

**C. DARRIN HULSEY**  
University College Dublin  
School of Biology and Environmental Science  
Science Centre West  
Belfield Dublin 4, Ireland

### **Degrees Awarded**

Ph.D. Population Biology  
B.S. Zoology  
B.A. Plan II (Humanities)

University of California-Davis 2004  
University of Texas-Austin 1997  
University of Texas-Austin 1997

### **Place of Birth**

Orange, Texas, USA

### **Nationality**

USA

### **Email**

darrin.hulsey1@ucd.ie

### **Phone**

+353 (089) 607 3981

### **Website**

<http://darrinhulsey.com>

### **Spoken Languages**

English (Native), Spanish (Conversational), German (Functional)

### **Programming Languages**

R (Advanced), Perl (Functional)

### **Orchid ID**

0000-0002-9653-6728

### **Google Scholar Metrics**

(Updated 25 September 2022)

Citations: 6178

h-index: 33

## Publications

- 73) **Hulsey, C.D.** and C.E. Gorman. 2022. Coevolution of the premaxillary ascending process and jaw protrusion in Lake Malawi cichlid fishes. *Hydrobiologia*. (in press). DOI: [10.1007/s10750-022-04949-y](https://doi.org/10.1007/s10750-022-04949-y)
- 72) Masonick, P., A. Meyer, and **C.D. Hulsey**. 2022. Phylogenomic analyses show repeated evolution of hypertrophied lips among Lake Malawi cichlid fishes. *Genome Biology and Evolution*. 14: evac051. DOI: [10.1093/gbe/evac051](https://doi.org/10.1093/gbe/evac051)
- 71) Scherz, M.D., P.K. Masonick, A. Meyer, and **C.D. Hulsey**. 2022. Between a rock and a hard polytomy: phylogenomics of the rock-dwelling mbuna cichlids of Lake Malaŵi. *Systematic Biology*. 71: 741-757. DOI: [10.1093/sysbio/syac006](https://doi.org/10.1093/sysbio/syac006)
- 70) Urban, S., J. Gerwin, **C.D. Hulsey**, A. Meyer, and C. Kratochwil. 2022. The repeated evolution of stripe patterns is correlated with body morphology in the adaptive radiations of East African cichlid fishes. *Ecology and Evolution*. 12: e8568. DOI: [10.1002/ece3.8568](https://doi.org/10.1002/ece3.8568)
- 69) MacGuigan, D.J., C.W. Hoagstrom, S. Domisch, **C.D. Hulsey**, and T.J. Near. 2021. Integrative ichthyological species delimitation: reconciling genetic, phenotypic, environmental, and biogeographic evidence in the Greenthroat Darter complex (Percidae: Etheostomatinae). *Zoologica Scripta*. 50: 707-733. DOI: [10.1111/zsc.12504](https://doi.org/10.1111/zsc.12504)
- 68) Xiong, P., **C.D. Hulsey**, C. Fruciano, W.Y. Wong, A. Nater, A.F. Kautt, O. Simakov, M. Pippel, S. Kuraku, A. Meyer, and P. Franchini. 2021. The comparative genomic landscape of adaptive radiation in crater lake cichlid fishes. *Molecular Ecology*. 30: 955-972. DOI: [10.1111/mec.15774](https://doi.org/10.1111/mec.15774)
- 67) Kautt, A.F., C.F. Kratochwil, C.F., A. Nater, G. Machado-Schiaffino, M. Olave, F. Henning, J. Torres-Dowdall, A. Härer, **C.D. Hulsey**, P. Franchini, M. Pippel, G. Myers, and A. Meyer. 2020. Contrasting signatures of genomic divergence in rapidly speciating crater lake cichlid fishes. *Nature*. 588: 106-111. DOI: [10.1038/s41586-020-2845-0](https://doi.org/10.1038/s41586-020-2845-0)
- 66) Karagic, N., R.F. Schneider, A. Meyer, and **C.D. Hulsey**. 2020. A genomic cluster with novel and conserved genes is associated with cichlid dental developmental convergence. *Molecular Biology and Evolution*. 37: 3165–3174. DOI: [10.1093/molbev/msaa153](https://doi.org/10.1093/molbev/msaa153)
- 65) Karagic, N., A. Meyer, and **C.D. Hulsey**. 2020. Phenotypic plasticity in vertebrate dentitions. *Integrative and Comparative Biology*. 60: 608-618. DOI: [10.1093/icb/icaa077](https://doi.org/10.1093/icb/icaa077)
- 64) Gorman, C.E. and **C.D. Hulsey**. 2020. Non-trophic functional ecology of vertebrate teeth: a review. *Integrative and Comparative Biology*. 60: 665-675. DOI: [10.1093/icb/icaa086](https://doi.org/10.1093/icb/icaa086)
- 63) **Hulsey, C.D.**, K.E. Cohen, Z. Johanson, N. Karagic, A. Meyer, C.T. Miller, A. Sadier, A.P. Summers, and G.J. Fraser. 2020. Grand challenges in comparative tooth biology. *Integrative and Comparative Biology*. 60: 563-580. DOI: [10.1093/icb/icaa038](https://doi.org/10.1093/icb/icaa038)

