

SARAH M. HIRD

Curriculum Vitae

Assistant Professor

University of Connecticut
Department of Molecular and Cell Biology
91 North Eagleville Road, U-3125
Storrs, CT 06269 USA

OFFICE (860) 486.6299

EMAIL sarah.hird@uconn.edu

URL <https://www.hirdlab.com>

 @sarahmhirid

Host-associated microbiomes, phylogeography, bioinformatics, ornithology, evolution, increasing diversity in STEM

EDUCATION

- 2013 **PhD** in Biological Sciences
Louisiana State University (LSU), Baton Rouge, LA, USA.
DISSERTATION: Novel computational tools and utilization of gut microbiota for phylogeographic inference
ADVISORS: Dr. Robb Brumfield, Dr. Bryan Carstens
- 2008 **MSc** in Biology
University of Idaho (UI), Moscow, ID, USA.
THESIS: Analysis of nuclear markers in red-tailed chipmunk (*Tamias ruficaudus*) hybrid zones
ADVISOR: Dr. Jack Sullivan
- 2005 **BSc** in Biology
University of Idaho (UI), Moscow, ID, USA.

RESEARCH AND ACADEMIC APPOINTMENTS

- 2016 – present **Assistant Professor**, Department of Molecular and Cell Biology, University of Connecticut
- 2014 – 2016 **UC Davis Chancellor's Postdoctoral Fellow**, Genome Center, University of California, Davis
MENTOR: Dr. Jonathan Eisen
- 2013 – 2014 **Postdoctoral Researcher**, Genome Center, University of California, Davis
MENTOR: Dr. Jonathan Eisen

PEER-REVIEWED PUBLICATIONS

* = Student or postdoc from the Hird Lab; † = Undergraduate researcher; ‡ = Contributed equally to the work

Google Scholar Profile including citations counts: <https://scholar.google.com/citations?hl=en&user=k4sa-hQAAAAJ>

30. Bodawatta K, **Hird SM**, Grond K, Poulsen M, Jønsson K. *Accepted*. Avian microbiomes taking flight. *Trends in Microbiology*.
29. Chen J, Li H, **Hird SM**, Chen M, Xu W, Maas K, Cong X. *Accepted*. Sex differences in gut microbial development of preterm infant twins in early life: a longitudinal analysis. *Frontiers in Cellular and Infection Microbiology*. (open access)
28. Herder E*, Spence A, Tingley M, **Hird SM**. 2021. Elevation correlates with significant changes in relative abundance in hummingbird fecal microbiota, but composition changes little. *Frontiers in Ecology and Evolution*, 8:534. (open access)

