

Cara E. Brook

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Education

- 2012-2017 **Ph.D. Ecology and Evolutionary Biology, Princeton University**
Elucidating mechanisms of viral hosting in bat reservoirs for emerging zoonotic disease.
Advisor: Andrew Dobson
- 2012-2014 **M.Sc. Ecology and Evolutionary Biology, Princeton University**
Deciphering the role of bats as reservoirs in emerging disease.
Advisor: Andrew Dobson
- 2006-2010 **B.S. Earth Systems, Stanford University**
*The Synanthropic Raven: Anthropogenic resource use and the invasion of *Corvus corax* in Yosemite National Park.* Advisor: Elizabeth Hadly

Appointments

- 2021-present **Assistant Professor**, Dept of Ecology and Evolution, University of Chicago, Chicago, IL
2020-present **Branco Weiss Society in Science Fellow**, ETH-Zurich, Zurich, Switzerland
2017-2020 **Miller Postdoctoral Fellow**, Department of Integrative Biology, UC Berkeley, CA

Awards and Fellowships

- 2023 Nominated for Presidential Early Career Award for Scientists and Engineers (*reviews ongoing*)
2023-present Biota Award for Conservation Practice, Walder Foundation
2020-present Branco Weiss 'Society in Science' Fellowship, ETH-Zurich
2020-2021 L'Oréal USA For Women in Science Fellowship
2017-2020 Miller Postdoctoral Fellowship, UC Berkeley
2013-2017 National Science Foundation, Graduate Research Fellowship
2013 National Defense, Science, and Engineering Graduate Fellowship (*Declined in favor of NSF*)
2010 Firestone Medal, Undergraduate Research Excellence, Stanford University
2010 Earth Systems Award, Senior Thesis Excellence, Stanford University

Publications (*in reverse chronological order; *equal lead/±equal senior contributions*)

In Review

1. Randriambolamanantsoa TH, Razanajatovo NH, Ranaivoson HC, Randrianasolo L, Rabarison JH, Razafinmanjato H, Ratsimbazafy A, Rakoto DAD, Héraud J-M, Lacoste V, and **Brook CE**. Climatic drivers of seasonal dynamics for Respiratory Syncytial Virus (RSV) in Antananarivo, Madagascar, 2011-2021. *In Review*. doi (*medRxiv* preprint): <https://doi.org/10.1101/2024.02.03.24302203>.
2. Kim C, Buchholz D, Yeo YY, Ma A, Ezzatpour S, **Brook CE**, and Aguilar-Carreno H. Angavokely virus fusion and attachment glycoproteins mediate membrane fusion in human cells. *In Review*.

In Revision

3. **Brook CE**, Rozins C, Bohl JA, Ah Yong V, Chea S, Fahsbender E, Huy R, Lay S, Leang R, Li Y, Lon C, Man S, Oum M, Northrup GR, Oliveira F, Pacheco AR, Parker DM, Young K, Boots M, Tato CM, DeRisi JL, Yek C, and Manning JE. Climate, demography, immunology, and virology combine to drive two decades of dengue virus dynamics in Cambodia. *In Revision*. doi (*medRxiv* preprint): <https://doi.org/10.1101/2022.06.08.22276171>.
4. Horgan S, Kistler A, Ranaivoson HC, Andrianianina A, Andry S, Kettenburg G, Raharinosy V, Randriambolamanantsoa TH, Tato CM, Lacoste V, Héraud, JM, Dussart P, and **Brook CE**. Detection, characterization, and phylogenetic analysis of a near-whole genome sequence of a novel astrovirus in an endemic Malagasy fruit bat, *Rousettus madagascariensis*. *In Revision*. doi (*bioRxiv* preprint): <https://www.biorxiv.org/content/10.1101/2023.10.27.564436v1>.

2023

5. Ruhs EC, Chia WN, Hiang Foo RJ, Peel AJ, Li Y, Larman HB, Irving AT, Wang LF, and **Brook CE**. Applications of VirScan to broad serological profiling of bat reservoirs for emerging zoonoses. 2023. *Frontiers in Public Health*. 11: 1212018. doi: 10.3389/fpubh.2023.1212018.
6. **Brook CE**, Rozins C, Guth S, and Boots M. Reservoir host immunology and life history shape virulence evolution in zoonotic viruses. 2023. *PloS Biology*. 21 (9): e3002268. doi: 10.1371/journal.pbio.3002268.

