

## BARBARA A. HAN

### Curriculum vitae



Cary Institute of Ecosystem Studies, Box AB Millbrook, NY 12545  
[hanb@caryinstitute.org](mailto:hanb@caryinstitute.org) | (845) 677-7600 ext. 135 | [www.hanlab.science](http://www.hanlab.science)

### EDUCATION

- 2002 – 2008 Ph.D. Zoology. Department of Zoology, Oregon State University.  
Advisor: Dr. Andrew R. Blaustein
- 1998 – 2002 B.S. Biology. Natural Science Division, Pepperdine University.  
Advisor: Dr. Lee B. Kats

### RESEARCH INTERESTS

- Infectious disease ecology, zoonotic spillover and disease emergence
- Ecological informatics, data mining, machine learning, predictive analytics
- Macroecology, population ecology, behavioral ecology

### POSITIONS HELD

- 2014 – Disease Ecologist, Cary Institute of Ecosystem Studies. Millbrook, NY.
- 2014 – Adjunct Faculty, Odum School of Ecology, University of Georgia.  
Athens, GA.
- 2011 – 2014 National Institutes of Health Ruth Kirschstein Postdoctoral Research  
Fellow. Odum School of Ecology, University of Georgia.  
Sponsor: Dr. John M. Drake
- 2008 – 2010 National Science Foundation Postdoctoral Research Fellow in Biological  
Informatics. Odum School of Ecology, University of Georgia.  
Sponsor: Dr. Sonia Altizer
- 2004 – 2005 U.S. Fulbright Fellow. Instituto Venezolano de Investigaciones Científicas  
(IVIC), Caracas, Venezuela.  
Sponsor: Dr. Margarita Lampo

### GRANTS & AWARDS

#### Funded

*\*denotes <\$10,000 USD*

- 2020 – 2025 *In progress. NIH National Institute of Allergens and Infectious  
Diseases, Emerging Infectious Diseases Research Center. CREATE-  
NEO: Coordinating Research on Emerging Arboviral Threats  
Encompassing the Neotropics. \$8M (CIES Subaward: \$556K). PIs: Nik  
Vasilakis (UTMB), Kathryn Hanley (NMSU); Co-Is: Barbara Han and 22  
others*

- 2020 – 2025 *In progress.* **NIH National Institute of Allergens and Infectious Diseases**, R01: *Genetic and ecological determinants of recombination in coronaviruses*. (CIES Subaward: \$16.5K). PI: Simon Anthony (Columbia University); Senior Personnel: Barbara Han
- 2019 – 2020 *In progress.* **Lang Assael Family Science Innovation Fund**. *Prototyping a global early warning system for zoonotic diseases*. \$53K. PI: Han BA; Team: Assaf Anyamba, Heidi Tubbs (USRA/NASA); Shannon LaDeau, Rick Ostfeld, Ilya Fischhoff, Adrian Castellanos (CIES).
- 2018 – 2021 *In progress.* **Defense Advanced Research Projects Agency (DARPA)**, PREEMPT program: *Preventing emergence and spillover of bat pathogens in high-risk global hotspots*. \$9.6M. Project director: Raina Plowright (MSU), Co-director: Peter Hudson (PSU); Co-PIs: Han (CIES), Aga Rynda-Apple (MSU), Alison Peel (Griffith), Cara Brook (UChicago), Emily Gurley (JHU), Hamish McCallum (Griffith), Hector Aguilar-Carreño (Cornell), Jamie Lloyd-Smith (UCLA), Liam McGuire (TTech), Nita Bharti (PSU), Olivier Restif (Cambridge), Peggy Eby (UNSW/Griffith), Tony Schountz (CSU), Vincent Munster (NIH RML), Colin Parish (Cornell).
- 2017 – 2022 *In progress.* **National Science Foundation**, Ecology and Evolution of Infectious Diseases Program. *Global patterns, predictors, and their dynamical consequences in zoonotic diseases of mammals*. \$2M. Lead PI: Han; Co-PIs: Suzanne O'Regan, John Drake.
- 2016 – 2021 *In progress.* **National Science Foundation**, Ecology and Evolution of Infectious Diseases Program. *The community ecology of viromes in a changing landscape: virome assembly and transmission in white-footed mice and blacklegged ticks*. \$2.4M. Lead PI: Kurt Vandegrift. Co-PIs: Han, Peter Hudson, Amit Kapoor, Rick Ostfeld.
- 2018 *Complete.* **NVIDIA Corporation**, Academic GPU Grant Program. Titan XP GPU donated as an unrestricted gift in aid of research via competitive proposal review. PI: Han
- 2018 *Complete.* **Lang Assael Family Science Innovation Fund**. *Exploring new frontiers in disease ecology*. \$36K. PI: Chris Solomon; Co-Is: Han, Shannon LaDeau, Emma Rosi, Rick Ostfeld.
- 2016 *Complete.* **National Institute for Mathematical and Biological Synthesis (NIMBioS)**, Short-term Visitor Award. *Machine learning and mathematical modeling of pace of life in disease ecology*. \*
- 2011 – 2014 *Complete.* **National Institutes of Health**, Ruth Kirschstein National Research Service Award Individual Postdoctoral Fellowship. *Machine learning to forecast zoonotic disease emergence*. Lead PI: Han. \$160K
- 2008 – 2010 *Complete.* **National Science Foundation**, Postdoctoral Research Fellowship in Biology, Biological Informatics. *Allometric scaling of*

