**Dr. Susan Lynn Balenger**

Department of BIology

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ACADEMIC RESEARCH APPOINTMENTS

2016 - Assistant Professor, Department of Biology, University of Mississippi, USA

2012 - 2016 Postdoctoral Researcher, Department of Ecology, Evolutionary Biology, and Behavior, University of Minnesota, USA

2011 - 2012 Postdoctoral Researcher, Division of Genetics and Physiology, Department of Biology, University of Turku, Finland

EDUCATION

2006 - 2011 Ph. D., Department of Biological Sciences, Auburn University, USA

Title: “Evolution of infection-induced changes in gene expression in the House Finch, *Carpodacus mexicanus*”

Advisor: Dr. Geoffrey E. Hill

2004 - 2008 M. S., Department of Biological Sciences, Towson University, USA

Title: “Sexual selection in a socially monogamous bird: Male color and paternity in the Mountain Bluebird, *Sialia currucoides*”

Advisor: Dr. L. Scott Johnson

1994 - 1998 B. S., Ecology, Evolutionary Biology and Behavior, University of Maryland-College Park

 Minor: Women’s Studies

OTHER RESEARCH & PROFESSIONAL EXPERIENCE

2002 - 2004 Cell Culture Core Facility Manager and General Laboratory Technician, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University

2000 - 2002 Research Technician, Center of Biotechnology, University of Nebraska

1999 - 2000 Intern, National Breeding Bird Survey, Patuxent Wildlife Research Center,

1998 - 1999 Environmental Educator, Adirondack Park AmeriCorps, Indian Lake School (K-12), NY

TEACHING EXPERIENCE

2017 (Spring) **Instructor**, *Evolution*, Department of Biology, University of Mississippi (3 cr.)

2016 (Spring) **Lecturer**, *Animal Behavior*, Department of Biology, St. Catherine’s Univeristy (4 cr.)

2015 **Co-Instructor**, *Sex and Animal Behavior*, Honors College, University of Minnesota (3 cr.)

2008 Teaching Assistant, *General Biology for Non-Majors*, Department of Biological Sciences, Auburn University

2008 Teaching Assistant, *Ornithology*, Department of Biological Sciences, Auburn University

2007 Teaching Assistant, *Genetics*, Department of Biological Sciences, Auburn University

2004-2006 Teaching Assistant, *General Biology for Non-Majors*, Department of Biological Sciences, Towson University (6 semesters)

*Guest lecturer:*

 Advanced Evolutionary Biology (Auburn University), Animal Behavior (University on Minnesota), Behavioral Genetics (University of Turku), Birds of the World (Auburn University), Comparative Genomics (Auburn University), Evolution and Biology of Sex (University of Minnesota), General Biology for Non-Majors (Towson University), Symbiosis (University of Mississippi)

TEACHING DEVELOPMENT ACTIVITIES

2015 Course Based Undergraduate Research Experience, Arthropod Reproductive Behavior Expert

2012 Preparing Future Faculty Retreat, Center for Teaching & Learning, University of Minnesota

2012 Teaching That Sticks Workshop, Center for Teaching & Learning, University of Minnesota

2010 Seminar in College Teaching, (semester long graduate course) Biggio Center for the Enhancement of Teaching & Learning, Auburn University

PEER-REVIEWED PUBLICATIONS

**Balenger S.L.**, Lara L.M., and Zuk M. (In press) Relative amplitude of courtship song chirp and trill components does not alter female *Teleogryllus oceanicus* mating behavior. *Ethology.*

**Balenger S.L.**, and Zuk M. (2015) Roaming Romeos: male crickets evolving in silence exhibit increased locomotor behaviors. *Animal Behaviour* 101: 213-219.

*Media coverage:*

* http://evolution.berkeley.edu/evolibrary/news/061201\_quietcrickets

**Balenger S.L.** (2015) Stridulated soft song in singing insects. *Animal Behaviour,* 105: 275-280(doi:10.1016/j.anbehav.2015.03.024).

**Balenger S.L.**, Bonneaud C., Sefick S., Zhang J., Edwards S.V., and Hill G.E. (2015) Plumage color and infection-induced gene expression in a wild bird. *Behavioral Ecology,* 26: 1100-1110 (doi: 10.1093/beheco/arv055).

