Donovan P. German

Department of Ecology and Evolutionary Biology
University of California
Irvine, CA 92697
dgerman@uci.edu

APPOINTMENTS

July 2017 – Present	Associate Professor, Ecology and Evolutionary Biology, UC Irvine
July 2011 – June 2017	Assistant Professor, Ecology and Evolutionary Biology, UC Irvine
July 2010 – June 2011	UC President's Postdoctoral Fellow, Ecol Evol Biol, UC Irvine
January 2009 – June 2010	Postdoctoral Scholar, Ecol Evol Biol, UC Irvine

EDUCATION

2008	Doctor of Philosophy—Zoology Dissertation advisor: David H. Evans	University of Florida Dissertation: Digestive physiology of wood-eating catfish
2003	Master of Science—Biology Thesis advisor: Michael H. Horn	California State University, Fullerton Thesis: Digestive specialization in prickleback fishes
1999	Bachelor of Arts—Marine Science Research advisor: Michel Boudrias Research advisor: Anne Sturz	University of San Diego Project: Vernal pool community dynamics Project: Geochemistry of geothermal mud pots

RESEARCH INTERESTS

- Resource acquisition and the biochemistry of digestion (Nutritional physiology)
- Genomics and transcriptomics as tools to study physiology
- Microbiomes and their contributions to digestion and metabolism
- Integrative and comparative physiology
- Global change and Biogeochemistry
- Invasive species: their adaptations and effects on biogeochemistry

PUBLICATIONS

59) Herrera, M.J., **D.P. German.** (2023) Intestinal microbiome function. In: *Encyclopedia of Fish Physiology*. C. Bucking (Ed.). Academic Press, San Diego, CA. 12 Pp.

58) **German, D.P.**, M.J. Herrera. (2023) Digestive Efficiency. In: *Encyclopedia of Fish Physiology*. C. Bucking (Ed.). Academic Press, San Diego, CA.12 Pp.

57) Rankins, D.L.[†], M.J. Herrera[†], M.P. Christensen*, A. Chen*, N.Z. Hood[†], J. Heras[§], **D.P. German**. (2023) When digestive physiology doesn't match "diet": *Lumpenus sagitta* (Stichaeidae) is an "omnivore" with a carnivorous gut. *Comparative Biochemistry and Physiology A* 285: 111508

56) Le, N., J. Heras[§], M.J. Herrera[†], **D.P. German**[a], L.T. Crummett[a]. (2023) The genome of *Anoplarchus purpurscens* (Stichaeidae) reflects its carnivorous diet. *Molecular Genetics and Genomics*: *In press* https://doi.org/10.1007/s00438-023-02067-5
[a]These authors contributed equally to this project

55) **German, D.P.**, M.S. Hedrick (2023) Editorial on "Adaptations of nutrient supply organs that fuel the fire of life". *Comparative Biochemistry and Physiology A* 278: 111371

54) Wehrle, B.A.[†], **D.P. German**. (2023) Reptilian digestive efficiency: past, present, and future. *Comparative Biochemistry and Physiology A* 277: 111369

53) Pham, T.*, H. Hong, B. Swig, **D.P. German**, K.M. Connor. (2023) Elevated aerial temperature modulates digestive enzyme activity in *Mytilus caifornianus*. *Comparative Biochemistry and Physiology B* 265: 110865

52) Wright, D.B., M. Escalona, M.P.A. Marimuthu, R. Sahasrabudhe, O. Nguyen, S. Sacco, E. Beraut, E. Toffelmier, C. Miller, H.B. Shaffer, G. Bernardi, and **D.P. German**. (2023) Reference genome of the Monkeyface Prickleback, *Cebidichthys violaceus* (Stichaeidae, Perciformes), a model California intertidal fish. *Journal of Heredity*: *In Press*

51) Leigh, S.C[†], C. Catabay*, **D.P. German.** (2022) Sustained changes in digestive physiology and microbiome across sequential generations of zebrafish fed different diets. *Comparative Biochemistry and Physiology A* 273: 111285

50) Lemieux-Labonté, V.[a], C. Vigliotti[a], S. Dowd, Z. Tadić, B. Wehrle[†], P. Lopez, E. Bapteste, F.-J. Lapointe[b], **D.P. German**[b], A. Herrel[b]. (2022) Proximate drivers of population level lizard gut microbial diversity: impacts of diet, insularity, and local environment. *Microorganisms* (In press)
[a]These authors contributed equally to this paper; [b]These authors contributed equally to this paper

