

CURRICULUM VITAE

LAWRENCE STEVEN BLUMER

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EDUCATION

BGS (with distinction and secondary education certificate),
University of Michigan, 1974

Graduate student, University of California, Santa Cruz,
1975/1976 academic year

MS Zoology, University of Michigan, 1978

PhD Biological Sciences, University of Michigan, 1982
Thesis: Parental care and reproductive ecology of the
North American catfish, *Ictalurus nebulosus*.

AWARDS and HONORS

Sigma Xi Grant-in-Aid of Research, 1979

Theodore Roosevelt Memorial Fund Awards,
American Museum of Natural History, 1979, 1981

Rackham Dissertation Grant, University of Michigan, 1980

Raney Award,
American Society of Ichthyologists and Herpetologists, 1980

ARCO Foundation Award,
University of Michigan Biological Station, 1981, 1982

AWARDS (continued)

Independent Investigator Awards, University of Michigan
Biological Station Mellon Foundation Naturalist-Ecologist
Training Program, 1983, 1984

University Postdoctoral Fellowship, Ohio State University, 1984

Postdoctoral Investigator on National Science Foundation Grant
(BSR-831476) to J.F. Downhower at Ohio State University, 1986

Faculty Development Grant, Kenyon College, 1988, 1989

Georgia Power Foundation Grants for Environmental Scholars Program at
Morehouse College, 1991- 2004 (yearly awards)

Curriculum Development and Instructional Technology Grant as part of a
Department of Education MSIP Grant (Dr. E. Archibold, PI) at Morehouse
College, 1991-1994, 1996-1999, and 1999-2003

Invited Participant in the MacArthur Foundation Spelman
College and Morehouse College Peace and International
Studies Program, Curriculum Workshop, 1992

Instrumentation and Laboratory Improvement Grant, National Science
Foundation, Enhancing instruction in the ecological sciences: An
experimental approach to the study of variation in plants and animals,
1992

Community Garden Project Grant from the Environmental Citizenship Program of
the Associated Colleges of the South with Dr. M. Svec (Furman
University), 2000

Venture Grant, NSF Center for Behavioral Neuroscience based at Emory
University with Dr. C. Beck (Emory University), Effects of neuropeptides
on mate size discrimination thresholds in female sailfin mollies, 2001

Nabrit Grant, Morehouse College, Faculty Research Committee, Effects of
neuropeptides on mate size discrimination thresholds in female sailfin
mollies, 2001

Community Service Award, Morehouse College, Emma and Joe Adams Public
Service Institute, 2001

AWARDS (continued)

Venture Grant, NSF Center for Behavioral Neuroscience based at Emory University with Dr. M. Grober (Georgia State University), The neuroendocrine correlates of dominance/subordinance in convict cichlids, 2002

Distinguished Teaching Award, Alpha Epsilon Delta National Premedical Honor Society and Beta Kappa Chi National Scientific Honor Society chapters at Morehouse College, 2002

Nabrit Grant, Morehouse College, Faculty Research Committee, Evolution of developmental switches in natural populations of a ground cricket (with Dr. A. Olvido), 2003

NIH-RISE, Morehouse College, Developed and implemented Peer-Led Team Learning modules for introductory biology courses (Dr. J. Adams, PI), 2005

National Science Foundation, HRD-HBCU-UP grant, Curriculum reform and laboratory enhancement for science, technology, engineering, and the mathematics, Activity Coordinator for Freshman orientation and mentoring (Dr. J. Hall, PI), 2005-2006

Science Reform New Course Design and Implementation Mini-Grant, Associated Colleges of the South funded by the W.M. Keck Foundation of Los Angeles, Science and Society: A New Interdisciplinary Core Course, 2005

Course, Curriculum and Laboratory Improvement Grant, National Science Foundation, Developing Bean Beetles as a Model System for Undergraduate Laboratories (with Dr. C.W. Beck, Emory University), 2006-2009

Teaching Excellence Award at Morehouse College, Vulcan Materials Company and Georgia Foundation for Independent Colleges, 2007

Course, Curriculum and Laboratory Improvement Grant, National Science Foundation, Supplemental Award for Developing Bean Beetles as a Model System for Undergraduate Laboratories (with Dr. C.W. Beck, Emory University), 2007-2009

Course, Curriculum and Laboratory Improvement Grant, National Science Foundation, Collaborative Research: Creating a Bean Beetle Curriculum Development Network (with Dr. C.W. Beck, Emory University), 2009-2014

HBCU-UP Grant, National Science Foundation, HBCU Identity Research Center for STEM Pilot Project HRD-1818458 (Co-PI with M. Hodge, L. Muldrow and others, Morehouse College) renamed STEM-Undergraduate Success (STEM-US) Center 2018 – 2021.

Improving Undergraduate STEM Education Grant, National Science Foundation, Collaborative Research - The Bean Beetle Microbiome Project: A Research-Education Collaboration DUE-1821184 (Co-PI with C.W. Beck, N. Gerardo, Emory University; and S. Younge, Morehouse College) 2018 – 2023.

HBCU-UP Grant, National Science Foundation, Broadening Participation Research Center: HBCU STEM Undergraduate Success Research Center HRD-2010676 (Co-PI with D. Bryan, Morehouse College; C. Talley, Virginia State University; D. Dickens, Spelman College) 2020 - 2025.