- infectious disease dynamics: integrating theory and empirical data.* Lead PI: B. Han. \$123K
- 2008 – 2011 *This fellowship was awarded but not accepted. National Institutes of Health, Ruth Kirschstein National Research Service Award Individual Postdoctoral Fellowship. Allometric scaling and infectious disease dynamics.* \$126K
- 2006 – 2007 *Complete. National Fish and Wildlife Foundation, Budweiser Conservation Scholarship. Amphibian declines and a globally emerging infectious disease.* \$10K
- 2006 *Complete. NIH Graduate Research Festival, Postdoctoral recruitment event.* \*
- 2006 *Complete. Korean American Scholarship Foundation, Designated scholarship* \*
- 2004 – 2005 *Complete. U.S. Fulbright Fellowship, U.S. Department of State. Disease ecology of an emerging infectious amphibian pathogen. Affiliations: Instituto Venezolano de Investigaciones Científicas (Caracas, Venezuela).* \$18K.
- 2003, 2004 **National Science Foundation**, Pre-doctoral Fellowship, Honorable mentions
- 2003, 2004 *Complete. Oregon State University, Zoology Research Fund Awards* \*
- 2003 *Complete. Society of Integrative and Comparative Biology, Grant in Aid of Research* \*

## PUBLICATIONS

*\*invited contribution*

48. Han BA, O'Regan SM, Schmidt JP, Drake JM. 2020. Integrating data mining and transmission theory for the ecology of infectious diseases. *Online early, Ecology Letters*. <https://doi.org/10.1111/ele.13520>
47. Fischhoff I, Han BA, Oggenfuss K, LaDeau S, Ostfeld RS. 2020. Cofeeding in blacklegged ticks: ecological predictors and effects on anaplasmosis. *Provisionally accepted, Parasites and Vectors*.
46. Fischhoff I, Huang T, Hamilton S, Han BA, Ladeau S, Ostfeld RS, Emma R, Solomon C. 2020. Parasite and pathogen effects on ecosystem processes: a quantitative review. *Ecosphere*, 11:e03057. <https://doi.org/10.1002/ecs2.3057>
45. \*Schmidt JP, Maher S, Huang T, Drake JM, Han BA. 2019. Ecological indicators of spillover potential among mammal bridge hosts of Ebola virus. *Philosophical Transactions of the Royal Society*, 374: 20180337. <https://doi.org/10.1098/rstb.2018.0337>