27. Hamchand R, Lafountain AM, Büchel R, Maas KR, **Hird SM**, Warren M, Frank HA, Brückner C. 2021. Red fluorescence of European Hedgehog (*Erinaceus europaeus*) spines results from free-base porphyrins of potential microbial origin. *Journal of Chemical Ecology*. 47: 588-596.
26. Gil J*, Helal Z, Risatti G, **Hird SM**. 2020. *Ixodes scapularis* microbiome correlates with life stage, not the presence of human pathogens, in ticks submitted for diagnostic testing. *PeerJ*, 8:e10424. (open access)
25. Capunitan D*‡, Johnson O, Terrill RS, **Hird SM**‡. 2020. Evolutionary signal in the gut microbiomes of 74 bird species from Equatorial Guinea. *Molecular Ecology*, 29(4), 829-847.
24. Grond K*, Guilani H*†, **Hird SM**. 2020. Spatial biogeography of the shorebird microbiome. *Royal Society Open Science*, 7(1), 191609. (open access)
23. Grond K*, Bell K, Demboski J, Santos M, Sullivan JM, **Hird SM**. 2020. No evidence for phyllosymbiosis in western chipmunk species. *FEMS Microbiology Ecology*, 96(1):fiz182.
22. Grond KC*‡, Perreau J‡, Loo W‡, Cavanaugh C, **Hird SM**. 2019. Longitudinal microbiome profiling reveals impermanence of probiotic bacteria in domestic pigeons. *PLOS One*, 14(6): e0217804 (open access).
21. **Hird SM**. 2019. Perspective: Microbiomes, community ecology and the comparative method. *mSystems*, 4(3): e00112-19. (open access)
20. Bik HM, Alexiev A†, Aulakh SK†, Bharadwaj L†, Flanagan L†, Haggerty JM†, **Hird SM**, Jospin G, Lang JM, Sauder LA, Neufeld JD, Shaver A†, Sethi A†, Eisen JA, Coil DA. 2019. Microbial community succession and nutrient cycling responses following perturbations of experimental saltwater aquaria. *mSphere*, 4:e00043-19. (open access)
19. **Hird SM**, Ganz HH, Eisen JA, Boyce WM. 2018. The cloacal microbiome of five wild duck species varies by species and influenza A infection status. *mSphere*, 3:e00382-18. (open access)
18. **Hird SM**. 2017. Evolutionary biology needs wild microbiomes. *Frontiers in Microbiology*, 8:725. (open access)
17. Ganz H, Firl A, Doroud L, **Hird SM**, Eisen J, Boyce W. 2017. Community-level differences in the microbiome of wild mallards associated with infection by influenza A viruses. *mSystems*. In press. (open access)
16. **Hird SM**, Sánchez C, Carstens BC, Brumfield RT. 2015. Comparative gut microbiota of 59 Neotropical bird species. *Frontiers in Microbiology*, 6: 1403. (open access)
15. NESCent Working Group on the Evolutionary Biology of the Built Environment, Martin LJ, Adams RI, Bateman A, Bik HM, Hawks J, **Hird SM**, Hughes D, Kembel SW, Kinney K, Kolokotronis S, Levy G, McClain C, Meadow JF, Medina RF, Mhuireach G, Moreau CS, Munshi-South J, Nichols LM, Palmer C, Popova L, Schal C, Taubel M, Trautwein M, Ugalde JA, Dunn RR. 2015. Evolution of the indoor biome. *Trends in Ecology and Evolution*, 30(4): 223-232.
14. **Hird SM**, Carstens BC, Cardiff SW, Dittmann DL, Brumfield RT. 2014. Sampling locality is more detectable than taxonomy or ecology in the brood-parasitic Brown-headed Cowbird (*Molothrus ater*). *PeerJ*, 2: e321. (open access)
13. Sullivan J, Demboski JR, Bell KC, **Hird SM**, Sarver B, Reid NM. 2014. Divergence-with-gene-flow within the recent chipmunk radiation (*Tamias*). *Heredity*, 113(3):185-194.
12. Reid NM, **Hird SM**, Brown JM, Pelletier TA, McVay JM, Satler JD, Carstens BC. 2013. Poor fit to the multispecies coalescent is widely detectable in empirical data. *Systematic Biology*, 63(3): 322-333.
11. **Hird SM**. 2012. lociNGS: a lightweight alternative for assessing suitability of next-generation loci for evolutionary analysis. *PLOS ONE* 7(10): e46847. (open access)
10. Zellmer AJ, Hanes MM, **Hird SM** and BC Carstens. 2012. Deep phylogeographic structure and environmental differentiation in the carnivorous plant *Sarracenia alata*. *Systematic Biology*, 61(5): 763-777.
9. McCormack JE, **Hird SM**, Zellmer AJ, Carstens BC and RT Brumfield. 2012. Applications of next-generation sequencing to phylogeography and phylogenetics. *Molecular Phylogenetics and Evolution*, 66: 526-538.

