

# Holly L. Lutz

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## EDUCATION

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- 2011 – 2016 PhD: Ecology and Evolutionary Biology, Cornell University, Ithaca, NY  
Co-Advisors: Michael J. Stanhope, André A. Dhondt  
Committee: John W. Fitzpatrick, Irby J. Lovette  
*Thesis: Ecology and evolution of malarial parasites in vertebrate hosts*
- 2005 – 2009 BA: Department of Biological Sciences, University of Chicago, Chicago, IL  
Specialization in Ecology and Evolutionary Biology  
*Thesis: Biogeography and spatio-temporal diversification of Selenidera and Andigena toucans (Aves: Ramphastidae)*

## PROFESSIONAL APPOINTMENTS

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- 2020 – pres. Assistant Project Scientist, Department of Pediatrics, UC San Diego School of Medicine
- 2016 – pres. Scientific Affiliate, Integrative Research Center, Field Museum of Natural History
- 2019 – 2020 Postdoctoral Scholar, Department of Pediatrics, UC San Diego School of Medicine
- 2017 – 2018 Postdoctoral Fellow, Department of Surgery, University of Chicago

**EMPHASIS OF RESEARCH** Symbioses and the microbiome, host-parasite and -pathogen ecology and evolution, comparative immunology, ecoimmunology

## PUBLICATIONS

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Citations: 533; h-index: 12  
*\*Denotes graduate student and \*\*undergraduate student mentee co-author*

22. Lutz H. L., Gilbert JA, Dick CW. 2021. Tripartite associations between Afrotropical bats, eukaryotic parasites, and microbial symbionts. *Molecular Ecology*. doi.org/10.1111/mec.16044. Online ahead of print. [Featured Cover Article]
21. Fecchio A, Clark NJ, Bell JA, Skeen H, Lutz HL, Vaughan JA, Tkach W, Schunck FC, Ferreira FC, Braga ÉM, Lugarini C, Wamiti W, Dispoto JH, Galen SC, Kirchgatter K, De La Torre GM, Sagario MC, Cueto VR, González-Acuña D, Voelker G, Collins MD, Hellgren O, Ellis VA, Bensch S, Ricklefs RE, Weckstein JD, Wells K. 2021. Global hotspots of haemosporidian prevalence in birds and drivers of infection. *Global Ecology and Biogeography*. doi.org/10.1111/geb.13390. Online ahead of print.
20. Colella JP, Bates JM, Burneo S, Camacho A, Carrion C, Constable I, D'Elia G, Dunnum J, Greiman S, Hoberg E, Lessa E, Liphardt S, Londono M, Losos E, Lutz HL, Ordóñez Garza N, Peterson T,