49) Frederick, A.R.[†], B.A. Wehrle[†], A.M. Lee*, C. Catabay*, D. Rankins*, **D.P. German.** (2022) Abalone under moderate heat stress have elevated metabolic rates and changes to digestive enzyme activities. *Comparative Biochemistry and Physiology A* 270: 111230

48) Williams, S., M. Stoskopf, R. Francis-Floyd, L. Koutsos, E. Dierenfeld , T. Harmon, E. Cicotello, **D.P. German**, K. Semmen, J. Keaffaber, F. Olea-Popelka, S. Livingston , K. Sullivan, L. Cersosimo, E. Valdez. (2022) Recommendations and action plans to improve ex-situ nutrition and health of marine teleosts. *Journal of Aquatic Animal Health* 34: 69-81

47) Herrera, M.J.[†], J. Heras[§], **D.P. German**. (2022) Comparative transcriptomics reveal tissue level specialization towards diet in prickleback fishes. *Journal of Comparative Physiology B* 192: 275-295

46) Frederick, A.R.[†], J. Heras[§], C.S. Friedman, **D.P. German**. (2022) Withering syndrome induced gene expression changes and a de-novo transcriptome for Pinto Abalone, *Haliotis kamtschatkana*. *Comparative Biochemistry and Physiology D*: 100930

45) **German, D.P.**, M.R. Rose. (2021) Notes towards an evolutionary biology of nutrition. In: *Nutrition, Food, and Diet in Ageing and Longevity*. Springer Nature, Switzerland. Healthy Ageing and Longevity (springer.com)

44) Leigh, S.C. [†], A.P. Summers, S.L. Hoffmann, **D.P. German**. (2021) Shark Spiral Intestines May Operate as Tesla Valves. *Proceedings of the Royal Society B* 288: 20211359

43) Leigh, S.C. [†], Y. Papastamatiou, **D.P. German**. (2021) Microbial diversity and function of an omnivorous shark. *Marine Biology* 168: 55

42) McCauley, M., **German, D.P**., N.K. Lujan, and C.R. Jackson. (2020) Gut microbiomes of sympatric Amazonian wood-eating catfishes (Loricariidae) reflect host identity but little role in wood digestion. *Ecology and Evolution* 10: 7117-7128

41) Wehrle, B.W. [†], A. Herrel, B-Q Nguyen-Phuc*, S. Maldanado Jr.*, R.K. Dang*, R. Agnihotri*, Z. Tadić, **D.P. German**. (2020) Rapid dietary shift in *Podarcis siculus* resulted in localized changes in gut function. *Physiological and Biochemical Zoology* 93: 396-415

40) Heras, J. [§], M. Chakraborty, J.J. Emerson, **D.P. German**. (2020) Genomic and biochemical evidence of dietary adaptation in a marine herbivorous fish. *Proceedings of the Royal Society B* 287: 20192327

39) Nguyen-Phuc, B.Q*., C. Demetropolous, S. Stewart, P. Saffarinia, J.D. Bastian-Salgado*, E. Hawkins*, A.R. Frederick[†], **D.P. German**. (2021) Nutritional Physiology of Santa Ana sucker, *Catostomus santaanae*: a threatened freshwater fish endemic to southern California. *Acta Zoologica* 102: 105-116

38) Leigh, S.C. [†], Y.P. Papastamatiou, **D.P. German**. (2018) Seagrass digestion by a notorious "carnivore". *Proceedings of the Royal Society B* 285: 20181583

37) Santos, A.[a], A.R. Frederick[a†], B.A. Higgins, A. Carrillo, A. Carter, K.M. Dickson, **D.P. German**, and M.H. Horn. (2018) Egg cannibalism in fishes: the beach-spawning grunion (*Leuresthes tenuis*) eats and digests its own eggs. *Journal of Fish Biology* 93: 282-289
[a] These authors contributed equally to this work

36) Leigh, S.C. [†], B.Q. Nguyen-Phuc*, and **D.P. German**. (2018) The effects of protein and fiber content on digestive tract structure and function in zebrafish (*Danio rerio*). *Journal of Comparative Physiology B* 188: 237-253

35) Leigh, S.C.[†], Y.P. Papastamatiou, and **D.P. German**. (2017) The Nutritional physiology of sharks. *Reviews in Fish Biology and Fisheries* 27: 561-585