7. Yek C, Li Y, Pacheco AR, Lon C, Duong V, Dussart P, Chea S, Lay S, Man S, Kimsan S, Huch C, Leang R, Huy R, **Brook CE**, and Manning JE. National dengue surveillance, Cambodia 2002-2020. 2023. *Bulletin of the World Health Organization*. 101: 605-616. doi: 10.2471/BLT.21.287728.

2022

8. Tegally H, San J, Cotten M, Tegomoh B, Martin D...**Brook CE**...Wilkinson E (397 authors). The evolving SARS-CoV-2 epidemic in Africa: Insights from rapidly expanding genomic surveillance. 2022. *Science*. 378 (6615): eabq5358. doi: 10.1126/science.abq5358.
9. Andrianiana A*, Andry S*, Gentles A, Guth S, Héraud JM, Ranaivoson HC, Ravelomanantsoa NAF, Treuer T, and **Brook CE**. Reproduction, seasonal morphology, and juvenile growth in three Malagasy fruit bats. 2022. *Journal of Mammalogy*. 103 (6): 1397-1408. doi: 10.1093/jmammal/gyac072.
10. Madera S, Kistler A, Ranaivoson HC, Ah Yong V, Andrianiana A, Andry S, Raharinosy V, Randriambolamanantsoa TH, Ravelomanantsoa NAF, Tato CM, DeRisi JL, Aguilar HC, Lacoste V, Dussart P, Héraud JM, and **Brook CE**. Discovery and genomic characterization of a novel henipavirus, Angavokely virus, from fruit bats in Madagascar. 2022. *Journal of Virology*. 96 (18): e00921-22. doi: 10.1128/jvi.00921-22.
11. Guth S, Mollentze N, Renault K, Streicker DG, Visher E, Boots M[±], and **Brook CE**[±]. Bats host the most virulent—but not the most dangerous—zoonotic viruses. 2022. *PNAS*. 119 (14): e2113628119. doi: 10.1073/pnas.2113628119.
12. Kettenburg G, Kistler A, Ranaivoson HC, Ah Yong V, Andrianiana A, Andry S, DeRisi JL, Gentles A, Raharinosy V, Randriambolamanantsoa TH, Ravelomanantsoa NAF, Tato CM, Dussart P, Héraud JM, and **Brook CE**. Full genome *Nobecovirus* sequences from Malagasy fruit bats define a unique evolutionary history for this coronavirus clade. 2022. *Frontiers in Public Health*. 10: 786060. doi: 10.3389/fpubh.2022.786060.
13. Jones DN, Ravelomanantsoa NAF, Yeoman CJ, Plowright RK[±], and **Brook CE**[±]. Do unique gastrointestinal microbiomes facilitate bats' roles as major viral reservoirs? 2022. *Trends in Microbiology*. 30 (7): 632-642. doi: 10.1016/j.tim.2021.12.009.
14. Andriamandimby SF*, **Brook CE***, Razanajatovo N, Randriambolamanantsoa TH, Rakotondramanga J-M, Rasambainarivo F, Raharimanga V, Razanajatovo IM, Mangahasimbola R, Razafindratsimandresy R, Randrianarisoa S, Bernardson B, Rabarison JH, Randrianarisoa M, Nasolo FS, Rabetombosoa RM, Ratsimbazafy A-M, Raharinosy V, Rabemananjara AY, Ranaivoson HC, Razafimanjato H, Randremanana R[±], Héraud J-M[±], and Dussart P[±]. Cross-sectional cycle threshold values reflect epidemic dynamics of COVID-19 in Madagascar. 2022. *Epidemics*. 38: 1000533. doi: 10.1016/j.epidem.2021.100533.