Zuk M. and **Balenger S.L.** (2014) Behavioral ecology and genomics: new directions, or just a more detailed map? *Behavioral Ecology*, 1277-1282 (*invited perspective*).

**Balenger S.L.** and Zuk M. (2014) Testing the Hamilton-Zuk hypothesis: past, present, and future. *Integrative and Comparative Biology* 54: 601-613 (doi:10.1093/icb/icu059).

Hill G. E., Fu X., **Balenger S. L.,** McGraw K. J., Girardeau M., and Hood W. R. (2013) Changes in concentrations of circulating heat shock proteins in wild songbirds in response to distinct environmental stressors. *Journal of Field Ornithology* 84: 416-424.

Bonneaud C., **Balenger S.L.**, Hill G.E., and Russell A.F. (2012) Experimental evidence for distinct costs of pathogenesis and immunity against a natural pathogen in a wild bird. *Molecular Ecology* 21: 4787-4796 (doi: 10.1111/j.1365-294X.2012.05736.x).

Bonneaud C., **Balenger S.L.**, Zhang J., Edwards S.V., and Hill G.E. (2012) Innate immunity and the evolution of resistance to an emerging infectious disease in a wild bird. *Molecular Ecology* 21: 2628-2639 (doi: 10.1111/j.1365-294X.2012.05551.x).

**Balenger S.L.**, McClure C. J. M. and Hill G.E. (2012) Primer design and transcript quantification of a highly multiplexed RT-PCR for a non-model avian species, *Carpodacus mexicanus*. *Molecular Ecology Resources* 12: 116-122 (doi: 10.1111/j.1755-0998.2011.03058.x).

Delaney N., **Balenger S.L.**, Bonneaud C., Marx C., Hill, G.E., Ferguson-Noel N., Tsai P., Roderigo A., and Edwards S.V. (2012) Ultrafast evolution and loss of CRISPRs following host shift in a novel wildlife pathogen, *Mycoplasma gallisepticum*. *PLoS Genetics* 8: e1002511 (doi:10.1371/journal.pgen.1002511).

*Media coverage:*

* http://www.nescent.org/news/documents/NESCENT\_Spring2012.pdf
* http://www.msnbc.msn.com/id/46343744/ns/technology\_and\_science-science/ #.TzV2K
* http://www.eurekalert.org/pub\_releases/2012-02/nesc-dbp020212.php
* http://www.sciencedaily.com/releases/2012/02/120209172803.htm

Bonneaud C., **Balenger S.L.**, Russell A.F., Zhang J., Hill G.E., and Edwards S.V. (2011) Rapid evolution of disease resistance is accompanied by functional changes in gene expression in a wild bird. *Proceedings of the National Academy of Sciences* 108: 7866-7871 (doi: 10.1073/pnas.1018580108).

**Balenger S.L.**, Johnson L.S., and Masters B.S. (2009) Sexual selection in a socially monogamous bird: male color predicts reproductive success in the mountain bluebird (*Sialia currucoides*). *Behavioral Ecology and Sociobiology* 63:403-411 (doi: 10.1007/s00265-008-0674-5).

**Balenger S.L.**, Johnson L.S., Mays H., and Masters B.S. (2009) Extra-pair paternity in the strongly sexually dichromatic Mountain Bluebird and its effect on the opportunity for sexual selection. *Journal of Avian Biology* 40:173-180 (doi: 10.1111/j.1600-048X.2009.04521.x).

**Balenger S.L.**, Johnson L.S., Brubaker J., and Ostlind E. (2007) Parental effort in relation to structural plumage coloration in the mountain bluebird (*Sialia currucoides*). *Ethology* 113: 838-846 (doi: 10.1111/j.1439-0310.2007.01386.x).

Johnson L.S., Ostlind E., Brubaker J., and **Balenger S.L.** (2006) Variation in parental provisioning effort along an elevational gradient in a population of mountain bluebirds (*Sialia currucoides*). *Journal of Ornithology* 148:9-16.

Johnson L.S., Ostlind E., Brubaker J., **Balenger S.L.**, Johnson B.G., and Golden H. (2006) Changes in egg size and clutch size with elevation in a Wyoming population of mountain bluebirds. *The Condor* 108: 591-600.

