

Christopher B. Cunningham
Swansea University
Department of Biosciences
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Education & Training

- 2012-2016 Post-Doctoral Research Associate, Department of Genetics
University of Georgia, Athens, GA
Advisor: Allen Moore
- 2006-2011 Doctor of Philosophy, Biology
University of Utah (U of U), Salt Lake City, UT
Dissertation Committee: David Carrier (Advisor), Fred Adler, Jon Seger, Wayne Potts, Elizabeth Cashdan (External)
Dissertation Title: The Behavioral Physiology of Competitive Ability in Recently Wild-Derived Male House Mice (*Mus musculus*).
- 2003-2006 Baccalaureate (Science), Biology
Belmont Abbey College (BAC), Belmont, NC
Minors: Physics/Mathematics, Chemistry, Allied Health
Honors: *Summa Cum Laude*

Academic Appointments

- 2017-Present Lecturer (Assistant Professor), Department of Biosciences, Swansea University (SU)

Professional Appointments

- 2017-Present Associate Editor, Ecology & Evolution
2017 Welsh Crucible Participant (Research Leadership & Media Training)

Short Research Statement

My research focuses on the evolution and mechanistic basis of behavior. I am specifically interested in social behaviors, such as, parental care and social dominance. My research uses a variety of methods and -omics techniques concentrating on understanding the contributions of genetic, genomic, chemosensory, and molecular elements to social behavior.

Published Manuscripts in Referred Journals

- 2018 Benowitz KM, McKinney EC, **Cunningham CB**, Moore AJ. Predictable gene expression related to behavioural variation in the burying beetle *Nicrophorus vespilloides*. *in review*.
- 2018 **Cunningham CB**, Ji L, McKinney EC, Benowitz KM, Schmitz RJ, Moore AJ. Changes of gene expression but not cytosine methylation are associated with plasticity of male parental care reflecting behavioural state, social context, and individual flexibility. *in*

review.

bioRxiv: doi.org/10.1101/139634

- 2017 Benowitz KM, McKinney EC, Roy-Zokan EM, **Cunningham CB**, Moore AJ. The role of lipid metabolism during parental care in two species of burying beetle (*Nicrophorus* spp.). *Animal Behaviour* 129, 143-149.
- 2017 Benowitz KM, McKinney EC, **Cunningham CB**, Moore AJ. Relating quantitative variation within a behavior to variation in transcription. *Evolution* 71, 1999-2009.
- 2017 Mehlferber EC, Benowitz KM, Roy-Zokan EM, McKinney EC, **Cunningham CB**, Moore AJ. Duplication and sub/neofunctionalization of *malvolio*, an insect homolog of *Nramp*, in the subsocial beetle *Nicrophorus vespilloides*. *G3: GENES, GENOMES, GENETICS* 7, 3393-3403.
- 2017 **Cunningham CB**, Badgett MJ, Meagher RM, Orlando R, Moore AJ. Ethological principles predict the neuropeptides co-opted to influence parenting. *Nature Communications* 8, 14225.
- 2017 Carrier DR, and **Cunningham CB**. The effect of foot posture on striking, grappling, and rapid turning. *Biology Open* 6, 269-277.
- 2016 **Cunningham CB**, VanDenHeuvel K, Khana D, and Moore AJ. The role of *neuropeptide F* in a transition to parental care. *Biology Letters* 12, 20160158.
- 2015 **Cunningham CB**, Li J, Wiberg A, Shelton J, McKinney EC, Parker DJ, Meagher RB, Benowitz KM, Roy-Zokan E, Ritchie MG, Brown SJ, Schmitz RJ, and Moore AJ. The genome and methylome of a beetle with complex social behavior, *Nicrophorus vespilloides* (Coleoptera: Silphidae). *Genome Biology and Evolution* 12, 3383-3396.
- 2015 Parker DJ, **Cunningham CB**, Walling CA, Stamper CE, Head ML, Roy-Zokan E, McKinney EC, Ritchie MG, and Moore AJ. Transcriptomes of parents help identify parenting strategies and sexual conflict in a subsocial beetle. *Nature Communication* 6, 8449.
- 2015 Roy-Zokan EM, **Cunningham CB**, Hebb LE, McKinney EC, and Moore AJ. Vitellogenin and vitellogenin receptor gene expression is associated with male and female parenting in a subsocial insect. *Proceedings of the Royal Society B: Biological Sciences* 282, rspb.2015.0787.
- 2015 Nelson A*, **Cunningham CB***, Ruff JS, and Potts WK. Protein pheromone expression levels predict and respond to the formation of social dominance networks. *Journal of Evolutionary Biology* 28, 1213-1224. *= co-first authors
- 2015 **Cunningham CB**, Douthit MK, and Moore AJ. Expression of octopaminergic receptor genes in four non-neural tissues in female *Nicrophorus vespilloides* beetles. *Insect Science* 22, 495-502.