- Martin ML, Ribas C, Strumminger B, Torres Pérez FT, Thompson C, Weksler M, Cook JA. 2021. Leveraging natural history biorepositories as a global, decentralized, pathogen surveillance network. *PLoS Pathogens*, 17(6) e1009583.
19. Özen S<sup>†</sup>, Lutz HL<sup>†</sup>, Rivera VM, Batu ED, Anderson E, Salas Garcia M, Aldrovandi MG, Pazarbasi İ, Akbaba T, Bilginer Y, Balat A, Peynircioglu B, Reiff A, Gilbert JA, Dedeoglu F, Hausmann JS. 2021. Microbiome is not linked to clinical disease severity of Familial Mediterranean Fever in an international cohort of children. *Clinical and Experimental Rheumatology*. PMID: 34251310. Online ahead of print. <sup>†</sup>Co-first authors
  18. Lutz HL, Vangelatos A\*, Gittel N\*\*, Osculati A, Visona S, Finley SJ, Tuomisto S, Karhunen P, Gilbert JA, Javan GT. 2020. Manner of death and demographic effects on microbial community composition in organs of the human cadaver. *Frontiers in Microbiology*, 11:569630.
  17. Jackson EW, Wilhelm R, Johnson M, Lutz HL, Danforth I, Gaydos J, Hart M, Hewson I. 2020. Diversity of sea star-associated densoviruses and transcribed endogenized viral elements of densovirus origin. *Journal of Virology*, 95(1). doi.org/10.1128/JVI.01594-20.
  16. Miller SE, Barrow LN, Ehlman SM, Goodheart JA, Greiman SE, Lutz HL, Misiewicz TM, Smith SM, Tan M, Thawley CJ, Cook JA, Light JE. 2020. Building natural history collections for the 21<sup>st</sup> Century and beyond. *BioScience*, 70(8). doi.org/10.1093/biosci/biaa069.
  15. Song SJ, Sanders J, Delsuc F, Metcalf J, Amato K, Taylor MW, Mazel F, Lutz HL, Winker K, Graves GR, Humphrey G, Gilbert JA, Hackett SJ, White KP, Skeen H, Kurtis SM, Withrow J, Braile T, Miller M, McCracken K, Maley J, Blanton JM, McKenzie VJ, Knight R. Comparative analyses of vertebrate gut microbiomes reveal convergence between birds and bats. 2020. *mBio*, doi.org/10.1128/mBio.02901-19
  14. Lutz HL, Jackson EW, Webala PW, Babyesiza WS\*\*, Kerbis Peterhans JC, Demos TC, Patterson BD, Gilbert JA. 2019. Ecology and host identity outweigh evolutionary history in shaping the bat microbiome. *mSystems*, doi.org/10.1128/mSystems.00511-19.
  13. Demos TC, Webala PW, Lutz HL, Kerbis Peterhans JC, Goodman SM, Cortés-Delgado N, Bartonjo M, Patterson BD. Molecular systematics and coalescent delimitation of a cryptic radiation of African long-fingered bats (Chiroptera, Miniopteridae). 2019. *Zoologica Scripta*. doi.org/10.1111/zsc.12388.
  12. Fecchio A, Bell J, Bosholn M, Vaughan J, Tkach V, Lutz HL, Cueto V, Gorosito C, González-Acuña D, Stromlund C, Kvasager D, Comiche K, Kirchgatter K, Pinho J, Berv J, Anciaes M, Fontana C, Zyskowski K, Sampaio S, Dispoto J, Galen S, Weckstein JD, Clark N. 2019. An inverse latitudinal gradient in infection probability and phylogenetic diversity for *Leucocytozoon* blood parasites in New World birds. *Journal of Animal Ecology*. doi.org/10.1111/1365-2656.13117
  11. Phillips CD, Dunnum JL, Dowler RC, Bradley LC, Garner HJ, MacDonald KA, Lim BK, Revelez MA, Campbell ML, Lutz HL, Cook JA, Bradley RD, and the Systematic Collections Committee of the American Society of Mammalogists. 2019. Curatorial guidelines and standards of the American Society of Mammalogists for collections of genetic resources. *Journal of Mammalogy*. 100(6), 1690-1694.
  10. Lutz HL, Carryl S\*\*, Santymire RM. 2019. Wildlife Microbial Genomics and Endocrinology. In D. Marco (editor). *Microbial Ecology: Current Advances from Genomics, Metagenomics, and other Omics*. Caister Academic Press, Poole, UK. doi.org/10.21775/9781912530021.

