

Terry R. Dial
Curriculum Vitae

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Education

Ph.D. 2016, Ecology and Evolutionary Biology, Brown University

M.S. 2010, Biology, University of Utah

B.S. 2007, Biology, Loyola Marymount University

Academic Appointments

2022 – present: Professional Practice Assistant Professor, Utah State University

2019 – present: Affiliate, University of Montana

2020 – 2023: Research Associate, Harvard University

2020 – 2022: Instructor, Utah State University

2019 – 2020: Laboratory Specialist, Utah State University

2017 – 2020: Postdoctoral Fellow, Harvard University

2016 – 2019: Course Instructor: Ecology, Evolution and Conservation of East Africa, Brown University and University of Montana

2016 – 2017: Postdoctoral Research Associate, Brown University

2013 – 2016: Teaching Assistant, Human Anatomy, Alpert Medical School, Brown University

2012 – 2013: Teaching Assistant, Evolution Lecture, Ecology and Evolutionary Biology, Brown University

2011 – 2012: Research Assistant, for Dr. Elizabeth Brainerd, EEB, Brown University

2008 – 2010: Teaching Assistant, Comparative Anatomy Lab, Department of Biology, University of Utah

2007 – 2008: Teaching Assistant, Animal Design and Evolution Lab, Division of Biological Sciences, University of Montana

2006 – 2007 Research Fellow, Dr. David Poulsen Neurobiology laboratory, University of Montana

2005 – 2007: Teaching Assistant, General Biology Lab, Department of Biology, Loyola Marymount University

Publications

Peer-reviewed publications

Matthews, D.G., Reznick, D.N. and **Dial, T.R.** *accepted*. Trophic niche drives the evolution of craniofacial shape in Trinidadian guppies. Submitted to the journal *Evolution*.

Dial, T.R., Collins, L.A, Liao, J.C. and Tobalske, B.W. *in prep*. Ontogeny of flow refuging in Rainbow trout. In preparation for the *Journal of Experimental Biology*

Avery, T.M., Matthews, D.G. and **Dial, T.R.** *in prep*. Intramandibular joint disrupts morphological integration of guppy oral jaws. In preparation for the journal *Functional Ecology*

Mayerl, C.J. *, **Dial, T.R.***, Mainwaring, M.C., Heers, A.M. and German, R.Z. 2023. Birth and the pathway to adulthood: integration across development, environment, and evolution. *Integrative and Comparative Biology*, 63(3): 548-556. DOI: 10.1093/icb/icad101
*Co-first author

Matthews, D.G., **Dial, T.R.** and Lauder, G.V. 2023. Genes, morphology, performance, and fitness: quantifying organismal performance to understand adaptive evolution. *Integrative and Comparative Biology*, 63(3): 843-859. DOI: 10.1093/icb/icad096

Dial, T.R. and Lauder, G.V. 2020. Longer development provides first-feeding fish time to escape hydrodynamic constraints. *Journal of Morphology* 281(8): 956-969. DOI: 10.1002/jmor.21224

Dial, T.R., Reznick, D.N. and Brainerd, E.L. 2017. Heterochrony in the evolution of offspring size: maturation along a uniform ontogenetic trajectory. *Proceedings of the Royal Society B* 20171319.

Dial, T.R., Hernandez, L.P. and Brainerd, E.L. 2017. Morphological and functional maturity of the oral jaw covaries with offspring size in Trinidadian guppies. *Scientific Reports* 7:5771 1-10 (DIO:10.1038/s41598-017-06414-6).

Dial, T.R., Reznick, D.N. and Brainerd, E.L. 2016. Effects of neonatal size on maturity and escape performance in the Trinidadian guppy. *Functional Ecology* 30:943–952 (DOI:10.1111/1365-2435.12565).

Dial, T.R. and Carrier, D.R. 2012. Precocial hindlimbs and altricial forelimbs: the partitioning of ontogenetic strategies in mallards (*Anas platyrhynchos*). *Journal of Experimental Biology* 215: 3703-3710 (doi:10.1242/jeb.057380).

