Evolution of Human Immunodeficiency 1 Virus (HIV-1)

Keywords: Virology, Genomics, Evolution, Eco/Evo of Infectious Disease

Wild Chimpanzee Immunogenetics & Infectious Disease

Keywords: Primatology, Immunology, Immunogenetics, Ecoimmunology, One Health

Education

2021

Ph.D., Evolutionary Anthropology

Dissertation: Energetic tradeoffs, infection, and immunity in wild chimpanzees of Uganda and Tanzania
University of New Mexico, Albuquerque, NM

2011

Master of Arts, Evolutionary Anthropology

Research Topic: Signatures of Historic Gene Flow and Archaic Admixture in Modern *Homo sapiens*
University of New Mexico, Albuquerque, NM

2002

Master of Science, Biological Sciences

Thesis: Phylogenetics of Lymnaeidae (Mollusca: Gastropoda) with emphasis on the evolution of susceptibility to *Fascioloides magna* infection
Eastern Illinois University, Charleston, IL

2000

Bachelor of Science, Zoology

Concentration: Parasitology & Immunology
Eastern Illinois University, Charleston, IL

Professional Appointments

Adjunct Assistant Professor (2021-current)
Department of Anthropology, University of New Mexico

Postdoctoral Associate (2023)
Ecology & Evolutionary Biology, Yale University
Viral Genomics & Evolution in Primate Hosts
Funded by Yale EEB

Postdoctoral Associate (2022)
Biology, San Francisco State University
Viral Genomics & Evolution in Primate Hosts
Funded by NSF

Graduate Teaching Assistant (2012-2021)
Department of Anthropology, University of New Mexico

PiBBs Program Instructor (2011)
Department of Biology, University of New Mexico
Team-taught course in Algal Biofuels (Human dimensions & genetics)
Funded by NIH, Howard Hughes Medical Institute, & UNM Biology
(PiBBs = Program in Interdisciplinary Biology & Biomedical Sciences)

Graduate Research Assistant (2016-2017)
Department of Anthropology, University of New Mexico,
Hominoid Reproductive Ecology Laboratory (Endocrinology)
Funded by NIH and NSF

PiBBs Fellow (2009 - 2011)
Department of Biology, University of New Mexico
Funded by NIH, Howard Hughes Medical Institute, & UNM Biology
(PiBBs = Program in Interdisciplinary Biology & Biomedical Sciences)

Instructor of Biology and Chemistry (2008-2009)
Math, Science, & Engineering, Central New Mexico Community Colleges
Instructor of multiple college courses in Biology, Chemistry, and
Environmental Science

Publications

(Blue denotes my authorship)

Reese A.T., [Phillips S.R.](#), Owens L.A., Venable E.M., Langergraber K.E.,
Machanda Z.P., Mitani J.C., Muller M.N., Watts D.P., Wrangham R.W.,
Goldberg T.L., Thompson M.E., and Carmody R.N. (2021). Age patterning
in the wild chimpanzee gut microbiota diversity reveals differences
from humans in early life. *Current Biology*. 31(3): 613-620.
<https://doi.org/10.1016/j.cub.2020.10.075>

[Sarah Renee Phillips](#), T.L. Goldberg, M.N. Muller, Z.P. Machanda, S. Friant,
E. Otali, J. Carag, K.E. Langergraber, J.C. Mitani, R.W. Wrangham,
E.E. Wroblewski, and M. Emery Thompson. (2020). Fecal parasites
increase with age but not reproductive effort in wild female
chimpanzees. *Phil. Trans. R. Soc. B.* 375(1811): 20190614.
<https://doi.org/10.1098/rstb.2019.0614>

M. Emery Thompson, S.A. Fox, A. Berghanel, K. Sabbi, [S. Phillips-Garcia](#),
D.K. Enigk, E. Otali, Z.P. Machanda, R.W. Wrangham, and M.N. Muller.
(2020). Wild Chimpanzees Exhibit Human-Like Aging of Glucocorticoid
Regulation. *PNAS*. 117(15): 8424-8430.
<https://doi.org/10.1073/pnas.1920593117>

