Heather R.L. Lerner

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Education

August 2007 **Ph.D.** Ecology and Evolutionary
University of Michigan, Ann Arbor
Thesis: *Molecular Phylogenetics of Diurnal Birds of Prey in the Avian Accipitridae Family*
Committee: David Mindell (chair); Bob Payne, Lacey Knowles and Jeff Long

April 2003 **M.S.** Ecology and Evolutionary Biology
University of Michigan, Ann Arbor
Research Project: Phylogeographic Structure in Avian Lineages: a meta-analysis

May 1999 **B.A**. Biology, Magna cum laude
Bryn Mawr College; Bryn Mawr, PA
Concentration: Environmental Science

Scientific Work Experience

2011—present **Museum Director and Assistant Professor of Biology**
Joseph Moore Museum, Earlham College, Richmond, IN

2007—2011 **Post-Doctoral Research Associate**
Smithsonian Institution, Washington D.C. and University of Maryland, College Park
Co-advisors: Rob Fleischer and Helen James
Project: Molecular and morphological phylogenetics of Hawaiian songbird radiations

2007 **Bird Division Collections Assistant**
University of Michigan Museum of Zoology; Ann Arbor, MI
Supervisors: Janet Hinshaw, David Mindell and Bob Payne

2006 **Genomic Diversity Laboratory Manager**
University of Michigan Museum of Zoology; Ann Arbor, MI

2003—2006 **National Institutes of Health Genome Science Training Grant Trainee**
Center for Statistical Genetics, University of Michigan; Ann Arbor, MI
Training at the interface of mathematics and biology, focusing on the use of computational methods for solving biological problems through coursework and seminars Link

1999-2001 **Wildlife and Wetland Biologist**
Wetlands Research Associates; San Rafael, CA

1999 **Naturalist and Environmental Educator**
San Francisco Estuary Project; Oakland, CA
"Project Wet" (environmental education) certified instructor

Research Grants, Awards, Scholarships

TOTAL AWARDS: $223,813
Total Research Awards: $104,503
Total Externally Funded Stipends: $77,522
Total Internal Competitive Stipends: $73,733

2012	Museum Assessment Program (American Association of Museums)	
2012	Borman Foundation (grant for research and museum improvements)	$13,500
2011	Mellon Foundation SEED grant for Experiential Education	$3,000
2010	Selected participant of Women Evolving the Biological Sciences Symposium (NSF ADVANCE program)	
2009	Mt-chips: Development of single chip capture arrays for whole mtDNA sequencing of all birds and all mammals; Restricted Endowment Fund; Smithsonian Institution Co-authored with PI Rob Fleischer	$33,333
2009	Phylogeny and rate calibration of Hawaiian bird radiations using next generation sequencing approaches; Scholarly Studies Grants Program; Smithsonian Institution Co-authored with PI Rob Fleischer	$70,000
2008	Society for Systematic Biologists Sponsored Attendee of the Women Evolving the Biological Sciences Symposium (NSF ADVANCE sponsored program), declined	
2007	University of Michigan Museum of Zoology Bird Division Research Assistant; UMMZ	$7800
2006	Rackham One-Term Dissertation Fellowship; Rackham Graduate School, UM	$7600
2006	Rackham/Hewlett/International Institute Travel Grant; Rackham Graduate School, UM	$700
2006	Research Fund Grant, Dept. of EEB, UM	$400
2006	Rackham Discretionary Funds 2006; Rackham Graduate School, UM	$2500
2005-2006	Ruth L. Kirschstein National Research Service Award; National Institute of Health Genome Science Training Grant; UM	$21772
2005	Block Grant/Endowed Fellowship Competition 2005; Dept of EEB, UM	$1581
2005	Peter Okkelberg Award; Dept of EEB, UM	$1600
2005	Museum of Zoology Hinsdale Scholarship Award; UMMZ	$4242
2005-2007	American Ornithologists' Union Outstanding Student Scholar Membership	$75
2004	Sokol International Summer Research Fellowship in the Sciences, UM	$5000
2004-2005	Ruth L. Kirschstein National Research Service Award; National Institute of Health Genome Science Training Grant UM	$21572
2004	Helen Brower Olsen Endowment Scholarship; Dept of EEB, UM	$1677
2004	Museum of Zoology Hinsdale Scholarship Award; UMMZ	$3000
2004	International Osprey Foundation 2004 Endowment Grant; Int. Osprey Foundation	$1000
2003-2004	Ruth L. Kirschstein National Research Service Award; National Institute of Health Genome Science Training Grant; UM	$20678
2003	Dean Amadon Grant; Raptor Research Foundation	$200
2003	Rackham Discretionary Funds 2003; Rackham Graduate School, UM	$1500
2003	Block Grant/Endowed Fellowship Competition 2003; Dept of EEB, UM	$900
2003	NSF Graduate Research Fellowship Honorable Mention	
2003	Rackham Spring/Summer Research Assistant Grant; Rackham Graduate School, UM	$4000
2003	Predissertation Research Award; International Institute, UM	$2500
2003	Student Research Fellowship; Latin American and Caribbean Studies Program, UM	$1250
2002	Travel Grant; Dept. of EEB, UM	$200
2002	Block Grant/Endowed Fellowship Competition 2002; Dept of EEB, UM	$633
2002	Rackham/International Institute Travel Grant; Rackham Graduate School, UM	$700