44. Plowright RK, Becker DJ, Crowley DE, Washburne AD, Huang T, Nameer PO, Gurley ES, **Han BA**. 2019. Prioritizing surveillance of Nipah virus in India. *PLoS Neglected Tropical Diseases*, 374: 20180337. <https://doi.org/10.1371/journal.pntd.0007393>
43. Berger KM, Wood JLN, Jenkins B, Olsen J, Morse SS, Gresham L, Root JJ, Rush M, Pigott D, Winkleman T, Gillespie TR, Nuzzo J, **Han BA**, Olinger P, Karesh WB, Mills JN, Anelli JF, Barnabei J, Lucey D, Hayman DTS. Policy and science for global health security: shaping the course of international health. 2019. *Tropical Medicine and Infectious Diseases*, Special issue: One Health and Zoonoses, 4: 2. <https://doi.org/10.3390/tropicalmed4020060>
42. **Han BA**, Majumdar S, Calmon FD, Horesh R, Kumar A, Perer A, von Marschall EB, Wei D, Mojsilovic A, Varshney K. 2019. Confronting data sparsity to identify potential sources of Zika virus infection among primates. *Epidemics*, 27:59-65. <https://doi.org/10.1016/j.epidem.2019.01.005>
41. Stephens PR, Altizer S, Gittleman JL, Moan E, **Han BA**, Pappalardo P. 2019. Parasite sharing in wild ungulates and their predators: effects of phylogeny, range overlap, and trophic links. *Journal of Animal Ecology*. <https://doi.org/10.1111/1365-2656.12987>
40. \***Han BA** and Ostfeld RS. 2019. Topic modeling of major research themes in disease ecology of mammals. *Journal of Mammalogy*, 100:1008–1018. <https://doi.org/10.1093/jmammal/gyy174>
39. Downs C, Schoenle L, **Han BA**, Harrison J, Martin M. 2019. The scaling of host competence. *Trends in Parasitology* 35: 182. <https://doi.org/10.1016/j.pt.2018.12.002>
38. Walker JW, **Han BA**, Ott IM and Drake JM. 2018. Transmissibility of emerging viral zoonoses. *PLoS ONE*. 13: e0206926. <https://doi.org/10.1371/journal.pone.0206926>
37. Almeida R, **Han BA**, Reisinger AJ, Kagemann C, Rosi E. 2018. High mortality of mosquito predators caused by widespread mosquito repellent: implications for a human-environment feedback loop. *Biology Letters* 14: 20180526. <https://doi.org/10.1098/rsbl.2018.0526>
36. Blaustein AR, Urbina J, Snyder PW, Reynolds E, Dang T, Hoverman JT, **Han BA**, Olson DH, Searle C, Hambalek NH. 2018. The effects of emerging infectious diseases on amphibians: a review of experimental studies. *Diversity* 10: 81. <https://doi.org/10.3390/d10030081>
35. Dallas T, Budischak S, Carlson C, Ezenwa V, **Han BA**, Huang S, Aguirre AA, Stephens PR. 2018. Gauging support for macroecological patterns in helminth parasites. *Global Ecology and Biogeography* 27: 1437. <https://doi.org/10.1111/geb.12819>
34. Dallas T, **Han BA**, Stephens PR, Park AW, Drake JM. 2018. Trait-based prediction of host species roles in parasite sharing networks. *Oikos*, 128:23-32. doi:10.1111/oik.05602
33. Strona G, Carstens CJ, Beck PSA, **Han BA**. 2018. The intrinsic vulnerability of networks to epidemics. *Ecological Modelling*, 383: 91–97.
32. Yang L and **Han BA**. 2018. Data-driven predictions and novel hypotheses about zoonotic tick vectors from the genus *Ixodes*. *BMC Ecology* 18:7 doi: 10.1186/s12898-018-0163-2
31. Necamp T, Sattigeri P, Wei D, Ray E, Drissi Y, Poddar A, Mahajan D, Bowden S, **Han BA**, Mojsilović A & Varshney KR. Sept 2017. Cognitive disease hunter: developing automated

pathogen feature extraction from scientific literature. Data Science for Social Good Conference (Chicago, IL). [PDF]

30. Stephens PR, Pappalardo P, Huang S, Byers JE, Farrell MJ, Gehman A, Ghai RR, Haas SE, **Han B**, Park AW, Schmidt JP, Altizer S, Ezenwa VO, Nunn CL. 2017. Global Mammal Parasite Database version 2.0. *Ecology*, 98:1476.
29. Evans MV, Dallas TA, **Han BA**, Murdock CC and Drake JM. 2017. Data-driven identification of potential Zika virus vectors. *eLife* 6: 077966.
28. Schmidt JP, Park AW, Kramer A, **Han BA**, Alexander L, Drake JM. 2017. Spatiotemporal fluctuations and triggers of Ebolavirus spillover. *Emerging Infectious Diseases*, 23:415.
27. \*LaDeau SL, **Han BA**, Rosi-Marshall EJ, Weathers KC. 2017. The next decade of big data in ecosystem science. *Ecosystems*, 20: 274–283.
26. \***Han BA** and Drake JM. 2016. Future directions in analytics for infectious disease intelligence. *EMBO Reports*, 17:785.
25. \***Han BA**, Kramer A, Drake JM. 2016. Global patterns of zoonotic disease in mammals. *Trends in Parasitology*, 32: 565-577
24. **Han BA**, Yang L. Predicting novel tick vectors of zoonotic disease. 2016. *Proceedings of the 33<sup>rd</sup> International Conference on Machine Learning (ICML)* Workshop on #Data4Good: Machine Learning in Social Good Applications, New York, NY, USA. [arXiv:1606.06323v1](https://arxiv.org/abs/1606.06323v1) [q-bio.PE]
23. Ilin R, **Han BA**. Formal Concept Analysis of Rodent Carriers of Zoonotic Disease. 2016. *Proceedings of the 33<sup>rd</sup> International Conference on Machine Learning (ICML)* Workshop on #Data4Good: Machine Learning in Social Good Applications, New York, NY, USA. [arXiv:1608.07241](https://arxiv.org/abs/1608.07241) [stat.ML]
22. **Han BA**, Schmidt JP, Hayman D, Alexander L, Bowden SE, Drake JM. 2016. Undiscovered bat hosts of filoviruses. *PLoS Neglected Tropical Diseases*, 7:e0004815
21. Stephens PR, Altizer S, Smith KF, Aguirre A, Brown JH, Budischak S, Byers JE, Critchlow R, Davies JT, Drake JM, Ezenwa V, Farrell M, Gittleman JL, **Han BA**, Huang S, Hutchinson RA, Johnson PTJ, Nunn CL, Onstad D, Park AW, Poulin R, Vazquez-Prokopec GM, Pappalardo P, Schmidt JP. 2016. The macroecology of infectious diseases: a new perspective on global-scale drivers of pathogen distributions and impacts. *Ecology Letters*. DOI: 10.1111/ele.12644
20. Pigott DM, Millier A, Earl L, **Han BA**, Shearer F, Weiss DJ, Brady OJ, Kraemer MUG, Moyes CL, Bhatt SJ, Gething PW, Golding N, Hay SI. 2016. Updates to the zoonotic niche map of Ebola virus disease in Africa. *eLife*, 5:e16412.
19. LaDeau S and **Han BA**. 2016. The emergence of disease ecology. *Japanese Journal of Zoo and Wildlife Management*, 21:53.
18. **Han BA**, Schmidt JP, Bowden SE, Drake JM. 2015. Rodent reservoirs of future zoonotic diseases. *Proceedings of the National Academy of Science*, 112:7039-7044. DOI: 10.1073/pnas.1501598112

