CURRICULUM VITAE

**Creagh W. Breuner**

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# Education

1991 B.A. (Zoology) University of Washington

1998 Ph.D. (Zoology) University of Washington

Dissertation Title: ‘The avian stress response: corticosterone and behavior

in a wild seasonal vertebrate’ John C. Wingfield, advisor

# Research and Professional Experience

2014- Professor, Organismal Biology and Ecology, University of Montana

2008-2014 Associate Professor, Organismal Biology and Ecology, University of Montana

2006-2008 Assistant Professor, Organismal Biology and Ecology, University of Montana

2001-2006 Assistant Professor, Integrative Biology, University of Texas at Austin

2010-2014 Adjunct Professor, Department of Biology, Utah State University

1998-2001 Post-doctoral fellow, Arizona State University: characterization of neuroendocrine

mechanisms of the stress response; Miles Orchinik, advisor

1992-98 Dissertation: avian endocrinology

1992 Research Technician--Bristol Meyers Squibb—mouse transgenics

1991 Post-bac Research Assistant: *Drosophila* genetics

# Grants and Awards

2014-2017 Noyce NSF Grant: Learning assistants become teachers (LABT), co-PI starting August 2014, $1,200,000

2012 International Committee short-term travel award $500

2008-14 NSF CAREER: Corticosteroid binding globulins in the vertebrate stress response: integrating cellular, plasma and organismal studies $800,000

2008-09 NSF DDIG to Rachel Sprague: Dissertation Research: Transition to Independence: Exploring an extreme life history $12,000

2005-10 NSF IGERT: Montana-Ecology of Infectious Disease: Integrative Graduate Training on Multi-Scalar Computational, Mathematical and Empirical Approaches to Complex Biological Problems. Co-PI starting in July, 2008. $3,260,729

2003-08 NSF LTREB grant: Responses to Unpredictable Environmental Events: an integrated study of stress physiology, environmental cues, and reproductive success. C. Breuner—lead PI; T.P. Hahn (U.C. Davis)—co-PI $300,000

2006 NSF Research Experience for Undergraduates (REU) supplement to LTREB $6,000

2006 Undergraduate Research Fellowship (UT) to Sharon Monsivais to work in my lab $1,000

2004 NSF Research Experience for Undergraduates (REU) supplement to LTREB $6,000

2004-05 Undergraduate Research Fellowship (UT) to Sonal Thakar to work in my lab $940

2003-04 Undergraduate Research Fellowships to Megan Noel, Sonal Thakar, and Brandy Zrubek to work in my lab $2,800 total.

2002-03 Fast Tex grant (UT) to develop interactive animation for classroom use ~ $2000

2002 Reeder Centennial Fellowship: Integrative Biology, UT Austin $10,000

2002 Undergraduate Research Fellowship (UT) to David Pinto to work in my lab $1,000

2002 NSF Starter Grant; for purchase of start-up equipment $35,000

2002 Faculty Development Program Summer Research Assignment $12,200

2001-02 Fast Tex grant (UT) to develop interactive CD-ROM and web modules ~ $2000

1998-00 National Science Foundation: Postdoctoral Research Fellowship in Biosciences related to the Environment $90,000

1998 Chapman Award from the American Museum of Natural History $1,400

# Academic and Professional Honors

2010 Student invited key-note speaker at North Dakota State University graduate symposium

2008 NSF CAREER Award

2004 The College of Natural Sciences Teaching Excellence Award

2004 Invited Participant, ESF/NSF Workshop: “Trade-offs and Constraints in Avian Reproduction” in Wageningen, Netherlands

2003 Invited Speaker, Institute for Neuroscience Symposium at University of Texas at Austin; one of three graduate student elected speakers.

2002 Invited Participant, ESF/NSF Exploratory Workshop: “Adaptation and constraints in avian reproduction: integrating ecology and endocrinology” in Wageningen, Netherlands

2002 Invited Speaker, “Frontiers in Comparative Physiology,” Univ. of California at Davis

1997 Honorable Mention; Best Student Paper Award for the Division of Comparative Endocrinology in the Society for Integrative and Comparative Biologists

1997 The Ingrith Deyrup-Olsen Teaching Award

1996 The Crary Award for Excellence in Biology Graduate Student Teaching

1994 The Richard C. Snyder Award for Graduate Student Research in Vertebrate Zoology

# Teaching Experience

Mentoring

PhDs awarded:

Haruka Wada: Ecology, Evolution and Behavior, University of Texas at Austin

Meredith Swett: Organismal Biology and Ecology, University of Montana

Rachel Seabury Sprague: Wildlife Biology University of Montana

Steve Patterson: Organismal Biology and Ecology, University of Montana

Ondi Crino: Organismal Biology and Ecology, University of Montana

MSs awarded:

Warren Hansen: Wildlife Biology Program, University of Montana

I currently have one Ph.D. and one M.S. graduate student

Sara Berk and Devin Landry

Courses Taught:

2008, 2010, 2011, 2013, 2014 Endocrinology (graduate and undergraduate)

2007-2014 Wildlife Physiological Ecology (undergraduate)

2011 Philosophy of teaching (graduate)

2011 Organismal Function (graduate—part of the core series of courses for OBE graduates)

2009 Advanced topics in Physiology (graduate)

2009 Essential concepts in Ecophysiology, Microbiology, Genetics and Evolution (gradate—co-taught with two other professors; core course for the IGERT program)

2005 Mechanisms of Behavior: part of the core course for Ecology, Evolution and Behavior graduate students (UT)

2001-2005 Vertebrate Endocrinology (UT-graduate and undergraduate)

2003 Physiological Ecology (UT-graduate and undergraduate)

Guest Lectures: Ecology; Comparative Physiology; Disease Ecology; Functional Neuroanatomy

Rural Girls in Science Program (UW-1995-96): I was a teacher and mentor in a two year, NSF-funded project aimed at increasing opportunities in science for high school girls from rural cities in Washington.