2021

15. **Brook CE**, Northrup GR, Ehrenberg AJ, the IGI SARS-CoV-2 Testing Consortium, Doudna JA, and Boots M. Optimizing COVID-19 control with asymptomatic surveillance testing in a university environment. 2021. *Epidemics*. 37: 100527. doi: 10.1016/j.epidem.2021.100527.
16. Albery GF, Becker DJ, Brierley L, **Brook CE**, Christofferson RC, Cohen LE, Dallas TA, Eskew EA, Fagre A, Farrell M, Glennon E, Guth S, Joseph MB, Mollentze N, Neely BA, Poisot T, Rasmussen AL, Ryan SJ, Sjodin AR, Seifert S, Sorrell EM, Carlson CJ. 2021. The science of the host-virus network. *Nature Microbiology*. 6: 1483-1492. doi: 10.1038/s41579-021-00652-2.
17. Ruiz-Aravena M, McKee C, Gamble A, Hudson P, Parrish CR, Bharti N, Faust C, Schountz T, Restif O, Morris A, Jax E, Dee L, Lunn T, Peel A, Munster VJ, Yinda CK, Port JR, **Brook CE**, Aguilar HC, Yeo YY, Buchholz DW, Lloyd-Smith JO, Snedden C, Gurley ES, Jones D, Kessler M, Falvo C, Crowley D, Botto G, Rynda-Apple A, Plowright RK. Coronaviruses in bats: Ecology, evolution, and zoonotic spillover. 2021. *Nature Reviews Microbiology*. 20: 299-314. doi: 10.1038/s41579-021-00652-2.
9. Wilkinson E, Giovanetti M, Tegally T, San JE, Lessels R, Cuadros D, Martin DP, Zekri A-RN...**Brook CE**, ... and de Oliveira T (293 authors). A year of genomic surveillance reveals how the SARS-CoV-2 pandemic unfolded in Africa. 2021. *Science*. 374 (6566): 423-431. doi: 10.1126/science.abj4336.
10. Annapragada A, **Brook CE**, Luskin MS, Rahariniaina RP, Helin M, Razafinarivo O, Ralaarison AR, Randriamady HJ, Olson LE, Goodman SM, and Golden CD. 2021. Evaluation of tenrec population viability and potential sustainable management under hunting pressure in northeastern Madagascar. *Animal Conservation*. 24 (6): 1059-1070. doi: 10.1111/acv.12714.
11. Ehrenberg AJ, Moehle EA, **Brook CE**, Doudna Cate AH, Witkowski LB, Sachdeva R, Hirsch A, Barry K, Hamilton JR, Lin-Shiao E, McDevitt S, Valentin-Alvarado L, Letourneau KN, Hunter L, Pestal K, Frankino PA, Murley A, Nandakumar D, Stahl EC, Tsuchida CA, Gildea H, Murdock A, Hochstrasser ML, Bardet L, Sherry C, the IGI SARS-CoV-2 consortium, Harte A, Nicolette G, Petersen M, Giannikopoulos P, Hockemeyer D, Urnov FD, Ringeisen BR, Boots M, and Doudna JA. 2021. Launching a saliva-based SARS-CoV-2 surveillance testing program on a university campus. *PLoS One*. 2021. 16 (5): e0251296. doi: 10.1371/journal.pone.0251296.

12. Randremanana R, Andriamandimby SF, Rakotondramanga J-M, Razanajatovo N, Mangahasimbola R, Randriambolamanantsoa T, Ranaivoson HC, Rabemananjara H, Razanajatovo I, Razafindratsimandresy R, Rabarison J, **Brook CE**, Rakotomanana F, Rabetombosoa R, Razafimanjato H, Ahyong V, Raharinosy V, Raharimanga V, Raharinantoanina S, Randrianarisoa M, Bernardson B, Randrianasolo L, Randriamampionona L, Tato CM, DeRisi JR, Dussart P, Vololoniaina M, Randriatsarafara F, Randriamanantany Z, and Heraud J-M. The COVID-19 Epidemic in Madagascar: clinical description and laboratory results of the first wave, March-September 2020. *Influenza and Other Respiratory Viruses*. 2021. 15 (4) 457-468. doi: 10.1111/irv.12845.