Publications (10) Nearly submitted (1)

Lerner, H. R. L., Lock, J. and R. Fleischer (in prep) Next generation sequencing for population and phylogenetic studies: reference-free mitochondrial genome sequencing across the avian tree of life.

Lerner, H. R. L. (2011) Phylogeny and Taxonomy of Bonelli's Eagle. In: Bonelli's Eagle (ed. Hernandez VJ). SEO/BirdLife, Madrid

Lerner, H. R. L., Meyer, M., Hofreiter, M., James, H. F., Fleischer, R. C. (2011) Multilocus resolution of phylogeny and timescale in the extant adaptive radiation of Hawaiian honeycreepers. **Current Biology** (cover, F1000 recommended)

Lerner, H. R. L. (2011) Eagle watchers: observing and conserving raptors around the world (Invited Book Review). **The Wilson Journal of Ornithology** 123:2

Lerner, H. R. L. and Fleischer, R. C. (2010) Prospects for next-generation sequencing in avian studies (invited reviewed commentary). **Auk** 127(1):4-15

Gjershaug, J. O., Lerner, H. R. L., and Diserud, O. H. (2009) Taxonomy and distribution of the pygmy eagle *Aquila* (*Hieraaetus*) *weiskeii*. **Zootaxa** 2326: 24-38

Lerner, H. R. L., Johnson, J. A., Lindsay, A. R., Kiff, L. and Mindell, D. P. (2009) Mitochondrial genetic diversity and differentiation among Harpy eagles (*Harpia harpyja*). **PLoS ONE** 4(10): e7336. doi:10.1371/journal.pone.0007336

Lerner, H. R. L. (2009) Raptor research and management techniques. **The Wilson Journal of Ornithology** 121 (1): 216-225.

Lerner, H. R. L., Klaver, M.* and Mindell, D. P. (2008) Molecular phylogenetics of the buteonine birds of prey (Aves: Accipitridae). **Auk** 125: 304-315

Johnson JA, Lerner H. R. L., Rasmussen PC, Mindell, DP (2006) Systematics within *Gyps* vultures: a clade at risk. **BMC Evolutionary Biology** 6:65

Lerner, H. R. L. and Mindell, D. P. (2005) Phylogeny of eagles, Old World vultures and other Accipitridae based on nuclear and mitochondrial DNA. **Molecular Phylogenetics and Evolution** 37 (2): 327-346

Bunce, M., Szulkin, M., Lerner, H. R. L., Barnes, I., Shapiro, B., Cooper, A. and Holdaway, R.N. (2005) The evolutionary history of New Zealand's extinct giant eagle revealed by ancient DNA. **PLoS Biol** 3(1):e9

* M. Klaver conducted a component of this research in the lab with me as part of his undergraduate honor's thesis and was an undergraduate when the work was published.