Negrey, J.D., Reddy, R.B., Scully, E.J., **Phillips-Garcia, S.**, Owens, L.A., Langergraber, K.E., Mitani, J.C., Emery Thompson, M., Wrangham, R.W., Muller, M.N., Otali, E., Machanda, Z., Hyeroba, D., Grindle, K.A., Pappas, T.E., Palmenberg, A.C., Gern, J.E., and T.L. Goldberg. (2019). Simultaneous outbreaks of respiratory disease in wild chimpanzees caused by distinct viruses of human origin. *Emerging Microbes & Infections*. 8(1): 139–149.
<https://doi.org/10.1080/22221751.2018.1563456>

Rodgers, J.K., Sandland, G.J., **Joyce, S.R.** and D.J. Minchella. (2005). Multi-species interactions among a commensal (*Chaetogaster limnaei limnaei*), a parasite (*Schistosoma mansoni*) and an aquatic snail host (*Biomphalaria glabrata*). *Journal of Parasitology*. 91(3): 709–712.
<https://doi.org/10.1645/GE-421R>

Preprints & Publications in Review:

Sarah Renee Phillips. (2023). *Patr-B* Gene Diversity and Respiratory Infection in Wild, East African Chimpanzees (*P. t. schweinfurthii*). *bioRxiv*.
<https://doi.org/10.1101/2023.08.02.551731>

Publications in Active Preparation:

Sarah Renee Phillips, Omer Tirosh, Evan Ho, Ana Rodriguez Vega, Kaho H. Tisthammer, Robert W. Shafer, C. Brandon Ogbunugafor, Adi Stern, and Pleuni S. Pennings. (*in prep, PLOS Genetics*). Within-patient evolution of the HIV-1B envelope (*env*) gene in humans.
(draft available upon request)

Sarah Renee Phillips. (*in prep*). Impact of sex, stress, and coinfection on parasite burden in wild chimpanzees (*P. t. schweinfurthii*).

Research Funding & Professional Recognition (asterisk denotes funding declined)

2018	Best Oral Presentation, SW Assoc. of Biological Anthropologists (\$100)
2018	Louis B. Leakey Foundation Research Grant (\$11,125.00)
2018	AAGA Outstanding Trainee Award in Anthropological Genetics (\$200)
2016	National Science Foundation DDRIG (\$19,625)
2012	Summer Institute in Statistical Genetics, UW (\$1200.00)*
2012	Student Enrichment Grant, NIH, HHMI, & UNM Biology (\$900.00)*
2010	PIBBS Fellowship - NIH/Howard Hughes Medical/UNM Biology (\$21,000)
2009	PIBBS Fellowship - NIH/ Howard Hughes Medical/UNM Biology (\$21,000)
2001	EIU Graduate Research/Creative Activity Award (\$750.00)
2000	Sigma Xi Grant in Aid of Research (\$715.00)
2000	Errett/Mazie Warner Presidential Award in Zoology (\$2140.00)
2000	Phi Sigma (Beta Pi Chapter) Research Award (\$250.00)

Invited Talks & Presentations

2023 Coding in the ecology and evolution of immunity and infectious disease, SCIP Program, Department of Biology, San Francisco State University, San Francisco, CA.

2023 Literature Review: Building Confidence & Skills, Antibiotic Resistance Course (Pleuni Pennings), Department of Biology, San Francisco State University

2022 Coding in the ecology and evolution of immunity and infectious disease, SCIP Program, Department of Biology, San Francisco State University, San Francisco, CA.

2021 Ecology and evolution of immunity and infectious disease in wild chimpanzees (*Pan troglodytes schweinfurthii*), Department of Evolutionary Anthropology (Amy Goldberg Laboratory), Duke University, Durham, NC.

2020 Ecoimmunology of wild chimpanzees (*Pan troglodytes schweinfurthii*): MHC-B genotypic and phenotypic associations with respiratory illness, Department of Anthropology (Emily Wroblewski Laboratory), Washington University in St. Louis, St. Louis, Mo.

2019 Trade-offs between Reproduction & Immunity in Wild Female Chimpanzees from Kibale National Park, Uganda, Department of Anthropology, Washington University in St. Louis, St. Louis, Mo.