2020

13. Ravelomanantsoa NAF, Guth S, Andrianiana A, Andry S, Gentles A, Ranaivoson HC, and **Brook CE**. 2020. The zoonotic potential of bat-borne coronaviruses. *Emerging Topics in Life Sciences*. 4 (4): 365-381. doi: 10.1042/ETLS20200097.
14. Gentles A, Guth S, Rozins C, and **Brook CE**. 2020. A review of mechanistic models of viral dynamics in bat reservoirs for zoonotic disease. *Pathogens and Global Health*. 114 (8): 407-425. doi: 10.1080/20477724.2020.1833161.
15. Rocha R, Aziz SA, **Brook CE**, Carvalho WD, Cooper-Bohannon R, Frick WF, Huang JCC, Kingston T, Lopez-Baucells A, Maas B, Mathews F, Medellin RA, Olival KJ, Peel AJ, Plowright RK, Razgour O, Rebelo H, Rodrigues L, Rossiter SJ, Russo D, Straka TM, Teeling EC, Treuer T, Voigt CC, and Webala PW. Bat conservation and zoonotic disease risk: A research agenda to prevent misguided persecution in the aftermath of COVID-19. 2020. *Animal Conservation*. 24 (3): 303-307. doi: 10.1111/acv.12636.
16. Olival KJ*, Cryan PM*, Amman BR, Baric RS, Blehert DS, **Brook CE**, Calisher CH, Castle KT, Coleman JTH, Daszak P, Epstein JH, Field H, Frick WF, Gilbert AT, Hayman DTS, Ip HS, Karesh WB, Johnson CK, Kading RK, Kingston T, Lorch JM, Mendendall IH, Peel AJ, Phelps KL, Plowright RK, Reeder DM, Reichard JD, Sleeman JM, Streicker DG, Towner JS, and Wang L-F. 2020. Possibility for reverse zoonotic transmission of SARS-CoV-2 to free-ranging wildlife: a case study of bats. *PLoS Pathogens*. 16 (9): e1008758. doi: 10.1371/journal.ppat.1008758.
17. Amen AM, Barry KW, Boyle JM, **Brook CE**, Choo S, Cornmesser LT, Dilworth DJ, Doudna JA[±], Ehrenberg AJ, Fedrigo I, Friedline SE, Graham TGW, Green R, Hamilton JR, Hirsh A, Hochstrasser ML, Hockemeyer D[±], Krishnappa N, Lari A, Li H, Lin-Shiao E, Lu T, Lyons EF, Mark KG, Martell LA, Martins ARO, McDevitt SL, Mitchell PS, Moehle EA, Naca CL, Nandakumar D, O'Brien E, Pappas DJ, Pestal K, Quach DL, Rubin BE, Sachdeva R, Stahl EC, Syed AM, Tan I-L, Tollner AL, Tsuchida CA, Tsui CK, Turkalo TK, Urnov F[±], Warf MB, Whitney ON, Witkowski LB. 2020. Blueprint for a Pop-up SARS-CoV-2 Testing Lab. *Nature Biotechnology*. 38 (7): 791-797. doi: 10.1038/s41587-020-0583-3
18. **Brook CE**, Boots M, Chandran KC, Dobson AP, Drosten C, Graham AL, Grenfell BT, Müller MA, Ng M, Wang L-F, and van Leeuwen A. 2020. Accelerated viral dynamics in bat cell lines, with implications for zoonotic emergence. *eLife*. 9: e48401. doi: 10.7554/eLife.48401.

2019

19. **Brook CE**. 2019. A batty concept goes viral. *Nature Ecology & Evolution*. 3 (12). 1620-1621. doi:10.1038/s41559-019-1045-5.
20. Guth S, Visher E, Boots M, and **Brook CE**. 2019. Host phylogenetic distance drives trends in virus virulence and transmissibility across the animal-human interface. *Philosophical Transactions of the Royal Society*. 374 (1782): 20190296. doi: 10.1098/rstb.2019.0296.
21. **Brook CE**, Ranaivoson HC, Broder CC, Cunningham AA, Héraud J-M, Peel AJ, Gibson L, Wood JLN, Metcalf CJE[±], and Dobson AP[±]. 2019. Disentangling serology to elucidate henipa- and filovirus transmission in Madagascar fruit bats. *Journal of Animal Ecology*. 88 (7): 1001-1016. doi: 10.1111/1365-2656.12985.
22. **Brook CE**, Ranaivoson HC, Andriafidison D, Ralisata M, Razafimanahaka J, Héraud JM, Dobson AP, and Metcalf CJE. 2019. Population trends for two Malagasy fruit bats. *Biological Conservation*. 234: 165-171. doi: 10.1016/j.biocon.2019.03.032.
23. Ranaivoson HC, Héraud JM, Goethert HK, Telford SR, Rabetafika L[±] and **Brook CE**[±]. 2019. Babesial infection in the Madagascan flying fox, *Pteropus rufus* É. Geoffroy, 1803. *Parasites & Vectors*. 12 (51): 1307101933. doi: 10.1186/s13071-019-3300-7.