## Publications (continued)

- 62) **Hulsey, C.D.**, A. Meyer, and J.T. Streebman. 2020. Convergent evolution of cichlid fish pharyngeal jaw dentitions in mollusk-crushing predators: comparative x-ray computed tomography of tooth sizes, numbers, and replacement. *Integrative and Comparative Biology*. 60: 656-664. DOI: [10.1093/icb/icaa077](https://doi.org/10.1093/icb/icaa077)
- 61) Fraser, G.J. and **C.D Hulsey**. 2020. Biology at the cusp: teeth as a model phenotype for integrating developmental genomics, biomechanics, and ecology. *Integrative and Comparative Biology*. 60: 559-562. DOI: [10.1093/icb/icaa104](https://doi.org/10.1093/icb/icaa104)
- 60) Franchini, P., P. Xiong, C. Fruciano, R.F. Schneider, J.M. Woltering, **C.D. Hulsey**, and A. Meyer. 2019. MicroRNA gene regulation in the extremely young and parallel adaptive radiations of Nicaraguan crater lake cichlid fish. *Molecular Biology and Evolution*. 36: 2498-2511. DOI: [10.1093/molbev/msz168](https://doi.org/10.1093/molbev/msz168)
- 59) Xiong, P., R.F. Schneider, **C.D. Hulsey**, A. Meyer, and P. Franchini. 2019. Conservation and novelty in the microRNA genomic landscape of hyperdiverse cichlid fishes. *Scientific Reports*. 9: 13848. DOI: [10.1038/s41598-019-50124-0](https://doi.org/10.1038/s41598-019-50124-0)
- 58) **Hulsey, C.D.**, M.E. Alfaro, J. Zheng, A. Meyer, and R. Holzman. 2019. Pleiotropic jaw morphology links the evolution of mechanical modularity and functional feeding convergence in Lake Malawi cichlids. *Proceedings of the Royal Society Series B*. 286: 20182358. DOI: [10.1098/rspb.2018.2358](https://doi.org/10.1098/rspb.2018.2358)
- 57) Bell, K., C. Nice, and **C.D. Hulsey**. 2019. Population genomic evidence reveals subtle patterns of differentiation in the trophically polymorphic Cuatro Ciénegas Cichlid, *Herichthys minckleyi*. *Journal of Heredity*. 110: 361-369. DOI: [10.1093/jhered/esz004](https://doi.org/10.1093/jhered/esz004)
- 56) Kratochwil, C.F., Y. Liang, J. Gerwin, J.M. Woltering, S. Urban, F. Henning, G. Machado-Schiaffino, **C.D. Hulsey**, and A. Meyer. 2018. Agouti related peptide 2 facilitates convergent evolution of stripe patterns across cichlid fish radiations. *Science*. 362: 457-460. DOI: [10.1126/science.aao6809](https://doi.org/10.1126/science.aao6809)
- 55) **Hulsey, C.D.**, J. Zheng, R. Holzman, M.E. Alfaro, M. Olave, and A. Meyer. 2018. Phylogenomics of a putatively convergent novelty: Did hypertrophied lips evolve repeatedly in Lake Malawi cichlid fishes? *BMC Evolutionary Biology*. 18: 179. DOI: [10.1186/s12862-018-1296-9](https://doi.org/10.1186/s12862-018-1296-9)
- 54) **Hulsey, C.D.**, R. Holzman, and A. Meyer. 2018. Dissecting a potential spandrel of adaptive radiation: Body depth and pectoral fin ecomorphology coevolve in Lake Malawi cichlid fishes. *Ecology and Evolution*. 8: 11945-11953. DOI: [10.1002/ece3.4651](https://doi.org/10.1002/ece3.4651)
- 53) Xiong, P., **C.D. Hulsey**, A. Meyer, and P. Franchini. 2018. Evolutionary divergence of 3' UTRs in cichlid fishes. *BMC Genomics*. 19: 433. DOI: [10.1186/s12864-018-4821-8](https://doi.org/10.1186/s12864-018-4821-8)