Dial, T.R., Heers, A.M. and Tobalske, B.W. 2012. Ontogeny of aerodynamics in mallards: comparative performance and developmental implications. *Journal of Experimental Biology* 215: 3693-3702 (doi:10.1242/jeb.062018).

Dial, K.P., Randall R.J. and **Dial, T.R.** 2006. What use is half a wing in the ecology and evolution of birds? *BioScience* 56: 437-445.

Book chapters

Dial, K.P., Heers, A.M. and **Dial, T.R.** 2015. Ontogenetic and evolutionary transformations in avian locomotion: the ecological significance of incipient structures. In: K.P. Dial, N.H. Shubin, E.L. Brainerd (eds.), *Great Transformations in Vertebrate Evolution*. University of Chicago Press, Chicago.

Grants

Funded

- Pathways to Adulthood: Environmental, developmental and evolutionary influences on the ontogeny of form and function. Company of Biologists. \$5126, 2023
- Collecting Trinidadian guppy fish to study environmental plasticity in craniofacial adaptation, Putnam Exploration Grant, \$5304, 2021
- Experimental miniaturization of guppy offspring. Doctoral Dissertation Improvement Grant, National Science Foundation, \$17,197, 2016
- Experimental miniaturization of guppy offspring. Dissertation Development Grant, Brown University, \$5000, 2015

Unfunded

- On the edge of function: immaturity and hydrodynamics of suction feeding in larval fishes. NSF Postdoctoral Research Fellowship in Biology, \$138,000, 2018
- Hibbitt Early Fellows Program, Marine Biological Laboratories, 2017
- Darwin Fellowship, University of Massachusetts, Amherst, 2017
- On the edge of function: immaturity and hydrodynamics of suction feeding in larval fishes. NSF Postdoctoral Research Fellowship in Biology, \$138,000, 2017
- Experimental miniaturization of guppy offspring. Doctoral Dissertation Improvement Grant, National Science Foundation, \$20,954, 2015

Awards/Distinctions

- Student Representative, Ecology Search Committee, Department of Biology, Loyola Marymount University, 2006

- President-Selected Student Representative, “Right time, right place” Campaign, Loyola Marymount University, 2006
- Summer Undergraduate Research Fellow, University of Montana, 3-month stipend amounting \$4000, 2006
- McLaughlin Family Foundation Scholarship, Loyola Marymount University, awarded \$10,000, 2005-2006

Courses taught (instructor of record)

- BIOL 2420 Human Physiology, Spring 2024, Utah State University Moab
- BIOL 2320 Human Anatomy, Fall 2023, Utah State University Moab
- ENVS 4950 Colorado River Science, Fall 2023, Utah State University Moab
- BIOL 2420 Human Physiology, Spring 2023, Utah State University Moab
- NR 6580 Data Analysis and Programming for Natural Resource Management, Spring 2023, MNR Program, Utah State University
- BIOL 2320 Human Anatomy, Fall 2022, Utah State University Moab
- BIOL 2420 Human Physiology, Spring 2022, Utah State University Moab
- BIOL 2320 Human Anatomy, Fall 2021, Utah State University Moab
- BIOL 2420 Human Physiology laboratory, Spring 2021, Utah State University Moab
- BIOL 2320 Human Anatomy, Fall 2020, Utah State University Moab
- BIOL 2420 Human Physiology laboratory, Spring 2020, Utah State University Moab
- BIOL 2320 Human Anatomy laboratory, Fall 2019, Utah State University Moab
- Ecology, Evolution and Conservation of East Africa, Fall 2018, Brown University and University of Montana
- Ecology, Evolution and Conservation of East Africa, Fall 2016, Brown University and University of Montana

Mentoring (Directed Student Learning)

- Lauren Houstoun, USU MS Biology Department, Committee member Fall 2023 – Slug-eating snake craniofacial morphology
- Valerie Gil, USU MNR Capstone Chair, Spring 2023 – Salmonid ecology and conservation
- Jeremiah Cabrera, Honors Research Thesis Committee California State University Los Angeles – Feathers vs. Flight
- Leila Hatier, Honors Research Thesis Committee California State University Los Angeles - The Ontogeny of Wings and Feathers in Flightless Indian Runner Ducks
- Dave Matthews, Harvard graduate student – Trinidadian guppy craniofacial development and quantitative genetics, zebrafish developmental pathway expression experiment
- Tess Avery, Harvard undergraduate – fish craniofacial morphometrics
- Natividad Chen, Brown undergraduate – art and science of Trinidadian guppies
- Yvonne Fong, Brown undergraduate – fish craniofacial and axial muscle immunohistochemistry