34) **German, D.P.**, D. Raven, N.M. Aguilar-Roca. (2017) Floating fishes: an activity investigating overfishing, buoyancy, and gas compressibility. *American Biology Teacher* 79: 49-54

33) Clements, K.D., **D.P. German**, J. Piché, A. Tribollet, and J.H. Choat. (2017) Integrating ecological roles and trophic diversification on coral reefs: multiple lines of evidence identify parrotfishes as microphages. Biological Journal of the Linnean Society 120: 729-751

32) Connor, K. [§], A. Sung*, N.S. Garcia, A. Gracey, and **D.P. German**. (2016) Modulation of digestive physiology and biochemistry in *Mytilus californianus* in response to feeding level acclimation and intertidal microhabitat. *Biology Open* 5: 1200-1210

31) **German, D.P.**[a], D.M. Foti[a§], J. Heras[§], H. Amerkhanian*, and B.L. Lockwood. (2016) Elevated gene copy number does not always explain elevated amylase activities in fishes. *Physiological and Biochemical Zoology* 89: 277-293
[a] these authors contributed equally to this work

30) Jhaveri, P.*, Y. Papastamatiou, and **D.P. German**. (2015) Digestive enzyme activities in the guts of bonnethead sharks (*Shyrna tiburo*) provide insight into their digestive strategy and evidence of microbial digestion in their hindguts. *Comparative Biochemistry and Physiology A* 189: 76-83

29) **German, D.P.**, and S.D. Allison (2015) Drying and substrate concentrations interact to inhibit decomposition of carbon substrates added to combusted Inceptisols from a boreal forest. *Biology and Fertility of Soils* 51: 525-533.

28) **German, D.P**., A Sung*, P.K. Jhaveri*, and R. Agnihotri*. (2015) More than one way to be an herbivore: convergent evolution of herbivory using different digestive strategies in prickleback fishes (family Stichaeidae). *Zoology* 118: 161-170

27) Sullam, K.E., C.M. Dalton, J.A. Russell, S.S. Kilham, R. El-Sabaawi, **D.P. German**, and A.S. Flecker. (2015) Changes in digestive traits and body nutritional composition accommodate a trophic niche shift in Trinidadian guppies. *Oecologia* 177: 245-257.

26) Allison, S.D., S.S. Chacon, and **D.P. German** (2014) Substrate concentration constraints on microbial decomposition. *Soil Biology and Biochemistry* 79: 43-49

25) **German, D.P.**, A.K. Gawlicka, and M.H. Horn. (2014) Evolution of ontogenetic dietary shifts and associated gut features in prickleback fishes (Teleostei: Stichaeidae). *Comparative Biochemistry and Physiology B* 168: 12-18

24) Kim, K.H., M.H. Horn, A.E. Sosa*, and **D.P. German**. (2014) Sequence of an α-amylase gene in four related species of prickleback fishes (Teleostei: Stichaeidae): ontogenetic, dietary, and species level effects. *Journal of Comparative Physiology B* 184: 221-234

23) Bach, C.E.*, D.D. Warnock, D.J. Van Horn, M.N. Weintraub, R.L. Sinsabaugh, S.D. Allison, and **D.P. German**. (2013) Measuring phenol oxidase and peroxidase activities with pyrogallol, L-DOPA, and ABTS: effect of assay conditions and soil type. *Soil Biology and Biochemistry* 67: 183-191

22) Alster, C.J.*, **D.P., German**, Y. Lu, and S.D. Allison (2013) Microbial enzymatic response to drought and to nitrogen addition in a southern California grassland. *Soil Biology and Biochemistry* 64: 68-79

21) **German, D.P.**, M.N. Weintraub, A.S. Grandy, Z.L. Rinkes, C.L. Lauber, and S.D. Allison. (2012) Response to Steen and Ziervogel's comment on "Optimization of hydrolytic and oxidative enzyme methods for ecosystem studies". *Soil Biology and Biochemistry* 48: 198-199

20) **German, D.P.**, K.R.B. Marcelo*, M.M. Stone*, and S.D. Allison. (2012) The Michaelis-Menten kinetics of soil extracellular enzymes in response to temperature: a cross-latitudinal study. *Global Change Biology* 18: 1468-1479

19) Stone, M.M.*, M.S. Weiss, C.L. Goodale, M.B. Adams, I.J. Fernandez, **D.P. German**, and S.D. Allison. (2012) Temperature sensitivity of soil enzyme kinetics under N-fertilization in two temperate forests. *Global Change Biology* 18: 1173-1184