8. McCormack JE, Maley JM, **Hird SM**, Derryberry EP, Graves GR and RT Brumfield. 2011. Next-generation sequencing reveals phylogeographic structure and a species tree for recent bird divergences. *Molecular Phylogenetics and Evolution*, 62: 397-406.
7. **Hird SM**, Brumfield RT and BC Carstens. 2011. PRGmatic: an efficient pipeline for collating genome-enriched second generation sequencing data using a “provisional-reference genome”. *Molecular Ecology Resources*, 11(4):743-748.
6. **Hird S**, Kubatko L and B Carstens. 2010. Replicated subsampling enables accurate species tree estimation in empirical systems. *Molecular Phylogenetics and Evolution*, 57(2): 888-898.
5. **Hird S**, Reid N, Demboski J and J Sullivan. 2010. Introgression at differentially aged contact zones in red-tailed chipmunks (*Tamias ruficaudus*). *Genetica*, 138(8): 869-883.
4. Reid N, **Hird S**, Schulte-Hostedde A and J Sullivan. 2010. Examination of nuclear markers at a zone of mitochondrial introgression in two chipmunk species (*Tamias amoenus* and *Tamias ruficaudus*). *Journal of Mammalogy*, 91(6): 1389-1400.
3. Koopman M, Fuselier D[†], **Hird S** and B Carstens. 2010. The carnivorous Pale Pitcher Plant harbors diverse, distinct and temporally dependent bacterial communities. *Applied and Environmental Microbiology*, 76: 1851-1860.
2. **Hird S** and J Sullivan. 2009. Assessing gene flow across a hybrid zone in red-tailed chipmunks (*Tamias ruficaudus*). *Molecular Ecology*, 18: 3097-3109.
1. Good J, **Hird S**, Reid N, Demboski J, Steppan S, Martin-Nims T and J Sullivan. 2008. Ancient Hybridization and Mitochondrial Capture between Two Distantly Related Species of Chipmunks (*Tamias*: Rodentia). *Molecular Ecology*, 17 (5): 1313-1327.

ADDITIONAL PUBLICATIONS: INVITED COMMENTARY

1. **Hird SM**. 2020. Context is key: comparative biology illuminates the vertebrate microbiome. *mBio*, 11(2): e00153-20.

FUNDING AND FELLOWSHIPS

- | | |
|------|--|
| 2021 | National Science Foundation (\$49,050): REP supplement for Jolene Addi (recommended for funding) |
| 2020 | National Science Foundation (\$199,995): <i>EAGER: Testing the Host-Microbiome Specificity Paradigm in Birds</i> |
| 2019 | University of Connecticut ISG Seed Grant (\$11,952): <i>Antibiotic pollution and the mallard microbiome</i> |
| 2018 | University of Connecticut Microbiome Research Seed Grant (\$50,000): <i>Range-wide variation in the microbiome of an endangered wild songbird, the Saltmarsh Sparrow</i> |
| 2017 | University of Connecticut Research Excellence Program (\$25,000): <i>The Avian Microbiome Atlas</i> |
| 2014 | UC Davis Chancellor’s Postdoctoral Fellowship |
| 2013 | LSU BioGrads Travel Award |
| 2011 | Society for the Study of Evolution Rosemary Grant Award
Society of Systematic Biologists Graduate Student Research Award
Sigma Xi Grants-In-Aid of Research
LSU BioGrads Travel Award |
| 2010 | LSU BioGrads Research Award |
| 2009 | LSU Graduate Student Enhancement |

TEACHING

Instructor

- 2021- *Host-Associated Microbiomes*, co-taught with Dr. Kat Milligan-Myhre. Undergraduate class. UConn.
- 2017-19 *Sequence-based Microbial Community Analysis*. Graduate class. UConn.
- 2017-20 *Host-Associated Microbiomes*, co-taught with Dr. Nichole Broderick. Graduate and undergraduate class. UConn.
- 2018 *Seminar in Microbiology*. Graduate seminar. UConn.

Teaching Assistant

- 2012 *Principles of Genetics*, recitation instructor. LSU
2005-07 *Plant and Animal Structure and Function*, laboratory instructor. UI.
2005-06 *Mammalogy*, laboratory instructor. UI.
2005 *Biology and Society*, laboratory instructor. UI.