## Publications (continued)

- 52) **Hulsey, C.D.**, G. Machado-Schiaffino, L. Keicher, D. Ellis-Soto, F. Henning, and A. Meyer. 2017. The integrated genomic architecture and evolution of dental divergence in East African cichlid fishes (*Haplochromis chilotes* x *H. nyererei*). **G3: Genes, Genomes, Genetics**. 7: 3195-3202. DOI: [10.1534/g3.117.300083](https://doi.org/10.1534/g3.117.300083)
- 51) **Hulsey, C.D.**, J. Zheng, B.C. Faircloth, A. Meyer, and M.E. Alfaro. 2017. Phylogenomic analysis of Lake Malawi cichlid fishes: further evidence that the three-stage model of diversification does not fit. **Molecular Phylogenetics and Evolution**. 114: 44-48. DOI: [10.1016/j.ympev.2017.05.027](https://doi.org/10.1016/j.ympev.2017.05.027)
- 50) Holzman, R. and **C.D. Hulsey**. 2017. Mechanical transgressive segregation and the rapid origin of trophic novelty. **Scientific Reports**. 7: 40306. DOI: [10.1038/srep40306](https://doi.org/10.1038/srep40306)
- 49) **Hulsey, C.D.**, G.J. Fraser, and A. Meyer. 2016. Biting into the genome to phenome map: developmental genetic modularity of cichlid fish dentitions. **Integrative and Comparative Biology**. 56: 373-388. DOI: [10.1093/icb/icw059](https://doi.org/10.1093/icb/icw059)
- 48) **Hulsey, C.D.**, K. Bell, F.J. García de Leon, C. Nice, and A. Meyer. 2016. Do relaxed selection and habitat temperature facilitate biased mitogenomic introgression in a narrowly endemic fish? **Ecology and Evolution**. 6: 3684-3698. DOI: [10.1002/ece3.2121](https://doi.org/10.1002/ece3.2121)
- 47) McGee, M.D., B.C. Faircloth, S.R. Borstein, J. Zheng, **C.D. Hulsey**, P.C. Wainwright, and M.E. Alfaro. 2016. Replicated divergence in cichlid radiations mirrors a major vertebrate innovation. **Proceedings of the Royal Society Series B**. 283: 20151413. DOI: [10.1098/rspb.2015.1413](https://doi.org/10.1098/rspb.2015.1413)
- 46) **Hulsey, C.D.**, F.J. García de León, and A. Meyer. 2015. Sexual dimorphism in a trophically polymorphic cichlid fish? **Journal of Morphology**. 276: 1448-1454. DOI: [10.1002/jmor.20433](https://doi.org/10.1002/jmor.20433)
- 45) Higham, T.E., A. Birn-Jeffery, C.E. Collins, **C.D. Hulsey**, and A.P. Russell. 2015. Adaptive simplification and the evolution of gecko locomotion: Morphological and biomechanical consequences of losing adhesion. **Proceedings of the National Academy of Sciences USA**. 112: 809-814. DOI: [10.1073/pnas.1418979112](https://doi.org/10.1073/pnas.1418979112)
- 44) York R.A., C. Patil, **C.D. Hulsey**, J.T. Streebman and R.D. Fernald. 2015. Evolution of bower building in Lake Malawi cichlid fish: Phylogeny, morphology, and behavior. **Frontiers in Ecology and Evolution**. 3: 18. DOI: [10.3389/fevo.2015.00018](https://doi.org/10.3389/fevo.2015.00018)
- 43) Rupp, M.F. and **C.D. Hulsey**. 2014. Influence of substrate orientation on feeding kinematics and performance of algae grazing Lake Malawi cichlid fishes. **Journal of Experimental Biology**. 217: 3057-3066. DOI: [10.1242/jeb.105080](https://doi.org/10.1242/jeb.105080)
- 42) Coghill, L.M., **C.D. Hulsey**, J. Chaves-Campos, F.J. García de Leon, and S.G. Johnson. 2014. Next generation phylogeography of cave and surface *Astyanax mexicanus*. **Molecular Phylogenetics and Evolution**. 79: 368-374. DOI: [10.1016/j.ympev.2014.06.029](https://doi.org/10.1016/j.ympev.2014.06.029)

**Publications (continued)**

- 41) Keck, B.P. and **C.D. Hulsey**. 2014. Continental monophyly of cichlid fishes and the phylogenetic position of *Heterochromis multidentis*. ***Molecular Phylogenetics and Evolution***. 73: 53-59. DOI: [10.1016/j.ympev.2014.01.011](https://doi.org/10.1016/j.ympev.2014.01.011)
- 40) Hollingsworth, P.R. Jr., A.M. Simons, J.A. Fordyce, and **C.D. Hulsey**. 2013. Explosive diversification following a benthic to pelagic shift in freshwater fishes. ***BMC Evolutionary Biology***. 13: 272. DOI: [10.1186/1471-2148-13-272](https://doi.org/10.1186/1471-2148-13-272)
- 39) Douglas, M., B.P. Keck, C. Ruble, M. Petty, J.R. Shute, P. Rakes, and **C.D. Hulsey**. 2013. Pelagic larval duration predicts extinction risk in a freshwater fish clade. ***Biology Letters***. 9: 20130672. DOI: [10.1098/rsbl.2013.0672](https://doi.org/10.1098/rsbl.2013.0672)
- 38) **Hulsey, C.D.** and F.J. García de León. 2013. Introgressive hybridization in a trophically polymorphic cichlid. ***Ecology and Evolution***. 3: 4536-4547. DOI: [10.1002/ece3.841](https://doi.org/10.1002/ece3.841)
- 37) Coghill, L.M., **C.D. Hulsey**, J. Chaves-Campos, F.J. García de León, and S.G. Johnson. 2013. Phylogeography and conservation genetics of a distinct lineage of sunfish in the Cuatro Ciénegas valley of Mexico. ***PLoS One***. 8: e77013. DOI: [10.1371/journal.pone.0077013](https://doi.org/10.1371/journal.pone.0077013)
- 36) Friedman M., B.P. Keck, A. Dornburg, R.I. Eytan, C.H. Martin, **C.D. Hulsey**, P.C. Wainwright, and T.J. Near. 2013. Molecular and fossil evidence place the origin of cichlid fishes long after Gondwanan rifting. ***Proceedings of the Royal Society Series B***. 280: 20131733. DOI: [10.1098/rspb.2013.1733](https://doi.org/10.1098/rspb.2013.1733)
- 35) **Hulsey, C.D.**, R.J. Roberts, Y.H.E. Loh, M.F. Rupp, and J.T. Streebman. 2013. Lake Malawi cichlid evolution along a benthic/limnetic axis. ***Ecology and Evolution***. 3: 2262-2272. DOI: [10.1002/ece3.633](https://doi.org/10.1002/ece3.633)
- 34) **Hulsey C.D.**, B.P. Keck, H. Alamillo, and B.C. O'Meara. 2013. Mitochondrial genome primers for Lake Malawi cichlids. ***Molecular Ecology Resources***. 13: 347-353. DOI: [10.1111/1755-0998.12066](https://doi.org/10.1111/1755-0998.12066)
- 33) Parnell, N.F., **C.D. Hulsey**, and J.T. Streebman. 2012. The genetic basis of a complex functional system. ***Evolution***. 66: 3352-3366. DOI: [10.1111/j.1558-5646.2012.01688.x](https://doi.org/10.1111/j.1558-5646.2012.01688.x)
- 32) Holzman, R., D.C. Collar, S.A. Price, **C.D. Hulsey**, R.C. Thomson, and P.C. Wainwright. 2012. Biomechanical trade-offs bias rates of evolution in the feeding apparatus of fishes. ***Proceedings of the Royal Society Series B***. 279: 1287-1292. DOI: [10.1098/rspb.2011.1838](https://doi.org/10.1098/rspb.2011.1838)
- 31) Chaves-Campos, J., S.G. Johnson, and **C.D. Hulsey**. 2011. Spatial geographic mosaic in an aquatic predator-prey network. ***PLoS One***. 6: e22472. DOI: [10.1371/journal.pone.0022472](https://doi.org/10.1371/journal.pone.0022472)
- 30) Hollingsworth, P.R. Jr. and **C.D. Hulsey**. 2011. Reconciling gene trees of eastern North American minnows. ***Molecular Phylogenetics and Evolution***. 61: 149-156. DOI: [10.1016/j.ympev.2011.05.020](https://doi.org/10.1016/j.ympev.2011.05.020)