18) Lujan, N.K., **D.P. German**, and K.O. Winemiller. (2011) Do wood grazing fishes partition their niche? Morphological and isotopic evidence for trophic segregation in Neotropical Loricariidae. *Functional Ecology* 25: 1327-1338

17) **German, D.P.**, S.S. Chacon*, and S.D. Allison. (2011) Substrate concentration and enzyme allocation can affect rates of microbial decomposition. *Ecology* 92: 1471-1480

16) **German, D.P.**, M.N. Weintraub, A.S. Grandy, Z.L. Rinkes, C.L. Lauber, and S.D. Allison. (2011) Optimization of hydrolytic and oxidative enzyme methods for ecosystem studies. *Soil Biology and Biochemistry* 43: 1387-1397

15) Day, R.D., **D.P. German**, J.M. Manjakasy, I. Farr, J. Hansen, and I.R. Tibbetts. (2011) Enzymatic digestion in stomachless fishes: how a simple gut accommodates both herbivory and carnivory. *Journal of Comparative Physiology B* 181: 603-613

14) **German, D.P.** (2011) Digestive efficiency. In: *Encyclopedia of Fish Physiology*, *From Genome to Environment*, Farrell A.P. (Ed). Volume 3, Pp. 1596-1607. Academic Press, San Diego, CA

13) Day, R.D., **D.P. German**, and I.R. Tibbetts (2011) Why can't young fish eat plants? Neither digestive enzymes nor gut development preclude herbivory in the young of a stomachless marine herbivorous fish. *Comparative Biochemistry and Physiology B* 158: 23-29

12) **German, D.P.**, and R.D. Miles (2010) Stable carbon and nitrogen incorporation in blood and fin tissue of the catfish *Pterygoplichthys disjunctivus* (Siluriformes, Loricariidae). *Environmental Biology of Fishes* 89: 117-133

11) **German, D.P.**, D.T. Neuberger*, M.N. Callahan*, N.R. Lizardo*, and D.H. Evans (2010) Feast to famine: the effects of food quality and quantity on the gut structure and function of a detritivorous catfish (Teleostei: Loricariidae). *Comparative Biochemistry and Physiology A* 155: 281-293

10) **German, D.P.**, B.C. Nagle, J.M. Villeda*, A.M. Ruiz*, A.W. Thomson, S. Contreras-Balderas, and D.H. Evans (2010) Evolution of herbivory in a carnivorous clade of minnows (Teleostei: Cyprinidae): effects on gut size and digestive physiology. *Physiological and Biochemical Zoology* 83: 1-18

9) **German, D.P.** (2009) Inside the guts of wood-eating catfishes: can they digest wood? *Journal of Comparative Physiology B* 179: 1011-1023

8) **German, D.P.**, and R.A. Bittong* (2009) Digestive enzyme activities and gastrointestinal fermentation in wood-eating catfishes. *Journal of Comparative Physiology B* 179: 1025-1042

7) **German, D.P.** (2009) Do herbivorous minnows have "plug-flow reactor" guts? Evidence from digestive enzyme activities, gastrointestinal fermentation, and luminal nutrient concentrations. *Journal of Comparative Physiology B* 179: 759-771

6) Gao, F., H. Yang, Q. Xu, F. Wang, G. Liu, and **D.P. German** (2008) Phenotypic plasticity of gut structure and function during periods of inactivity in *Apostichopus japonicus* (Selenka). *Comparative Biochemistry and Physiology B* 150:255-262

5) **German, D.P.** and M.H. Horn (2006). Gut length and mass in herbivorous and carnivorous prickleback fishes (Teleostei: Stichaeidae): ontogenetic, dietary, and phylogenetic effects. *Marine Biology* 148: 1123-1134

4) Horn, M.H., A. Gawlicka, **D.P. German**, E.A. Logothetis, J.W. Cavanagh and K.S. Boyle (2006). Structure and function of the stomachless digestive system in three related species of New World silverside fishes (Atherinopsidae) representing herbivory, omnivory, and carnivory. *Marine Biology* 149: 1237-1245

3) Pryor, G.S., **D.P. German,** and K.A. Bjorndal (2006). Gastrointestinal fermentation in Greater Sirens (*Siren lacertina*). *Journal of Herpetology* 41: 112-117

2) **German, D.P.**, M.H. Horn and A. Gawlicka (2004). Digestive enzyme activities in herbivorous and carnivorous prickleback fishes (Teleostei: Stichaeidae): ontogenetic, dietary, and phylogenetic effects. *Physiological and Biochemical Zoology* 77: 789-804

1) Sturz, A., **D.P. German** and D. Putnam (1998). Salton Sea Geothermal Area Mud Pots: 1991-1998. In: Geology and Geothermal Resources of the Imperial and Mexicali Valleys, L. Lindsey and W. Hample (eds). San Diego Association of Geologists publication 98-1, Pg. 109-128.