# Professional and Public Service

National Science Foundation Grant Review Panel Member: 2003: DDIG; 2004: EEP; 2006: EEP; 2008: PSI; 2010: OEI; 2012: ModII

Ad hoc reviewer for the following journals and granting agencies: American Journal of Physiology: Regulatory, Integrative, and Comparative Physiology; American Naturalist; Animal Behaviour; Animal Conservation; ANR: Agence Nationale de la Recherche (French Granting Agency); BARD: Binational Agricultural Research and Development fund (Israeli granting agency); Behaviour; Biological Journal of the Linnaean Society; The Condor; Conservation Biology; Current Zoology; Ecology; Endocrinology; European Journal of Wildlife Research; Functional Ecology; General and Comparative Endocrinology; Hormones and Behavior; Integrative and Comparative Biology; Journal of Avian Biology; Journal of Comparative Physiology B; Journal of Experimental Biology; Journal of Experimental Zoology, Part A; National Science Foundation; Oecologia; Marine Ecology Press Series; Physiology and Behavior; Physiological and Biochemical Zoology; PLoS ONE; Proceedings of the Royal Society, B; Science; The Wilson Bulletin; Trends in Ecology and Evolution; Washington Sea Grant

2015-2016 SICB nominating committee—assist in the election process to fill the society leadership and administrative positions

2014- Avian Science Center (UM), Advisory Council

2011- Member of the International Committee for the International Symposium on Avian Endocrinology

2014 Organized and taught a summer workshop on active and collaborative learning for STEM high school teachers and undergraduates becoming STEM teachers.

2011-14 NSF Noyce grant LABT advisory board

2011-12 UM STEM task force

2009-11 Graduate evaluation committee for the Wildlife Biology Graduate Program

2008-11 Chair-Admissions Committee for Organismal Biology and Ecology Graduate Program

2007-11 Steering Committee for Montana-- Ecology of Infectious Disease (MEID-IGERT) graduate program

2007-08 Admissions Committee for Organismal Biology and Ecology Graduate Program

2008, 2010-11 Graduate Evaluation Committee for Ecology of Infectious Disease (MEID-IGERT) graduate program

2008-09 Division of Biological Sciences search committee for Neurobiologist—OBE representative

2008-09 Integrative Microbiology and Biochemistry search committee for Virologist—outside member

2007-10 Admissions Committee for Montana-- Ecology of Infectious Disease (MEID-IGERT) graduate program

2007-10 WBIO undergraduate advising

2008 Montana High School Science Fair: lead judge

2007 Authored a Diversity Report on the Organismal Biology and Ecology program

2007 Lead judge and organizer for the Student Poster and Oral presentation competition for the Society of Integrative and Comparative Biology Meetings

2006-07 Wildlife Biology search committee member for the Boone & Crockett Chair

2005-07 Member of the Steering Committee for an NSF-Research Coordination Network: Integrating Ecology and Endocrinology into Avian Reproduction

2005 Judge for the Regional Siemens Westinghouse Science & Technology Competition

2004-05 Admissions Committee for Ecology, Evolution, and Behavior graduate program

2004 Core Course Development committee for EEB graduate program

2003-04 Institute for Neuroscience Graduate Rotation Committee

2002-04 Ecology, Evolution, and Behavior Graduate Student Evaluation and Fellowship Committee

2002-06 Minority Liaison Officer for Integrative Biology, University of Texas

2002-03 Ecology Evolution and Behavior Search Committee for an Evolutionary Biologist committed to the UTeach program

2002, 2003 Student Poster and Oral presentation judge for the Society of Integrative and Comparative Biology meetings

2001 Judge for the Regional Siemens Westinghouse Science & Technology Competition

1994-95 Graduate Student Representative on the Curriculum and Undergraduate Affairs Committee, University of Washington

1992-93 Senator for the Zoology Department in the Graduate and Professional Student Senate, University of Washington

# Memberships in Scientific Societies

Society for Integrative and Comparative Biology; Sigma Xi, AAAS

**PUBLICATIONS** [http://dbs.umt.edu/research\_labs/breunerlab/publications.html .](%20http://dbs.umt.edu/research_labs/breunerlab/publications.html%20.)