Shawkey M.D., **Balenger S. L.**, Hill G.E., Johnson L.S., Keyser A.J., and Siefferman L. (2006) Mechanisms of evolutionary change in structural plumage coloration among bluebirds (*Sialia spp*.). *Journal of the Royal Society – Interface* 3: 527-532.

Wagner K.F., Hellberg A.K., **Balenger S.L.**, Depping R., Dodd-O J., Johns R.A., and Li D. (2004) Hypoxia induced mitogenic factor has antiapoptotic action and is upregulated in the developing lung: coexpression with hypoxia-inducible factor-2 alpha. *American Journal of Respiratory Cellular Molecular Biology* 31:276-282.

Rohr J., Sarkar N., **Balenger S.L.**, Jeong B., and Cerutti H. (2004) Tandem inverted repeat system for selection of effective transgenic RNAi strains in *Chlamydomonas reinhardtii*. *The Plant Journal* 40:611-621.

MANUSCRIPTS CURRENTLY IN REVIEW

**Balenger S.L.**, Bastiaans E., and Zuk M. Acoustic experience and social exposure during development shape adult male reproductive tactics and condition. *Behavioral Ecology & Sociobiology*

Zuk M., Tanner J.C., Schmidtman E., Bee M.A., and **Balenger S.L.** Calls of recently introduced coqui frogs do not interfere with cricket phonotaxis in Hawaii. *Journal of Insect Behavior*

GRANTS, FELLOWSHIPS, and HONORS

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| --- | --- | --- |
| 2012-2015 | Academy of Finland Postdoctoral Research Fellowship(declined to accept position at UMN) | $390,000 |
| 2012 | Oskar Öflunds Research Grant | $6250 |
| 2012 | European Science Foundation Exchange Visit (to France) Grant | $1885 |
| 2011  | Kenneth Otis Distinguished Graduate Award in Physiology & Molecular Biosciences, Dept of Biological Sciences, Auburn U  |  |
| 2008-2011  | National Science Foundation-Experimental Program to Stimulate Competitive Research Graduate Fellowship  | $75,000  |
| 2010  | American Ornithologists’ Union Research Grant  | $2470  |
| 2010  | Animal Behavior Society Research Grant  | $1080  |
| 2009  | NSF Animal Behavior Research Grant (P.I.’s: G.E. Hill and S.V. Edwards)  | $600,000 |
| 2009  | Gordon Conference in Evolutionary and Ecological Functional Genomics Travel Award  | $850  |
| 2008  | American Ornithologists’ Union student Travel Grant  | $400  |
| 2007  | Society of Integrative and Comparative Biology Research Grant  | $1000  |
| 2006-2007 | Research Fellow, Cellular and Molecular Biosciences, Auburn University | $18,000 |
| 2006  | National Science Foundation-East Asia & Pacific Summer Institute Research Fellowship, National Taiwan University | $10,000  |
| 2004  | Sigma Xi Grant In Aid of Research  | $500  |

+ Professional advancement grants for travel and research from the University of Mississippi (1 grant for $500), University of Minnesota (1 grant for $400), Auburn University (3 grants totaling $1400), and Towson University (3 grants totaling $2000)

INVITED SYMPOSIA TALKS & DEPARTMENT SEMINARS

Sexy finches and silent crickets: Parasite mediated elaboration and loss of sexually selected traits

* Dept of Integrative Biology, Oregon State University, 2017
* Dept of Biology, Appalachian State University, 2016
* Dept of Biology, University of Mississippi, 2016
* Division of Ecology, Behavior and Evolution, University of California, San Diego, 2016
* Dept of Integrative Biology, University of South Florida, 2015

Insights from wild birds into control of poultry diseases

– Department of Poultry Sciences, University of Georgia, 2015

High, low, and no amplitude signalling: courtship song in moths and crickets

– Animal Behavior Society, Princeton, New Jersey, 2014

* Behavior Seminar, Dept of Ecology, Evolution and Behavior, University of Minnesota, 2014

Testing the Hamilton-Zuk hypothesis with 21st century genetics tools

– Society of Integrative and Comparative Biology, Austin, Texas, 2014

Rapid Evolution in Silence: Adaptive Signal Loss in the Pacific Field Cricket

* Dept of Biology, Rollins College, 2015
* Dept of Biology, St. Catherine University, 2013

The Degenerate Male: Sex Chromosome Evolution in the Threespined Stickleback

– Edward Grey Institute of Ornithology, Oxford University, UK 2012

Evolution of Pathogen-Induced Gene Expression in the House Finch, *Carpodacus mexicanus*