9. Barrow LN, McNew SM, Mitchell, N, Galen, SC, **Lutz HL**, Skeen H, Valqui T, Weckstein JD, Witt CC. 2019. Deeply conserved susceptibility in a multi-host, multi-parasite system. ***Ecology Letters***, 22(6), 987-998.
8. Fecchio A, Bell JA, Pinheiro R, Cueto V, Gorosito C, **Lutz HL**, Gaiotti M, Paiva L, França L, Toledo-Lima G, Tolentino M, Pinho J, Tkach V, Fontana C, Grande J, Santillán M, Caparroz R, Roos A, Bessa R, Nogueira W, Moura T, Nolasco E, Comiche K, Kirchgatter K, Guimarães L, Dispoto J, Marini M, Weckstein JD, Batalha-Filho H, Collins MD. 2019. Avian host composition, local speciation, and dispersal drive the regional assembly of avian malaria parasites in South American birds. ***Molecular Ecology***, 28(10), 2681-2693.
7. **Lutz HL**, Ramírez-Puebla T, Abbo L, Schlundt C, Sjaarda AK\*, Durand A, Hanlon RT, Gilbert JA, Mark Welch JL. 2019. A simple microbiome in the European common Cuttlefish, *Sepia officinalis*. ***mSystems***. doi.org/10.1128/mSystems.00177-19.
6. Fecchio A, Wells K, Bell JA, Tkach VV, **Lutz HL**, Weckstein JD, Clegg SM, Clark NJ. 2019. Climate variation influences host specificity in avian malaria parasites. ***Ecology Letters***, doi.org/10.1111/ele.13215.
5. **Lutz HL**, Tkach VT, Weckstein JD. 2017. Methods for Specimen-based Studies of Avian Symbionts. Pp. 157-183 in M. S. Webster (editor). *The Extended Specimen: Emerging Frontiers in Collections-based Ornithological Research*. Studies in Avian Biology (no. 50). CRC Press, Boca Raton, FL. doi.org/10.1093/auk/ukz024.
4. **Lutz HL**, Marra NJ, Grewe F, Carlson J, Palinauskas V, Valkiunas GV, Stanhope MJ. 2016. Laser capture microdissection microscopy and genome sequencing of the avian malaria parasite, *Plasmodium relictum*. ***Parasitology Research***, 115, 4503 – 4510.
3. **Lutz HL**, Patterson BD, Kerbis JC, Webala PW, Stanley WT, Gnoske TP, Hackett SJ, Stanhope MJ. 2016. Diverse sampling of East African bats and birds supports a chiropteran origin of malaria parasites in primates and rodents. ***Molecular Phylogenetics and Evolution***, 99, 7-15.
2. **Lutz HL**, Hochachka WM, Engel JI, Bell JA, Tkach VV, Bates JM, Hackett SJ, Weckstein JD. 2015. Parasite prevalence corresponds to host life history in a diverse assemblage of Afrotropical birds and haemosporidian parasites. ***PLoS ONE***, 10(4), e0121254.
1. **Lutz HL**, Weckstein JD, Patané JL, Bates JM, Aleixo A. 2013. Biogeography and spatio-temporal diversification of *Selenidera* and *Andigena* toucans (Aves: Ramphastidae). ***Molecular Phylogenetics and Evolution***, 69, 873 – 883.

## IN REVIEW

4. Kodera S\*, Das P, Gilbert JA, **Lutz HL**. Conceptual tools for understanding microbial interactions across scales of complexity. ***iScience***.
3. Porter ML, **Lutz HL**, Steck M, Chong RA. The complete mitochondrial genomes and phylogenetic analysis of two Nycteribiidae bat flies (Diptera: Hippoboscoidea). ***Mitochondrial DNA Part B***.
2. Shaffer JP, Louis-Félix Nothias LN, Thompson LR\*, Sanders JG, Salido RA, Couvillion SP, Brejnrod AD, Huang S, Lejzerowicz F, **Lutz HL**, Zhu Q, Martino C, Morton JT, Karthikeyan S, Nothias-Esposito M, Dürkhop K, Böcker S, Kim H, Askenov AA, Bittremieux W, Minich JJ, Marotz C, Bryant MM, Sanders K, Schwartz T, Humphrey G, Vásquez-Baeza Y, Tripathi A, Parida L, Carrieri AP,

Haiminen N, Beck KL, Das P, González A, McDonald D, Karst SM, Albertsen M, Ackermann G, DeReus J, Thomas T, Petras D, Shade A, Stegen J, Song SJ, Metz TO, Swafford AD, Dorrestein PC, Jansson JK, Gilbert JA, Knight R, & the Earth Microbiome Project 500 (EMP500) Consortium. Multi-omics profiling of Earth's biomes reveals that microbial and metabolite composition are shaped by the environment. *Nature Biotechnology*. BioRxiv Preprint: doi.org/10.1101/2021.06.04.446988.