17. **Han BA**, Park AW, Jolles AE, Altizer S. 2015. Infectious diseases transmission and behavioral allometry in wild mammals. *Journal of Animal Ecology*, 84:637-646. DOI: 10.1111/1365-2656.12336
16. **Han BA**, Kerby JL, Searle CL, Storfer A, Blaustein AR. 2015. Host species composition influences infection severity among amphibians in the absence of spillover transmission. 2015. *Ecology and Evolution*, 5:1432-1439. DOI: 10.1002/ece3.1385
15. Kats LB, Bucciarelli G, Schlais DE, Blaustein AR, **Han BA**. 2012. Ultraviolet radiation influences perch selection by a neotropical poison-dart frog. *PLoS ONE*, 7:e51364. doi:10.1371/journal.pone.0051364
14. **Han BA**, Searle CL, Blaustein AR. 2011. The effects of an infectious fungal pathogen, *Batrachochytrium dendrobatidis*, on amphibian predator-prey interactions. *PLoS ONE*, 6(2): e16675. doi:10.1371/journal.pone.0016675
13. Altizer S, Bartel R, **Han BA**. 2011. Animal migrations and infectious disease risk. *Science*, 331:296-302.
12. Blaustein, A.R., **Han, B.A.**, Relyea, R., Johnson, P.T.J., Buck, J., Gervasi, S. and Kats, L.B. 2011. The complexity of amphibian population declines: understanding the role of cofactors in driving amphibian losses. *Annals of the New York Academy of Sciences*, The Year in Ecology and Conservation Biology (Eds. Ostfeld, R.S. and Schlesinger, W.H.), 1223:108-119. doi: 10.1111/j.1749-6632.2010.05909.x
11. Bancroft, B.A., **Han, B.A.**, Searle, C.L., Biga, L.M., Olson, D.H., Kats, L.B., Lawler, J.J., and Blaustein, A.R. 2011. Species-level correlates of susceptibility to the pathogenic amphibian fungus *Batrachochytrium dendrobatidis* in the United States. *Biodiversity and Conservation*, 20:1911-1920. doi: 10.1007/s10531-011-0066-4
10. Romansic, J.R., Johnson, P.T.J., Searle, C.L., Johnson, J.E., Tunstall, T., **Han, B.A.**, Rohr, J.R., and Blaustein, A.R. 2011. Individual and combined effects of multiple pathogens on Pacific treefrogs. *Oecologia*, DOI: 10.1007/s00442-011-1932-1
9. Searle, C.L., Belden, L.K., Bancroft, B.A., **Han, B.A.**, Biga, L.F., and Blaustein, A.R. 2010. Experimental examination of the effects of ultraviolet-B radiation in combination with other stressors in frog larvae. *Oecologia*, 162:237-245.
8. **Han, B.A.**, Bradley, P.W., and Blaustein, A.R. 2008. Ancient behaviors of larval amphibians in response to an emerging fungal pathogen, *Batrachochytrium dendrobatidis*. *Behavioral Ecology and Sociobiology*, 63:241-250.
7. Lampo, M., Sánchez, D., Nicolás, A., Márquez, M., Nava-González, F., Garcia, C.Z., Rinaldi, M., Rodríguez-Contreras, A., León, Fabiola, **Han, B.A.**, Chacón-Ortiz, A. 2008. *Batrachochytrium dendrobatidis* in Venezuela. *Herpetological Review*, 39:449-454.
6. Sánchez, D.A., Chacón-Ortiz, A., León, R., **Han, B.A.**, and Lampo, M. 2008. Widespread occurrence of an emerging pathogen in amphibian communities of the Venezuelan Andes. *Biological Conservation*, 141:2898-2905.