Invited Seminars (6) Oral Conference Presentations (8) and Posters (1)

Lerner, H. R. L., Lock, J. and R. Fleischer (2012) Next generation sequencing for population and phylogenetic studies: reference-free mitochondrial genome sequencing across the avian tree of life. North American Ornithologists Conference. Aug 15, Vancouver, Canada (*Oral Presentation)*

McLinn, C. **and H. R. L. Lerner.** (2012) Teaching Phylogenetic Thinking Using Physical and Digital Museum Specimens. Society for College Science Teachers Conference. March. (*Oral Presentation*)

Lerner, H. R. L. (2010) Evolution of the Hawaiian Honeycreepers: Phylogeny and Comparative Rates. Biology Department Colloquium. Earlham College. (**Invited Speaker**)

Lerner, H. R. L. (2010) Hawaiian Honeycreeper Radiation: Phylogeny and Comparative Evolutionary Rates from Pyrosequencing and Species-Tree Methods. Biological Sciences Seminar. University of North Texas. (**Invited Speaker**)

Lerner, H. R. L. (2010) Next-generation sequencing methods open doors for ecologists and evolutionary biologists. Biological Sciences Colloquium. University of Wisconsin, Milwaukee. (**Invited Speaker**)

Lerner, H. R. L., Meyer, M., Hofreiter, M., James, H. F., Fleischer, R. C. (2009) Resolving the Phylogeny of the Hawaiian Honeycreepers (Drepanidinae) with 454 Parallel Tagged Sequencing of Complete

Mitochondrial Genomes. American Ornithologists' Union. August 12-15, Philadelphia, Pennsylvania (*Oral Presentation*)

Lerner, H. R. L., James, H. F., Fleischer, R. C. (2009) Resolving the Phylogeny of a Rapid Adaptive Radiation: the Hawaiian Honeycreepers (Drepanidinae). Evolution Annual Meetings. June 12-16, Moscow, Idaho (*Oral Presentation*)

Lerner, H. R. L., Meyer, M., Hofreiter, M., James, H. F., Fleischer, R. C. (2008) Resolving the Phylogeny of the Hawaiian Honeycreepers (Drepanidinae) with 454 Parallel Tagged Sequencing of Complete Mitochondrial Genomes. American Ornithologists' Union. August 4-8, Portland, Oregon (*Oral Presentation*)

Lerner, H. R. L., James, H. F., Fleischer, R. C. (2008) New Approaches to Understanding an Adaptive Radiation in Hawaiian Honeycreepers. Max Planck Institute for Evolutionary Anthropology. Leipzig, Germany. (**Invited Speaker**)

Lerner, H. R. L. (2007) Diversity and Systematics of Birds of Prey in the Accipitridae. Department of Conservation Biology, Smithsonian Institution, (**Invited Speaker)**

Lerner, H. R. L. (April 25, 2007) Diversity and Systematics of Birds of Prey in the Accipitridae. University of Arizona. (**Invited Speaker**)

Lerner, H. R. L., Lindsay, A R, Johnson, J A, Kiff, L, Mindell, D. P. (2006) Is the Harpy Eagle at risk? Population genetics of a long-lived top-predator based on nuclear and mitochondrial DNA. American Ornithologists' Union. October 4-7, Veracruz, Mexico (*Oral Conference Presentation*)

Lerner, H. R. L., Klaver, M.C. and Mindell, D.P. (2005) Polyphyly of a genus of Neotropical forest hawks (Accipitridae: *Leucopternis*) based on mitochondrial and nuclear DNA. Society for the Study of Evolution. June 10-15, Anchorage, AK. (*Oral Presentation*)

Lerner, H. R. L. and Mindell, D. P. (2004) Molecular Systematics and Evolution in the Accipitridae. Society for the Study of Evolution. June 26-30, Forth Collins, CO. (*Oral Presentation*).

