

Holly L. Lutz

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The Scripps Research Institute
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www.hollylutz.com

EDUCATION

- 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

- 2022 – pres. Postdoctoral Associate, Department of Immunology & Microbiology, Scripps Research
- 2016 – pres. Research Associate, Negaunee Integrative Research Center, Field Museum of Nat. Hist.
- 2020 – 2022 Assistant Project Scientist, Department of Pediatrics, UC San Diego School of Medicine
- 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 Evolution of host-symbiont systems, viral ecology and evolution, ecoimmunology, One Health and the human-wildlife interface

PUBLICATIONS Citations: 1163; h-index: 18; i10-index: 21

*Denotes graduate student and **undergraduate student mentee co-author

31. Demos TC, Webala PW, Goodman SM, Kerbis Peterhans JC, **Lutz HL**, Agwanda BR, Cortés-Delgado N, Briones S, Ree RH, Patterson BD. Ultraconserved elements resolve phylogenetic relationships and biogeographic history of African-Malagasy bent-winged bats (*Miniopterus*). In Press. *Molecular Phylogenetics and Evolution*.
30. Herder EA, **Lutz HL**, Hird SM. 2023. Body size poorly predicts host-associated microbial diversity in wild birds. *Microbiology Spectrum*, e03749-22, 1-19.
29. Kelliher JM, Rudolph M, Vangay P, Abbas A, Borton MA, Santistevan C, Davenport ER, Davenport KW, Erazo NG, Herman C, Karstens L, Kocurek B, **Lutz HL**, Myers KS, Ockert I, Rodriguez FE, Saunders JK, Smith ML, Vogtmann E, Windsor A, Wood-Charlson EM, Woodley L, Eloie-Fadrosch

- EA. 2023. Cohort-based learning for microbiome research community standards. **Nature Microbiology**, 8, 751-753.
28. Kodera S, Sharma A, Martino C, Dsouza M, Grippo M, Cox A, **Lutz HL**, Knight RK, Gilbert JA, Negri C, Allard SM. 2023. Microbiome response in an urban river system is dominated by seasonality over wastewater treatment upgrades. **Environmental Microbiome**, 18(10), doi.org/10.1186/s40793-023-00470-4.
27. 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. 2022. Multi-omics profiling of Earth's biomes reveals that microbial and metabolite composition are shaped by the environment. **Nature Microbiology**, 7, 2128-2150.
26. Porter, ML, **Lutz, HL**, Steck, M, Chong, RA. 2022. The complete mitochondrial genomes and phylogenetic analysis of two Nycteribiidae bat flies (Diptera:Hippoboscoidea). **Mitochondrial DNA Part B Resources** 7(8),1486-1488.
25. Colella JP, Greiman SE, Kutz S, **Lutz HL**, Cook JA. 2022. Genomic identification and surveillance of infectious disease in natural systems. In C. Holleley & O. Berry (eds) Applied Environmental Genomics, CSIRO, Canberra, Australia. ISBN: 9781486314928.
24. Kodera S*, Das P, Gilbert JA, **Lutz HL**. 2022. Conceptual strategies for characterizing interactions in microbial communities. **iScience**, 25(2), e103775.
23. 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. 2021. Gut microbiome-driven brain A β amyloidosis in mice requires microglia. **Journal of Experimental Medicine**, 219(1), e20200895.
22. **Lutz HL**, Gilbert JA, Dick CW. 2021. Associations between Afrotropical bats, eukaryotic parasites, and microbial symbionts. **Molecular Ecology**, 31(7), 1939-1950. **[Featured Cover Article]**
21. Fecchio A, Clark NJ, Bell JA, Skeen H, **Lutz HL**, Vaughan JA, De La Torre GM, Tkach WV, Schunck FC, Ferreira FC, Braga ÉM, Lugarini C, Wamiti W, Dispoto JH, Galen SC, Kirchgatter K, Sagario MC, Cueto VR, González-Acuña D, Inumaru M, Sato Y, Schumm YR, Quillfeldt P, Pellegrino I, Dharmarajan G, Gupta P, Robin WV, Cilolgu A, Yildirim A, Huang X, Chapa-Vargas L, Álvarez-Mendizábal P, Santiago-Alarcon D, Drovetski SV, Hellgren O, Voelker G, Ricklefs RE, Hackett SJ, Collins MD, Weckstein JD, Wells K. 2021. Global drivers of avian haemosporidian infections vary across zoogeographical regions. **Global Ecology and Biogeography**, 30(12), 2393-2406.
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[†], **Lutz HL**[†], 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*, 132(5), 102-108.