- Trisha Jain, Brown undergraduate – guppy feeding performance and breeding experiment

Presentations

Conference presentations

Dial, T.R., Heers, A.M. and Mainwaring, M.C. 2023. The impact of early life conditions on performance during adulthood: past, present and future. *Integrative and Comparative Biology*: S5.

Matthews, D.G., **Dial, T.R.** and Lauder, G.V. 2023. Effects of altered Wnt expression on craniofacial morphology and feeding performance in zebrafish. *Integrative and Comparative Biology*: S5.

Matthews, D.G., Reznick, D.N. and **Dial, T.R.** 2022. Local adaptation of craniofacial shape in Trinidadian guppies. *Integrative and Comparative Biology*: 93.

Dial, T.R., Collins, L.A., Liao, J.C. and Tobalske, B.W. 2022. Ontogeny of flow refuging in rainbow trout. *Integrative and Comparative Biology*: 94.

Matthews, D.G., Reznick, D.N. and **Dial, T.R.** 2021. Relative effects of genetics and plasticity in benthic-limnetic morphological divergences of Trinidadian guppies. *Evolution*.

Dial, T.R. and Lauder, G.V. 2020. Longer development provides first-feeding fish with the jaw kinematics to escape hydrodynamic constraints. *Integrative and Comparative Biology*: 4-1.

Matthews, D.G., **Dial, T.R.** and Lauder, G.V. 2020. Suction feeding in zebrafish is improved by upregulated Wnt signaling. *Integrative and Comparative Biology*: 4-2.

Dial, T.R. and Lauder, G.V. 2019. Larval fish prey capture: comparing zebrafish and guppies. *Integrative and Comparative Biology*: p1-48.

Dial, T.R. and Brainerd, E.L. 2017. Effects of Feeding Performance on the Limits of Guppy Offspring Size. *Integrative and Comparative Biology*: 1925-610931.

Dial, T.R. Hernandez, L.P. and Brainerd, E.L. 2016. Size, not age, predicts feeding morphology and kinematics among guppy offspring and juveniles. *International Congress of Vertebrate Morphology*.

Dial, T.R., Brainerd, E. L. 2016. Guppy offspring are born at different stages of morphological and functional maturity among populations. *Integrative and Comparative Biology*: 56, E53-E53.

Dial, T.R., Brainerd, E.L. 2014. Perinatal escape performance and morphological scaling of Trinidadian guppies (*Poecilia reticulata*). *Integrative and Comparative Biology*: 54, E265-E265.

Dial, T.R., Summers, A.P. and Brainerd, E.L. 2013. Tradeoffs in anguilliform locomotion over complex substrates in Stichaeid fishes. *Integrative and Comparative Biology*: 53, E276-E276.

Tobalske, B.W., Warrick, D.R., Heers, A.M., **Dial, T.R.** and Crandell, K.R. 2011. Effects of Wing Morphology on Aerodynamics in Birds Revealed Using Revolving-Wing Models. *Integrative and Comparative Biology*: 51, E139-E139.

Dial, T.R. and Carrier, D.R. 2010. Precocial hindlimbs and altricial forelimbs of developing Mallard ducks: A study of locomotor performance and morphometrics. *International Congress of Vertebrate Morphology*.

Dial, T.R. and Carrier, D.R. 2010. Precocial hindlimbs and altricial forelimbs: the modulation of ontogenetic strategies in Mallard ducks. *Integrative and Comparative Biology* 50, E43-E43.

Honorable Mention, D. Dwight Davis Competition.