[§]Denotes postdoctoral researcher; [†]graduate student; * undergraduate research assistant

MANUSCRIPTS SUBMITTED OR IN PREPARATION

- Brocco French, K.I. [†], M.J. Herrera[†], **D.P. German**. Where did you get those microbes? *Strongylocentrotus purpuratus* larvae select and maintain a unique microbiome compared to environmental and dietary sources. In prep- to be submitted

- Slay, C.E., J. Eme, B.A. Wehrle[†], **D.P. German**, R.M. Elsey, J.W. Hicks. Digestion is unaffected by surgical elimination of the right-to-left cardiac shunt in American alligators (*Alligator mississippiensis*). *Journal of Experimental Biology* (Under Review)

- Herrera, M.J.[†], J. Heras[§], C. Catabay*, J.D. Bastian-Salgado*, M. Turken*, K.M. Connor, **D.P. German**. Dietary-induced shifts in the hindgut microbiome of a marine herbivorous fish leads to subtle changes in gut and liver function. *Molecular Ecology* (Submitted)

- Herrera, M.J. [†], J. Heras[§], N.N. Smith[†], N.Z. Hood, [†] **D.P. German**. Digestive physiology and individual variation impact the hindgut microbiome of prickleback fishes (Stichaeidae) with different diets. In prep- to be submitted to *BMC Animal Microbiome*

- Herrera, M.J. [†a], **D.P. German**[a], J. Buckner*, N.N. Smith Christman[†], M. Hilleman*, J. Heras[§,]. Gastric enzyme activities and stomach transcriptomics correlate with diet in prickleback fishes (Stichaeidae). In prep- to be submitted to *Journal of Comparative Physiology B*
  [a] these authors contributed equally to this article

- Lee, A.M.*, M.J. Herrera[†], **D.P. German**, A.R. Frederick[†]**.** Digestive biochemistry from opposite ends of the Pacific: red abalone and pāua show differences in digestive enzyme activities, microbial diversity, and gastrointestinal fermentation. In Prep- to be submitted to *Marine Biology*

- Heras, J.[§,] M.J. Herrera[†], **D.P. German**. Comparative transcriptomics reveal underpinnings of digestive differences in prickleback fishes with different diets. In prep- to be submitted to *Comparative Biochemistry and Physiology D*

- Rafanan, K.C.*, M.J. Herrera[†], C. Catabay*, **D.P. German**. Diet shifts alter the activity and distribution of digestive enzymes in an herbivorous fish. In prep- to be submitted to *Comparative Biochemistry and Physiology A*

TEACHING EXPERIENCE

- Assistant Professor, School of Biological Sciences, University of California, Irvine. Marine Biology (E120). Responsible for curriculum and lectures (2014).
- Assistant/Associate Professor, School of Biological Sciences, University of California, Irvine. Human Nutrition (E136). Responsible for curriculum and lectures (2013-present).
- Assistant/Associate Professor, School of Biological Sciences, University of California, Irvine. Comparative Physiology (E208). Responsible for curriculum and lectures (2012, 2016, 2019).
- Assistant/Associate Professor, School of Biological Sciences, University of California, Irvine. Human Physiology (E109) Lecture. Responsible for curriculum, lectures, and exams (2012-present).
- Associate Faculty, University of Phoenix, Southern CA Campus. Introductory Biology (2010).
- Graduate Teaching Assistant, Department of Zoology, University of Florida. Functional Vertebrate Anatomy Laboratory. Responsible for leading lectures and laboratory examination of the evolution of different anatomical structures of vertebrates (2007).
- Graduate Teaching Assistant, Department of Zoology, University of Florida. Special Topics Course: Nutritional Physiology of Anoles. Led graduate level course to teach techniques of nutritional physiology using anoles as a model (2007).
- Graduate Teaching Assistant, Department of Zoology, University of Florida. Integrative Principles of Zoology. Course required of all first year graduate students in the department. Taught module on nutritional physiology and grant writing and aided other professors with their modules of varying topics (2006-2007).
- Graduate fellow in NSF GK-12 program, Science Partners in Inquiry-Based Collaborative Education (SPICE): Responsible for leading inquiry-based lectures and laboratory activities with an ecosystem health focus in a middle school classroom in an effort to raise scientific awareness and scientific literacy (2004-2006).
- Private tutoring. Wide range of biological topics including: biochemistry, physiology, ecology, microbiology, marine biology, molecular biology, cellular biology, and genetics (2001-2008).
- Graduate Teaching Assistant, Department of Biological Science, CSU Fullerton. Principles of Ecology Laboratory. Responsible for laboratory lecture, preparations, functions, field trips, quizzes, practicums, and grades (1999)
- Instructor at Marine Science Summer Camp for youth, "Aquatic Adventures", in San Diego, CA. Duties included teaching youth about marine and intertidal flora and fauna, wetland ecology, and biological sampling techniques (1998)