* Centre for Biological Diversity, University of St. Andrews, UK 2014
* Darwin Day Speaker, Dept of Biological Sciences, Carleton College, 2013
* Behavior Seminar, Dept of Ecology, Evolution and Behavior, University of Minnesota, 2012
* Dept of Biology, University of Turku, Finland 2011
* College of Veterinary Sciences, Auburn University, 2009

Sexual Selection in a Socially Monogamous Bird: Male Color and Paternity in the Mountain Bluebird

* Behavior Seminar, Dept of Ecology, Evolution and Behavior, University of Minnesota, 2012
* Dept of Biological Sciences, Auburn University, 2008

SELECTED CONFERENCE PRESENTATIONS (List includes first author presentations and presentations by \*undergraduate researchers)

2017 Field crickets evolving in silence exhibit increased investment in alternative reproductive tactics. Annual Meeting of the Society of Integrative and Comparative Biology, New Orleans, Louisiana, (oral)

2016 Acoustic and social experiences shape adult male reproductive tactics and condition. International Society of Behavioral Ecology, Exeter, UK (oral)

2016 Acoustic environment and social exposure during development shape adult male reproductive tactics and condition. Annual Meeting of the Society of Integrative and Comparative Biology, Portland, Oregon (oral)

2015 It’s the song, not the singers: Acoustic experience is more important than population density in shaping male field cricket alternative mating tactics. Animal Behavior Conference, Bloomington, Indiana, USA (oral)

2015 \*Effect of immune challenge at varied life history stages on male courtship song in a cricket. Animal Behavior Conference, Bloomington, Indiana, USA (Xinci Tan, poster)

2015 \*Effect of the Coqui frog call on *Teleogryllus oceanicus*. Midwestern Ecology and Evolution Conference, Bloomington, Indiana, USA (Libby Schmidtman, oral)

2015 \*Effect of immune challenge at varied life history stages on male courtship song in a cricket. Midwestern Ecology and Evolution Conference, Bloomington, Indiana, USA (Xinci Tan, oral)

2014 Roaming Romeos: Evolution in silence selects for male crickets with increased locomotory behaviors. International Society of Behavioral Ecology, New York, New York, USA (oral)

2013 Does exposure to sexual signals during rearing affect adult male search behavior? Animal Behavior Society, Boulder, Colorado, USA (poster)

2013 Genetic and calling song variation in the Pacific field cricket, *Teleogryllus oceanicus*, across a wide geographical range. Society for the Study of Evolution, Snowbird, Utah, USA (poster)

2013 Plumage color predicts infection-induced gene expression in a wild bird. Society for the Study of Evolution, Snowbird, Utah, USA (oral)

2012 Y chromosome degeneration in the threespine stickleback. Workshop in Evolution of Sex-Determination Mechanisms, La Sage, Switzerland (oral)

2010 Plumage color predicts infection-induced gene expression in a wild bird. International Conference of New Directions in Sexual Selection Research: Unifying Behavioural and Genomic Approaches, Bath, UK (oral)

2009 Genomics of a host-parasite coevolutionary interaction. EMBO World Practical Course in Advanced Bioinformatics of Gene and Genome Evolution, Medellin, Columbia (oral)

2009 Searching for good genes in a wild songbird. National NSF-EPSCoR Conference, Washington, DC, USA (poster)

2009 Plumage color predicts pathogen-induced gene expression in a wild songbird. Gordon Research Conference in Evolutionary and Ecological Functional Genomics, Tilton, New Hampshire,USA (poster)

2008 Searching for good genes in the house finch. 12th International Society of Behavioral Ecology Conference, Ithaca, NY, USA (poster)

2008 Sexual selection in a socially monogamous bird: male color and paternity in the mountain bluebird. Annual Meeting of the American Ornithologists’ Union, Portland, Oregon, USA (oral)

2008 Gene expression and parasite-mediated sexual selection in the house finch. Annual Meeting of the Society of Integrative and Comparative Biology, San Antonio, Texas, USA (poster)

2005 Does male UV-blue color indicate parental effort in Mountain Bluebirds? Joint meeting of the Association of Field Ornithologists and the Wilson Ornithological Society, College Park, Maryland,USA (oral)