5. **Han, B.A.**, Kats, L.B., Pommerening, R.C., Ferrer, R.P., Murry-Ewers, M. and Blaustein A.R. 2007. Behavioral avoidance of ultraviolet-B radiation by two species of neotropical poisondart frogs. *Biotropica*, 39:433-435.
4. Lampo, M., Barrio-Amoros, C.L., and **Han, B.A.** 2006. *Batrachochytrium dendrobatidis* infection in the recently rediscovered *Atelopus mucubajiensis* (Anura, Bufonidae) in the Venezuelan Andes. *EcoHealth*, 3:299-302.
3. Johnson, P.T.J., Preu, E. R., Sutherland, D. R., Romansic, J., **Han, B.A.**, and Blaustein, A.R. 2006. Adding infection to injury: Synergistic effects of predation and parasitism on salamander limb malformations. *Ecology*, 87:2227–2235.
2. Blaustein, A. R., Romansic, J. M., Scheessele, E. A., **Han, B.A.**, Pessier, A.P., and Longcore, J.E. 2005. Interspecific variation in susceptibility of frog tadpoles to the pathogenic fungus *Batrachochytrium dendrobatidis*. *Conservation Biology*, 19:1460-1468.
1. Blaustein, A.R., **Han, B.**, Fasy, B., Romansic, J., Scheessele, E.A., Anthony, R.G., Marco, A., Chivers, D.P., Belden, L.K., Kiesecker, J.M., Garcia, T.S., Lizana, M. and Kats, L.B. 2004. Variable breeding phenology affects the exposure of amphibian embryos to ultraviolet radiation and Optical characteristics of natural waters protect amphibians from UV-B in the U.S. Pacific Northwest: Comment. *Ecology*, 85:1747-1754.

Other publications:

Pandit P, **Han BA**. 2019. Rise of machines in disease ecology: the arising and established researcher. *Bulletin of the Ecological Society of America*, 100: 1008-1018.

<https://doi.org/10.1093/jmammal/gyy174>

**Han, B.A.** 2016. The Algorithm That’s Hunting Ebola. Invited feature article, *IEEE Spectrum Magazine*. In press and online: <http://spectrum.ieee.org/biomedical/diagnostics/the-algorithm-thats-hunting-ebola>

**Han, B.A.** and Altizer, S. 2013. *Invited chapter*, Conservation and Infectious Disease in **The Encyclopedia of Biodiversity** (2<sup>nd</sup> edition). Levin, S. (Ed.) Academic Press.

**Han, B.A.**, Rushmore, J., Fritzsche, A., Satterfield, D., and Winternitz, J. 2012. Preempting pandemics. *Science*, 337:647-648. (*Book Review: The Viral Storm by Nathan Wolfe*).

**SELECTED GENERAL PRESS**

2020

March. **NBC News Now**. [Tracking a virus: how technology can predict outbreaks faster.](#)

March. **Freethink**. [Can an algorithm predict the next zoonotic disease outbreak?](#)

February. Podcast: **RESET, Vox Media**. Episode. [How AI could predict the next big outbreak/Machine Learning & Disease Surveillance](#)

- 2019 October. [To Predict the Next Infectious Disease Outbreak, Ask a Computer](#), **PBS NOVA**.
- 2018 August. [With Big Data and Predictive Analytics, Scientists Are Getting Smarter About Outbreaks](#), **Discover Magazine**.
- 2018 Podcast: **Big Biology**, Episode 5. [Please Don't Kill the Bats](#).
- 2017 **NPR Goats and Soda** interview, aired on **NPR All Things Considered**. [Spillover beasts: which animals pose the biggest viral risk?](#)
- 2017 Podcasts:
- [The Front Row, Episode 3. Future of Epidemics](#)
  - Pulse of the Planet: Predicting disease (3 part series)
    - Part 1. [Which animal, which country](#)
    - Part 2. [Making the leap](#)
    - Part 3. [Tracking probabilities](#)
- 2016 **WAMC/Northeast Public Radio**, Earthwise:
- June. [Forecasting future infectious disease outbreaks](#)
  - June. [Big Data + Technology = Improved Global Health](#)
  - July. [Mapping emerging infectious diseases](#)
  - August. [Ebola and bats](#)
- 2016 January. **Nature | News**. [Hunt for Ebola's wild hideout takes off as epidemic wanes](#).
- 2014 October. **WAMC/Northeast Public Radio**, Earthwise: [Algorithms and Ecology: A New Partnership](#).
- 2011 November. **The New Scientist**. [Nature's unruly patterns unlocked with AI](#).

## COLLABORATIVE WORKING GROUPS

- 2019 Ending Pandemics and Salzburg Global Seminar, Finding Outbreaks Faster: Metrics for One Health Surveillance. Salzburg, Austria. Nov 2019.
- 2018 Allometry of immunity. Hamilton College.
- 2018 Predicting pathogen spillover. DARPA-funded working group led by R. Plowright at Univ. Montana, February 2018.
- 2016 - *ongoing* Pandemic Prediction and Forecasting Science and Technology (PPFST) Working Group, Subcommittee on Biological Defense Research And Development, Committee On Homeland And National Security, National Science And Technology Council.
- 2016 - *ongoing* IBM Thomas J. Watson Research Center, Data Science Group.



2013 - *ongoing* National Science Foundation, Research Coordination Network.  
Macroecology of Infectious Disease. PIs: Patrick Stephens, Alonso Aguirre, Sonia Altizer.