- 2014 **Cunningham CB**, Douthit MK, and Moore AJ. Octopaminergic gene expression and flexible social behavior in the subsocial burying beetle *Nicrophorus vespilloides*. *Insect Molecular Biology*, 23, 391-404.
- 2013 **Cunningham CB**, Ruff J, Chase K, Potts WK and Carrier DR. Competitive ability in male house mice (*Mus musculus*): Genetics influences. *Behavior Genetics* 43, 151-160.
- 2010 **Cunningham CB**, Schilling N, Anders C and Carrier DR. The influence of foot posture on the cost of transport in humans. *Journal of Experimental Biology* 213, 790-797.
- 2009 Shapiro MD, Summers B, Balabhadra S, Miller A, Aldenhoven J, **Cunningham CB**, Bell MA and Kingsley DM. The genetic architecture of skeletal convergence and sex determination in ninespine sticklebacks. *Current Biology* 19, 1140-1145.

Manuscripts in Preparation for Referred Journals (Working Title)

- 2017 **Cunningham CB**, Khana D, Carter A, McKinney EC, Moore AJ. Neurotransmitter and neuropeptide pathway gene expression changes during a transition into parental care.

Research and Academic Grants

- 2018 *Identifying the genetic networks of anti-viral immune response of Galleria mellonella*. College of Science Research Fund. Principal Investigator, SU. £4,600.
- 2018 *Development of genetic tools for assessing anti-viral immunity in insect (Galleria mellonella) larvae with MinION sequencing technology*. College of Science Research Fund. Co-Investigator, SU. £2,182.
- 2017 Knowledge Economy Skills Scholarships 2 (KESS2) MRes Scholarship . Principal Investigator. £15,358
- 2016 *Gene expression and its regulation during context-specific social behavior*. Evolutionary, Ecological, or Conservation Genomics Research Award, American Genetics Society. Principal Investigator. \$10,300
- 2010 NSF Young Investigators Travel Grant to attend ICVM- 9 in Uruguay: \$1,000
- 2009 Funding Incentive Seed Grant, Research Assistantship, U of U: \$8,800
- 2008-2012 Charlotte Mangum Student Support Program, Society for Integrative and Comparative Biology (4 awards): \$1,956
- 2008, 2011 Associated Students of the University of Utah Student Travel Award, U of U (2 awards): \$555
- 2007-2012 Department of Biology Graduate Student Travel Award, U of U (5 awards): \$2,000
- 2007-2012 Graduate School Graduate Student Travel Award, U of U (5 awards): \$2,000

Fellowships

- 2011-2012 NSF GK-12 Educational Outreach Fellowship- Declined
- 2010-2011 NSF GK-12 Educational Outreach Fellowship

Research and Academic Honors

- 2012 Riser Award for Outstanding Graduate Research, Department of Biology, U of U
- 2006 *Summa Cum Laude* (BAC)
- 2006 Award for Academic Excellence in Biology (BAC)