Professional Instructor

- 2008-09 *ACT Test Preparation*. Educational Testing Consultants, Inc. Baton Rouge, LA.
2009 *GRE Test Preparation*. Educational Testing Consultants, Inc. Baton Rouge, LA.

MENTORING

- Current Graduate Students (UConn):** Ryan Duggan (PhD), Joshua Gil (PhD), Elizabeth Herder (PhD)
Current Undergraduate Students (UConn): Celeste Cuellar (McNair Fellow; Kelly Summer MCB Fellowship recipient)
Previous Graduate Students (UConn): Darien Capunitan (M.S., 2018), Brent Basso (PSM, 2020)
Previous Postdoctoral Researchers: Dr. Kirsten Grond (currently a postdoc at University of Alaska, Anchorage)
Previous Undergraduate Students (UConn): Jolene Addi (McNair Scholar; 2020-2021), David Mathieu (2020-2021), Nehal Navali (2018-2020), Inglis Tucker (SURF recipient; 2018 - 2020), Hannah Guilani (2018-2019), Francis Regala (2017-2018)
2014-6 Staff mentor with Guardian Scholar Program, UC Davis
2006 Laboratory training and supervision of undergraduate Tara Potter, UI.

INVITED TALKS

- 2021 *Birds and Bacteria: Evolution of the avian microbiome*. Brown University, Ecology and Evolution Seminar Series, online seminar.
2021 *Birds and Bacteria: Evolution of the avian microbiome*. Connecticut Agricultural Experiment Station, online seminar.
2020 *Birds and Bacteria: Evolution of the avian microbiome*. Sam Houston State University, Department Seminar; online seminar.
2020 *Birds and Bacteria: Evolution of the avian microbiome*. The Ohio State University's Evolution, Ecology and Organismal Biology Department Seminar. Columbus, OH.
2020 *Birds and Bacteria: Evolution of the avian microbiome*. Keynote: Rhode Island Microbiome Symposium. South Kingstown, RI
2019 *Evolution of the microbiome as a trait of the host*. Deciphering the Microbiome. Alexandria, VA (NSF-sponsored workshop).
2019 *The avian microbiome: past, present, future*. Keynote: Pioneer Valley Microbiology Symposium. Amherst, MA.
2018 *The avian microbiome: past, present, future*. University of Maine's School of Biology and Ecology Department Seminar. Orono, ME.
2018 *Evolutionary signal in the avian microbiome*. Stanford University Microbiome Symposium. Palo Alto, CA.
2018 *Big data and bird microbiomes*. University of Connecticut Computational Biology Core Open House. Storrs, CT.
2018 *The avian microbiome: past, present, future*. University of California Berkeley Integrative Biology Department Seminar Series. Berkeley, CA.
2018 *Evolution and the Microbiome*. Eighth Annual Workshop on Genomics. Český Krumlov, Czech Republic.
2017 *The avian microbiome: past, present, future*. The American Museum of Natural History Ruth Gilder Graduate School Comparative Biology Seminar Series. New York City, NY.
2017 *Avian influenza virus and the cloacal microbiome of wild avian hosts*. University of Connecticut, Department of Pathobiology and Veterinary Sciences Comparative Pathology Seminar Series. Storrs, CT.
2017 *Avian influenza virus and the cloacal microbiome of wild avian hosts*. Connecticut College, Life Sciences Seminar Series. New London, CT.
2015 *Metagenomics, phylogeography and the evolution of host-associated microbiota*. University of Connecticut,

- Department of Molecular and Cell Biology. Storrs, CT.
- 2015 *Phylogeography, bioinformatics and host-associated microbiota*. California State University Monterey Bay, Biology Department. Monterey Bay, CA.
- 2015 *Metagenomics, phylogeography and the evolution of host-associated microbiota*. UC Davis, Center for Population Biology. Davis, CA.
- 2009 *Nuclear markers at red-tailed chipmunk hybrid zones*. LSU, Museum of Natural Science. Baton Rouge, LA.