GRANTS

- UC Irvine Biological Sciences Faculty Research and Travel Grant (February 2022): $8950
- California Sea Grant Aquaculture Award (February 2022): $242,500
- California Conservation Genomics Program Research Grant (May 2020): $33,537
- UC Irvine Biological Sciences Faculty Research and Travel Grant (March 2019): $3250
- UC Irvine Biological Sciences Bridge Funds (March 2019): $50,000
- UC Irvine Biological Sciences Faculty Research and Travel Grant (February 2018): $2500
- NSF Integrative Organismal Systems (IOS-1355224, PI: D.P. German, Sept 2014): $543,124
- UC MEXUS Program (PI: D.P. German, M. Mendoza-Carranza, September 2014): $25,000
- NSF Catalyzing New International Collaborations (IIA, PI: D.P. German, August 2013): $46,902
- Codon Code Alignment Software, Free License Grant (April 2012): $700 (license)
- Kimble-Chase New Lab Start-Up Grant (September 2011): $1000 (free glassware)
- UC President's Postdoctoral Fellowship Research Funds (July 2010): $4000
- University of Florida Mentoring Opportunity Program grant (May 2008): $300
- American Society of Ichthyologists and Herpetologists Raney Award (May 2007): $1000
- University of Florida, University Scholars Program (March 2007): $2500
  Mentored student: Daniel Neuberger; Faculty Mentor: Dr. David H. Evans
- University of Florida, University Scholars Program (March 2007): $2500
  Mentored student: Rosalie Bittong; Faculty Mentor: Dr. Richard D. Miles
- University of Florida, University Scholars Program (March 2006): $2500
  Mentored student: Meaghan Callahan; Faculty Mentor: Dr. David H. Evans
- SPICE Research Stipend (September 2005): $1000
- American Museum of Natural History Theodore Roosevelt Memorial Fund (May 2005): $2000
- American Society of Ichthyologists and Herpetologists Raney Award (May 2005): $1000
- SPICE Research Stipend (September 2004): $1000
- Brian Rewald Memorial Scholarship (May 2005): $300
- University of Florida Mentoring Opportunity Program grant (Feb 2004): $300
- Brian Rewald Memorial Scholarship (May 2004): $300
- University of Florida, Department of Zoology Student Research Award (April 2004): $1100.00
- CSUF Department of Biological Science Funds (2000-2002): $600
- Sigma Xi Grants in Aid of Research (Fall 2001): $350
- CSUF Departmental Associations Council Research Grant (Fall 2000): $450
- USD Associated Students Undergraduate Research Grant (Spring 1998): $400

SCHOLARSHIPS, AWARDS, AND FELLOWSHIPS

- UC Irvine School of Biological Sciences Chancellor's Award for Excellence in Fostering Undergraduate Research (May 2017)
- UC Irvine School of Biological Sciences Dean's Award for Postdoctoral Excellence (Dec 2010)
- UC President's Postdoctoral Fellowship Program Recipient (March 2010)
- UC President's Postdoctoral Fellowship Program Finalist (March 2009)
- ASIH Travel Award (July 2008)
- ASIH Stoye Award—best physiology presentation (July 2008)
- International Congress on the Biology of Fishes Travel Award (July 2008)
- International Congress on the Biology of Fishes—2nd Place "Best Poster" competition (July 2008)
- UF Graduate Student Council Travel Award (July 2008)
- UF Department of Zoology Travel Award (April 2008)
- UF Department of Zoology Travel Award (April 2007)
- UF Graduate Student Council Travel Award (July 2007)