2018

24. **Brook CE**, Herrera JP, Borgerson C, Fuller E, Andriamahazoarivosoa P, Rasolofoniaina BJR, Randrianasolo JLRR, Rakotondrafarasata ZRE, Randriamady HJ, Dobson AP and Golden CD. 2018. Population viability and harvest sustainability for Madagascar lemurs. *Conservation Biology*. 33 (1): 99- 111. doi: 10.1111/cobi.13151.

2017

25. **Brook CE**, Bai Y, Yu EO, Ranaivoson HC, Shin H, Dobson AP, Metcalf CJE[±], Kosoy MY[±], and Dittmar K[±]. 2017. Elucidating transmission dynamics and host-parasite-vector relationships for rodent-borne *Bartonella* spp. in Madagascar. *Epidemics*. 20: 56-66. doi:10.1016/j.epidem.2017.03.004.

2016

26. Wesolowski A*, Mensah K*, **Brook CE***, Andrianjafimasy M, Winter A, Buckee CO, Razafindratsimendresy R, Tatem AJ, Heraud J-M[±], and Metcalf CJE[±]. 2016. Introduction of Rubella-Containing-Vaccine to Madagascar: Implications for roll-out and local elimination across low-income countries. *Journal of the Royal Society Interface* 13 (177): 20151101. doi:10.1098/rsif.2015.110.

2015

27. **Brook CE**, Beauclair R, Ngwenya O, Worden L, Ndeffo-Mbah M, Lietman TM, Satpathy SK, Galvani AP, and Porco TP. 2015. Spatial heterogeneity in projected leprosy trends in India. *Parasites & Vectors*. 8 (1): 542. doi: 10.1186/s13071-015-1124-7.
28. Rist CL, Ngonghala CN, Garchitorena A, **Brook CE**, Ramananjato, Miller AC, Randrianarivelosia M, Wright PC, Gillespie TR, and Bonds MH. 2015. Modeling the burden of poultry disease on the rural poor in Madagascar. *One Health*. 1: 60-65. doi: 10.1016/j.onehlt.2015.10.002.
29. **Brook CE**, Bai Y, Dobson AP, Osikowicz L, Ranaivoson HC, Zhu Q, Kosoy MY, and Dittmar K. 2015. *Bartonella* spp. in fruit bats and blood-feeding ectoparasites in Madagascar. *PLoS Neglected Tropical Diseases*. 10 (2): e0003532. doi:10.1371/journal.pntd.0003532.
30. **Brook CE** and Dobson AP. 2015. Bats as 'special' reservoirs for emerging zoonotic pathogens. *Trends in Microbiology*. 23 (3): 172-180. doi:10.1016/j.tim.2014.12.00.
31. Guyton J and **Brook CE**. 2015. African Bats: Conservation in the Time of Ebola. *Therya*. 6 (1): 69-88. doi: 10.12933/therya-15-244.
32. Young HS, McCauley DJ, Dirzo R, Goheen JR, Agwanda B, **Brook CE**, Castillo EO, Ferguson AW, Kinyua SN, McDonough MM, Palmer TM, Pringle RM, Young TP, and Helgen KM. 2015. Context -dependent effects of large wildlife declines on small mammal communities in central Kenya. *Ecological Applications*. 25 (2): 348-60. doi:10.1890/14-0995.1.

2013

33. **Brook CE**, Bernstein DP, and Hadly EA. 2013. Human food subsidies and Common Raven occurrence in Yosemite National Park, CA. *Western Birds*. 44 (2):127-34.