## Publications (continued)

- 29) **Hulsey, C.D.** and P.R. Jr. Hollingsworth. 2011. Do constructional constraints influence cyprinid (Leuciscine: Cyprinidae) craniofacial coevolution? *Biological Journal of the Linnean Society*. 103: 136-146. DOI: [10.1111/j.1095-8312.2011.01628.x](https://doi.org/10.1111/j.1095-8312.2011.01628.x)
- 28) **Hulsey, C.D.** and H. López-Fernández. 2011. Chapter 17: Historical biogeography of the fishes of Nuclear Central America. in *Historical Biogeography of Neotropical Freshwater Fishes* (eds. James Albert and Roberto Reis). University of California Press.
- 27) Chaves-Campos, J., S.G. Johnson, F.J. García de León, and **C.D. Hulsey**. 2011. Phylogeography, genetic structure, and gene flow in the endemic freshwater shrimp *Palaemonetes suttkusi* from Cuatro Ciénegas, Mexico. *Conservation Genetics*. 557-567. DOI: [10.1371/journal.pone.0173356](https://doi.org/10.1371/journal.pone.0173356)
- 26) **Hulsey, C.D.**, B.P. Keck, and P.R. Jr. Hollingsworth. 2011. Species tree estimation and the historical biogeography of heroine cichlids. *Molecular Phylogenetics and Evolution*. 58: 124-131. DOI: [10.1016/j.ympev.2010.11.016](https://doi.org/10.1016/j.ympev.2010.11.016)
- 25) **Hulsey, C.D.**, P.R. Jr. Hollingsworth, and J.A. Fordyce. 2010. Temporal diversification of Central American cichlids. *BMC Evolutionary Biology*. 10: 279. DOI: [10.1186/1471-2148-10-279](https://doi.org/10.1186/1471-2148-10-279)
- 24) **Hulsey, C.D.**, P.R. Jr. Hollingsworth, and R. Holzman. 2010. Co-evolution of the premaxilla and jaw protrusion in cichlid fishes (Heroine: Cichlidae). *Biological Journal of the Linnean Society*. 100: 619-629. DOI: [10.1186/1471-2148-10-279](https://doi.org/10.1186/1471-2148-10-279)
- 23) **Hulsey, C.D.**, M.C. Mims, N.F. Parnell, and J.T. Streelman. 2010. Comparative rates of lower jaw diversification in cichlid adaptive radiations. *Journal of Evolutionary Biology*. 23: 1456-1467. DOI: [10.1111/j.1420-9101.2010.02004.x](https://doi.org/10.1111/j.1420-9101.2010.02004.x)
- 22) Mims, M.C., **C.D. Hulsey**, B.M. Fitzpatrick, and J.T. Streelman. 2010. Geography disentangles introgression from ancestral polymorphism in Lake Malawi cichlids. *Molecular Ecology*. 19: 940-951. DOI: [10.1111/j.1365-294X.2010.04529.x](https://doi.org/10.1111/j.1365-294X.2010.04529.x)
- 21) **Hulsey, C.D.** 2009. Cichlid genomics and phenotypic diversity in a comparative context. *Integrative and Comparative Biology*. 49: 618-629. DOI: [10.1093/icb/icp071](https://doi.org/10.1093/icb/icp071)
- 20) **Hulsey, C.D.** and S.C.P. Renn. 2009. Genomics and vertebrate adaptive radiation: a celebration of the first cichlid genome. *Integrative and Comparative Biology*. 49: 613-617. DOI: [10.1093/icb/icp039](https://doi.org/10.1093/icb/icp039)
- 19) Fraser, G.J., **C.D. Hulsey**, R.F. Bloomquist, K. Uyesugi, N.R. Manley, and J.T. Streelman. 2009. An ancient gene network is co-opted for teeth on old and new jaws. *PLoS Biology*. 7: e1000031. DOI: [10.1371/journal.pbio.1000031](https://doi.org/10.1371/journal.pbio.1000031)
- 18) **Hulsey C.D.**, R.J. Roberts, A.S.P Lin, R. Guldberg, and J.T. Streelman. 2008. Convergence in mechanically complex phenotype: Detecting structural adaptations for crushing in cichlid fish. *Evolution*. 62: 1587-1599. DOI: [10.1111/j.1558-5646.2008.00384.x](https://doi.org/10.1111/j.1558-5646.2008.00384.x)