- UF Department of Zoology Graduate Student Teaching Award (December 2005)
- NSF GK-12 Fellowship: Science Partners in Inquiry-Based Collaborative Education (SPICE); Teaching inquiry based science to under-resourced middle school students (2004-2006)
- Comparative Nutrition Society Best Student Presentation (July 2004)
- UF CLAS Alumni Fellowship—full funding for four years (2003-2007)
- CSUF President's Associates Outstanding Graduate Student Award (May 2003)
- CSUF Department of Biological Science Outstanding Thesis Award (May 2003)
- Southern California Academy of Sciences Best Physiology Talk (May 2003)
- CSUF Natural Sciences and Mathematics Inter-Club Council Travel Award (Fall 2002)
- CSUF Coppell Graduate Science Scholarship (Spring 2001)
- NSF REU, Scripps Inst. of Oceanography, Antarctic Biol. Oceanography Research (Fall 1999)
- USD Marine Science Undergraduate Research Award (Fall 1998)

MENTORING

- Postdoctoral Fellows: Dr. Kwasi Connor, UC President's and Ford Foundation Postdoctoral Fellow (2012-2015, now faculty at UC Irvine), Dr. Joseph Heras (2015-2019, now faculty at CSU San Bernardino), Dr. Silvia Hinojosa, Fulbright Postdoctoral Fellow (2018-2019; now faculty at Tecnológico de Monterey, Mexico)
- Research Scientists: Dr. Dolly Foti (2011-2014)
- Completed PhD degrees: Dr. Beck A. Wehrle (2018, now faculty at LeMoyne College); Dr. Samantha Leigh (2019, now faculty at CSU Dominguez Hills); Dr. Alyssa Frederick (2019, now the director of the White Abalone Captive Breeding Program at UC Davis Bodega Marine Laboratory); Dr. Michelle Herrera (now a postdoctoral scholar at UC San Diego); Dr. Karina Brocco French (pursuing career in science policy)
- Current PhD Students: Nefertiti Smith Christman (2019-present), Newton Hood (2019-present), Matea Djokic (2020-present), Daniel Rankins (2021-present; co-mentored with Dr. Kwasi Connor).
- Undergraduate Researchers: 90 and counting.

UNIVERSITY SERVICE

- Opponent for University of Bergen (Norway) doctoral defense of Thi My Dung Le (2019)
- Chair, Graduate Admissions Committee (2017-present)
- Ad-Hoc Committee Charged with establishing a UCI Senate Committee on Diversity (2018)
- Member, Graduate Admissions Committee (2011-2016)
- School of Biological Sciences Executive Committee (2011-2013)
- Personnel Committee for Faculty Merit Review (2011, 2013, 2015, 2017, 2019, 2021, 2023)

OUTREACH AND DIVERSITY ACTIVITIES

- Chair, Panel on Life Sciences: UC President's Postdoctoral Fellowship Program 2024
- UC President's Postdoctoral Fellowship Program on-site review panel 2021
- UCI School of Biological Sciences Dean's Council on Diversity, Equity, and Inclusion. 2020-2022: charged with addressing DEI issues for the School, including interviewing candidates for the newly created Associate Dean for Diversity, Equity, and Inclusion
- Diverse Educational Community and Doctoral Experience (DECADE) 2017-2023: Mentor for the Department of Ecology & Evolutionary Biology at UC Irvine.

- Targeted Instruction Generating Excitement about Research and Science (TIGERS) 2013-Present: Partnership between my laboratory and the biology instructors (Rebecca Bonet and Leina Rizzo) at Valencia High School, an underserved high school in Placentia, CA. Once a month, my graduate students, postdoctoral fellows, and I lead inquiry-based science lessons with the general biology classes at VHS (and of course, their mascot is the Tigers).
- Crystal Cove Alliance Citizen Science Marine Biology Cruises 2014-2020: Partnership between my laboratory and the Crystal Cove Alliance, which features middle school students gathering oceanographic and marine biology data from Crystal Cove State Park, and the Laguna Beach Marine Protected Area. The long-term goal is to generate a large dataset that tests the efficacy of the marine protected area.
- Equitable Science Curriculum Integrating Arts in Public Education (ESCAPE) 2014-2016: Partnership between UC Irvine and the Orange County Department of Education to improve science education through the integration of art (performing and visual). I am responsible for evaluating and generating science curriculum for Earth Science and Life Science.
- NSF-Blinks-Beacon Research Experience for Undergraduates program, summer 2016: Mentored Michelle Herrera in an eight-week research program in fish nutritional physiology at University of Washington's Friday Harbor Laboratories.