Invited Oral Presentations

October 2023 *Department of Biology Seminar Series*, University of Pennsylvania, Philadelphia, PA.
 October 2023 *School of Medicine 'Grand Rounds'*, Yale University, New Haven, CT.
 September 2023 *Undergraduate Biology Seminar Series*, City University of New York, New York, NY.
 April 2023 *Quantitative and Computational Biology Seminar Series*, Princeton University, Princeton, NJ.
 Nov 2022 *The Branco Weiss Annual Lecture*, ETH-Zurich, Zurich, Switzerland.
 Oct 2022 *Department of Ecology and Evolution Weekly Seminar Series*, University of Illinois, Chicago, IL.
 Oct 2022 *Department of Mathematical Biology Seminar Series*, University of Sheffield, United Kingdom.
 May 2022 *Department of Ecology, Evolution, and Marine Biology Seminar Series*, UC Santa Barbara, CA.
 April 2022 *IGI Seminar Series*, Innovative Genomics Institute, UC Berkeley, CA.
 Jan 2022 *Weekly Seminar Series*, Uniformed Services University of the Health Sciences, Bethesda, MD.
 Dec 2021 *COVID-19 Modeling Seminar Series*, UT COVID-19 Modeling Consortium, University of Texas, Austin, TX.
 May 2021 *Molecular Methods in Animal Ecology*, Universidad Federal do Paraná, Brazil.
 Dec 2020 *Bugs and Drugs: Infectious Disease Seminar Series*, UCSF, San Francisco, CA.
 Oct 2019 *Gates Grand Challenges Annual Meeting*, Addis Ababa, Ethiopia.
 Oct 2019 *Interdisciplinary Disease Across Scales Seminar Series*, Univ. of Georgia, Athens, GA.

Research Grants

2023-present	NIH Pilot Project Centers for Research in Emerging Infectious Diseases (CREID) Network. Scientific Mentor to Postdoctoral Scholar, Dr. Hafaliana Christian Ranaivoson. \$150,000. "Expanding in-country surveillance capacity for bat-borne henipaviruses in Madagascar."
2023-present	Walder Foundation Biota Award. PI. \$300,000. "Harnessing fruit bat conservation to combat zoonotic risk in Madagascar."
2023-present	University of Chicago Provost's Global Faculty Awards. PI. \$30,000 "A quantitative biology training program for students from Madagascar."
2023-present	University of Chicago Accelerator Microbiome Awards. PI. \$18,000