Lerner, H. R. L., Rest, J and Mindell, D.P. (2002) Preliminary phylogenetic analyses for Accipitridae based on mitochondrial DNA. Neotropical Raptor Conference. October 24-27, Panama City, Panama. *(Poster Presentation)*

Teaching and Advising Experience

Fall 2012 **Advanced Natural History Museum Curation (BIOL 342)**
Faculty Instructor, Earlham College, Richmond, Indiana
Designed (and currently teaching) new advanced course in museum collections care and use

Spring 2012 **Natural History Museum Curation (BIOL 240)**
Faculty Instructor, Earlham College, Richmond, Indiana
Designed and taught new lecture and lab course in care and use of museum collections

Fall 2011, 2012 **Ecological Biology (BIOL 111)**
Faculty Instructor, Earlham College, Richmond, Indiana
Team-taught first semester introductory biology course (enrollment ~110 each year)
Sole responsibility for one lab section (enrollment ~20)

Fall 2011—present **Natural History Museum Lab**
Faculty Instructor, Earlham College, Richmond, Indiana
Design and lead weekly labs three afternoons per week covering all aspects of maintaining a natural history exhibit museum and research specimen collection, from exhibit development to specimen preparation and research using specimens

Fall 2011—present **Research Projects with Undergraduate Students**
Faculty Mentor, Earlham College, Richmond, Indiana
Evidence for Sexual Dimorphism in Weight in the American Robin (*Turdus migratorius)*

Effects of Time and Climate on Amphibian Reproduction in Local Ponds
Analyzing Textile Artifacts in the Joseph Moore Museum Anthropological Collection
UV Fluorescence in Eastern Fox Squirrel (*Sciurus niger*) Cranial Materials
Porphyria Concentrations in Fox Squirrels (*Sciurus niger*)
Detecting West Nile Virus in Joseph Moore Museum Avian Specimens from 1999 to present
Comparative Genomics of the Harpy Eagle, Condor, Bald Eagle and White-tailed Eagle

Fall 2012—present **Undergraduate Faculty Advisor**
Earlham College, Richmond, Indiana
Faculty advisor for three first-year undergraduate students

July-Dec 2010 **Next-Generation Sequencing Data Analysis Workshop**
Instructor and organizer, Smithsonian Conservation Biology Institute, Washington, D.C.
Led ten weekly seminars covering next-generation sequencing technologies, Unix, Python, cloud computing, BLAST, read mapping software, sequence alignment software and matplotlib

January 2010 **Ornithology (BSCI 338Y)**
Faculty instructor, Biological Sciences Program, University of Maryland, College Park
Sole faculty instructor for new course in Ornithology

January 2010 **Laboratory Manual for (student-directed learning in) Ornithology**
Authors*: Russell Benford (Northern Arizona University) and Colleen McLinn (Cornell Lab of Ornithology)*
Help develop a manual that engages students and encourages them to think and act like working scientists, developing cognitive skills transferable to any scientific subject
Designed separate modules on phylogenetics and social behavior
Tested and provide feedback on other modules

2003—2011 **Non-Faculty Advisor/Mentor for Undergraduate Students**
Dept of EEB, UM, Ann Arbor and Smithsonian Institution, Genetics Lab, Washington, D.C.
Supervised nine undergraduate students in the laboratory (three female and six male) for a period of one to seven terms each (average three semesters per student)
Advised biology honors students in thesis design and preparation

June 2006 **Preparing Future Faculty Intensive Seminar**
Center for Research on Learning and Teaching, UM, Ann Arbor
Five-week seminar prepared a select group of advanced graduate students for faculty jobs
Instruction in research on teaching and learning, including multicultural teaching, instructional technology and other pedagogical topics