RESEARCH

Reproductive ecology and parental care in the brown bullhead, *Ictalurus nebulosus*, University of Michigan Biological Station, Cheboygan Co., Michigan, 1978-1982

Kin recognition and social behavior of catfishes, University of Michigan Biological Station, Cheboygan Co. Michigan, 1983-1984

Mate choice and behavioral ecology in temperate stream fishes, Measuring phenotypic selection in animal populations, evolution and consequences of endothermy, Ohio State University and Kenyon College, 1985-1990

Mate choice in fishes, mate choice and fitness in insects, human kin attribution based on infant facial characteristics, neurobiology of mating behavior and social stress in fishes, laboratory curriculum development, Morehouse College, 1991-2009

Laboratory curriculum development, assessing teaching-learning innovation, insect behavioral ecology and insect-microbiome interactions, Morehouse College, 2010-present

MEMBERSHIPS

Animal Behavior Society

Association for Biology Laboratory Education
Ecological Society of America

PUBLICATIONS (Peer Reviewed)

1. Blumer, L.S. 1979. Male parental care in the bony fishes. *Q. Rev. Biol.*, 54:149-161.
2. Blumer, L.S. 1982. A bibliography and categorization of bony fishes exhibiting parental care. *Zool. J. Linnean Soc. London*, 75:1-22.
3. Dominey, W.J., and Blumer, L.S. 1984. Cannibalism of early life stages in fishes. In: *Infanticide: Comparative and Evolutionary Perspectives*. G. Hausfater and S. Blaffer Hrdy (eds.), p. 43-64. Aldine, New York.
4. Blumer, L.S. 1984. Simple, inexpensive method of tagging Ictalurid fishes for individual identification. *Prog. Fish-Cult.*, 46:152-154.
5. Blumer, L.S. 1985. The significance of biparental care in the brown bullhead, *Ictalurus nebulosus*. *Env. Biol. Fish.*, 12:231-236.
6. Blumer, L.S. 1985. Reproductive natural history of the brown bullhead, *Ictalurus nebulosus*, in Michigan. *Am. Midl. Nat.*, 114:318-330.
7. Blumer, L.S. 1986. The function of parental care in the brown bullhead, *Ictalurus nebulosus*. *Am. Midl. Nat.*, 115:234-238.
8. Blumer, L.S. 1986. Parental care sex differences in the brown bullhead, *Ictalurus nebulosus* (Pisces, Ictaluridae). *Behav. Ecol. Sociobiol.*, 19:97-104.
9. Blumer, L.S. 1987. Review of *The Behavior of Teleost Fishes* edited by T.J.Pitcher. *Q. Rev. Biol.*, 62:122.
10. Downhower, J.F., Blumer, L.S., and Brown, L. 1987. Seasonal variation in sexual selection in the mottled sculpin. *Evolution*, 41:1386-1394.
11. Downhower, J.F., Blumer, L.S., and Brown, L. 1987. Opportunity for selection: An appropriate measure for evaluating variation in the potential for selection? *Evolution*, 41:1395-1400.

PUBLICATIONS (Peer Reviewed continued)

12. Downhower, J.F., and Blumer, L.S. 1988. Calculating just how small a whale can be. *Nature* (London), 335:675.
13. Downhower, J.F., and Blumer, L.S. 1989, Size of aquatic endotherms. *Nature* (London) 341:192.
14. Downhower, J.F., Blumer, L.S., Lejeune, P., Gaudin, P, Marconato, A., and Bisazza, A. 1990. Otolith asymmetry in *Cottus bairdi* and *C. gobio*. *Polish Arch. Hydrobiol.* 37: 209-220.
15. Blumer, L. S. 1997. Phenotypic variation in plants. Pages 231-247, in *Tested Studies for Laboratory Teaching, Volume 18* (J.C. Glase, Editor). Proceedings of the 18th Workshop/Conference of the Association for Biology Laboratory Education (ABLE), 320 pages.
16. Beck, C.W., Blumer, L.S. and Brown*, T.M. 2003. Effects of salinity on metabolic rate of black mollies. Pages 211-222, *in Tested Studies for Laboratory Teaching, Volume 24* (M. O'Donnell, Editor). Proceedings of the 24th Workshop/Conference of the Association for Biology Laboratory Education (ABLE), 334 pages. (*Morehouse student)
17. Earley, R.L., Blumer, L.S. and Grober, M.S. 2003. The gall of subordination: Changes in gallbladder function associated with social stress. *Proc R Soc London Series B.* 03PB0465:1-7 (internet publication) and 2004, 271:7-13 (in printed journal).
18. Beck, C.W., Guinan, J.A., Blumer, L.S. and Matthews, R.W. 2004. Exploring the Lotka-Volterra Competition Model with Two Species of Parasitoid Wasps. *Ecological Society of America, Teaching Issues and Experiments in Ecology, Volume 2*, published on-line at www.tiee.ecoed.net
19. Olvido, A.E. and L.S. Blumer. 2005. Introduction to mark-recapture census methods using the seed beetle, *Callosobruchus maculatus*. Pages 197-211, *in Tested Studies for Laboratory Teaching, Volume 26* (M.A. O'Donnell, Editor). Proceedings of the 26th Workshop/Conference of the Association for Biology Laboratory Education (ABLE), 452 pages.
20. Guinan, J.A., Beck, C.W., Blumer, L.S. and Matthews, R.W. 2005. Competition within and between species of parasitoid wasps. Pages 213-232, *in Tested Studies for Laboratory Teaching, Volume 26* (M.A. O'Donnell, Editor). Proceedings of the 26th Workshop/Conference of the Association for Biology Laboratory Education (ABLE), 452 pages.

PUBLICATIONS (Peer Reviewed continued)

21. Earley, R.L., Edwards*, J.T., Aseem*, O., Felton, K., Blumer, L.S., Karom, M. and Grober, M.S. 2006. Social interactions tune aggression and stress responsiveness in a territorial cichlid fish (*Archocentrus nigrofasciatus*). *Physiology and Behavior* 88:353-363. (*Morehouse students)
22. Blumer, L.S., Denton*, M.K. and Brooks, L.E. 2007. Induction of Secondary Chemical Defenses. Pages 1-16, *in* Tested Studies for Laboratory Teaching, Volume 28 (M.A. O'Donnell, Editor). Proceedings of the 28th Workshop/Conference of the Association for Biology Laboratory Education (ABLE), 403 pages. (*Morehouse student)
23. Beck, C.W. and Blumer, L.S. 2007. Bean Beetles, *Callosobruchus maculatus*, a Model System for Inquiry-Based Undergraduate Laboratories. Pages 274-283, *in* Tested Studies for Laboratory Teaching, Volume 28 (M.A. O'Donnell, Editor). Proceedings of the 28th Workshop/Conference of the Association for Biology Laboratory Education (ABLE), 403 pages.
24. Blumer, L.S. and Beck, C.W. 2008. Oviposition substrate choice by bean beetles, *Callosobruchus maculatus*. Pages 50-66, *in* Tested Studies for Laboratory Teaching, Volume 29 (K. Clase, Editor). Proceedings of the 29th Workshop/Conference of the Association for Biology Laboratory Education (ABLE).
25. Sarver*, J.P., Blumer, L.S. and Denton, M.K. 2008. A Methanol-Free Method of Extracting Secondary Chemicals, Pages 376-388, *in* Tested Studies for Laboratory Teaching, Volume 29 (K. Clase, Editor). Proceedings of the 29th Workshop/Conference of the Association for Biology Laboratory Education (ABLE). (*Morehouse student)
26. Beck, C.W. and Blumer, L.S. 2009. Intraspecific competition in bean beetles. Pages 13-24, *in* Tested Studies for Laboratory Teaching, Volume 30 (K. Clase, Editor). Proceedings of the 30th Workshop/Conference of the Association for Biology Laboratory Education (ABLE).
27. Beck, C.W. and Blumer, L.S. 2009. Rapid local adaptation in bean beetles. Ecological Society of America, Teaching Issues and Experiments in Ecology, Volume 6, published on-line at www.tiee.ecoed.net
28. Blumer, L.S. and Beck, C.W. 2010. Inducing evolution in bean beetles. Pages 25-35, *in* Tested Studies for Laboratory Teaching, Volume 31 (K. Clase, Editor). Proceedings of the 31st Workshop/Conference of the Association for Biology Laboratory Education (ABLE).