2018 Ecoimmunology & Disease Ecology of Wild Chimpanzees, Ecohealth Course (Michael Wasserman), Department of Anthropology, Indiana University, Bloomington, IN

2017 Life History Trade-offs Between Reproduction & Immunological Health in Wild Chimpanzees, Department of Pathobiological Sciences (Tony Goldberg Laboratory), University of Wisconsin, Madison, WI

2017 Life History Trade-offs Between Reproduction & Immunological Health in Wild Chimpanzees, Biological Anthropology Section, Department of Anthropology, University of Wisconsin, Madison, WI

2017 Life History Trade-offs Between Reproduction & Immunological Health in Wild Chimpanzees, School of Medicine (Peter Parham Laboratory), Stanford University, Stanford, CA

2015 Genetics of the Human Diaspora with Emphasis on Archaic Admixture, Evolution & Human Emergence (Corey Ragsdale), Department of Anthropology, University of New Mexico, Albuquerque, NM

Conference Papers and Posters

2023 Within-patient Evolution of the HIV-1B Envelope (*Env*) Gene in Humans. Sarah Renee Phillips, Omer Tirosh, Evan Ho, Ana Rodriguez Vega, Robert Shafer, C. Brandon Ogbunugafor, Adi Stern, and Pleuni S. Pennings; Evolution; podium; Albuquerque, NM.

2023 Through the Looking-Glass: Life History Trade-offs Not as Predicted in Wild Chimpanzees (*P. t. schweinfurthii*). Sarah Renee Phillips; American Society of Primatologists; podium; Reno, NV.

2022 Through the Looking-Glass: Why Wild Apes are Integral to the Global Human Health Story. Sarah Renee Phillips; Stanford Center for Innovation in Global Health; poster; Stanford, CA.
https://drive.google.com/file/d/1XgDog0W9_4TYTIPXZtxG5mzDugmxUG1P/view)

2019 Trade-offs between reproduction and immunity in wild female chimpanzees (*Pan troglodytes schweinfurthii*) of Kibale National Park, Uganda. Sarah Phillips-Garcia, Tony L. Goldberg, Martin N. Muller, Zarin P. Machanda, Sagan Friant, Emily Otali, Jessica Carag, Kevin E. Langergraber, John C. Mitani, Richard W. Wrangham, Melissa Emery Thompson; American Association of Biological Anthropologists; podium; Cleveland, OH.

2019 Chimpanzee reverse zoonoses: unfortunate natural experiments in great ape comparative medicine and demography. Tony L. Goldberg, Sarmi Basnet, Melissa Emery-Thompson, James E. Gern, Kristine A. Grindle, Kevin E. Langergraber, Zarin P. Machanda, John C. Mitani, Martin M. Muller, Jacob D. Negrey, Emily Otali, Leah Owens, Ann C. Palmenberg, Tressa E. Pappas, Sarah Phillips-Garcia, Rachna B. Reddy, Erik J. Scully, Richard W. Wrangham;

American Association of Biological Anthropologists; podium by T.L. Goldberg; Cleveland, OH.

2018 Identification of Parasites with Metagenomic Barcoding Confirms Microscopy Findings and Detects Additional Organisms. L.A. Owens, S.L. Friant, Sarah Phillips-Garcia, M.E. Thompson, T.L. Goldberg; American J. of Tropical Medicine and Hygiene; podium by L.A. Owens; New Orleans, LA.

2018 Ecoimmunology of wild chimpanzees (*Pan troglodytes schweinfurthii*) from Uganda & Tanzania: Does *Patr-B* genotype or phenotype predict occurrence of respiratory illness? S. Phillips-Garcia, M. Emery Thompson, E.V. Lonsdorf, M.N. Muller, Z.P. Machanda, E. Scully, E. Otali, T.L. Goldberg, T.R. Gillespie, D.A. Travis, R.W. Wrangham, P. Parham, and E.E. Wroblewski; SW Association of Biological Anthropologists; podium; Las Vegas, NV.