## SELECED PRESENTATIONS

- 2020 Invited symposium speaker. American Association for the Advancement of Science. Seattle, WA. February 2020.
- 2019 Invited symposium speaker. American Society of Tropical Medicine and Hygiene. Baltimore, MD. November 2019.
- 2019 Speaker. WNYC/ Jerome Greene Performance Center-The Greene Space. [Using AI to Predict and Preempt Epidemics](#). New York City. October 2019
- 2019 Invited speaker. icddr,b. Dhaka, Bangladesh. July 2019.
- 2019 Invited speaker. NASA Goddard Applied Sciences Seminar. May 2019.
- 2019 DARPA PREEMPT Program Meeting for Principal Investigators. May 2019.
- 2019 Invited speaker. University of Michigan. April 2019.
- 2019 Invited speaker. Infectious Diseases Colloquium UTMB. April 2019.
- 2019 Invited symposium speaker. ASM BioThreats. January 2019.
- 2019 Invited speaker. James Madison University. January 2019.
- 2018 Invited speaker. University of New Mexico. November 2018.
- 2018 Invited speaker. Grand Challenges Meeting of the Bill and Melinda Gates Foundation. November 2018. Berlin, Germany.
- 2018 Invited speaker. University of Maine. October 2018. Orono, ME.
- 2018 Invited lecturer. Ecological Forecasting summer course. Machine learning. July 2018. Boston, MA.
- 2018 Invited speaker. IGNITE session, Frontiers and Limits in Disease Macroecology. 103<sup>rd</sup> annual meeting of the Ecological Society of America. Title: *Topic modeling to identify major themes and future research needs in disease ecology*. August 2018.
- 2018 Invited lecturer. Ecological Forecasting summer course. *Machine learning*. July 2018. Boston University, Boston, MA.

- 2018 Invited speaker. Scaling of Host Defenses Workshop. *Infectious disease transmission and behavioral allometry in wild mammals*. July 2018. Hamilton College, Clinton, NY.
- 2018 Public lecture, Friday night at the Cary Institute of Ecosystem Studies. *Predicting the future of infectious diseases*. March 2018. Millbrook, NY
- 2018 Invited speaker. Columbia University. *Predicting zoonotic risk from species-level data using machine learning*. January 2018. New York, NY.
- 2017 Invited speaker. Organized oral session at the 102<sup>nd</sup> annual meeting of the Ecological Society of America. Han BA. Title: *Data-driven approaches to building predictive capacity for zoonotic diseases*. Organized oral session title: Ecological Forecasting: Advances and Opportunities. Portland, OR. August 2017.
- 2017 Invited speaker. Defense Threat Reduction Agency. Title: *Predictive analytics for infectious disease intelligence*. Fort Belvoir, VA. July 2017.
- 2017 Invited speaker by graduate students of Fordham University. *Machine learning for prediction of zoonotic hosts and vectors*. Brooklyn, NY. May 2017
- 2017 Invited speaker, WHO-Imperial College Joint Roundtable Discussion on Epidemic and Pandemic Modelling. London, UK. March 2017.
- 2017 Invited speaker, Animal Disease Data Digitization workshop (AHEAD 2017). *Health prediction and the data frontier*. University of Exeter, Exeter, Devon, UK. March 2017
- 2017 Invited speaker, ASM Biothreats: Research, Response and Policy meeting. *Machine learning for forecasting and prediction of zoonotic diseases*. Washington, DC. February 2017
- 2017 Invited speaker, Center for Infectious Disease Dynamics, Penn State University. *Combining machine learning and life history to predict zoonotic disease*. State College, PA. February 2017
- 2016 Invited speaker, Rutgers University. *Applications of machine learning for macroecology of zoonotic disease*. New Brunswick, NJ.
- 2016 Invited speaker, Pandemic Prediction and Forecasting Science and Technology Working Group, Office of Science Technology and Policy, White House. Title: *Machine learning for forecasting and prediction of zoonotic diseases*. Washington, DC.