1. Dodiya HB, Lutz HL, Patel P, Leibowitz J, Zhang C, Weigle I, Xia J, Oshomuvwe D, Olszewski M, Zhang X, Schipma MJ, Butovsky O, Tanzi RE, Gilbert JA, Sisodia SS. Early life microbiome perturbation results in sex-specific changes of brain amyloidosis and microglia phenotypes in APPPS1-21 Alzheimer's transgenic mice. *Journal of Experimental Medicine*.

## GRANTS

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### Pending

|      |   |             |
|------|---|-------------|
| 2022 | OSP; NIH R01 (Feb '22 1 <sup>st</sup> submission anticipated)           | TBD         |
| 2021 | PI; NIH R21 (1 <sup>st</sup> submission)                                | \$447,719   |
| 2021 | PI; NSF DEB Bridging Ecology & Evolution (1 <sup>st</sup> resubmission) | \$828,199   |
| 2021 | Co-PI; NSF EEID (3 <sup>rd</sup> resubmission)                          | \$2,395,307 |
| 2021 | Grainger Bioinformatics Fund, Field Museum of Natural History           | \$15,000    |

### Awarded

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|------|--|-----------|
| 2021 | Council on Africa, Chicago, IL   | \$7,100   |
| 2020 | Schmidt Ocean Institute  | \$460,000 |
| 2019 | Negaunee Seed Grant, Field Museum of Natural History                     | \$28,100  |
| 2019 | Grainger Bioinformatics Fund, Field Museum of Natural History            | \$12,375  |
| 2018 | Council on Africa, Chicago, IL   | \$5,976   |
| 2015 | Athena Fund, Cornell Lab of Ornithology                                  | \$4,000   |
| 2014 | Illumina MiSeq Grant, Pritzker Lab. of Molecular Systematics & Evolution | \$5,000   |
| 2014 | CALS Alumni Association Grant  | \$545     |
| 2014 | Cornell Center for Comparative and Population Genomics                   | \$750     |
| 2013 | NSF Malaria Research Coordination Network                                | \$1,975   |
| 2013 | American Society of Naturalists  | \$200     |
| 2013 | Athena Fund, Cornell Lab of Ornithology                                  | \$1,800   |
| 2012 | Sigma Xi, Cornell Chapter  | \$400     |
| 2012 | Andrew W. Mellon Grant   | \$1,000   |
| 2012 | NSF Malaria Research Coordination Network                                | \$3,000   |
| 2011 | Krammer Graduate Research Grant  | \$1,000   |

## FELLOWSHIPS, HONORS, & AWARDS

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|             |   |           |
|-------------|---|-----------|
| 2017 – 2019 | National Science Foundation Postdoctoral Research Fellowship in Biology | \$138,000 |
| 2015        | Diversity Fellow, Edward A. Bouchet Graduate Honor Society              | NA        |
| 2014 – 2015 | L. Armour, W. A. & S. Rowley Fellow, Field Museum of Natural History    | \$40,000  |
| 2013 – 2016 | National Science Foundation Graduate Research Fellowship Program        | \$96,000  |
| 2011 – 2012 | Presidential Life Sciences Fellow, Cornell University                   | \$30,930  |

In 2012, I was honored by the naming of a tropical avian louse species after my contributions to parasite collections: *Cotingacola lutzae*, ex. *Laniocera hypopyrra* (Cinereous Mourner).

Valim MP, Weckstein JD. Two new species of *Cotingacola* Carriker, Phthiraptera: Ischnocera: Philopteridae) from Amazonian Brazil, with comments on host-specificity. *Syst Parasitol*. 2012 Mar;81(3):159-67. doi.org/10.1007/s11230-011-9334-7.