Hansen, WH, LJ Bate, S Gniadek and **CW Breuner** (in review) Stream flow and reproductive success in the harlequin duck (Histrionicus histrionicus): Using historical patterns to predict effects of climate change. *Condor*

Schaefer, A, Lukacs, P, Kissling, M, Lewis, S, Parenteau, C, Chastel, O, Berk, S; Breuner, C (in review) The influence of ocean productivity on stress and parental investment in a long-lived seabird *Conservation Physiology*

Crino, OL,B Klassen Van Oorschot, KE Crandell, CW Breuner, BW Tobalske (in review) Flight performance in the altricial zebra finch: development effects and reproductive consequences. *Proceedings of the Royal Society B*

Hansen, WH, Bate, LJ, Landry, D., Chastel, O, Parenteau, C, Breuner, CW (in press) Feather Corticosterone Concentrations Predict Future Reproductive Decision in Harlequin Ducks (Histrionicus histrionicus) *Conservation Physiology*

Lattin, CR, **CW Breuner**, and LM Romero (2015) Do corticosteroids delay breeding onset in free-living vertebrates?: Evidence from hormone titers, negative feedback, plasma binding proteins, enzymes and receptors. *Hormones and Behavior* 78:107-120

Crino, OL and **CW Breuner** (2015) Developmental stress: evidence for positive phenotypic and fitness effects in birds. *Journal of Ornithology* DOI: 10.1007/s10336-015-1236-z

Zylberberg, M, EP Derryberry, **CW Breuner**, EA Macdougall-Shackleton, JM Cornelius, and TP Hahn (2015) Haemoproteus infected birds have increased lifetime reproductive success *Parasitology* 142:1033-1043

Crino, OL, CT Prather, SC Driscoll, JM Good, and **CW Breuner** (2014) Developmental stress increases reproductive success in male zebra finches *Proceedings of the Royal Society, B* 281:20141266; http://dx.doi.org/10.1098/rspb.2014.1266; this paper was highlighted at ScienceNews.org: <https://www.sciencenews.org/blog/scicurious/stressful-youth-makes-devoted-finch-dad>

Crino, OL, SC Driscoll, R Ton, and **CW Breuner** (2014) Corticosterone exposure during development improves performance on a novel foraging task in zebra finches. *Animal Behavior* 91:27-32

Cornelius, JM, M Zylberberg, **CW Breuner**, and TP Hahn (2014) Assessing the role of reproduction and stress in the spring emergence of Haematozoan parasites in birds. *Journal of Experimental Biology* 217:841-849

Crino, OL, SC Driscoll, and **CW Breuner** (2014) Developmental stress has sustained but not lifelong effects on body size and total and free corticosterone responses in the zebra finch. *General and Comparative Endocrinology* 196:123-129

Patterson, SH, TP Hahn, JM Cornelius, and **CW Breuner** (2014) Natural selection and glucocorticoid physiology. *Journal of Evolutionary Biology* doi: 10.1111/jeb.12286

# Cornelius, JM, T Boswell, S. Jenni-Eiermann, CW Breuner, M Ramenofsky (2013) Contributions of endocrinology to the migration life history of birds *General and Comparative Endocrinology*190; 47-60

Crino, O, EE Johnson, JL Blickley, GL Patricelli\*, and **CW Breuner**\* (2013) The effects of experimentally elevated traffic noise on nestling white-crowned sparrow physiology, immune function and life-history *Journal of Experimental Biology* 216; 2055-2062\*co-principal investigators

**Breuner, CW**, RS Sprague, SH Patterson, and HA Woods (2013) Environment, Physiology and Behavior: can birds use barometric pressure to predict storms? *Journal of Experimental Biology* 216:1982-1990; doi:10.1242/jeb.081067; Inside JEB column concerning this research: doi: 10.1242/jeb.088740

**Breuner, CW**, B Delehanty and R Boonstra (2013). Current problems in quantifying stress in natural populations of vertebrates: total CORT is not good enough. *Functional Ecology* 27: 24-36; DOI: 10.1111/1365-2435.12016

Cornelius, J., **C Breuner** and T Hahn (2012). Coping with the extremes: Stress physiology varies among winter and summer in breeding opportunists. *Biology Letters* 8:312-315doi:10.1098/rsbl.2011.0865

Lattin, CR, K Waldron-Francis, JW Richardson, R de Bruijn, CM Bauer, **CW Breuner** and LM Romero (2012). Pharmacological characterization of intracellular glucocorticoid receptors in nine house sparrow tissues. *General and Comparative Endocrinology* 179: 214-220

Crino, OL, B Klaassen Van Oorschot, Johnson, EE, JL Malisch and **CW Breuner** (2011) Proximity to a high traffic road: Glucocorticoid and life history consequences for nestling white-crowned sparrows. *General and Comparative Endocrinology* 173; 323-332

Cornelius, JM, N Perfito, R Zaun, **CW Breuner**, and TP Hahn (2011) Physiological trade-offs in self-maintenance: plumage molt and stress physiology in birds. *Journal of Experimental Biology*214: 2768-2777

Patterson, SH, DW Winkler, and **CW Breuner** (2011) Glucocorticoids, individual quality and reproductive investment in a passerine bird. *Animal Behavior* 81:1239-1247

Whitman, BA, **CW Breuner**, and AM Dufty, Jr. (2011) The effects of neonatal handling on adrenocortical responsiveness, morphological development and corticosteroid binding globulin in nestling American kestrels (*Falco sparverius*) *General and Comparative Endocrinology* 172: 260-267