2018 Ecoimmunology of wild chimpanzees (*Pan troglodytes schweinfurthii*) from Uganda & Tanzania: Does *MHC* genotype or phenotype predict occurrence of respiratory illness? S. Phillips-Garcia, M. Emery Thompson, E.V. Lonsdorf, M.N. Muller, Z.P. Machanda, E. Scully, E. Otali, T.L. Goldberg, T.R. Gillespie, D.A. Travis, R.W. Wrangham, P. Parham, and E.E. Wroblewski; Int. Primatological Society; podium; Nairobi, Kenya.

2018 Trade-offs between reproduction & immunity in wild female chimpanzees from Kibale National Park, Uganda. S. Phillips-Garcia, T.L. Goldberg, M.N. Muller, Z.P. Machanda, E. Otali, S. Friant, J. Carag, K.E. Langergraber, J.C. Mitani, R.W. Wrangham, & Melissa Emery Thompson; Midwest Primate Interest Group; podium presentation; Bloomington, IN.

2018 Ecoimmunology of wild chimpanzees (*Pan troglodytes schweinfurthii*): Does *MHC* genotype or phenotype predict occurrence of respiratory infection? S. Phillips-Garcia, M. Emery Thompson, M.N. Muller, Z.P. Machanda, E. Scully, E. Otali, T.L. Goldberg, R.W. Wrangham, P. Parham, and E.E. Wroblewski; American Association of Biological Anthropologists; podium; Austin, TX.

2018 Characterization of *MHC-DRB* immunogenetic diversity in the wild chimpanzees (*Pan troglodytes schweinfurthii*) of Gombe National Park, Tanzania. E.E. Wroblewski, S. Phillips-Garcia, L. Guethlein, and P. Parham; American Association of Biological Anthropologists; podium by E.E. Wroblewski; Austin, TX.

2017 Characterization of a Class I *MHC* gene in East African Chimpanzees (*Pan troglodytes schweinfurthii*): Does *MHC* Genotype or Phenotype Predict Frequency of Respiratory Illness? S. Phillips-Garcia, M. Emery Thompson, M.N. Muller, Z.P. Machanda, E. Scully, E. Otali, T.L. Goldberg, R.W. Wrangham, P. Parham, and E.E. Wroblewski; Midwest Primate Interest Group; podium; Northwestern University, Chicago, IL.

2017 Longitudinal changes in diet and reproduction among wild chimpanzees at Kanyawara, Kibale National Park. M. Emery Thompson, Z.P. Machanda, S. Phillips-Garcia, E. Otali, M.N. Muller, R.W. Wrangham; American Association of Biological Anthropologists; podium by M. Emery Thompson; New Orleans, LA.

2013 The signature of language and geography on the genetic structure of human populations in Africa. M.E. Schaeffer, S.R. Joyce, and J.C. Long; American Association of Biological Anthropologists; podium by M.E. Schaeffer; Knoxville, TN.

2010 Analysis of global gene identity reveals a history of serial founder effects and admixture with archaic humans. S.R. Joyce, K.L. Hunley, and J.C. Long; American Journal of Physical Anthropology. Volume 141 Issue S50; podium; American Association of Biological Anthropologists; Albuquerque, NM.

2003 Phylogenetics of lymnaeid snails with emphasis on the evolution of susceptibility to *Fascioloides magna* infection. S.R. Joyce, M. Mort, & J.R. Laursen; podium; American Society of Parasitologists, Westin Inn, Halifax, Nova Scotia.

2002 Phylogenetics of lymnaeid snails with emphasis on the evolution of susceptibility to *Fascioloides magna* infection. S.R. Joyce, M. Mort, & J.R. Laursen; podium; Annual Midwest Conference of Parasitologists, Millikin University, Decatur, IL.

2002 Phylogenetics of lymnaeid snails with emphasis on the evolution of susceptibility to *Fascioloides magna* infection. S.R. Joyce, M. Mort, & J.R. Laursen; podium presentation; Illinois State Academy of Science, Southern Illinois University, Edwardsville, IL.