PUBLICATIONS (Peer Reviewed continued)

29. Beck, C.W., Migabo, S., and Blumer, L.S. 2011 Substrate size selection by bean beetles. Pages 25-31, *in* Tested Studies for Laboratory Teaching, Volume 32 (K. McMahon, Editor). Proceedings of the 32nd Workshop/Conference of the Association for Biology Laboratory Education (ABLE), 445 pages.
30. Zuk, M., Blumer, L. S., and Gray, B. 2012. Runaway Sexual Selection Simulation Game. Pages 340-347, *in* Tested Studies for Laboratory Teaching, Volume 33 (K. McMahon, Editor). Proceedings of the 33rd Workshop/Conference of the Association for Biology Laboratory Education (ABLE), 390 pages.
31. Beck, C.W. and L.S. Blumer. 2012. Inquiry-based ecology laboratory courses improve student confidence and scientific reasoning skills. *Ecosphere* 3(12):112. 11 pages. (open-source on-line publication) <http://dx.doi.org/10.1890/ES12-00280.1>
32. Beck, C.W., L.S. Blumer and J. Habib*. 2013. Effects of evolutionary history on adaptation in bean beetles, a model system for inquiry-based laboratories. *Evolution: Education and Outreach* 6:5. 6 pages (open-source on-line publication) <http://www.evolution-outreach.com/content/6/1/5> (*undergraduate student)
33. Pearce, A.R., A.L. Sale, M. Srivatsan, C.W. Beck, L.S. Blumer, and A.A. Grippo. 2013. Inquiry-based investigation in biology laboratories: Does neem provide bioprotection against bean beetles? *Bioscene* 39(2):11-16. http://www.acube.org/files/2113/9230/5485/Bioscene_December_2013_Final_Secure.pdf
34. Blumer, L.S. 2015. Learning Evolution in the “Lecture” Room: Using Post-It® Notes Size Variation to Learn About Population Frequency Distributions. Article 23 in Tested Studies for Laboratory Teaching, Volume 36 (K. McMahon, Editor). Proceedings of the 36nd Workshop/Conference of the Association for Biology Laboratory Education (ABLE). <http://www.ableweb.org/volumes/vol-36/v36reprint.php?ch=23>
35. Beck, C.W. and L.S. Blumer. 23 August 2016, posting date. Egg size plasticity in bean beetles (*Callosobruchus maculatus*): Does host bean species matter? *Teaching Issues and Experiments in Ecology*, Vol. 11: Experiment #2 [online] <http://tiee.esa.org/vol/v11/experiments/beck/abstract.html>
36. Staub, N. L. L.S. Blumer, C.W. Beck, V.A. Delesalle, G.D. Griffin, R.B. Merritt, B.S. Hennington, W.H. Grillo, G.P. Hollowell, S.L. White, C.M. Mader. 2016. Course-based Science Research Promotes Learning in Diverse Students at Diverse Institutions. *CUR Quarterly* 38(2):36-46. doi: 10.18833/curq/37/2/11 <http://www.cur.org/publications/curquarterly/>

PUBLICATIONS (Peer Reviewed continued)

37. Beck, C.W. and L.S. Blumer. 2016. Alternative Realities: Faculty and Student Perceptions of Instructional Practices in Laboratory Courses. CBE Life Sciences Education. vol. 52 no. 4 ar52 doi: 10.1187/cbe.16-03-0139 <http://www.lifescied.org/content/15/4/ar52.full.pdf+html>
38. Smith, R.T. and L.S. Blumer. 2017. Course-based Research with Bean Beetles, *Callosobruchus maculatus*, and a Y-maze Olfactometer. Article 17 in Tested Studies for Laboratory Teaching, Volume 38 (K. McMahon, Editor). Proceedings of the 38th Workshop/Conference of the Association for Biology Laboratory Education (ABLE). <http://www.ableweb.org/volumes/volumes/vol-38/?art=17>
39. Mader, C.M., C.W. Beck, W.H. Grillo, G.P. Hollowell, B.S. Hennington, N.L. Staub, V.A. Delesalle, D. Lello, R.B. Merritt, G.D. Griffin, C. Bradford, J. Mao, L.S. Blumer, S.L. White. 2017. Multi-Institutional, Multidisciplinary Study of the Impact of Course-Based Research Experiences. Journal of Microbiology and Biology Education 18: doi:10.1128/jmbe.v18i2.1317
40. Blumer, L.S. 2018. Light bulb efficiency and environmental impacts. Article 2 in Tested Studies for Laboratory Teaching, Volume 39 (K. McMahon, Editor). Proceedings of the 39th Workshop/Conference of the Association for Biology Laboratory Education (ABLE). <http://www.ableweb.org/volumes/volumes/vol-39/?art=2>
41. Blumer, L.S. and C.W. Beck. 2019. Laboratory Courses with Guided-Inquiry Modules Improve Scientific Reasoning and Experimental Design Skills for the Least-Prepared Undergraduate Students. CBE Life Sciences Education. 18:ar2, 1-13. doi: 10.1187/cbe.18-08-0152
42. Blumer, L.S. and A. Peister. 2019. Research immersion improves outcomes for underprepared freshmen. Article 59 In: McMahon K, editor. Tested studies for laboratory teaching. Volume 40. Proceedings of the 40th Conference of the Association for Biology Laboratory Education (ABLE). <http://www.ableweb.org/volumes/vol-40/?art=59>
43. Beck, C.W. and L.S. Blumer. 2019. A Model for an Intensive Hands-on Faculty Development Workshop to Foster Change in Laboratory Teaching. Journal of Microbiology and Biology Education, Volume 20, Number 3:1-8. doi:10.1128/jmbe.v20i3.1799
44. Blumer, L.S. 2020. Solar panel electricity, efficiency and environmental impacts. Article 4 In: McMahon, K. editor. Advances in Biology Laboratory Education Volume 41. Publication of the 41st Conference of the Association for Biology Laboratory Education (ABLE), <https://doi.org/10.37590/able.v41.art4>