- 2016 Keynote speaker, Huyck Preserve Research Symposium. Title: *Applications of machine learning for zoonotic disease*. Rensselaerville, NY.
- 2016 Invited speaker, Data4Good organized session for the 33<sup>rd</sup> International Conference on Machine Learning. **Han, B.A.** and Yang, L. Title: *Predicting novel tick vectors of zoonotic disease*. Manhattan, NY.
- 2016 Invited speaker. University of South Florida, Department of Integrative Biology. Tampa, FL. Title: *Quantifying unrealized risk of zoonotic disease*. April 2016.
- 2016 Invited speaker. TTI/Vanguard Conference, From Big Data to Big Understanding. Austin, TX. Title: *The algorithm that's hunting Ebola*. February 2016.
- 2016 Invited speaker. Gordon Research Conference: Predator-Prey Interactions. Title: *Does predation reduce human infectious disease? Predicting disease reservoirs and zoonotic risk from terrestrial carnivores*. Ventura, CA. January 2016
- 2015 Invited speaker. Organized oral session at the 100<sup>th</sup> annual meeting of the Ecological Society of America. Baltimore, MD. Han, B.A., Schmidt, J.P., Hayman, D. and Drake, J.M. Title: *Machine learning to predict new bat reservoirs of filoviruses: Africa and beyond*. Session title: Macroecology of infectious disease. August 2015.
- 2015 Invited speaker. NIH RAPIDD-GHSA Workshop: Policy implications of detecting hemorrhagic fever viruses in wildlife and domestic animals. Sponsored by NIH Fogarty International Research and Policy for Infectious Disease Dynamics (RAPIDD) and the Global Health Security Agenda (GHSA). Title: *Targeting surveillance for the discovery of novel filovirus reservoirs in the wild*. Takoma Park, MD. June 2014.
- 2015 Invited speaker. Ecology and Evolution of Infectious Diseases Annual Meeting. Athens, GA. May 2015. Title: *Unidentified carriers of filoviruses in the wild*.
- 2015 Invited speaker. RAPIDD Workshop, Viral Hemorrhagic Fevers. Title: *Predicting candidate bat reservoirs of filoviruses*. Fort Collins, CO. May 2015.
- 2014 Invited speaker. Bard College, Division of Science, Mathematics, and Computing. *Predicting future reservoirs of zoonotic disease*. October 2014.
- 2014 Invited panelist. "In the News: Ebola". Bard College, Center for Civic Engagement. September 2014.

- 2013 Invited speaker. Cary Institute of Ecosystem Studies, Scientific Seminar series. Millbrook, NY. Title: *Host traits and infectious disease risk: learning and prediction.*
- 2011 Organizer, Oral Session for the 96<sup>th</sup> annual meeting of the Ecological Society of America in Austin, TX. *Ecological Applications of Machine Learning.* Co-organized with Dr. John Drake (UGA).
- 2011 Invited speaker. Symposium for the 96<sup>th</sup> annual meeting of the Ecological Society of America in Austin, TX. Symposium title: Towards trait-based disease ecology: integrating theory and data across kingdoms (Organizers: James P. Cronin, Felicia Keesing, Colleen Webb). Han, B.A., Park, A.W., Altizer, S. *Body size scaling of host behavioral traits to predict infectious disease dynamics among mammals.*
- 2011 Invited seminar. Natural Science Seminar Series, Pepperdine University. Malibu, CA. *Wildlife disease – risks and rewards of life on the move.*
- 2009, 2010 Invited panelist. U.S. Fulbright fellowships at the University of Georgia, hosted by the Department of Anthropology and the University Honors Program. Athens, GA.
- 2009 Invited seminar. Odum School of Ecology, University of Georgia. Athens, Georgia. *Diversity effects and correlates of host susceptibility to an infectious fungal pathogen of amphibians.*
- 2009 Invited seminar. Environmental Futures Centre, Griffith University. Brisbane, Australia. *The influence of wildlife diseases on host interactions: from amphibians to apes.*
- 2008 Invited seminar. Biology Undergraduate Seminar series. Pacific University, Portland, OR. *Amphibian population declines: cause and consequence of infectious pathogens.*
- 2007 Invited seminar. Washington State University, School of Biological Sciences. Pullman, WA. *Behavior and community effects of an emerging pathogen on amphibian hosts.*
- 2005 Invited speaker. Han, B.A. *Ecology of an emerging infectious disease of amphibians.* U.S. Fulbright Student Enhancement Meeting for the Andean region, South America. Cartagena, Colombia.

## **SERVICE**

Journal editor:

2020

Ecology Letters

Journal reviewer:

<i>Nature</i>	<i>PLoS ONE</i>
<i>Science</i>	<i>PLoS Neglected Tropical Diseases</i>
<i>Proceedings of the Nat'l Acad. Sciences</i>	<i>Ecosphere</i>
<i>Proceedings of the Royal Society B</i>	<i>Global Ecology and Biogeography</i>
<i>Ecology Letters</i>	<i>Ecography</i>
<i>Trends in Ecology and Evolution</i>	<i>Journal of Experimental Biology</i>
<i>American Naturalist</i>	<i>Ethology, Ecology and Evolution</i>
<i>Journal of Animal Ecology</i>	<i>Ticks and Tickborne Diseases</i>
<i>Ecology</i>	<i>Science Advances</i>
<i>Ecosystems</i>	<i>Herpetological Review</i>
<i>Nature Communications</i>	<i>Journal of Herpetology</i>
<i>Conservation Biology</i>	<i>Diseases of Aquatic Organisms</i>
<i>Royal Society Open Science</i>	<i>Canadian J. Fisheries Aquatic Sciences</i>
<i>Behavioral Ecology and Sociobiology</i>	<i>EcoHealth</i>

Grant reviewer:

NSF EEID Grant Program (Panelist)  
NSF EPSCoR Grant Program (Panelist)  
NSF CAREER Grant Program (Ad hoc)  
NIH IRAP: Infectious Disease Epidemiology (Panelist)

Mentorship:

2020 – Dr. Kyle Dahlin, postdoctoral researcher (NSF EEID project, based at the University of Georgia; co-advised by Drake, O'Regan, Han)

2019 – Heather Wells, PhD student, Columbia University. Committee member. Main advisor: Simon Anthony.