Wada, H and **CW Breuner** (2010) Developmental changes in neural corticosteroid receptor binding capacity in altricial nestlings *Developmental Neurobiology* 277: 2399-2404

**Breuner, CW** (2010) Stress and Reproduction in Birds. In: DO Norris (Ed.) Hormones and Reproduction in Vertebrates. Vol 4, chapter 5; Elsevier, Oxford

Cornelius, JM, **CW Breuner** and TP Hahn (2010) Under a neighbor’s influence: public information affects stress hormones and behavior of a songbird. *Proceedings of the Royal Society B* 277: 2399-2404

Schmidt, KS, JL Malisch, **CW Breuner\*** and KK Soma\* (2010) Corticosterone and cortisol binding sites in plasma, immune organs and brain of developing zebra finches: intracellular and membrane-associated receptors *Brain, Behavior and Immunity* 24:908-918\*co-principal investigators

Sprague, RS and **CW Breuner** (2010) Timing of fledging is influenced by glucocorticoid physiology in Laysan albatross chicks *Hormones and Behavior* 58: 297-305

Malisch, JL and **CW Breuner** (2010) Steroid binding proteins and free steroids in birds *Molecular and Cellular Endocrinology* 316: 42-52

Malisch, JL, DG Satterlee, JF Cockrem, H Wada, H, and **CW Breuner** (2010) How acute is the acute stress response? Baseline corticosterone and corticosteroid-binding globulin levels change 24 hours after an acute stressor in Japanese quail. *General and Comparative Endocrinology* 165:345-350

Almasi, B, A Roulin, S Jenni-Eierrmann, **CW Breuner**, and L Jenni (2009) Regulation of free corticosterone and CBG capacity under different environmental conditions in altricial nestlings.  *General and Comparative Endocrinology* 164: 117-124

Swett, MBand**CW Breuner**(2009)Plasma Testosterone correlates with morph-type across breeding sub-stages in male white-throated sparrows *Physiological and Biochemical Zoology* Vol 82(5): 572-579

**Breuner, C.W**., Orchinik, M., (2009) Pharmacological characterization of intracellular, membrane, and plasma binding sites for corticosterone in house sparrows. *General and Comparative Endocrinology*. 163: 214-224

Malisch, J. L., **Breuner, C. W**., Kolb, E. M., Wada, H., Hannon, R. M., Chappell, M. A., Middleton, K. M., Garland, T., (2009) Behavioral Despair and Home-Cage Activity in Mice with Chronically Elevated Baseline Corticosterone Concentrations. *Behavior Genetics*. 39**:** 192-201.

Muller, C., Almasi, B., Roulin, A., **Breuner, C. W.**, Jenni-Eiermann, S., Jenni, L., (2009) Effects of corticosterone pellets on baseline and stress-induced corticosterone and corticosteroid-binding-globulin. *General and Comparative Endocrinology*. 160**:** 59-66.

Wada, H., Salvante, K. G., Wagner, E., Williams, T. D., **Breuner, C. W**., (2009) Ontogeny and individual variation in the adrenocortical response of zebra finch (*Taeniopygia guttata*) Nestlings. *Physiological and Biochemical Zoology*. 82**:** 325-331.

Swett, M.B., and **C.W. Breuner**(2008) Interactions of testosterone, corticosterone, and corticosteroid binding globulin in the White-throated Sparrow (*Zonotrichia albicollis*).  *Comparative Biochemistry and Physiology PT A* Vol 151 (2): 226-231

**Breuner, CW**, SH Patterson, and TP Hahn (2008) In search of relationships between the acute adrenocortical response and fitness. *General and Comparative Endocrinology* Vol 157: 288-295

**Breuner, CW** (2008) Maternal stress, glucocorticoids and the maternal match hypothesis *Hormones and Behavior* Vol 54: 4875-4876

**Breuner, CW** (2008) Stressed tissue in a calm organism: focus on 'cortisol and corticosterone in the songbird immune and neural systems' by Schmidt and Soma. *American Journal of Physiology: Regulative, Integrative, and Comparative Physiology* Vol 295: R101-102

Wada, H. and **Breuner, C.W.** (2008) Transient elevation of corticosterone alters begging behavior and growth of white-crowned sparrow nestlings. *Journal of Experimental Biology* Vol 211: 1696-1703

Malisch, J.L., **Breuner, C.W.**, Gomes, F.R., Chappell, M.A., and T. Garland Jr. (2008) Circadian pattern of total and free corticosterone concentrations, corticosteroid-binding globulin, and physical activity in mice selectively bred for high voluntary wheel-running behavior. *General and Comparative Endocrinology* Vol 156: 210-217

Wada, H., Salvante, K.G., Stables, C., Wagner, E., Williams, T.D., and **Breuner, C.W**. (2008). Adrenocortical responses in zebra finches (Taeniopygia guttata): individual variation, repeatability and relationship to phenotypic quality. *Hormones and Behavior* Vol 53: 472-480

Wada, H., Hahn, T.P., and **Breuner, C.W.** (2007) Development of stress reactivity in white-crowned sparrow nestlings: total corticosterone response increases with age, while free corticosterone response remains low. *General and Comparative Endocrinology* **150**(3): 405-413