PUBLICATIONS (Peer Reviewed continued)

45. Blumer, L.S. and C.W. Beck. 2020. Introducing community ecology and data skills with the bean beetle microbiome project. Article 24. In: McMahon, K. editor. *Advances in Biology Laboratory Education Volume 41*. Publication of the 41st Conference of the Association for Biology Laboratory Education (ABLE) <https://doi.org/10.37590/able.v41.art24>
46. Zelaya, A.J., N.M. Gerardo, L.S. Blumer and C.W. Beck. 2020. The Bean Beetle Microbiome Project: A Course-Based Undergraduate Research Experience in Microbiology. *Frontiers in Microbiology*. <https://doi.org/10.3389/fmicb.2020.577621>
47. Jacobs-Sera, D. et al. 2020. Genomic diversity of bacteriophages infecting *Microbacterium* spp. *PLOS ONE* <https://doi.org/10.1371/journal.pone.0234636>
48. Beck, C.W. and L.S. Blumer. 2021. Advancing undergraduate laboratory education using non-model insect species. *Annual Reviews of Entomology*, 66:25.1.1-25.20. <https://doi.org/10.1146/annurev-ento-062920-095809> (posted online 23 September 2020) publication in January 2021, 66:485-504. <http://www.annualreviews.org/eprint/WPAWQUEBUYSV2PWK9EUC/full/10.1146/annurev-ento-062920-095809>
49. Beck, C.W. and L.S. Blumer. 2021. The relationship between perceptions of instructional practices and student self-efficacy in guided-inquiry laboratory courses. *CBE Life Sciences Education*. March 1, 2021 20:ar8. DOI: 10.1187/cbe.20-04-0076
50. Zelaya, A.J., N.M. Gerardo, L.S. Blumer and C.W. Beck. 2022. Analysis of microbiomes using free web-based tools in online and in-person undergraduate science courses. *CourseSource* 9. <https://doi.org/10.24918/cs.2022.35>
51. Zelaya, A.J., L.S. Blumer and C.W. Beck. 2022. Comparison of published assessments of biological experimentation as mapped to the ACE-Bio competence areas. Chapter 14. In: Pelaez, N.J., S.M. Gardner, and T.R. Anderson editors. *Trends in Teaching Experimentation in the Life Sciences - Putting research into practice to drive institutional change*. Springer Nature, Switzerland AG, Cham, Switzerland, ISBN 978-3-030-98591-2. This chapter is open access at: https://doi.org/10.1007/978-3-030-98592-9_14
52. Blumer, L.S., A.J. Zelaya, C.W. Beck, N.M. Gerardo, and S.N. Younge. 2022. Teaching the bean beetle microbiome CURE in an online format. Article 19 In: Boone, E. and Thuecks, S. editors. *Advances in Biology Laboratory Education Volume 42*. Publication of the 42st Conference of the Association for Biology Laboratory Education (ABLE), <https://doi.org/10.37590/able.v42.art19>

PUBLICATIONS (Peer Reviewed continued)

53. Huang, Carolyne, A.J. Zelaya, L.S. Blumer, N.M. Gerardo, and C.W. Beck. 2022. BeanBeetleMicrobiome app: an online app for community analysis of microbiome data. Article 31 In: Boone E and Thuecks S, eds. *Advances in biology laboratory education*. Volume 42. Publication of the 42nd Conference of the Association for Biology Laboratory Education (ABLE). <https://doi.org/10.37590/able.v42.art31>
54. Blumer, L.S. and W.C. Whitfield. 2023. Creating artificial beans for bean beetles, *Callosobruchus maculatus*, using a mechanical pill press. Abstract 41 In: Boone E and Thuecks S, eds. *Advances in biology laboratory education*. Volume 43. Publication of the 43rd Conference of the Association for Biology Laboratory Education (ABLE). <https://doi.org/10.37590/able.v43.abs41>
55. Zelaya A, Younge S, Gerardo NM, Blumer LS, and Beck CW. 2023. The Bean Beetle Microbiome Project: The impact of student-autonomy on science identity, project ownership, and abilities to overcome perceived challenges in course-based undergraduate research experiences. Abstract 54 In: Boone E and Thuecks S, eds. *Advances in biology laboratory education*. Volume 43. Publication of the 43rd Conference of the Association for Biology Laboratory Education (ABLE). <https://doi.org/10.37590/able.v43.abs54>

PUBLICATIONS (not peer reviewed)

Blumer, L.S. and Beck, C.W. 2021. Bean Beetles, A Model Organism for Inquiry-based Undergraduate Laboratories. www.beanbeetles.org This website contains laboratory methods, researcher links, tested laboratory protocols, and information on inquiry-based learning. This website is updated at 3 - 6 month intervals with new materials.

Beck, C.W. and Blumer, L.S. 2009. Experiments with Bean Beetles, *Callosobruchus maculatus*. 64 pages. Privately published book sold exclusively by Carolina Biological Supply Company.