2006 Student of the Year, Mathematics/Physics (BAC)

Invited Seminars

2017 University of Cambridge, Dept. of Zoology
2017 University of Bath, Milner Centre for Evolution
2016 Georgia College & State University, Dept. Biological and Environmental Sciences
2012 Belmont Abbey College, Dept. of Biology

Graduate Students

2017 Tomas Generalovic – MRes – “The application of solid state chromatin Immunoprecipitation (ChIP) for epigenetic profiling of insects”
In collaboration with an biotechnology/industrial partner, Provair Sciences

Teaching Experience

Swansea University

2018 Instructor, Department of Biosciences
Animal Physiology

University of Georgia

11 students Undergraduate Research Supervisor, Department of Genetics
~Direct research supervisor of Honor Thesis/Independent Study Students
- 3 Currently in Medical/Physician Assistant School
- 2 Currently in Graduate School
- 4 have published with me

University of Utah

2011 Teaching Assistant, Department of Biology
~Comparative Vertebrate Morphology (1 semester)
2008-2010 Teaching Assistant, Department of Biology
~Biology of Aggression (3 semester)
2009 Co-Instructor, Department of Biology
~Comparative Physiology Laboratory Lecture (1 semester)
2007-2009 Laboratory Instructor, Department of Biology
~Comparative Physiology Laboratory (3 semesters)
5 students Undergraduate Research Supervisor, Department of Biology
~Direct research supervisor of Honor Thesis/Independent Study Students

Belmont Abbey College

2004-2006 Laboratory Assistant, Department of Biology
~Introduction to Biology Laboratory (4 semesters)
2004-2006 Teaching Assistant, Department of Mathematics
~College Algebra (4 semesters)

Highland High School (SLC, UT)

2010-2011 NSF GK-12 Educational Outreach Teaching Fellow
~AP Environmental Science

Professional and Academic Service

2017-present	Administration and maintenance of shared equipment; Dept. of Biosciences, Swansea University
2011-present	Referee for <i>Evolution</i> , <i>PLoS ONE</i> , <i>Ecology & Evolution</i> , <i>Functional Ecology</i> , <i>BMC Genomics</i> , <i>BMC Biology</i> , <i>Proceeding of Royal Society B</i> , <i>Giga Science</i>
2014	Discussion Leader, Genes & Behavior, Gordon Research Conference
2014	Associate Chair, Genes & Behavior, Gordon Research Seminar
2013	Judge- Best Student Presentation, SICB, Division of Animal Behavior
2011	Panel Discussion Member, “What to expect as a TGLL Fellow”, University of Utah, NSF Educational Outreach Fellowship Workshop
2011	Panel Discussion Member, “Partnering with Public School Teachers”, University of Utah, NSF Educational Outreach Fellowship Workshop
2010-2011	Vice-Chair, Graduate Student Advisement Committee, University of Utah, Department of Biology ~Biology Graduate Student Government Committee
2010-2014	4 times- Chaired oral presentation sessions at academic conferences
2009-2010	Retention/Promotion/Tenure Committee, University of Utah, Department of Biology ~Synthesized graduate student experiences and input for professor eligible for R.P.T. ~Chair, Graduate Student R.P.T. Committee
2008-2009	Graduate Improvement Committee, University of Utah, Department of Biology ~Co-founded committee to suggest improvements of the graduate program and increase recruiting.
2006-2008	Communication Committee (Graduate Student Representative), University of Utah, Department of Biology ~Revised rules for inviting speakers for both faculty and graduate student body.

Community Outreach

2012-2013	Science Fair Mentor, NorthStar Academy, Salt Lake City: The Genetic Basis of Endurance Running
2010-2011	3 times- Science Fair Judge for Schools in Salt Lake City School District
2011	1 time- Science Fair Judge for Salt Lake District Science Fair