CONTRIBUTED TALKS AND POSTERS

- 2019 Capunitan DC, Johnson O, Terrill R, **Hird SM**. *Evolutionary signal in the gut microbiome of 73 species of bird from Equatorial Guinea*. Oral Presentation. Evolution 2019, Providence, RI, USA.
- 2019 Capunitan DC, Johnson O, Terrill R, **Hird SM**. *Evolutionary signal in the gut microbiome of 73 species of bird from Equatorial Guinea*. Poster presentation. Animal-Microbe Symbioses (Gordon Research Conference), West Dover, VT.
- 2017 **Hird SM**, W Boyce. *Avian influenza virus and the cloacal microbiome of wild avian hosts*. Oral presentation. American Ornithological Society Meeting, East Lansing, MI.
- 2017 **Hird SM**, W Boyce. *Avian influenza virus and the cloacal microbiome of wild avian hosts*. Oral presentation. Evolution 2017, Portland, OR, USA.
- 2017 **Hird SM**, W Boyce. *No consistent changes in the cloacal microbiome of 5 wild duck species based on Influenza A virus (IAV) infection*. Poster presentation. Animal-Microbe Symbioses (Gordon Research Conference), West Dover, VT.
- 2013 **Hird SM**, Dittmann DL, Cardiff SC, Carstens BC and RT Brumfield. Oral presentation. *Nature vs. Nurture in the gut microbiota of brown-headed cowbirds*; Evolution 2013, Snowbird, UT, USA.
- 2012 **Hird SM**, Carstens BC and RT Brumfield. Oral presentation. *Using gut microbiota to explore ecology and evolution in Neotropical birds*; Evolution 2012, Ottawa, Ontario, Canada.
- 2012 **Hird SM**, Carstens BC and RT Brumfield. Poster. *Gut microbiota of an avian brood parasite (Molothrus ater) and nine potential host species*; Ecology and Evolution of Host-associated Microbiota Workshop, Basel, Switzerland.
- 2011 **Hird SM**, Brumfield RT and BC Carstens. Oral presentation. *Creating and using a provisional-reference genome from anonymous next-gen fragments using PRGMATIC*; Evolution 2011, Norman, OK, USA.
- 2010 **Hird SM**, Koopman MM, Ence DD, Brumfield RT and BC Carstens. Poster. *An Efficient Pipeline for the Preparation of Phylogeographic Data Collected Via Next-Generation Sequencing*; Evolution 2010, Portland, OR.
- 2006 **Hird S** and J Sullivan. Poster. *Preliminary Microsatellite Analysis of a Chipmunk Hybrid Zone*; Evolution 2006, Stony Brook, NY.

ACADEMIC SERVICE

- 2020 - Associate Editor, *mSystems*.
- 2018 RISE Facilitator, addressing microaggressions on campus through a 90 minute workshop for incoming freshmen
- 2018- Founding faculty advisor for UgO:MCB (Undergraduate Organization for Molecular and Cell Biology) - an undergraduate social club centered on the MCB classes and majors at UConn
- 2017- Founding faculty advisor for UConn WinS – a Women in Science club for graduate students and postdocs at UConn
- 2014-6 Organizing committee, Women in Science (WiSci) group, UC Davis
- 2012-3 LSU Biological Sciences Diversity Committee, graduate student representative.
- 2012 LSU Computational Biology Faculty Search, graduate student representative.

Departmental Service: Graduate Student Recruitment Committee (2016 – current); Undergraduate Engagement Committee (2019 – current); Honors Student and Thesis Committee (2021-current)

Manuscript Reviewing: *Auk*, *Bioinformatics*, *Biological Invasions*, *BMC Bioinformatics*, *Frontiers in Microbiology*, *ISME Journal*, *Journal of Animal Ecology*, *Journal of Heredity*, *Microbial Ecology*, *Microbiome*, *Molecular*