Beck, C.W. and Blumer, L.S. 2019. A Handbook on Bean Beetles, *Callosobruchus maculatus*. 14 pages. Privately published booklet for free distribution and posted on our website: www.beanbeetles.org

PRESENTATIONS

- 1977, The Evolution of Male Parental Care in the Osteichthyes. Ethology and Behavioral Ecology of Fishes, Normal, IL
- 1978, The Evolution of Male Parental Care in the Bony Fishes, Abstract 292. AAAS Annual Meeting, Washington, DC
- 1983, Reproductive behavior and parental care in a biparental catfish. Invited Lecture, Illinois State University, Department of Biological Sciences, Normal, IL
- 1983, The significance of biparental care in the brown bullhead, *Ictalurus nebulosus*. Ethology and Behavioral Ecology of Fishes, Normal, IL
- 1984, Kin recognition in the brown bullhead, *Ictalurus nebulosus*. Invited Lecture, Bryn Mawr College, Department of Biology, Bryn Mawr, PA
- 1984, Kin recognition in the brown bullhead, *Ictalurus nebulosus*. ABS Annual Meeting, Cheney, WA
- 1985, The evolution and maintenance of parental care sex differences in the brown bullhead, *Ictalurus nebulosus*. Invited Lecture, Michigan State University, Kellogg Biological Station, Hickory Corners, MI
- 1985, The evolution and maintenance of parental care sex differences in the brown bullhead, *Ictalurus nebulosus*. Ecological and Evolutionary Ethology of Fishes, Guelph, Ontario.
- 1986, Parental care sex differences in the brown bullhead, *Ictalurus nebulosus*. ABS Annual Meeting, Tucson, AZ
- 1986, The evolution of parental care patterns. Invited Lecture, Ohio State University, Graduate School, Columbus, OH
- 1987, Parental care in fishes. Invited Lecture, Lock Haven University, Biology Department, Lock Haven, PA
- 1987, Seasonal variation in sexual selection in the mottled sculpin. Ecological and Evolutionary Ethology of Fishes, Beaumont, TX

PRESENTATIONS (continued)

- 1987, The evolution of parental care patterns in fishes. Invited Lecture, Rice University, Biology Department, Houston, TX
- 1987, Seasonal variation in sexual selection in the mottled sculpin. International Ethological Conference XX, Madison, WI
- 1987, The evolution of parental care patterns. Invited Lecture, Kenyon College, Department of Biology, Gambier, OH
- 1988, The opportunity for selection: when measures matter. ABS Annual Meeting, Missoula, MT
- 1989, The evolution of parental care patterns. Invited Lecture, University of Maryland, Appalachian Environmental Laboratory, Frostburg, MD
- 1989, The evolutionary significance of endothermy or why do birds and mammals have such wasteful energy metabolism? Invited Lecture, Ohio Wesleyan University, Department of Zoology, Delaware, OH
- 1989, The evolutionary significance of endothermy. ABS Annual Meeting, Highland Heights, KY
- 1989, The evolutionary significance of endothermy, or why are birds and mammals energy gluttons? Invited Lecture, Denison University, Biology Department, Granville, OH
- 1989, The evolutionary significance of endothermy, or why are birds and mammals energy gluttons? Invited Lecture, Kenyon College, Science Division Colloquium, Gambier, OH
- 1990, A multivariate evaluation of phenotypic selection in the Mottled Sculpin. Ecological and Evolutionary Ethology of Fishes, Flagstaff, AZ
- 1990, The evolution of parental care patterns in fishes. Invited Lecture, University of South Dakota, Department of Biology, Vermillion, SD
- 1990, The evolution of parental care patterns in fishes. Invited Lecture, Morehouse College, Department of Biology, Atlanta, GA

PRESENTATIONS (continued)

- 1990, Measuring natural selection. Invited Lecture, Morehouse College, Department of Biology, Atlanta, GA
- 1991, The evolution of sex roles in parental care. Invited Lecture, Clark-Atlanta University, Department of Biology, Atlanta, GA
- 1992, The function of endothermy. Invited Lecture, Morehouse College, Department of Biology, Atlanta, GA
- 1992, Parental care in fishes. Invited Lecture, University of Georgia, Department of Zoology, Athens, GA
- 1992, The evolution of endothermy. Invited Lecture, University of Georgia, Department of Zoology, Athens, GA
- 1992, Patterns in attribution of infant-parent resemblance. Invited Lecture, Morehouse College, Department of Psychology ADAMHA-MARC Program, Atlanta, GA
- 1992, Who do newborns resemble? ABS Annual Meeting, Kingston, Ontario, Canada
- 1992, Curriculum reform and facilities for undergraduate science. Invited Lecture, Project Kaleidoscope Workshop, Lake Forest College, IL
- 1992, The significance of differential attribution in facial resemblance of human infants. Invited Lecture, Georgia Baptist Medical Center, Atlanta, GA
- 1992, The function and consequences of endothermy in marine environments. Invited Lecture, Clark-Atlanta University, Geophysical Sciences Colloquium, Atlanta, GA
- 1993, Patterns in the evolution and maintenance of parental care. Invited Lecture, National Zoological Park, Smithsonian Institution, Washington, DC
- 1993, Parental care patterns in fishes. Invited Lecture, University of Georgia, Department of Zoology, Athens, GA

PRESENTATIONS (continued)

- 1993, Parental care patterns in fishes and other vertebrates. Invited Lecture, Morehouse College, Department of Psychology ADAMHA-MARC Program, Atlanta, GA
- 1996, Where we are and where we go from here: Faculty involvement in academic building design and construction. Invited Lecture, Project Kaleidoscope Workshop, Atlanta, GA
- 1996, Phenotypic variation in plants. Invited Workshop Presentation, Association for Biology Laboratory Education, 18th Annual Workshop/Conference, Boston University, Boston, MA
- 1998, Principles of Ecology (ENV 470). Invited lectures presented for video production of distance learning course. Total of 42 lecture hours recorded for US Department of Energy, Technical Qualifications Program, Northern Arizona University, Department of Chemistry, Flagstaff, AZ
- 1998, Parental care: Who does what and why? Invited Lecture, Purdue University, Department of Biological Sciences, West Lafayette, IN
- 1998, My Philosophy of Instruction in the Biological Sciences. Invited Lecture, Purdue University, Department of Biological Sciences, West Lafayette, IN
- 1998, Evolution and natural selection. Invited Lecture, Morehouse College, Department of Religion and Philosophy, Atlanta, GA
- 1999, Parental care: Who does what and why? Invited Lecture, University of Georgia, Institute of Ecology, Athens, GA
- 1999, Evolution, Behavior, and Human Sociobiology. Invited Lecture, University of Georgia, Department of Zoology, Athens GA
- 1999, Integrating education technology in science learning and teaching at Morehouse College. Invited Lecture, Project Kaleidoscope 10th Anniversary Meeting, University of Maryland, College Park, MD
- 2000, Parental Care Patterns in Animals. Invited Lecture, University of Georgia, Department of Zoology, Athens, GA
- 2001, Introduction to Information Technology Workshop. Invited Lecture, Morehouse College, College-wide Faculty Workshop, Atlanta, GA