Lynn, S.E., Hahn, T.P., and **Breuner, C.W.** (2007) Free-living male mountain white-crowned sparrows exhibit territorial aggression without modulating total or free plasma testosterone. *Condor* **109**(1): 173-180

Ward, C., Fontes, C., **Breuner, C**., and Mendonca, M. (2007) Characterization and quantification of corticosteroid binding globulin in a southern toad, *Bufo terrestris*, exposed to coal combustion waste *General and Comparative Endocrinology* **152** (1): 82-88

Zysling, D.A., Greives, T.J., **Breuner, C.W.,** Casto, J.M., Demas, G.E., and Ketterson, E.D. (2006) Behavioral and physiological responses to experimentally elevated testosterone in female dark-eyed juncos (*Junco hyemalis carolinensis*). *Hormones and Behavior* **50**(2): 200-207

**Breuner, C.W**., Lynn, S.E., Julian, G.E., Cornelius, J.M., Heidinger, B.J., Love, O.P., Sprague, R.S., Wada, H., and Whitman, B.A. (2006) Plasma binding globulins and the acute stress response. *Hormone and Metabolic Research* **38**(4): 260-268

Wada, H., Moore, I.T., **Breuner, C.W**., and Wingfield, J.C., (2006). Stress responses in equatorial sparrows: comparing tropical and temperate Zonotrichia. *Physiological and Biochemical Zoology* **79**(4): 784-792

Hahn, T. P., Sockman, K. W., **Breuner, C. W.,** and Morton, M. L. (2004). Storm-induced facultative altitudinal migration prior to breeding by mountain white-crowned sparrows, *Zonotrichia leucophrys oriantha*. *Auk*. **121**(4): 1269-1281

Love, O.P., **Breuner, C.W.,** Vezina, F., and Williams, T.D. (2004). Modulation of corticosterone-mediated reproductive conflicts. *Hormones and Behavior*. **46**: 59-65

Wingfield, J.C., Owen-Ashley, N., Benowitz-Fredericks, Z M., Lynn, S.E., Hahn, T. P., Wada, H., **Breuner, C.**, Meddle, S., and Romero, M. (2004). Arctic Spring: The arrival biology of migrant birds. Proceedings of the 23rd International Ornithological Congress **50**(6): 948-960

**Breuner, C. W**., Orchinik, M., Hahn, T. P., Meddle, S.L., Moore, I.T., Owen-Ashley, N. T., Sperry, T.S., and Wingfield, J. C. (2003). Differential mechanisms for plasticity of the stress response across latitudinal gradients *American Journal of Physiology: Regulatory, Integrative, and Comparative Physiology* **285**: R594-R600

**Breuner, C. W**., and Hahn, T. P. (2003). Integrating stress physiology, environmental change, and behavior in free-living sparrows. *Hormones and Behavior*. **43**: 115-123

Lynn, S. E., **Breuner, C. W**., and Wingfield, J. C. (2003). The effects of short-term fasting on activity, corticosterone, and corticosterone binding globulin in a migratory songbird, Gambel’s white-crowned sparrow (*Zonotrichia leucophrys gambelii*). *Hormones and Behavior*. **43**: 150-157

**Breuner, C. W.**, and Orchinik, M. (2002). Plasma binding proteins as mediators of corticosteroid action in vertebrates. *Journal of Endocrinology* **175**: 99-112

**Breuner, C.W.** and Orchinik, M. (2002) Downstream from corticosterone: seasonality of binding globulins, receptors, and behavior in the avian stress response. In *Avian Endocrinology*, pp 385-399. A. Dawson (Ed.), Narosa Publishing, New Delhi and London

Orchinik, M., Gasser, P., and **Breuner, C.** (2002) Rapid Corticosteroid Action and Behavior: Mechanisms and Functional Consequences. In *Steroids, Brain, and Behavior*, D. Pfaff *et al.* (Eds.), Academic Press

**Breuner CW** and Orchinik M (2001) Seasonal Regulation of Membrane and intracellular corticosteroid receptors in the house sparrow brain. *Journal of Neuroendocrinology* **13**: 412-420

Deviche P, **Breuner C** and Orchinik M (2001) Testosterone, corticosterone, and photoperiod interact to regulate free steroid hormone levels in dark-eyed juncos, *Junco hyemalis*. *General and Comparative Endocrinology* **122**: 67-77.

**Breuner, C.W.**, Jennings, D., and Orchinik, M. (2000) Pharmacological Adrenalectomy with Mitotane. *General and Comparative Endocrinology* **120**: 27-34.

**Breuner, C. W**., and Wingfield, J. C. (2000) Rapid Behavioral Response to Corticosterone Varies With Photoperiod and Dose. *Hormones and Behavior* **37**: 23-30.

**Breuner, C. W**., Wingfield, J.C., and Romero, L. M. (1999). Diel Rhythms of Basal and Stress-Induced Corticosterone in a Wild, Seasonal Vertebrate, Gambel’s White-Crowned Sparrow. *Journal of Experimental Zoology* **284**: 334-342.