Invited lectures and Seminars

- Avian Biomechanics and Evolution, Summer Program for Bioinspired Engineering, George Washington University, Summer 2021
- Functional and hydrodynamic constraints on offspring size in fishes, Utah State University Biology Department Seminar, Fall 2020
- Ecology and Evolution of East Africa Research Projects symposium report, Ecology and Evolutionary Biology Department, Brown University, Spring 2019
- Morphological and functional development among Trinidadian guppy offspring, Darwin Fellowship, Albertson Lab group interview, University of Massachusetts, Amherst, Spring 2017
- Ecology and Evolution of East Africa Research Projects symposium report, Ecology and Evolutionary Biology Department, Brown University, Spring 2017
- Morphological and functional development among Trinidadian guppy offspring, Hibbitt Early Careers Fellowship program interview, Roger Hanlon laboratory, Marine Biological Laboratories, Winter 2016
- Morphological and functional development among Trinidadian guppy offspring, Miller Fellowship interview, Berkeley University, Summer 2016
- Gut Embryology, Gross Anatomy, MED 2160, Alpert Medical School, 2015
- Pelvis, Gross Anatomy, MED 2160, Alpert Medical School, 2014
- The mechanics and origins of avian flight
Comparative Vertebrate Morphology lecture, University of Utah, 2009
- What use is half a wing in the origin of flight?
Comparative Vertebrate Morphology lecture, University of Utah, 2008

Societies

- American Association for the Advancement of Science 2018-present
- Atlantic Salmon Federation 2016 - present
- American Society of Naturalists, 2014 - present
- Society for the Study of Evolution, 2013 - present
- International Congress of Vertebrate Morphology, 2010 – present
- Society of Integrative and Comparative Biology, 2007 – present
- *Sigma Xi* Biology Honors Society, 2007
- *Alpha Sigma Nu* Jesuit Honors Society, 2006
- *Beta Beta Beta* Biology Honors Society, 2004

Synergistic Activities

- Member: Development Committee, Society of Integrative and Comparative Biology (SICB; 2017-2021; 2023-present); Chair starting in 2025
- Session Chair, Society of Integrative and Comparative Biology, 2023, Complementary to S5: Pathways to Adulthood: Environmental, Developmental, and Evolutionary Influences on the Ontogeny of Form and Function
- Moderator, Science Moab hosting Science on Screen with Dr. Sasha Reed, Movie: Don't Look Up (summer 2022)
- Co-creator, Arches GeoTour, collaboration with Chris Benson (USGS), Science Moab and Moab Festival of Science (2021) (<https://sciencemoab.org/geotours/>)
- Moderator, Science Moab hosting Science on Screen with Dr. Jayne Belnap, Movie: The Martian (summer 2021)
- Mentor, Utah State University Statewide Faculty-to-Student Mentoring Program (2020-present)
- Judge, Science Fair, Moab Charter School (March 2021)
- Co-creator, Moab Geology Podcast driving tour, collaboration with Chris Benson (USGS), Science Moab and Moab Festival of Science 2020 (<https://sciencemoab.org/geotours/>)
- Co-leader of field course 'Ecology, Evolution and Conservation of East Africa' through Brown University and the University of Montana (2016-2019)
- President, Graduate Student Association (2015), Department of Ecology and Evolutionary Biology, Brown University.
- Teaching assistant for field course 'Ecology and Evolution of East Africa' through the University of Montana (2009-2015)
- Vice president, Graduate Student Association (2014), Department of Ecology and Evolutionary Biology, Brown University.
- Graduate Teaching Assistant for Marine Science Club at Paul Cuffee High School, Providence, RI (2012-2016). Collaborating with high school teachers to teach a weekly science club focused on the biology of fishes.
- Assistant and interviewee, NOVA-PBS special on the evolution of flight (Summer 2014)
- Volunteer, tutoring science and math at Boys and Girls Club, Los Angeles CA (2004-2007)

Reviewer

- Journal of Experimental Biology
- Functional Ecology
- Ecology Letters
- PLOS One
- Genetics, Selection and Evolution
- Integrative and Comparative Biology
- Biological Journal of the Linnaean Society

Other interests

- Piloting (1300 hours total time)
 - Pilot in Command type rating (CE 525B)
 - Multiengine, Instrument ratings
- Non-profit, NGO work:
 - Member: Drollinger Family Charitable Foundation (2005-present)