PRESENTATIONS (continued)

- 2001, Using Electronic Media in Lecture. Invited Workshop-Lecture, Morehouse College, College-wide Faculty Workshop, Atlanta, GA
- 2001, Effects of neuropeptides on mate choice behavior of female sailfin mollies, Invited Lecture, Reproduction Colaboratory, Center for Behavior Neuroscience, Georgia State University, Atlanta, GA
- 2002, Cannibalism: Adaptation or Accident, Invited Lecture, Georgia State University, Department of Biology, Atlanta, GA
- 2002, Salinity Effects on Metabolism in Sailfin Mollies, Invited Major Workshop, 24th Annual Meeting of the Association for Biology Laboratory Education, Louisiana State University, Baton Rouge, LA (with C.W. Beck)
- 2002, Introduction to Web Page Development Workshop, Invited Lecture, Morehouse College, College-wide Faculty Workshop, Atlanta, GA
- 2003, Using GIS in Case Study Learning, Invited Lecture, Associated Colleges of the South GIS Symposium, Southwestern University, Georgetown, TX
- 2004, Introduction to Mark-Recapture Census Methods Using the Seed Beetle, *Callosobruchus maculatus*, Invited Major Workshop, 26th Annual Meeting of the Association for Biology Laboratory Education, Bowling Green State University, Bowling Green, OH (with A.E. Olvido)
- 2004, Competition Within and Between Species of Parasitoid Wasps, Invited Major Workshop, 26th Annual Meeting of the Association for Biology Laboratory Education, Bowling Green State University, Bowling Green, OH (with J.A. Guinan, C.W. Beck, and R.W. Matthews)
- 2004, Exploring the Lotka-Volterra Competition Model with Two Species of Parasitoid Wasps. Poster presented at the Annual Meeting of the Ecological Society of America, Oregon State University, Portland, OR (with J.A. Guinan, C.W. Beck, and R.W. Matthews)
- 2004, A new core curriculum at Morehouse College, Poster presented at the Associated Colleges of the South Science Education Reform Workshop, Millsaps College, November 12-14, Jackson, MS (with V. Haftel and L. Shipman)

PRESENTATIONS (continued)

- 2006, Induction of Secondary Chemical Defenses. Invited Major Workshop, 28th Annual Meeting of the Association for Biology Laboratory Education, Purdue University, West Lafayette, IN (with M.K. Denton* and L.E. Brooks) (*Morehouse student)
- 2006, Bean Beetles, *Callosobruchus maculatus*, a Model System for Inquiry-Based Undergraduate Laboratories, Invited Mini-Workshop, 28th Annual Meeting of the Association for Biology Laboratory Education, Purdue University, West Lafayette, IN (with C.W. Beck)
- 2006, The Bruchid Bean Beetle, *Callosobruchus maculatus*, a Model System for Inquiry-Based Undergraduate Laboratories, Invited workshop, 91st Annual Meeting of the Ecological Society of America, Memphis, TN (with C.W. Beck)
- 2007, Oviposition Substrate Choice by Bean Beetles, *Callosobruchus maculatus*, Invited Major Workshop, 29th Annual Meeting of the Association for Biology Laboratory Education, University of Kentucky, Lexington (with C.W. Beck)
- 2007, A Methanol-Free Method of Extracting Secondary Chemicals, Poster presented at the 29th Annual Meeting of the Association for Biology Laboratory Education, University of Kentucky, Lexington (with J.P. Sarver* and M.K. Denton) (*Morehouse student)
- 2007, Oviposition Substrate Choice by Bean Beetles, A New Model Organism, Invited Special Workshop, National Association of Biology Teachers (NABT) Professional Development Conference, Atlanta (with C.W. Beck)
- 2008, Inquiry-Based Laboratory Learning, Hands-on Faculty Workshop, Division of Science and Mathematics, HBCU-UP Program, Morehouse College.
- 2008, Intraspecific Competition in Bean Beetles. Invited Major Workshop, 30th Annual Meeting of the Association for Biology Laboratory Education, University of Toronto, Mississauga, ON Canada (with C.W. Beck)
- 2008, Implementation of Peer-Led Team Learning in an Introductory Biology Course. Invited Mini Workshop, 30th Annual Meeting of the Association for Biology Laboratory Education, University of Toronto, Mississauga, ON Canada (with T. W. Hendrickson)

PRESENTATIONS (continued)

- 2008, Bean beetles, *Callosobruchus maculatus*, as a model system for inquiry based laboratories in ecology. Invited poster, 93rd Annual Meeting of the Ecological Society of America, Milwaukee, WI (with C.W. Beck)
- 2008, Developing Bean Beetles as a Model System for Undergraduate Laboratories, Invited poster, Course, Curriculum and Laboratory Improvement Project Directors Conference, hosted by the National Science Foundation and the Association for the Advancement of Science, Washington, DC (with C.W. Beck)
- 2009, Inducing Evolution in Bean Beetles, Invited Major Workshop, 31st Annual Meeting of the Association for Biology Laboratory Education, University of Delaware, Newark, DE (with C.W. Beck)
- 2009, Strong Evidence for Intraspecific Competition in Bean Beetles. Invited Poster at the 31st Annual Meeting of the Association for Biology Laboratory Education, University of Delaware, Newark, DE (with W.H. McGowan*, B.A. Davids* and C.W. Beck) (*Morehouse students)
- 2009, Developing Bean Beetles as a Model Organism for Inquiry-Based Undergraduate Laboratories, Invited poster, Transforming Undergraduate Education in Biology: Mobilizing the Community for Change conference hosted by the National Science Foundation and the Association for the Advancement of Science, Washington, DC (with C.W. Beck)
- 2010, Substrate Size Selection by Bean Beetles, Invited Major Workshop, Regional meeting of the Association for Biology Laboratory Education, McDaniel College, Westminster, MD (with C.W. Beck and S. Migabo)
- 2010, Bean Beetles, a Model Organism for Inquiry-Based Undergraduate Laboratories, Invited Mini-Workshop Presentation, Joint Annual Meeting of National Science Foundation Division of Human Resource Development and Directorate for Education and Human Resources Grant Recipients (JAM10), Washington, DC (with C.W. Beck and S. Migabo)
- 2010, Substrate Size Selection by Bean Beetles, Invited Major Workshop, 32nd Annual Meeting of the Association for Biology Laboratory Education, Dalhousie University, Halifax, NS Canada (with C.W. Beck and S. Migabo)