## Publications (continued)

- 17) Parnell, N.F., **C.D. Hulsey**, and J.T. Streebman. 2008. Hybridization produces novelty when the mapping of form to function is many to one. ***BMC Evolutionary Biology***. 8: 122. DOI: [10.1186/1471-2148-8-122](https://doi.org/10.1186/1471-2148-8-122)
- 16) **Hulsey, C.D.**, M.C. Mims, and J.T. Streebman. 2007. Do constructional constraints influence cichlid craniofacial diversification? ***Proceedings of the Royal Society Series B***. 274: 1867-1875. DOI: [10.1098/rspb.2007.0444](https://doi.org/10.1098/rspb.2007.0444)
- 15) Johnson, S.G., **C.D. Hulsey**, and F.J. García de León. 2007. Spatial mosaic evolution of snail defensive traits. ***BMC Evolutionary Biology***. 7: 50. DOI: [10.1186/1471-2148-7-50](https://doi.org/10.1186/1471-2148-7-50)
- 14) Higham, T.E., **C.D. Hulsey**, O. Rican, and A.M. Carroll. 2007. Feeding with speed: prey capture evolution in cichlids. ***Journal of Evolutionary Biology***. 20: 70-78. DOI: [10.1111/j.1420-9101.2006.01227.x](https://doi.org/10.1111/j.1420-9101.2006.01227.x)
- 13) **Hulsey, C.D.**, F.J. García de León, and R. Rodiles-Hernández. 2006. Micro- and macroevolutionary decoupling of cichlid jaws: a test of Liem's key innovation hypothesis. ***Evolution***. 60: 2096-2109. DOI: [10.1111/j.0014-3820.2006.tb01847.x](https://doi.org/10.1111/j.0014-3820.2006.tb01847.x)
- 12) **Hulsey, C.D.** 2006. Function of a key morphological innovation: fusion of the cichlid pharyngeal jaw. ***Proceedings of the Royal Society Series B***. 273: 669-675. DOI: [10.1098/rspb.2005.3375](https://doi.org/10.1098/rspb.2005.3375)
- 11) **Hulsey, C.D.**, J. Marks, D.A. Hendrickson, C.A. Williamson, A.E. Cohen, and M.J. Stephens. 2006. Feeding specialization in *Herichthys minckleyi*: a trophically polymorphic fish. ***Journal of Fish Biology***. 68: 1-12. DOI: [10.1111/j.0022-1112.2006.01021.x](https://doi.org/10.1111/j.0022-1112.2006.01021.x)
- 10) **Hulsey, C.D.**, G.J. Fraser, and J.T. Streebman. 2005. Evolution and development of complex biomechanical systems: 300 million years of fish jaws. ***Zebrafish***. 2: 243-257. DOI: [10.1089/zeb.2005.2.243](https://doi.org/10.1089/zeb.2005.2.243)
- 9) **Hulsey, C.D.** and F.J. García de León. 2005. Cichlid jaw mechanics: linking morphology to feeding specialization. ***Functional Ecology***. 19: 487-494. DOI: [10.1111/j.1365-2435.2005.00987.x](https://doi.org/10.1111/j.1365-2435.2005.00987.x)
- 8) Wainwright, P.C., M.E. Alfaro, D.I. Bolnick, and **C.D. Hulsey**. 2005. Many-to-one mapping of form to function: a general principle in organismal design. ***Integrative and Comparative Biology***. 45: 256-262. DOI: [10.1093/icb/45.2.256](https://doi.org/10.1093/icb/45.2.256)
- 7) **Hulsey, C.D.**, D.A. Hendrickson, and F.J. García de León. 2005. Trophic morphology, feeding performance, and prey use in the polymorphic fish *Herichthys minckleyi*. ***Evolutionary Ecology Research***. 7: 303-324.
- 6) **Hulsey, C.D.**, F.J. García de León, Y. Sanchez-Johnson, D.A. Hendrickson, and T.J. Near. 2004. Temporal diversification of Mesoamerican cichlid fishes across a major biogeographic boundary. ***Molecular Phylogenetics and Evolution***. 31: 754-764. DOI: [10.1016/j.ympev.2003.08.024](https://doi.org/10.1016/j.ympev.2003.08.024)