Wikelski, M., Lynn, S., **Breuner, C**., Wingfield, J.C., and Kenagy, G.J. (1999). Energy metabolism, testosterone and corticosterone in white-crowned sparrows. *Journal of Comparative Physiology* *A* **185:** 463-470

**Breuner, C. W**., Greenberg, A. L., and Wingfield, J. C. (1998). Non-Invasive Corticosterone Treatment Rapidly Increases Activity in Gambel's White-Crowned Sparrow (*Zonotrichia leucophrys gambelii*). *General and Comparative Endocrinology* **111**: 386-394.

Wingfield, J. C., **Breuner, C. W**., Honey, P., Jacobs, J., Lynn, S., Maney, D., Ramenofsky, M., and Richardson, R. (1998). Ecological bases of hormone-behavior interactions: the "emergency life history stage". *American Zoologist* **38(1):** 191-206.

Tramontin, A. D., Smith, G. T., **Breuner, C. W**., and Brenowitz, E. A. (1998). Seasonal plasticity and sexual dimorphism in the avian song control system: Stereological measurement of neuron density and number. *Journal of Comparative Neurology,* **396(2):** 186-192.

Wingfield, J. C., **Breuner, C. W**., and Jacobs, J. (1997). Corticosterone and behavioral responses to unpredictable events. In S. Harvey and R. J. Etches (Eds.), *Perspectives in Avian Endocrinology*, pp. 267-278. Journal Endocrinology Ltd., Bristol.

Wingfield, J. C., Hunt, K., **Breuner, C**., Dunlap, K., Fowler, G. S., Freed, L., and Lepson, J. (1997). Environmental Stress, Field Endocrinology and Conservation Biology. In J. R. C. a. R. Buckholtz (Ed.), *Behavioral Approaches to Conservation in the Wild*, pp. 95-131. Cambridge University Press, Cambridge.

# Presentations

Invited Seminars:

2015 Washington State University, Department of Biology

2015 Deakin University, Center for Integrative Ecology, Australia

2015 Penn State University, Ecology Program

2015 Central Michigan University, Department of Biology

2012 Centres d’Études Biologique de Chizé, CNRS, France

2012 François Rabelais University, Biology, France

2011 Utah State University, Department of Biology

2010 North Dakota State University, Dept of Biological Sciences, Keynote speaker at graduate symposium

2009 University of Montana, Center for Structural and Functional Neuroscience

2008 Reed College, Biology Department

2007 University of Montana, Organismal Biology and Ecology

2006 College of Wooster, Department of Biology

2005 University of Montana, Division of Biological Sciences

2005 Trinity University, Department of Biology

2005 University of Texas, Marine Sciences Institute

2004 University of California at Berkeley, Integrative Biology

2004 University of Texas at Austin, Integrative Biology

2004 University of Nevada at Las Vegas, Biological Sciences

2004 University of Texas at Austin, Behavioral Neuroendocrinology seminar

2003 Texas Tech University, Department of Biological Sciences

2003 University of Oklahoma, Department of Zoology

2003 Colby College, Department of Biology

2003 University of Texas, Neuroscience Institute

2003 University of Texas, Behavioral Neuroscience seminar

2002 University of California at Davis, Neurobiology, Physiology, and Behavior

1999 Indiana University, Department of Biology

1999 Kansas State University, Department of Biology

1999 Indiana State University, Department of Life Sciences

1999 University of Texas at Austin, Integrative Biology

1998 Arizona State University, Department of Life Sciences, west campus

Invited Papers:

# Breuner CW (2015) The migration-breeding transition: integrating behavior, stress physiology and experience from a long term data set. International Ethological Conference, symposium on Neuroendocrine regulation of Behavior. Cannes, Australia

Breuner, CW and TP Hahn (2014). The migration-breeding transition: integrating behavior, stress physiology and experience from a long term data set. Society for Integrative and Comparative Biology, Symposium honoring John Wingfield.

Breuner CW, H Wada and OL Crino (2014) Adult phenotypes after developmental stress: assessing costs and benefits with fitness metrics. International Ornithological Congress, Symposium on Developmental Stress

C.W. Breuner (2012) Stress hormones, survival and reproduction: using glucocorticoids as fitness metrics in wild populations. African-Eurasian Waterbirds Agreement Meeting of Participants, La Rochelle, France

C.W. Breuner (2012) The migration-breeding transition: Integrating behavior, stress physiology and experience from a long-term data set. International Symposium on Avian Endocrinology, Gifu, Japan. Symposium: Life on the Move: Hormones and stages of Migration

C.W. Breuner, Doug Emlen, Jeff Good, Steve Running and Scott Mills (2010) Can camouflage keep up with climate change? Creating a working model of seasonal color change in snow-shoe hare. American Physiological Society, Comparative Biology. Symposium on Physiology and Life History Strategies

C.W. Breuner (2008) A Good Stress Response? In search of relationships between the acute stress response and fitness. International Symposium on Avian Endocrinology, symposium: Stress and Behavior--oral presentation

C.W. Breuner (2004) Corticosteroid Binding Globulins and the Acute Stress Response. International Symposium on Avian Endocrinology, symposium: The Stress Response: Acute Stress Physiology—oral presentation

S.E. Lynn, C.W. Breuner and J.C. Wingfield (2004) Corticosterone and binding globulins: plasma interactions in response to short-term food restriction. International Symposium on Avian Endocrinology, symposium: The Stress Response: Acute Stress Physiology—oral presentation