## **PRESENTATIONS**

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### **Invited Symposia**

- 2021 Purina Institute Microbiome Forum
- 2021 President's Symposium, 96<sup>th</sup> Annual meeting of the American Society of Parasitologists.
- 2019 INSPIRE Symposium, Joint meeting of the Ecological Society of America/USSEE, Louisville, KY.
- 2015 Cornell Lab of Ornithology, Cornell University, Ithaca, NY.
- 2013 Symposium on Afrotropical Biodiversity, Makerere University, Kampala, Uganda.
- 2013 American Ornithological Union, Chicago, IL.

### **Invited Seminars**

- 2021 University of North Carolina, Charlotte, NC.
- 2021 University of Western Kentucky, Bowling Green, KY.
- 2020 Suzanne Ott Prather Annual Lecture Series, University of Nebraska-Lincoln, Lincoln, NE.
- 2019 National Animal Health and Diagnosis and Investigation Center, Sebeta, Ethiopia.
- 2018 Conservation and Science Lecture Series, Lincoln Park Zoo, Chicago, IL.
- 2017 Moore Lab of Zoology, Occidental College, Los Angeles, CA.
- 2017 A. Watson Armour Seminar Series, Field Museum of Natural History, Chicago, IL.
- 2015 Edward A. Bouchet Conference on Diversity and Graduate Education, Yale U., New Haven, CT.
- 2014 Council on Africa, Field Museum of Natural History, Chicago, IL, USA.

### **Select Presentations**

- 2021 Evolution, Virtual
- 2021 101<sup>st</sup> Annual Meeting of the American Society of Mammalogists, Virtual.
- 2019 International Bat Research Conference, Phuket, Thailand.
- 2019 99<sup>th</sup> Annual Meeting of the American Society of Mammalogists, Washington, DC.
- 2017 2<sup>nd</sup> International Symposium on Infectious Diseases of Bats, Fort Collins, CO.
- 2017 Ecology and Evolution of Infectious Diseases, Santa Barbara, CA.
- 2015 45<sup>th</sup> Annual Symposium of the North American Society for Bat Research, Monterey Bay, CA.
- 2014 PREDEMICS Zoonotic features of viral infections, Nat.Institute for Infectious Diseases, Rome, Italy
- 2013 International Conference on Malaria and Related Haemosporidia in Wildlife, Vilnius, Lithuania.
- 2011 Ecology and Evolution of Infectious Diseases, Santa Barbara, CA.

## **TEACHING EXPERIENCE**

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University of California, San Diego; Scripps Institution of Oceanography

Fall 2021 Co-Instructor, SIO242A Marine Biotechnology I

Fall 2020 Co-Instructor, SIO242A Marine Biotechnology I

Cornell University

Winter 2016 Teaching Assistant, BIOEE2640 Tropical Field Ornithology in the Dominican Republic

Spring 2014 Teaching Assistant, BIOEE1780 Introduction to Evolutionary Biology and Diversity

Fall 2012 Head Teaching Assistant, BIOEE1780 Intro. To Evolutionary Biology and Diversity

Field Museum of Natural History

Summer 2010-2012 Residency Advisor, DNA Research Summer Residency for high school students

University of Chicago  
Fall 2008 Teaching Assistant, BIOSCI20184 Biodiversity

## INTERNATIONAL FIELD WORK

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*following scientific expeditions range from 1.5 – 2 months and involve bird, mammal, and symbiont specimen collection, preservation, export/import permitting and undergraduate/graduate student training*

Scheduled

2022 **Togo**. Project Lead. Collaboration with University of Lomé (Feb-Mar 2022)

Completed

2018 **Kenya**. Project Lead. Coll. with National Museums of Kenya; Karatina University

2016 **Kenya**. Project Lead. Coll. with National Museums of Kenya; Karatina University

2016 **Uganda**. Co-Lead. with Makere University; Uganda Wildlife Authority

2014 **Kenya**. Project Lead. Coll. with National Museums of Kenya; Karatina University

2014 **Honduras**. Co-Lead. Coll. with Cornell Lab of Ornithology and Zamorano University

2013 **Uganda**. Co-Lead. Coll. with Makere University; Uganda Wildlife Authority