### Publications (continued)

- 5) Bolnick, D.I., R. Svanbäck, J.A. Fordyce, L.H. Yang, J.M. Davis, **C.D. Hulsey**, and M.L. Forister. 2003. The ecology of individuals: incidence and implications of individual specialization. *American Naturalist*. 161: 1-28. (\*\*Mercer Award-Ecological Society of America for best ecological research paper by young researchers. 2005). DOI: [10.1086/343878](https://doi.org/10.1086/343878)
- 4) **Hulsey, C.D.** and P.C. Wainwright. 2002. Projecting mechanics into morphospace: disparity in the feeding system of Labrid Fish. *Proceedings of the Royal Society Series B*. 269: 317-326.
- 3) Wainwright, P.C., L.A. Ferry-Graham, T.B. Waltzek, A.M. Carroll, **C.D. Hulsey**, and J.R. Grubich. 2001. Examination of ram and suction feeding performance in cichlid fishes. *Journal of Experimental Biology*. 204: 3039-3051.
- 2) Ferry-Graham, L.A., P.C. Wainwright, **C.D. Hulsey**, and D.R. Bellwood. 2001. Evolution and mechanics of long jaws in Butterflyfishes (Family Chaetodontidae). *Journal of Morphology*. 248: 120-143. DOI: [10.1002/jmor.1024](https://doi.org/10.1002/jmor.1024)
- 1) Vargo, E.L. and **C.D. Hulsey**. 2000. Multiple glandular origins of queen pheromones in the fire ant *Solenopsis invicta*. *Journal of Insect Physiology*. 46: 1151-1159. DOI: [10.1016/s0022-1910\(99\)00226-7](https://doi.org/10.1016/s0022-1910(99)00226-7)

### Publications (submitted)

Masonick, P., A. Meyer, and **C.D. Hulsey**. 2022. The kiss of deep homology: convergence in the genomic basis of cichlid fish trophic novelties and human cleft lip. *Genome Biology and Evolution*. (submitted)

### Synergistic Activities

**Etnier Ichthyological Collection:** As curator of this fish collection, I contributed to the growth and maintenance of this natural history collection that governmental and non-governmental groups in the Southeastern United States utilize extensively. During this time, we completed the digitization of the collection and made it web-accessible. Additionally, I oversaw the creation and building of a \$50,000 endowment for this collection to contribute to its long-term maintenance and improvement.

**Symposium "Biology at the Cusp: Teeth as a Model Phenotype for Integrating Developmental Genomics, Biomechanics, and Ecology":** I co-organized with Gareth Fraser this symposium at the Society for Comparative and Integrative Biology meeting in Austin in 2020 that discussed the integrative biology of teeth.

**Symposium "The Molecular Basis of Convergent Evolution":** I co-organized with Marie Semon and Yoel Stuart a symposium at the Second Joint Conference on Evolutionary Biology in Montpellier, France in 2018. This symposium centered around the genomic underpinnings of the gains and loss of adaptive traits.

## Synergistic Activities (continued)

**Nimbios Suction Feeding Working Group:** In collaboration with Peter Wainwright and Steven Day, I helped to organize a working group at the U.S. National Institute of Mathematical and Biological Sciences that examined the biomechanics of the suction feeding apparatus in vertebrates.

**Symposium "Genomics and vertebrate adaptive radiation: a celebration of the first cichlid genome":** I co-organized with Suzy Renn a symposium at the Society for Comparative and Integrative Biology meeting in Boston in 2010 that addressed the promise and utility of the first fully sequenced cichlid genome.

## Presentations at Professional Meetings (2015-2022)

- C. D. Hulsey.** 2022. Genomics and convergent evolution of premaxilla morphology during cichlid trophic adaptation. Genomics of Convergence Symposium. Konstanz, Germany.
- Masonick, P., A. Meyer, **C.D. Hulsey.** 2022. Phylogenomics and the evolution of hypertrophied lips in Lake Malawi cichlid fishes. Genomics of Convergence Symposium. Konstanz, Germany.
- Masonick, P., A. Meyer, **C.D. Hulsey.** 2021. Phylogenomics and the evolution of hypertrophied lips in Lake Malawi cichlid fishes. Evolution Meetings, Virtual Conference.
- Masonick, P., A. Meyer, **C.D. Hulsey.** 2021. Phylogenomics and the evolution of hypertrophied lips in Lake Malawi cichlid fishes. DFG Taxonomic Kickoff Meeting, Virtual Conference.
- Hulsey, C.D.** 2020. The evolutionary developmental genetics of vertebrate tooth size. Society for Integrative and Comparative Biology, Austin, TX, USA.
- Karagic, N., A. Meyer, **C.D. Hulsey.** 2020. Plasticity of vertebrate dentitions. Society for Integrative and Comparative Biology, Austin, TX, USA.
- Hulsey, C.D.** 2019. Pleiotropic jaw morphology links the evolution of mechanical modularity and feeding convergence in Lake Malawi cichlids. International Conference of Vertebrate Morphology, Prague, Czech Republic.
- Hulsey, C.D.** 2018. Phylogenomics of Lake Malawi cichlid fish relationships: the evolution of markers from mitochondrial genes, to targeted enrichment, to whole genomes. Pan-African Fish and Fisheries Conference, Mangochi, Malawi.
- Hulsey, C.D.** 2018. Pleiotropic jaw morphology links the evolution of mechanical modularity and feeding convergence in Lake Malawi cichlids. European Society for Evolutionary Biology, Montpellier, France.
- Hulsey, C.D.** 2018. Phylogenomics of Lake Malawi cichlid fish relationships. DFG SPP Taxonomics 2<sup>nd</sup> Annual Meeting, Montpellier, France.
- Hulsey, C.D.** and A. Meyer. 2018. The genomic architecture of a key innovation and evolution of dental divergence in East African cichlid fishes. Society for Integrative and Comparative Biology. San Francisco, CA, USA.