2019 – Michael Celone, PhD student, Uniformed Health Sciences University. Committee member. Main advisor: Simon Pollett.

2019 – Vernaliz Cruz, PhD student, University of Florida. Committee member. Main advisor: Miguel Acevedo.

2019 – Sanjay Natesan. Student research intern, Cary Institute of Ecosystem Studies. Co-mentored with Dr. Ilya Fischhoff.

2019 – Zach James, undergraduate in Computer Science at Georgia Tech. Research intern. Automated identification of bats from camera trap images from Bangladesh with deep learning. Co-mentored with Dr. Ilya Fischhoff.

2018 – Dr. Ilya Fischhoff, postdoctoral researcher in the Han lab.

2018 – Ania Majewska, Cecilia Sanchez, Joy Vaz; PhD candidates at the Odum School of Ecology, University of Georgia. Main advisor: John M. Drake

- 2018 Keshav Ramji, Poughkeepsie, NY. Student research intern. Deep learning of Google search terms for early warning indicators of Lyme disease in the United States. Co-mentored with Dr. Ilya Fischhoff.
- 2016 – 2017 Dr. Sarah E. Bowden, Postdoctoral associate. Current position: Data scientist at the Centers of Disease Control. Atlanta, GA.
- 2017 Dr. Timothy NeCamp, Building a cognitive disease hunter. IBM Summer Internship for Social Good. Current position: freelance statistical consultant.
- 2016 Dr. Subhabrata Majumdar, Predicting wildlife reservoirs of Zika virus. IBM Summer Internship for Social Good. Current position: Senior Inventive Scientist, Data Science and AI Group, AT&T Labs Research. New York, NY.
- 2014 – 2016 Laura Yang, Spackenkill High School. Poughkeepsie, NY. Research intern. Zoonotic tick vectors and machine learning. Current position: undergraduate, School of Civil and Environmental Engineering, Georgia Tech. Atlanta, GA.
- 2015 Michelle Victoria (St. Edwards University) and Catherine Kageman (University of Illinois). NSF Research Experience for Undergraduates (REU) Summer Research Program at the Cary Institute of Ecosystem Studies, Translational Ecology.
- 2013 Hilary Andrews (Georgetown University), NSF Research Experience for Undergraduates (REU) Summer Research Program at the University of Georgia, Population Biology of Infectious Diseases.
- 2012 – 2013 Elizabeth Dennard (University of Georgia), undergraduate research assistant; Eco-informatics to understand traits of zoonotic infectious parasites of wild mammals.
- 2009 – 2011 Adam Havaland (University of Georgia), undergraduate honors research assistant, eco-informatics; Currently a board-certified internist at Montefiore Medical Center. New York, NY.
- 2008 Jennifer Hubbard (Oregon State University), undergraduate research assistant, infectious disease ecology and animal behavior; Currently: ecotoxicologist at WIL Research Laboratories. Ashland, OH.
- 2007 – 2008 Paul Bradley (Oregon State University), Howard Hughes Medical Institute Undergraduate Research Fellow; co-authored a peer-reviewed publication (above); Currently adjunct assistant professor at Univ. San Diego, CA.
- 2007 – 2008 Laura Linn (Oregon State University), amphibian ecology; research technician in cheetah biology with Cheetah Conservation Fund, Namibia.
- 2002 – 2009 Other mentored students. At Oregon State University: Cheri Lum, Jessica Takishita, Rebecca LeMaster; involved in experimental design, data collection, and the collection and husbandry of amphibians for laboratory

experiments. At the University of Georgia: Randall Singer; involved in updating a relational database on parasites of wild ungulate species.

### Community and Education

- 2015 – *ongoing* Lecture for Fundamentals of Ecosystem Ecology course, Cary Institute of Ecosystem Studies. *Intro to R, Big Data, and Best Data Practices* (2015); *Big Data in Ecology* (2016). *Disease ecology* (2018). *Big Data in Ecology* (2019, 2020).
- 2016 – 2017 Chair, Disease Ecology Section, Ecological Society of America.
- 2015 – 2016 Vice chair, Disease Ecology Section, Ecological Society of America.
- 2016 – 2017 Scientific Advisory Committee, Huyck Preserve and Biological Research Station. Rensselaerville, NY.
- 2015, 2016 Judge. Dutchess Day School Science Fair. Millbrook, NY.
- 2015, 2016 Judge. Hudson Data Jam. Cary Institute of Ecosystem Studies.