2011 **Mozambique**. Team member. Gorongosa National Park

2010 **Peru**. Team member. Coll. with Centro de Ornitología Biodiversidad (CORBIDI)

2009 **Malawi**. Team member. Coll. with Museums of Malawi

## PROFESSIONAL SERVICE

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2021 – pres. Ambassador, National Microbiome Data Collaborative (<https://microbiomedata.org/>)

2021 – pres. Member, Museums and Emerging Pathogens in the America Network  
(<https://hsc.unm.edu/echo/institute-programs/mepa/>)

2020 – pres. Editor, *mSystems*, American Society for Microbiology

2019 – pres. Member, Conservation Committee, American Society of Mammalogists

2019 – pres. Member, Curatorial Guidelines Committee, American Society of Mammalogists

2017 – 2018 Contributing Writer, [www.micronow.com](http://www.micronow.com), American Society of Microbiology

2011 – 2014 Student Advocacy Committee, Graduate and Professional Student Assembly, Cornell U.

## Peer Review

American Naturalist, Current Microbiology, EcoHealth, Ecology & Evolution, Folia Zoologica, Frontiers in Microbiology, International Journal of Parasitology, ISMEJ, Journal of Avian Biology, Journal of Biogeography, Journal of Ornithology, Malaria Journal, Microbial Biotechnology, Parasitology, Parasitology Research, Zoologica Scripta, Nature Microbiology, Nature Communications

## Proposal Review

2021 External Reviewer, National Science Foundation

2021 External Reviewer, Czech Science Foundation

2021 External Reviewer, Marsden Fund of the Royal Society Te Apārangi, New Zealand

## Societies and Memberships

American Society of Mammalogists

American Society of Parasitologists

American Ornithologists Union

American Society for Microbiology

Bat Conservation International  
Ecological Society of America  
The Society for the Preservation of Natural History Collections

## OTHER TRAINING & EXPERIENCE

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- 2021 CITI Training in Biomedical Research Ethics, Practices, and Standards (citiprogram.org)
- 2019 Federal Bird Banding and Marking USGS Permit Holder (2019-present)
- 2017 Select Agent Training, Howard T. Ricketts Laboratory, Argonne National Laboratory, Argonne, IL
- 2017 IATA Certification, University of Chicago, Chicago, IL
- 2017 Animal BSL-3 Training, Biocontainment Laboratory, HTRL ANL, Argonne, IL
- 2014 PREDEMICS Workshop on Zoonotic Features of Viral Infections, National Institute for Infectious Diseases, Rome, Italy
- 2013 Workshop on Molecular Evolution, Marine Biological Laboratory, Woods Hole, MA
- 2012 International Workshop on Malaria and Related Haemosporidian Parasites, National Conservation Training Center, Shepherdstown, WV
- 2010 Veterinary Assistant, Hyde Park Animal Clinic, Chicago, IL
- 2009 Animal Keeper, Lincoln Park Zoo, Chicago, IL

## EDUCATION AND OUTREACH

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Education: General Public

Members' Nights at Field Museum of Natural History, educating public on role of collections and scientific research in conservation, medicine and health, and societal progress. Pop-up science talks at various public venues in Chicago, during which I discuss my research in general terms and field questions as well as provide hands-on experiences with scientific tools and specimens. Provide tours and interviews with artists, authors, and science communicators to disseminate scientific concepts, discoveries, and resources to the public.

Education & Outreach: K-12

Lutz, HL & Kodera, S. "K-12: Child-centric framework for Microbiology Education" (2021), Topic Framework contributed to The International Microbiology Literacy Initiative of the Environmental Biotechnology Network (<https://ebnet.ac.uk/microbiology-literacy/>)

Editorial review for Backyard Biology: Investigate Habitats Outside Your Door with 25 Projects (Build it Yourself Series), Authors: Donna Latham, Beth Hetland, Nomad Press: White River Junction, VT. 2014. ASIN: B07F47HYV7

## REFERENCES

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## ADDITIONAL REFERENCES

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Dr. Rob Knight  
*Postdoctoral Supervisor*  
Founding Director, Center for  
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