2001 Phylogenetics of Lymnaeidae (Mollusca: Gastropoda) based on multiple molecular data sets. S.R. Joyce, M. Mort, & J.R. Laursen; poster; Evolution; University of Tennessee, Knoxville, TN.

2001 Effects of Aquashade™ and CuSO₄ on growth and reproduction of *Biomphalaria glabrata*. S.R. Joyce & J.R. Laursen; poster; Annual Midwest Conference of Parasitologists, Eastern Illinois University, Charleston, IL

2000 Effects of Aquashade™ on the survival, growth, and reproduction of *Biomphalaria glabrata*. S.R. Joyce & J.R. Laursen; podium; North-Central Tri-Beta Conference, IL

Mentored Research

Ketty Munyenjembe. (2023). Trade-offs in virus evolution models: A meta-analysis. Ph.D. student, Ogbunu laboratory, Yale University, New Haven, CT.

Evan Ho. (Summer/Fall 2022). Within-patient viral genomics & evolution of HIV-1 *env* gene. Summer Research Assistant, San Francisco State University, San Francisco, CA.

Ana Rodriguez Vega. (Summer 2022). Within-patient viral genomics & evolution of HIV-1 *env* gene. Summer Research Assistant, San Francisco State University, San Francisco, CA.

Shauna Brown. (Winter 2021). The relationship between reproductive hormones and gastro-intestinal parasites in rhesus macaques from Cayo Santiago Field Station, Puerto Rico. Master's Thesis, Bangor University, Wales, United Kingdom.

Kate Burkart. (Fall 2017). *Troglodytella abrassarti* as a marker of health in wild, East African chimpanzees (*P. t. schweinfurthii*) from Kibale National Park, Uganda. Undergraduate Research, University of Wisconsin, Madison, WI

Cristina Diaz. (Fall 2017). Morphometrics of *Oesophagostomum* eggs in wild chimpanzees: Is there evidence for multiple species? Undergraduate Research, University of Wisconsin, Madison, WI

Laboratory Trainees

Ketty Munyenjembe, 3rd year Ph.D. student, Department of Ecology and Evolutionary Biology, Yale University, CT
(currently a Ph.D. student at Yale University)

Ana Rodriguez Vega, 2nd year M.S. student, Department of Biology, San Francisco State University, CA
(currently an Ph.D. student in neurobiology at UCLA)

Evan Ho, 2nd year M.S. student, Department of Biology, San Francisco State University, CA
(currently a Ph.D. student in EEB at UCSC)

Jess Carag, 3rd year DVM, School of Veterinary Medicine, University of Wisconsin, Madison, WI
(currently a D.V.M. & Program Manager at Emory University School of Medicine, Infectious Disease)

Kylie Grady, 2nd year DVM, School of Veterinary Medicine, University of Wisconsin, Madison, WI
(currently a DVM and postdoctoral associate at NC State University)

Richard Dulli, 3rd year DVM, School of Veterinary Medicine, University of Wisconsin, Madison, WI
(currently a DVM & practicing veterinarian)

Kayla Bonack, Senior Undergraduate, University of Wisconsin, Madison, WI
(currently a MPH working in Public Health)

Kate Burkart, Junior Undergraduate, University of Wisconsin, Madison, WI
(currently a DVM student at University of Wisconsin-Madison School of Veterinary Medicine)

Cristina Diaz, Sophomore Undergraduate, University of Wisconsin, Madison, WI
(currently a DVM student at University of Wisconsin-Madison School of Veterinary Medicine)

Gaby Shay, Freshman Undergraduate, University of Wisconsin, Madison, WI
(currently a wildlife ecology student at University of Wisconsin-Madison)

Teaching Interests

Primate Immunogenetics
Parasitology
Molecular Epidemiology
Neglected Tropical Diseases

Viral Genomics & Evolution
Ecological Immunology
Eco/Evo of Infectious Diseases
One Health/Evolutionary Medicine

Teaching

(Blue font denotes courses where I was instructor of record)