Ecology (A “Top Reviewer” in 2013 and 2014), *Molecular Ecology Resources*, *Molecular Phylogenetics and Evolution*, *PeerJ*, *PLOS ONE*, *Proceedings B*, *Science*, *Science Advances*, *Scientific Reports*, *Systematic Biology*

Grant Reviewing: NSF Ad-hoc reviewer: PCE (2020), IOS (2017), SBS (2016), AOE (2016); National Science Centre in Poland (2019); NSF Panel (2021); NSF DEB SBS Panel (2018); Netherlands Organisation for Scientific Research (2018); NSF DEB SBS Preproposal Panel (2017, 2015); National Geographic Society (2017); Czech Science Foundation (2017); Internal UConn Microbiome Seed Grant (2019)

Graduate Committees (UConn). Current: Nidhi Vijayan (MCB PhD), Yutian Feng (MCB PhD), Emily Green (MCB PhD), Derrick Kamp (MCB PhD), Kathleen Kyle (MCB PhD), Todd Testerman (MCB PhD), Cora McGehee (PS PhD), Nicole Gonzalez (AS MS), Lang Sun (AS PhD), Benjamin Robinson (AS MS) **Graduated:** Sarah Goldstein (MCB PhD, 2020), Emily Gagnon (MCB PSM, 2019), Maria del Carmen Rosas (MCB PSM, 2020); Diler Haji (EEB MS, 2019), Morgan Napier (EEB MS, 2018)

Graduate Committees (external): David Sneddon (PhD, University of Idaho); Anton Lavrinienko (PhD, University of Jyväskylä, Finland, 2020)

OUTREACH

- 2020 Invited talk, Nuttall Ornithological Club. *Birds and Bacteria*. February 3, 2020.
2019 BAHfest participant at MIT, video available: www.youtube.com/watch?v=6jGDPH5h_Mg
2018 Story Collider story teller – “true, personal stories about science”. Hartford, CT; appearance on Story Collider podcast, available: www.storycollider.org/stories/2019/3/27/peace-stories-about-searching-for-solace
2017-8 Skype-A-Scientist Participant
2017 Panelist for "Feminism and Academia", in honor of International Women's Day, invited by the GEU-UAW9560's Women's Committee, UConn
2017 Panelist, "Family Matters: Navigating the Job Market with Partners and Children"; UConn Graduate School and Career Center
2016-8 Advisory board and judge for The Science Ambassador Scholarship (with Cards Against Humanity)
2017 BAHfest judge at MIT
2015 BAHfest judge at Bay Area Science Festival
2015 Science Friday guest (discussing BAHfest), available: www.sciencefriday.com/segments/festival-of-fake-hypotheses-generates-real-laughs/
2014 BAHfest participant at Bay Area Science Festival, video available: www.youtube.com/watch?v=MUw3s4evhTE
2014-5 Outreach coordinator for BOSC (Bioinformatics Open Source Conference)
2011-6 Co-founder and contributor to popular and academic sciences blog *Nothing in Biology Makes Sense!*

REFERENCES

Jonathan Eisen, Ph.D. (Post-Doctoral Advisor)

University of California, Davis
UC Davis Genome Center
451 East Health Sciences Drive
Davis, CA 95616
Phone: 530.752.3498
Email: jaeisen@ucdavis.edu

Robb Brumfield, Ph.D. (Doctoral Co-Advisor)

Louisiana State University
Museum of Natural Science
119 Foster Hall
Baton Rouge, LA 70803
Phone: 225.578.3081
Email: robb@lsu.edu

Bryan Carstens, Ph.D. (Doctoral Co-Advisor)

Ohio State University
Evolution, Ecology and Organismal Biology
300 Aronoff Laboratory
318 W. 12th Avenue
Columbus, OH 43210
Phone: 614.292.6587
Email: carstens.12@osu.edu

Jack Sullivan, Ph.D. (Master's Advisor)

University of Idaho
Department of Biological Sciences
Room 274, Life Sciences South
Box 443051
Moscow, ID 83844
Phone: 208.885.9049
Email: jacks@uidaho.edu