	“The role of gut microbiota in modulating seasonal immunological variation in bat-reservoirs for emerging viral zoonoses.”
2022-present	NIH NIAID New Innovators Award (DP2). <i>PI.</i> \$2,340,832.
2022-present	“Crossing scales to predict and prevent bat viruses zoonoses in a Madagascar ecosystem.” Bill & Melinda Gates Foundation Grand Challenges Explorations. <i>PI.</i> \$100,000.
2022-2023	“Understanding the genomic landscape of coronavirus circulation in Madagascar.” University of Chicago Susan and Richard Kiphart Center for Global Health and Development. <i>PI.</i> \$50,000.
2022-2023	“Safeguarding food security to reduce the risk of bat-borne zoonoses in rural Madagascar” University of Chicago Provost’s Global Faculty Awards. <i>PI.</i> \$30,000
2022-present	“Deciphering mechanisms of coronavirus seasonality in Cambodian horseshoe bats.” National Geographic Society. <i>PI.</i> \$25,000.
2020-present	“Coding for Conservation: Quantitative training for the next generation of environmental leaders in Madagascar.” Branco Weiss Science in Society Fellowship. <i>PI.</i> 500,000 CHF.
2020-2022	“Understanding bats to decipher disease, aging, and virus virulence in one fell swoop.” Loréal USA For Women in Science Fellowship. <i>PI.</i> \$60,000.
2020-2021	“Understanding bats to simultaneously solve disease and aging.” Innovative Genomics Institute. <i>PI.</i> \$100,000.
2019-2021	“Next Generation Sequencing to inform COVID-19 outbreak response in Madagascar.” Bill & Melinda Gates Foundation Grand Challenges Explorations. <i>PI.</i> \$100,000.
2018-2020	“Metagenomics and the etiology of zoonotic disease: Deciphering bat-to-human viral transmission in Madagascar.” DARPA PREdicting Emerging Pathogenic Threats (PREEMPT). <i>co-PI with RK Plowright (lead), H Aguilar-Carreno, N Bharti, P Ebby, E Gurley, B Han, PJ Hudson, JO Lloyd-Smith, H McCallum, L McGuire, V Munster, CR Parrish, AJ Peel, O Restif, T Schountz.</i> \$10,000,000.
2018-2019	“Preventing emergence and spillover of bat viruses in high-risk global hotspots.” Center for Emerging and Neglected Tropical Diseases, Thomas C. Alber Science and Engineering Fellowship. <i>PI.</i> \$10,000.
2017-2023	“A transcriptomic window into zoonotic bat virus seasonality in Madagascar.” National Institutes of Health, International Research in Infectious Diseases (R01). <i>Co-PI with P Dussart.</i> \$625,000.
2016-2017	“Investigating seasonal drivers of viral zoonoses from Madagascar fruit bats.” Princeton Environmental Institute, Walbridge Graduate Award. <i>PI.</i> \$10,000.
2016-2017	“Climate Change, Resource Scarcity, & Emerging Fruit Bat Zoonoses in Madagascar.” National Science Foundation, Doctoral Dissertation Improvement Grant. <i>co-PI with AP Dobson and AL Graham.</i> \$13,000.
2015-2016	“Within-host seasonal drivers of pathogen dynamics in a fruit bat reservoir.” PIVOT Research Award. <i>co-PI with AP Dobson and J-M Héraud.</i> \$15,000.
2015-2016	“Investigating spillover of viral hemorrhagic fevers from fruit bats in Madagascar.” National Geographic Society: Waite Grant. <i>PI.</i> \$15,000.
2013-2014	“Investigating risks for Ebola virus spillover from Madagascar fruit bats.” Lubee Bat Conservancy. Bacardi Conservation & Research Fund. <i>PI.</i> \$5,000.
2013-2014	“Bushmeat harvesting impacts on risk for henipavirus spillover among fruit bats in Madagascar.” Bat Conservation International. Student Research Scholarship. <i>PI.</i> \$3,200.
2013-2014	“Bushmeat harvesting impacts on population dynamics and corresponding risk for henipavirus spillover in Malagasy fruit bats.” The Explorer’s Club. Exploration Fund. <i>PI.</i> \$2,250.
2013-2014	“Mechanisms for viral persistence among mixed species fruit bat populations in Madagascar.” Bill and Melinda Gates Foundation: Grand Challenges in Global Health Explorations. <i>co-PI with MH Bonds, PC Wright, and TR Gillespie.</i> \$100,000.
2013-2014	“Quantifying the economic burden of disease in Ranomafana NP, Madagascar.” Princeton University: Health Grand Challenges Grant. <i>PI.</i> \$5,000.
2013	“Biodiversity and human livelihood: Quantifying vector-control impact of insectivorous bats on human malaria burden in Ranomafana, Madagascar.” American Society of Mammalogist: Grants-in-Aid. <i>PI.</i> \$1,500.
2013	“Mammalian Biodiversity, Metapopulation Connectivity, & Potential for Zoonosis.” National Geographic Society: Young Explorer Grant. <i>PI.</i> \$5,000.
	“Habitat Modification and the Ecology of Plague Emergence in Madagascar.”

Teaching

- starting 2024 **BIOS27186: Population Biology of Infectious Diseases of Global Health Concern, University of Chicago.** *Professor.*
- Starting in winter quarter 2024, this will be one of the core courses in the Center for Global Health study abroad program in Paris, France.
 - The course is focused on quantitative approaches to understanding the transmission dynamics of infectious diseases, with a focus on pathogens of key global health concern (HIV, TB, malaria, helminths)
- 2023-present **BIOS20153: Fundamentals of Ecology and Evolution, University of Chicago.** *Professor.*
- This is one of the three-quarter biology series required for undergraduate biology majors at the University of Chicago. About 170 students are enrolled annually.
 - My colleague, Dr. Marcus Kronforst, teaches the evolution half, and I teach the ecology half.
 - In the ecology half of the course, we focus on population ecology and cover topics ranging from geometric and logistic growth to Leslie and Lefkovitch matrix models, to Lotka Volterra predator-prey and competition models to basic disease dynamics, and processes of community assembly.
- 2022-present **C4C: Coding for Conservation.**
Founder, Instructor: coding4conservation.org
- This is a one-on-one mentoring program I founded to support Malagasy graduate students in biology and medicine to analyze, interpret, and publish their own field studies.
 - We meet virtually as a community once a month to discuss hurdles in research and sometimes share lectures and exercises on data analysis and ecological modeling.
 - Each student (14 total) is paired with a mentor, with whom they meet regularly to receive help and guidance on their own research progress. We aim for 30% of the class to submit publications before the end of 2023.
- 2016-present **E²M²: Ecological and Epidemiological Modeling in Madagascar.**
Founder, Instructor: E2M2.org
- I founded this annual workshop in 2016 to support Malagasy graduate students in biology and medicine in the quantitative analysis of data and the development of model-guided scientific questions. It is a basic introduction to the more advanced C4C program.
 - In part with this 10-day course, I design and deliver lectures and tutorials in the R programming language workshop, with a focus on topics related to ecology and public health.
- 2015-2016 **International Clinics on Infectious Disease, Dynamics, and Data.**
Workshop Faculty: ici3d.org
- As a member of the ICI3D faculty, I designed and delivered lectures and exercises for an introductory programming (R) workshop targeted to supporting African and North American students in biology, medicine, public health.
- 2014 **Evolution & Behavior of Sexes.** EEB 301. Princeton University. *Assistant-in-Instruction.*
- As an Assistant-in-Instruction, I taught weekly discussion section and designed exams and assignments for this upper-division seminar in Ecology and Evolutionary Biology (EEB).
- 2012-2013 **Life on Earth.** EEB 211. Princeton University. *Assistant-in-Instruction.*
- As an Assistant-in-Instruction, I taught weekly discussion section and designed exams, labs and assignments for the primary introductory course in the EEB major at Princeton.
- 2009 **Introduction to Earth Systems.** ES10. Stanford University. *Teaching Assistant.*
- As a TA, I taught weekly classroom section, wrote and graded assignments, and designed curriculum for the primary introductory course in the ES major at Stanford.