2021 Spring, ANTH 150 - Evolution and Human Emergence, UNM
2019 Fall, ANTH 160 - Human Life Course, UNM
2019 Spring, ANTH 150 - Evolution and Human Emergence, UNM
2018 Fall, ANTH 160 - Human Life Course, UNM
2018 Spring, ANTH 160 - Human Life Course, UNM
2017 Fall, ANTH 160 - Human Life Course, UNM
2017 Spring, ANTH 150 - Evolution and Human Emergence, UNM
2016 Fall, ANTH 151L - Evolution and Human Emergence Lab, UNM
2016 Spring, ANTH 160 - Human Life Course, UNM
2015 Spring, ANTH 151L - Evolution and Human Emergence Lab, UNM
2014 Fall, ANTH 151L - Evolution and Human Emergence Lab, UNM
2014 Spring, ANTH 150 - Evolution and Human Emergence, UNM
2013 Fall, ANTH 150 - Evolution and Human Emergence, UNM
2013 Summer, ANTH 150 - Evolution and Human Emergence, UNM
2013 Summer, ANTH 160 - Human Life Course, UNM
2013 Spring, ANTH 350 - Human Biology, UNM
2012 Fall, ANTH 160 - Human Life Course, UNM
2012 Summer, ANTH 150 - Evolution and Human Emergence, UNM
2012 Spring, ANTH 150/151L - Evolution and Human Emergence, UNM
2011 Spring, BIOL 419/519 - Algal Biofuels (Team Taught), UNM
2009 Summer, General Biology for science majors (lecture), CNM
2009 Spring, General Biology for science majors (lecture), CNM
2008 Summer, Molecular and Cell Biology (lecture), CNM
2008 Spring, General Biology for science majors (lecture), CNM

2008 Spring, General Biology for non-science majors (lecture), CNM
2003 Fall, Molecular/Cell Biology (lecture), Purdue University
2002 Fall, Ecology, Diversity and Behavior (lab), Purdue University
2002 Field Biology (lecture/lab), IL Eastern Community Colleges
2001 Environmental Biology (lecture/lab), IL Eastern Community Colleges
2000 General Biology (lecture/lab), IL Eastern Community Colleges
2000 General Chemistry (lecture/lab), IL Eastern Community Colleges

International & Domestic Field Sites

Kibale National Park, Uganda, Africa
(wild chimpanzees, host immunogenetics, respiratory viruses, parasites, wildlife/One Health)

Gombe National Park, Tanzania, Africa
(wild chimpanzees, host immunogenetics, respiratory viruses, wildlife/One Health)

Minas Gerais, Brazil, South America
(humans, schistosome parasites, snail intermediate host genetics, Global Public/One Health)

Minnesota, United States of America, North America
(white-tailed deer, fasciolid parasites, snail intermediate host genetics, wildlife/One Health)

Professional Service

Society Memberships:

Genetics Society of America
American Association of Biological Anthropologists
American Society of Primatologists
International Primatological Society
Society for the Study of Evolution
American Association of Anthropological Genetics
American Society of Parasitologists
Society of Systematic Biologists
Sigma Xi
Tri-Beta
Phi Sigma

Society Service:

2023-current	Early Career Leadership Program (Multimedia), GSA
2023-current	Mentor, American Society of Primatologists
June 2023	Poster Award Committee, Evolution/SSE
June 2022	Poster Award Committee, Evo Genetics, PEQG, GSA
2016-2018	LGBTQIAA Social Media Committee, AABA

Computer Programming Languages

R programming language
Matlab

Science-based Community Outreach

***Genetics in Your World* podcast (2022-current)**
Early Career Leadership Fellow with Genetics Society of America
Episode 5 - Advertiser
Episode 9 - Advertiser
Episode 10 - Producer

Episode 11 - Advertiser
Episode 14 - Producer

Skype-A-Scientist Classroom Visiting Scientist (2017-current)
Skype-A-Scientist Program
Virtual (North American Classrooms)

K-12 Health Program Visiting Scientist (Summer 2018)
Kibale Forest School System
Fort Portal, Uganda

Academic Coordinator, STEM Engineering Summer Camp (Summer 2015)
Department of Engineering
University of New Mexico

Nature Program Coordinator, Grades 9-12 (Summer 2014)
Albuquerque BioPark
Albuquerque, New Mexico