### Presentations at Professional Meetings (2015-2022 continued)

- Hulsey, C.D.**, G. Machado-Schiaffino, L. Keicher, D. Ellis-Soto, F. Henning, and A. Meyer. 2017. Genomic architecture of dental divergence in East African cichlid fishes. Cichlid Science. Prague, Czech Republic.
- Gerwin, J., **C.D. Hulsey**, A. Meyer, C. Kratochwil. 2017. Repeated evolution of adaptive color patterns in cichlid fish. European Society for Evolutionary Biology. Groningen, Netherlands.
- Hulsey, C.D.** and A. Meyer. 2016. Evolutionary consequences of modularity in vertebrate dentitions at multiple levels of biological design. Society for Integrative and Comparative Biology. Portland, OR, USA.
- Hulsey, C.D.**, Bell, K.L, C.C. Nice, F.J. García de Leon, and A. Meyer. 2015. Genetics of jaw divergence in a trophically polymorphic cichlid fish. Society for Molecular Biology and Evolution. Vienna, Austria.
- Hulsey, C.D.** and A. Meyer. 2015. Biomechanical and kinematic evolution of the feeding apparatus in Nicaraguan crater lake cichlids. Society for Experimental Biology. Prague, Czech Republic.

### Invited Seminars

- 2022** Axel Meyer Lab, University of Konstanz, Germany
- 2021** Earth Institute Coffee Morning, University College Dublin, Dublin, Ireland  
School of Biology and Environmental Science, University College Dublin, SBES  
Thursday Lunch Seminar Series, Dublin, Ireland
- 2020** Department of Biology, University of Antwerp, Antwerp, Belgium  
Department of Biology, Christian-Albrechts-Universität zu Kiel, Kiel, Germany  
School of Biological Sciences, University of Bristol, Bristol, UK  
School of Biology and Environmental Science, University College Dublin, Dublin, Ireland
- 2019** Senckenberg Research Institute and Natural History Museum, Frankfurt, Germany  
Senckenberg Natural History Collections, Museum of Zoology, Dresden, Germany  
University of Oviedo, Molecular Genetics Seminar, Oviedo, Spain
- 2018** European Society for Evolutionary Biology. The macroevolutionary dynamics of form-function relationships symposium, Montpellier, France  
DFG Taxonomics Annual Meeting, Montpellier, France
- 2017** University of Hamburg, Center of Natural History Seminar Series, Hamburg, Germany  
Cichlid Science Meeting. Genomic Architecture of Dental Divergence in East African Cichlid Fishes. Cichlid Science. Prague, Czech Republic
- 2016** A Bigger Picture: Organismal Function at the Nexus of Development, Ecology, and Evolution. Society for Integrative and Comparative Biology Symposium. Portland, Oregon, USA
- 2015** Department of Animal and Plant Sciences Seminar Series. Sheffield, United Kingdom  
Aquatic Research Institute Seminar Series (EAWAG). Lucerne, Switzerland  
Department of Biology Seminar Series. University of Konstanz, Germany

### Invited Seminars (continued)

- 2013** Inter-University Institute for Marine Sciences Eilat, Israel  
Ecology and Evolution Seminar Series. University of Tennessee-Knoxville, USA
- 2012** Fish and Wildlife Seminar Series. University of Tennessee-Knoxville, USA
- 2011** Fishhead seminar series. Oak Ridge National Laboratories, USA
- 2010** Evolutionary Morphology Seminar Series. University of Chicago, USA
- 2009** Young Investigators in Aquatic and Fisheries Science. University of Washington, USA  
Ecology and Evolutionary Biology Seminar Series. Brown University, USA  
Biology Department Seminar Series Case Western University, USA
- 2007** Ecology and Evolution Seminar Series. Yale University, USA  
Department of Biology. Florida State University, USA  
Department of Zoology. University of Florida, USA  
Ecology and Evolution Seminar Series. University of Tennessee-Knoxville, USA
- 2006** Evolutionary Biology Series. Konstanz University, Germany
- 2005** Department of Biology Seminar Series. Clemson University, USA
- 2004** Ecology and Evolution Seminar Series. University of New Orleans, USA  
Ecology and Evolution Seminar Series. University of Tennessee-Knoxville, USA  
Population Biology Seminar Series. University of California-Davis, USA  
Biology Departmental Seminar. Texas State University-San Marcos, USA
- 2003** Museum of Vertebrate Zoology and Evolutionary Biology Seminar Series.  
University of California-Berkeley, USA

### Postdoctoral Advisees

- Nicolas Ehemann (2022-current) Konstanz University, Germany
- Paul Masonick (2021-2022) Postdoc at University of California-Riverside
- Mark Scherz (2019-2020) Curator Natural History Museum of Denmark, Denmark
- Peiwen Xiong (2019-2020) Postdoc at Hunan Childrens Hospital, China
- Andreas Härer (2018-2019) Postdoc at University of California-San Diego, USA
- Ryan Martin (2012-2013) Assistant Professor at Case Western University, USA
- Benjamin Keck (2011-2013) Lecturer at the University of Tennessee, USA
- Hugo Alamillo (2010-2011) Assistant Professor at Seattle Community College, USA

### Graduate Student Advisees

- Nidal Karagic (PhD 2022) Dissertation: "Evolutionary developmental genetics of cichlid jaws and teeth"
- Anne Van Humbeeck (MS 2020) Masters: "Modularity of tooth gene expression in cichlid jaws"
- Sarah Weis (MS 2020) Masters: "Tooth gene expression in cichlid fish pharyngeal jaws"
- Phillip Hollingsworth (PhD 2014) Dissertation: "Evolution of North American minnows along a benthic/limnetic axis"