C.W. Breuner (2002) Corticosterone and inclement weather: mechanisms underlying adaptive behavioral responses in birds. American Physiological Society: the power of comparative Biology, symposium: *Physiological and genetic responses to stressful environments*—oral presentation

C.W. Breuner (2002) Plasma Binding Proteins As Mediators Of Corticosteroid Action In Vertebrates. Society for Integrative and Comparative Biology, symposium: *Beyond Carriers: Integrative and Evolutionary Roles of Hormone-binding Proteins*—oral presentation

C.W. Breuner (2001) A role for corticosteroid receptors in seasonal regulation of the stress response. Steroids in the Brain Workshop—oral presentation

C.W. Breuner and T.P. Hahn (2001) Corticosterone and inclement weather: mechanisms underlying adaptive behavioral responses in birds. Society for Integrative and Comparative Biology, symposium: *Stress—is it more than a disease? A comparative look at stress and adaptation*—oral presentation

C.W. Breuner and M. Orchinik (2000) Membrane and Intracellular Glucocorticoid Receptors are Differentially Regulated on a Seasonal Basis in the Avian Brain. International Symposium on Avian Endocrinology—oral presentation

Contributed Papers:

Hansen, WK, LJ Bate, O Chastel, and CW Breuner (2014). Society for Integrative and Comparative Biology--Poster

Zylberberg, M., EP Derryberry, CW Breuner, EA Macdougall-Shackleton, JM Cornelius, and TP Hahn (2014). Society for Integrative and Comparative Biology--Poster

Crino, OL, SC Driscoll, CT Prather, and CW Breuner (2013) Society for Integrative and Comparative Biology—oral

Crino, OL, SC Driscoll and CW Breuner (2012) International Symposium on Avian Endocrinology—poster

Crino, OL, B Klaassen Van Oorschot, BW Tobalske, and CW Breuner (2012) Society for Integrative and Comparative Biology—oral

Driscoll, SC, OL Crino and CW Breuner (2012) Society for Integrative and Comparative Biology—poster

Waldron-Francis, K, CR Lattin, CW Breuner, and LM Romero (2012) Society for Integrative and Comparative Biology—poster

Johnson, EE, OL Crino and CW Breuner (2011) Society for Integrative and Comparative Biology—poster

Lattin, CR, K Waldron-Francis, JW Richardson, CW Breuner and LM Romero (2011) Society for Integrative and Comparative Biology—poster

Breuner, CW, RS Sprague, and HA Woods (2011) Society for Integrative and Comparative Biology—oral

Crino, OL, EE Johnson, and CW Breuner (2011) Society for Integrative and Comparative Biology—oral

Moorhead, L, C Breuner, and L Blank (2011) Society for Integrative and Comparative Biology—oral

Williams, CK, PP Marra, VO Ezenwa, and CW Breuner (2011) Society for Integrative and Comparative Biology—oral

Patterson, SH and Breuner, CW (2010) Society for Integrative and Comparative Biology—oral

Crino, OL, B Klaasen Van Oorschot, JL Malisch and CW Breuner (2010) Society for Integrative and Comparative Biology—oral

Malisch, JL, OL Crino and CW Breuner (2010) Society for Integrative and Comparative Biology—oral

Klaassen Van Oorschot, B., O. Crino and CW Breuner (2010) Society for Integrative and Comparative Biology—poster

Lawson BK, JL Malisch and CW Breuner (2010) Society for Integrative and Comparative Biology—poster

Lawson, BK, JL Malisch and CW Breuner (2010) National Conference on Undergraduate Research

Malisch, JL (2010) Physiological Ecology meeting—oral

Crino, OL (2010) Physiological Ecology meeting—oral

Klaassen, B and A Crino (2009) University of Montana Undergraduate Research Symposium (won best poster award)

Breuner, CW, SH Patterson and TP Hahn (2009) Society for Integrative and Comparative Biology—oral

Sprague, RS, JC Sprague and CW Breuner (2009) Society for Integrative and Comparative Biology—oral

Patterson, SH, B MacDougall-Shackleton and CW Breuner (2009) Society for Integrative and Comparative Biology—oral

Malisch, JL, DG Satterlee, JF Cockrem, H Wada and CW Breuner (2009) Society for Integrative and Comparative Biology—oral

Cornelius, JM, M Zylberberg, CW Breuner and TP Hahn (2009) Society for Integrative and Comparative Biology—poster

Sprague, RS and CW Breuner (2008) International Symposium for Avian Endocrinology—poster

Greener, K, Noson, A and CW Breuner (2008) University of Montana Undergraduate Research Symposium--oral

Cornelius, JM, TP Hahn, and CW Breuner (2008) Society for Integrative and Comparative Biology—oral

Patterson, SH, CW Breuner, and TP Hahn (2008) Society for Integrative and Comparative Biology—poster

Sprague, RS, BJ Zaun, and CW Breuner (2008) Society for Integrative and Comparative Biology—oral

Wada, H, and CW Breuner (2008) Society for Integrative and Comparative Biology—poster

Cornelius, JM, M Zylberberg, CW Breuner, and TP Hahn (2007) Society for Integrative and Comparative Biology—oral