PRESENTATIONS (continued)

- 2011, Creating a Bean Beetles Curriculum Development Network, Invited poster, Course, Curriculum and Laboratory Improvement Principal Investigators Conference, hosted by the National Science Foundation and the Association for the Advancement of Science, Washington, DC (with C.W. Beck)
- 2011, Factors that Influence Learning Gains in Inquiry-Based Laboratory Courses. Invited poster at the 33rd Annual Meeting of the Association for Biology Laboratory Education, New Mexico State University, Las Cruces, NM (with C.W. Beck)
- 2011, Runaway Sexual Selection Simulation Game. Invited mini-workshop at the 33rd Annual Meeting of the Association for Biology Laboratory Education, New Mexico State University, Las Cruces, NM (with M. Zuk and B. Gray)
- 2012, Why Do Bean Beetles Avoid Split Beans? Invited poster at the 34th Annual Meeting of the Association for Biology Laboratory Education, University of North Carolina, Chapel Hill, NC (with K.J. Harris and C.W. Beck)
- 2012, Authentic Research In Undergraduate Biology Laboratory Courses, Definitions, Implementation, and Barriers. Invited poster at the 34th Annual Meeting of the Association for Biology Laboratory Education, University of North Carolina, Chapel Hill, NC (with C.W. Beck, J.A. Guinan, K.R. Miller and R.M. Spell)
- 2012, Authentic Research Experience in Laboratory Courses. Invited seminar (Interactive Session) at the Council on Undergraduate Research (CUR) Conference, College of New Jersey, Trenton, NJ. (with S. Ghosh, J. Guinan, L. Guralnick, P. Hanson, N. Jacob, M. Miller, K. Miller, C. Ogilvie, G. Patterson, G. Reiness, R. Spell, J. Vondrasek, J. Rhode Ward, L. Wimmers, and K. Winnet-Murray)
- 2012, Authentic Research In Undergraduate Biology Laboratory Courses, Definitions, Implementation, and Barriers. Invited poster at the Ecology Research as Education Network All Members Meeting, Meredith College, Raleigh, NC (with C.W. Beck, J.A. Guinan, K.R. Miller and R.M. Spell)

PRESENTATIONS (continued)

- 2012, Authentic Research Experience in Laboratory Courses. Invited seminar at the Introductory Biology Project Summer Conference, Washington, DC (with B. Abraham, C. Beck, S. Ghosh, J. Guinan, L. Guralnick, P. Hanson, N. Jacob, M. Miller, K. Miller, C. Ogilvie, G. Patterson, G. Reiness, E. Schussler, R. Spell, J. Vondrasek, J. Rhode Ward, L. Wimmers, and K. Winnet-Murray)
- 2013, Substrate Size Selection by Bean Beetles. Invited Major Workshop, Regional meeting of the Association for Biology Laboratory Education, San Diego State University, San Diego, CA (with C.W. Beck and S. Migabo)
- 2013, Learning Gains from Guided-Inquiry Laboratories with the Bean Beetle Model System. Invited poster, NSF HQ Atrium and Curriculum and Laboratory Improvement Principal Investigators Conference, hosted by the National Science Foundation and the Association for the Advancement of Science, Washington, DC (with C.W. Beck)
- 2013, Substrate Size Selection by Bean Beetles. Laboratory Workshops at the Annual IRACDA Conference, June 2013, Morehouse College, Atlanta, GA. (with C.W. Beck and S. Migabo, workshops presented with V. Haftel, Guided-Inquiry in Introductory Biology with the Bean Beetle Model Organism)
- 2013, Vision and Change? Challenges and Opportunities for ABLE. Invited Mini-workshop at the 35th Annual Meeting of the Association for Biology Laboratory Education, University of Calgary, Calgary, Alberta, Canada (with C.W. Beck)
- 2013, Learning Gains from Guided-Inquiry Laboratories with the Bean Beetle Model System. Invited poster, Vision and Change in Undergraduate Biology: Chronicling the Changes Conference, hosted by the Association for the Advancement of Science, Washington, DC (with C.W. Beck)
- 2014, Bean Beetles, A Model Organism for Inquiry-Based Undergraduate Laboratories. Invited One-day Faculty Development Workshop hosted by Oklahoma INBRE Program at Tulsa Community College, Tulsa, OK (with C.W. Beck)
- 2014, Inquiry-based learning to course-based research experience. Invited Two-day Faculty Development Workshop hosted by HHMI CRE Collaborative at Smith College, Northampton, MA (with C.W. Beck)

PRESENTATIONS (continued)