### **Graduate Student Advisees (continued)**

Maxwell Rupp (MS 2014) Masters: "Pectoral fin locomotion in Lake Malawi cichlid fishes"

Morgan Douglas (MS 2013) Masters: "Evolution of pelagic larval duration in freshwater darter fishes"

### **Undergraduate Student Advisees/Researchers**

Kevin Coogan (Ireland), Ceili Cardiff (Ireland), Fatima Elbaruni (Ireland), Joanna Stier (Germany), Patrick Coleman (Germany), Marius Schön (Germany), Antonia Keller (Germany), Johannes Windorfer (Germany), Patrick Beller (Germany), Denise Jansen (Germany), Laurentz Schuhknecht (Germany), Katie Watson (USA), Callie Grabenstein (USA), Meredith Leigh (USA), Benjamin Allen (USA), Denise Kendall (USA), Barry Hedgespeth (USA), Donnie Pickel (USA), Bradley Pruitt (USA), Iman Ferdjallah (USA), Ryan Umphenour (USA), Meryl Mims (USA), Yara Sanchez-Johnson (Mexico)

### **Graduate Classes**

Lab and Lecture in Evolutionary Molecular Biology – 5 Semesters  
Lecture Macroevolution and Comparative Methods – 3 Semesters  
Evolution/Development Journal Club – 7 Semesters  
Seminar in Speciation and Adaptation – 4 Semesters  
Seminar in Evolution of Genomic Architecture – 1 Semester  
Seminar in Human Evolutionary Genomics – 1 Semester  
Genetics for Environmental Science – 1 Semester

### **Undergraduate Classes**

Lab and Lecture in Ichthyology - 4 Semesters  
Lab and Lecture in Vertebrate Biology – 3 Semesters  
Freshman Seminar in Biology of the Hunger Games – 1 Semester  
Evolution Lecture – 6 Semesters  
Developmental Biology – 2 Semesters  
Fundamentals of Biology – 1 Semester

### **Classes Taught as Graduate Teaching Assistant**

Ecology  
Herpetology

### Submitted Grants

\$1000 Genetic Characterization of Native Trout from the Sierra Madre Occidental in Mexico. PIs: A.C. Martínez, **C.D. Hulsey**, F.J. García de León. Desert Fishes Council. 2022.

### Funded Grants

- €444,474 VitaDevo: Angling for a New Model of Osteoimmunology-Environmental Developmental Genetics of Vitamin D in Atlantic Salmon. PI: **C.D. Hulsey** in collaboration with P. McGinnity. Science Foundation Ireland. 2022-2025
- €12,132 Transcriptomics, Anatomy, and Vitamin D in Atlantic Salmon PI: **C.D. Hulsey** in collaboration with P. McGinnity. University College Dublin Seed Funding - Career Development Award. 2022.
- €355,550 Genomics of Hybridization and Species Delimitation in Cichlid Fishes PIs: **C.D. Hulsey** and A. Meyer. Deutsche Forschungsgemeinschaft (German National Science Foundation) SPP 1991 Taxon-Omics: New Approaches for Discovering and Naming Biodiversity. 2020-2023.
- €234,200 The Genomic Architecture of Convergent Snail Crushing Jaws in Cichlid Fishes PI: **C.D. Hulsey**, Deutsche Forschungsgemeinschaft (German National Science Foundation). 2017-2020.
- €358,750 Species Delimitation in East African Cichlid Fish Adaptive Radiations. PIs: A. Meyer and **C.D. Hulsey**. Deutsche Forschungsgemeinschaft (German National Science Foundation) SPP 1991 Taxon-Omics: New Approaches for Discovering and Naming Biodiversity. 2017-2020.
- \$19,250 Swimming Tunnel System. PIs: **C.D. Hulsey** and A. Meyer. University of Konstanz Equipment Grant. 2015-2016.
- \$172,000 Evolution of Functional Novelty. PIs: **C.D. Hulsey** and R. Holzman. US-Israel Bi-National Science Foundation. 2012-2016.
- \$19,221 Phenotypic Plasticity and Evolution in the Pharyngeal Jaw Apparatus. PIs: **C.D. Hulsey** and S.F. Clemmensen. U.S. National Science Foundation. 2013-2014.
- \$161,600 Initiative for Quaternary Paleoclimate Research. PIs: Horn, S., L. Zhenghua, D. Finkelstein, H.D. Grissino-Mayer, L.D. McKay, L. Yingkui, D.G. Anderson, and **C.D. Hulsey**. University of Tennessee Organized Research Unit Funding. 2010-2013.
- \$8500 Light Sources for Vertebrate Biology Classes. PI: **Hulsey, C.D.** University of Tennessee ARAA stimulus funds. 2009.
- \$166,555 Evolutionary Plasticity: Is Remodeling Key to Cichlid Pharyngeal Jaw Diversification? PI: **C.D. Hulsey**. U.S. National Science Foundation. 2009-2011.
- \$15500 Evolution of a Polymorphic Cichlid. PI: **C.D. Hulsey**. National Geographic Research Grant. 2003-2004.
- \$11387 Evolution of a Polymorphic Cichlid in Mexico. PI: **C.D. Hulsey**. University of California UCMexus. 2002-2004.
- \$110,000 Predoctoral Fellowship. U.S. National Science Foundation. 1998-2001.

**\$2,204,667 Total Funding Awarded**