Christopher B. Cunningham

Lecturer (Assistant Professor)
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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 (Tenure-Track 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 group interrogates the evolution and mechanistic basis of behavior. I am specifically interested in social behaviors, such as, parental care. My research uses a variety of methods and -omics techniques concentrating on understanding the contributions of molecular genetics, genomics, and epigenetics.

Published Manuscripts in Referred Journals

2019 Morris JS, **Cunningham CB**, Carrier DR. Sexual dimorphism in postcranial skeletal shape suggests male-biased specialization for physical competition in anthropoid primates. *Journal of Morphology* 280, 731-738.

2019 **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. *Journal of Experimental Biology* 222, jeb188649.

2019 Benowitz KM, McKinney EC, **Cunningham CB**, Moore AJ. Predictable gene expression related to behavioral variation in parenting. *Behavioural Ecology* 30, 402-407.

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)

2019 **Cunningham CB**, Khana D, Carter A, McKinney EC, Moore AJ. Neurotransmitter receptor changes into and out of parental care.

Research and Academic Grants ()

2019 *Curious Science, Health Outcomes*. College of Arts Strategic Research Allocation. Co-Investigator, U of Glasgow. £2,090.

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. £19,800

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

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

2018 University of St. Andrews, Centre for Biological Diversity
2018 Oxford Brookes University, Department of Biological and Medical Sciences
2017 University of Cambridge, Dept. of Zoology
2017 Swansea University, Dept. of Biosciences
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 a biotechnology/industrial partner, Provair Science
- Current: PhD Candidate (Jiggins Lab), University of Cambridge, Dept. of Zoology

Teaching Experience

Swansea University
2018 Instructor, Department of Biosciences
BIO258 - Animal Physiology
BIO340 – Professional Laboratory Skills
BIO350 – Independent Research Project

University of Georgia
11 students Undergraduate Research Supervisor, Department of Genetics
~Direct research supervisor of Honor Thesis/Independent Study Students
- 3 went on to Medical/Physician Assistant School
- 3 went on to 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

2019 National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP) proposal reviewer (Genetics & Neuroscience)
2017-present Administration and maintenance of shared equipment; Dept. of Biosciences, Swansea University
2011-present Referee for *Nature Communications, Evolution*, *PLoS ONE, Ecology & Evolution, Functional Ecology, BMC Genomics, BMC Biology, Proceeding of Royal Society B, Giga Science*
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
2010-2011 Vice-Chair, Graduate Student Advisement Committee, University of Utah, Department of Biology
~Biology Graduate Student Government Committee
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

2019 Curious Science, Healthy Outcomes Pilot Project
~ 2 visits to elementary school to give interactive presentation about value of Basic Research, Glasgow, Scotland
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