†Co-first authors

18. Lutz HL, Vangelatos A**, Gottel N*, Osculati A, Visona S, Finley SJ, Tuomisto S, Karhunen P, Gilbert JA, Javan GT. 2020. Effects of extended postmortem interval on microbial communities 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 densovirus 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 21st 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. 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). 2020. *Zoologica Scripta*, 49 (1), 1-13.
13. 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.
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*, 4(4), 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*, 22(3), 547-557.
 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.

GRANTS

Pending (intention to resubmit)

2024	PI; NIH R21 (1 st resubmission)	\$447,719
2024	PI; NSF DEB Bridging Ecology & Evolution (1 st resubmission)	\$828,199
2024	Co-PI; NSF EEID (recommended for funding; 3 rd resubmission)	\$2,395,307

Awarded

2023	National Geographic Society	\$98,810
2022	Grainger Bioinformatics Fund, Field Museum of Natural History	\$10,000
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 (declined)	\$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

2022	Maxwell-Hanrahan Field Biology Award	\$100,000
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

Invited Symposia

- 2021 Purina Institute Microbiome Forum
- 2021 President's Symposium, 96th 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 101st Annual Meeting of the American Society of Mammalogists, Virtual.

- 2019 International Bat Research Conference, Phuket, Thailand.
- 2019 99th Annual Meeting of the American Society of Mammologists, Washington, DC.
- 2017 2nd International Symposium on Infectious Diseases of Bats, Fort Collins, CO.
- 2017 Ecology and Evolution of Infectious Diseases, Santa Barbara, CA.
- 2015 45th 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

African Centre of Excellence for Genomics of Infectious Diseases (ACEGID), Redeemer's University, Ede, Nigeria

Summer 2023 Lead Instructor: Laboratory and bioinformatics training for wastewater surveillance of human pathogens

The Scripps Research Institute (via WARN-ID; www.warn-id.org)

Summer 2022 Instructor (Liberia) Genomic Epidemiology Training Series: workshop held at sites in W Africa as part of the NIH-funded CREID network effort to increase capacity in genomic epidemiology and surveillance of viral pathogens including Ebola, Lassa, SARS-CoV-2, and other zoonotic viruses.

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

The following scientific expeditions range from 1– 2 months and involve mammal, bird, and symbiont specimen collection, preservation, export/import permitting and undergraduate/graduate student training

Scheduled

2024 **Democratic Republic of Congo.** Project Co-Lead. Coll. with Dian Fossey Gorilla Fund

Completed

2023 **Liberia.** Project Co-Lead. Coll. with National Public Health Institute of Liberia (NPHIL)

2023 **Costa Rica EEZ.** Team member. Coll. with Schmidt Ocean Institute, R/V Falkor (too).

2023 **Nigeria.** Project Co-Lead. Coll. with ACEGID, Redeemer's University

2023 **Togo.** Project Lead. Coll. with University of Lomé

2022 **Liberia.** Project Co-Lead. Coll. with National Public Health Institute of Liberia (NPHIL)

2022 **Togo.** Project Lead. Coll. with University of Lomé

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 Makerere 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

- 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 – 2022 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, 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, Environmental Microbiology, Folia Zoologica, Frontiers in Microbiology, Global Ecology and Conservation, International Journal of Parasitology, ISMEJ, Journal of Avian Biology, Journal of Biogeography, Journal of Ornithology, Malaria Journal, Microbial Biotechnology, Molecular Ecology, mBio, mSystems, Nature Microbiology, Nature Communications, Parasitology, Parasitology Research, Trends in Microbiology, Zoologica Scripta,

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

- 2021 CITI Training in Biomedical Research Ethics, Practices, and Standards (citiprogram.org)
 2019 Federal Bird Banding and Marking USGS Permit Holder (2019-2023)
 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

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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