Malisch, JL, F Gomes, CW Breuner, and T Garland Jr (2007) Society for Integrative and Comparative Biology—oral

Singletary, KG, JA Edwards, P Deviche, CW Breuner, and Y Delville (2007) Society for Neuroscience—poster

Lim, S, KG Singletary, P Deviche, CW Breuner, and Y Delville (2007) Undergraduate Research Forum at UT Austin—poster

Sprague, RS and CW Breuner (2007) Organismal Biology and Ecology Departmental Seminar, University of Montana—oral

Sprague, RS, BJ Zaun, and CW Breuner (2007) Pacific Seabird Group Annual Meeting: Asilomar, CA. – poster

Sprague, RS 2006. *To:* Kilauea Point Natural History Association, Refuge Staff, and Community Members: Kilauea, HI. - oral

Sprague, RS, BJ Zaun, and CW Breuner (2006) The Wildlife Society (Hawaii Chapter) Seabird Conservation and Management in the Hawaiian Islands Workshop: Kaneohe, HI. – poster

CW Breuner and R Seabury (2006) NSERC/NSF/ESF E-Bird Workshop on Individual Variability – oral

H Wada, CW Breuner, K Salvante, E Wagner, M Curnillon, and TD Williams (2006) NSERC/NSF/ESF E-Bird Workshop on Individual Variability – oral

RS Sprague and CW Breuner (2006) Western Regional Conference on Comparative Endocrinology—oral

RS Sprague, and CW Breuner (2006) Pacific Seabird Group Annual Meeting—oral

CW Breuner, JM Cornelius, and TP Hahn (2006) Society for Integrative and Comparative Biology—oral

R Seabury Sprague and CW Breuner (2006) Society for Integrative and Comparative Biology—oral

H Wada, TP Hahn, and CW Breuner (2006) Society for Integrative and Comparative Biology—oral

BA Whitman, CW Breuner, and AM Dufty (2006) Society for Integrative and Comparative Biology—oral

TP Hahn and CW Breuner (2006) Society for Integrative and Comparative Biology—poster

M Swett and CW Breuner (2005) Society for Integrative and Comparative Biology—oral

H Wada, CW Breuner, JC Wingfield, and IT Moore (2005) Society for Integrative and Comparative Biology—oral

T Hattori, CW Breuner, and W Wilczynski (2005) Society for Integrative and Comparative Biology—oral

JM Cornelius, CW Breuner, and TP Hahn (2005) Society for Integrative and Comparative Biology—poster

ML Noel, M Ramsey, D Crews, and CW Breuner (2005) Society for Integrative and Comparative Biology—poster

SE Lynn, TP Coombs-Hahn, and CW Breuner (2005) Society for Integrative and Comparative Biology—poster

K Singletary, CW Breuner, and Y Delville (2005) Society for Behavioral Neuroendocrinology—poster

OP Love, CW Breuner, F Vezina, and TD Williams (2005) Society for Behavioral Neuroendocrinology—poster

T Hattori, CW Breuner, and W Wilczynski (2005) Society for Behavioral Neuroendocrinology—poster

M Swett and CW Breuner (2004) International Symposium on Avian Endocrinology—poster

H Wada, TP Hahn, and CW Breuner (2004) International Symposium on Avian Endocrinology —poster

CW Breuner, H Wada, J Shyu, and OP Love (2004) Society for Integrative and Comparative Biology—oral

M Swett and CW Breuner (2004) Society for Integrative and Comparative Biology—poster

H Wada, TP Hahn, and CW Breuner (2004) Society for Integrative and Comparative Biology—oral

CW Breuner, H Wada, J Shyu, and OP Love (2003) Society for Behavioral Neuroendocrinology—poster

H Wada, TP Hahn, and CW Breuner (2003) Society for Integrative and Comparative Biology—poster

SE Lynn, CW Breuner, and JC Wingfield (2002) [Society for Integrative and Comparative Biology—poster](http://www.sicb.org/meetings/2002/schedule/abstractdetails.php3?id=797" \t "new)

CW Breuner, M Orchinik, TP Hahn, and JC Wingfield (2001) Society for Neuroscience—poster

CW Breuner, M Orchinik, TP Hahn, and JC Wingfield (2001) Society for Integrative and Comparative Biology—poster presentation

CW Breuner and M Orchinik (2000) Western Regional Conference on Comparative Endocrinology--oral

CW Breuner and M Orchinik (1999) Society for Neuroscience--poster presentation

CW Breuner and M Orchinik (1999 Society for Behavioral Neuroendocrinology--poster presentation

CW Breuner, JC Wingfield, and TP Hahn (1999) Society for Integrative and Comparative Biology--oral

CW Breuner, JC Wingfield, ML Morton, and TP Hahn (1998) Western Regional Conference on Comparative Endocrinology--oral presentation

CW Breuner, M Orchinik, and JC Wingfield (1997) Society for Neuroscience--poster presentation

CW Breuner, LM Romero, and JC Wingfield (1996) Society for Integrative and Comparative Biology--oral

CW Breuner, AL Griffith, and JC Wingfield (1996) International Symposium on Avian Endocrinology--poster

CW Breuner, AL Griffith, and JC Wingfield (1996) Western Regional Conference on Comparative Endocrinology--oral presentation