- 2014, Learning Evolution in the “Lecture” Room: Using Post-It® Notes Size Variation to Learn About Population Frequency Distributions. Mini-workshop at the 36th Annual Meeting of the Association for Biology Laboratory Education, University of Oregon, Eugene, OR
- 2015, Alternative Realities: Students have different perceptions of inquiry-based laboratory instruction than their instructors. Invited poster at the Gordon Research Conference: Undergraduate Biology Education Research (with C.W. Beck)
- 2016, Course-based Research with Bean Beetles, *Callosobruchus maculatus*, and a Y-maze Olfactometer. Major workshop at the 38th Annual Meeting of the Association for Biology Laboratory Education, University of Houston, Houston, TX (with R.T. Smith)
- 2016, Sustainable models of STEM education reform: A survey of institutional factors. Invited poster at the Association of American Colleges and Universities (AAC&U) conference Transforming Undergraduate STEM Education, Boston, MA (with R.M. Spell and G.E. Uno)
- 2017, Light bulb efficiency and environmental impacts. Major workshop at the 39th Annual Meeting of the Association for Biology Laboratory Education, University of Wisconsin, Madison, WI
- 2018, A CURE* for STEM Education *Course-based Undergraduate Research Experience. Invited Faculty Cafe' research seminar, January 26, 2018, Morehouse College
- 2018, A CURE* for STEM Education *Course-based Undergraduate Research Experience. Invited Faculty research seminar, March 21, 2018, Atlanta University Center, Robert W. Woodruff Library
- 2018, Research Immersion Improves Outcomes for Underprepared Freshmen. Invited Poster at the 40th Annual Meeting of the Association for Biology Laboratory Education, The Ohio State University, Columbus, OH
- 2018, Research Immersion Improves Outcomes for Underprepared Freshmen. Invited Poster at the 10th Annual SEA-Phages research conference, Howard Hughes Medical Institute, Janelia Farms Research Campus, MD
- 2018, The Association for Biology Laboratory Education: A Resource for Vision and Change. Invited talk, Annual IRACDA Conference, July 2018, Morehouse College, Atlanta, GA

- 2018, Research Immersion Improves Outcomes for Underprepared Freshmen. Invited Poster, AAC&U Conference, Transforming STEM Higher Education, November 2018, Atlanta, GA
- 2018, Incorporating authentic research in introductory lab courses. Invited one-day workshop, ABRCMS conference, November 2018, Indianapolis, IN (with R.M. Spell and C.W. Beck)
- 2019, Introducing community ecology and data skills with the Bean Beetle Microbiome Project. Invited workshop, Life Discovery-Doing Science Conference, March 2019, University of Florida, Gainesville, FL (with C.W. Beck)
- 2019, Solar panel electricity, efficiency and environmental impacts. Major workshop at the 41th Annual Meeting of the Association for Biology Laboratory Education, University of Ottawa, Ottawa, Canada
- 2019, Introducing community ecology and data skills with the bean beetle microbiome project. Extended mini-workshop at the 41th Annual Meeting of the Association for Biology Laboratory Education, University of Ottawa, Ottawa, Canada (with C.W. Beck)
- 2019, Incorporating authentic research in science and mathematics courses. Invited faculty development workshop at HBCU STEM-Undergraduate Success conference, Atlanta, GA (with C.W. Beck)
- 2019, Incorporating authentic research in science courses. Invited faculty development workshop at Delaware State University, Dover, DE (with C.W. Beck)
- 2021, CUREs improve STEM student success. Invited panel discussion presentation in *Session I: STEM Education Reform and Innovation at Morehouse*, Morehouse College Virtual Town Hall: Successes in STEM Education, Research, and Workforce Preparedness, hosted by The National Academies of Science, Engineering and Medicine, Policy and Global Affairs Division, Board on Higher Education and Workforce, April 27, 2021
- 2021, Incorporating authentic research in science and mathematics courses. Invited faculty development workshop at HBCU STEM-Undergraduate Success conference, Atlanta, GA (online workshop with C.W. Beck)
- 2021, Teaching the Bean Beetle Microbiome CURE in an Online Format. Mini-workshop discussion at the ViABLE Conference (online conference of the 42nd Annual Meeting of the Association for Biology Laboratory Education)

- 2022, The Bean Beetle Microbiome Project: The impact of student-autonomy on science identity, project ownership, and abilities to overcome perceived challenges in course-based undergraduate research experiences. Poster presented at the 43rd Annual Meeting of the Association for Biology Laboratory Education, University of Victoria, Victoria, BC, Canada (with A.J. Zelaya, S.N. Younge, N.M. Gerardo and C.W. Beck)
- 2022, Creating artificial beans for bean beetles, *Callosobruchus maculatus*, using a mechanical pill press. Poster presented at the 43rd Annual Meeting of the Association for Biology Laboratory Education, University of Victoria, Victoria, BC, Canada (with W.C. Whitfield Morehouse student)
- 2022, The Bean Beetle Microbiome Project: The impact of student-autonomy on CURE efficacy. Poster submitted to the 2022 NSF IUSE Summit, Propelling Change: Moving from Strategy Toward Effective and Equitable Undergraduate STEM Education. Washington, DC. (with A.J. Zelaya, S.N. Younge, N.M. Gerardo and C.W. Beck)
- 2022, Incorporating authentic research in science and mathematics courses. Invited faculty development workshop for the HBCU STEM-Undergraduate Success Research Center, Morehouse College, Atlanta, GA (in-person 1.5 day workshop with C.W. Beck and G.P. Hollowell)
- 2023, Techniques for Conducting the Bean Beetle Microbiome Project on Eggs. Poster presented at the 44th Annual Meeting of the Association for Biology Laboratory Education, University of California San Diego. (with E. Vereen Jr. and T.G. Gardner)

TEACHING AND ADMINISTRATION

Assistant Professor, Kenyon College, 1987-1990

Courses:

Comparative Animal Physiology
Experimental Animal Physiology
Genetics and Experimental Genetics
Introduction to Experimental Biology
Introductory Biology:
Population and Environmental
Cells to Organism

Associate Professor, Morehouse College, 1990-2007

Courses:

Environmental Biology
General Biology for Science Majors
Biological Sciences for non-majors
Ecology and Ecology Laboratory

Outreach Programs at Central Middle School, Newnan, GA
and Kennedy Middle School, Atlanta, GA, 1992 - 1996

Community Garden Public Service Program, Atlanta, GA, 1999 - 2005

Professor, Morehouse College, 2007-present

Courses:

Ecology and Ecology Laboratory
Science and Society for non-majors
Environmental Studies and ES Laboratory
Introductory Populations, Community and Biosphere with Research
Immersion Laboratory
Phage Hunters Research Immersion Course

Chair, Department of Biology, Morehouse College, 2018-2019, 2022-2024

Director, Environmental Studies Program (Academic Minor),
Morehouse College, 2001- present

President-Elect, Association for Biology Laboratory Education (ABLE) 2010-2011

President, Association for Biology Laboratory Education (ABLE) 2011-2013

Past-President, Association for Biology Laboratory Education (ABLE) 2013-2014