Advising

University of Chicago PhD Students:

- Sophie Lockwood (2023-current)
- Gwen Kettenberg (2021-current)
- Sophia Horigan (2019-current; co-advised with Greg Dwyer)

University of Chicago Postdocs:

- Dr. Natalia Cortes-Delgado (2023-current)
- Dr. Hafaliana Christian Ranaivoson (2022-current)
- Dr. Emily Rhus (2021-current)
- Dr. Theresa Laverty (2021-2022)
 - o Now Assistant Professor in the Department of Fish, Wildlife, and Conservation Ecology at NMSU

- Dr. Katie Young (2022)
 - o Now postdoctoral scholar at University of Texas El Paso

University of Chicago Post-Baccalaureate Fellows:

- Madison Woodward (NIH PREP Fellow, 2023-*current*)
- Freddy Gonzalez (NIH PREP Fellow, 2021-2022)
- Yimei Li (2021-2022)

University of Chicago Undergraduates:

- Anna Riccardi (2023-*current*)
- Vera Soloviev (2021-2023)
- Margot Bolanos-Gamez (2022-2023)

Chicago Laboratory Schools High School Advisees (Summer Lab Link):

- Areen Khan (summer 2023)

University of Antananarivo PhD Student Advisees:

- Santino Andry (University of Antananarivo, 2019-*current*)
- Angelo Andrianaina (University of Antananarivo, 2018-*current*)
- Christian Ranaivoson (University of Antananarivo, PhD, 2013-2021)

University of Antananarivo Master's Student Advisees

- Rova Ratsimamanga (University of Antananarivo, 2023-*current*)
- Miora Rasolomanantsoa (University of Antananarivo, 2015-2016)

Service and Outreach

- University of Chicago, Dept of Ecology and Evolution, DEI Committee Faculty Liaison (2023-*present*)
- University of Chicago, Dept of Ecology and Evolution, Faculty Search Committee (2022-2023)
- University of Chicago, Dept of Ecology and Evolution, Seminar Speaker Committee (2021-*present*)
- University of Chicago, Dept of Ecology and Evolution, Graduate Admissions Committee (2020-2021)
- Bay Area Ecology and Evolution of Infectious Diseases Conference – *Co-Organizer* (2020)
- UC Berkeley Ecology and Evolution of Infectious Diseases Seminar Series – *Co-Organizer* (2019-2021)
- Miller Institute Annual Symposium – *Planning Committee* (2018-2020)
- Women's March Madagascar, Ranomafana, Madagascar – *Co-Founder, Co-Organizer* (2019)
- Women-In-Science Partnership, Princeton University – *Organizer* (2015-2017)

Skills

- **Language:** French (proficient written and spoken). Malagasy (proficient spoken).
- **Computer:** R, MatLab, C++, ArcGIS, Microsoft Office (Powerpoint, Word, Excel)