2002-2003 **Evolution (BIO 390)**
Graduate Student Instructor, Dept of EEB, UM, Ann Arbor
Sole responsibility for two weekly discussion sections

2001-2002 **Introduction to Biology (BIO 162)**
Graduate Student Instructor, Dept of EEB, UM, Ann Arbor
Sole responsibility for one weekly lab and discussion

Public Outreach and Community/Departmental Service

2011—present **Joseph Moore Museum Outreach**
Earlham College, Richmond, Indiana
Initiated a transformation from a museum of glass-bound exhibits to one focused on experiential education
- Designed, installed and obtained funding for eight experiential learning centers
- Currently designing a new 200 sq foot experiential exhibit on insects

Initiated a redirection from a natural history museum based on exhibited specimens to one focsed on scientific discovery using natural history specimens
- Designed and installed an exhibit on Hawaiian Honeycreeper diversification

Implemented new free twice-a-month public programs for preschool to elementary school children

2011—present **Committee Member**
Earlham College, Richmond, Indiana
New Science Facility Design Executive Committee, Museum Studies Program Committee, Joseph Moore Museum Department Convener

Fall 2010 **Smithsonian Conservation Biology Institute (SCBI) Seminar Series Coordinator**
SCBI, Washington, D.C.
Select and invite seminar presenters for weekly seminar series
Arrange all travel and seminar-day details, including scheduling meetings with researchers
Manage seminar budget and speaker reimbursements

2010 **NSF Panelist**
National Science Foundation, Washington, D.C

2007-2011 **Smithsonian Public Outreach**
Smithsonian Institution, National Zoo, Washington, D.C
Design and contribute to displays on genetics and Hawaiian honeycreepers
Staff outreach booths at the National Museum of Natural History and the National Zoo
Lecture on genetics, systematics and conservation for visiting groups of high school students

2006—present **Manuscript and Proposal Reviewer**
Evolution, PLOS One, Molecular Phylogenetics and Evolution, Ibis**,** Biological Journal of the Linnaean Society**,** Zootaxa
NSF ad hoc reviewer

2005—present **Tree of Life Website Curator**
Maintain phylogenetic tree and references for Accipitridae
http://tolweb.org/Accipitridae/26375

2006 **Evolution and the Nature of Science Workshop Developer and Assistant**
Dept. of EEB, UM, Ann Arbor
Designed workshops for undergraduate science and non-science majors exploring the nature of science to distinguish scientific questions and inquiry from non-science and present current evolutionary research through an interactive display. See http://www.lsa.umich.edu/lsatheme/exploreevolution/curriculum/workshops.htm

2004-2006 **Diversity Committee Member**
Dept. of EEB, UM, Ann Arbor
Developed written components of an NSF Advance Departmental Transformation Grant funded for $25,000 in 2006
Developed and implemented an annual survey about Dept. climate for graduate students (75% response rate) identifying areas of concern for future diversity committee initiatives

2003-2004 **Exhibit Museum Public Display Contributor**
Exhibit Museum of Natural History, UM, Ann Arbor
Designed an exhibit about my research on genetic variation in the harpy eagle which makes
Contributed text for an interactive exhibit exploring global biodiversity and phylogeny

Professional Memberships

American Ornithologists' Union (2005 to present)
Society for Systematic Biologists (2004 to present)
Raptor Research Foundation (since 2002 to present)

References

Wendy Tori
Assistant Professor
Biology Department
Earlham College
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(current dept. colleague)

Rob Fleischer
Center Head
Center for Conservation and Evolutionary Genetics
Smithsonian Institution
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202-633-4190
(post-doc adviser)

Helen James
Curator of Birds
Smithsonian Institution
National Museum of Natural History
jamesh@si.edu
202-633-0792
(post-doc adviser)

David Mindell
Visiting Professor
UCSF School of Medicine
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415-476-4581
(Ph.D. adviser)