DIRECTED RESEARCH MENTORING EXPERIENCE

*University of Minnesota – Twin Cities*

Kristin Grab (August 2015 – present), “Satellite behavior of field crickets evolving in silence”

Xinci Tan (April 2014 – May 2016), “Behavioral adaptation to high density conditions by commercially bred *Acheta domesticus*” (Undergraduate Research Opportunities fellowship winner 2015)

Elizabeth Schmidtman (July 2013 – January 2016), “Effects of Coqui frog calls on field cricket mating behavior” (Undergraduate Research Opportunities fellowship winner 2015)

Laura Peterson (March 2014-December 2014), “The effect of amplitude modulation of male cricket courtship song on female phonotaxis behavior” (laboratory technician at University of Minnesota)

Henry Kunerth (March 2013-Aug 2014), “Genetic and geographic variation in the acoustically-orienting fly *Ormia ochracea*” (Undergraduate Research Opportunities fellowship winner 2015; began PhD in Evolutionary Biology at Cornell University Fall 2014)

Ryan Duffy (November 2013-November 2014), “Fecundity of flatwing and normal winged female field crickets” (graduated from University of Minnesota College of Biological Sciences Summer 2014)

Paul Swim (June 2013-Aug 2014), “Reproductive behavior after immune challenge in the Pacific field cricket” (began MS in Animal Behavior at Salisbury University Fall 2014)

Zach Emberts (October 2012-May 2013), “The effect of rearing environment on female preference for male courtship song” (began PhD in Animal Behavior at University of Florida Fall 2014)

*Auburn University*

Emily Brennan (August 2009-May 2011), “Do maternal antibodies protect songbird nestlings from infection with a natural bacterial pathogen?” (completed MPH at Emory University 2015, currently a statistical analyst at the Mayo Clinic)

*Towson University*

Jessica Brubaker (May 2004-July 2004), “Parental effort by high and low altitude breeding pairs of Mountain Bluebirds” (completed MS at Tufts University 2009, currently a laboratory technician)

Emilene Ostlind (May 2003- July 2003), “Parental effort by high and low altitude breeding pairs of Mountain Bluebirds” (editor, *Confluence* magazine, University of Wyoming)

PROFESSIONAL SERVICE

Manuscript Review:

*Amphibia-Reptilia, Animal Behaviour, Annales Zoologica Fennici, Auk: Ornithological Advances, Behavioral Ecology, Behavioural Processes, Ecology and Evolution, Ethology, Experimental Gerontology, Heredity, Ibis, Journal of Avian Biology, Journal of Evolutionary Biology, Journal of Field Ornithology, Proceedings of the Royal Society of London Series B, Molecular Ecology*

Other Service Activities:

* Session chair, “Mating systems and strategies,” Society of Integrative and Comparative Biology Meeting, New Orleans, Louisiana, 2017
* Judge, Oxford Middle School Science Fair, 2016
* *Ad hoc* reviewer, NSF IOS cluster, 2016
* Session co-chair, “Courtship and Mating,” Society of Integrative and Comparative Biology Meeting, Portland, Oregon, 2016
* Took directed research undergraduate students to the CISAB Animal Behavior Conference and the Midwestern Ecology and Evolution Conference where they presented posters and gave oral presentations of their research, Bloomington, Indiana, 2015
* Expert panel member, “The Nature of Research,” College of Biological Sciences, University of Minnesota, 2014
* International Society of Behavioral Ecology abstract reviewer for 2014 biannual meeting
* College of Biological Sciences Welcome Week Volunteer, University of Minnesota, 2013, 2014
* Behavior Outreach Fair, “Insect Love Songs,” Animal Behavior Society annual meeting, 2013
* Treasury officer for the Biological Sciences Graduate Student Association, 2008-2011
* Regional Science Olympiad Ornithology Coordinator, 2010
* Organizer of Hill lab group “Sexual Selection” Journal Club, 2009-2010
* Organizer of Auburn University Department of Biological Sciences “Behavior, Ecology and Evolutionary Biology” Journal Club, 2009
* Education Committee Member, North American Bluebird Society, 2007-2009
* Judge, South’s BEST Robotics Competition, 2007
* Graduate student representative on new faculty hiring committee, Towson University 2005
* Field Assistant, Department of Biological Sciences, University of Nebraska, 2000