SELECTED PUBLIC PRESENTATIONS

- Rafanan, K.C., M.J. Herrera[†], C. Catabay, D.P. German*. Diet shifts alter the activity and distribution of digestive enzymes in an herbivorous fish. Society for Integrative and Comparative Biology, Seattle, WA, January 2024
  *Presenting author

- German, D.P., M.J. Herrera, J. Buckner, M. Hileman, N.N. Smith Christman, J. Heras. Can you stomach it? Comparative transcriptomics and biochemistry of the stomachs of prickleback fishes (Stichaeidae) consuming different diets. Southern California Academy of Sciences Meeting, Santa Barbara, CA, May 2023.

- D. P. German, M. Herrera, J. Heras. The meat sweats: the effects of increasing protein content on enteric microbial diversity and metabolism of a marine herbivorous fish. Society for Integrative and Comparative Biology, Tampa, FL, January 2019

- D. P. German, M. Herrera*, J. Heras. Can you stomach it? Comparative biochemistry and transcriptomics of the stomachs of prickleback fishes consuming different diets. Society for Integrative and Comparative Biology, San Francisco, CA, January 2018
  *Presenting author

- German, D.P. Trust your gut: using digestive physiology as a tool to understand animal ecology. Ecological Society of America, Portland, OR, August 2017

- German, D.P., and J. Heras. Dietary specialization on the molecular level: comparative transcriptomics of prickleback fishes (Stichaeidae) with different diets. Society for Integrative and Comparative Biology, New Orleans, LA, January 2017.

- Herrera, M.J., J. Heras, and D.P. German. Digestive specialization in prickleback fishes (Family Stichaeidae): molecular underpinnings and potential for plasticity. Society for Integrative and Comparative Biology, New Orleans, LA, January 2017. (Given by DPG)

- German, D.P., B.Q. Nguyen-Phuc, S. Stewart and C. Demetropolous. The Nutritional Physiology of Santa Ana sucker, *Catostomus santaanae*. American Fisheries Society California-Nevada Chapter Meeting, Reno, NV, March 2016.

- German, D.P. and D.M. Foti. More than one way to skin a cat: convergent evolution of herbivory following different trajectories in prickleback fishes (Stichaeidae). Evolution Meeting, Guaruja, Brazil, June 2015.

- German, D.P. Trust your gut: using digestive physiology as a tool to understand animal ecology. California's Organization of Aquatic Show Tropicals, Costa Mesa, CA, June 2015.

- German, D.P. Amylase genetics underlies a digestive specialization in prickleback fishes (family Stichaeidae). Southwest Organismal Biology meeting, Irvine, CA, September 2014.

- German, D.P. Elevated amylase activities have different genetic underpinnings in prickleback fishes (family Stichaeidae) with different diets. Society for Integrative and Comparative Biology meeting, Austin, TX, January 2014.

- German, D.P. Digestive enzyme activities elucidate the digestive strategies of prickleback fishes (Stichaeidae) with different diets. Society for Integrative and Comparative Biology meeting, San Francisco, CA, January 2013.

- German, D.P. and S.D. Allison. The potential interaction of organic matter concentration and moisture level in decomposition. Ecological Society of America meeting, Austin, TX August 2011.

- German, D.P. Soil organic matter concentration can act as a constraint on microbial decomposition. UC President's Postdoctoral Fellowship Retreat, Arrowhead, CA October 2010

- German, D.P. Beavers of the fish world: can wood-eating catfishes actually digest wood? Comparative Nutrition Society meeting, Liscomb Mills, Nova Scotia, Canada, August 2008.

- German, D.P. Beavers of the fish world: can wood-eating catfishes actually digest wood? International Congress on the Biology of Fishes, Portland, OR, July 2008.

- German, D.P. Digestive enzyme activities in wood-eating catfishes: sources and consequences. American Society of Ichthyologists and Herpetologists meeting, Montreal, Quebec, Canada, July 2008.

- German, D.P. and D.H. Evans. I'll show you my gut if you show me yours! Evolution of herbivory in a carnivorous clade of minnows. Evolution meetings, Christchurch, New Zealand, June 2007.

- German, D.P. and D.H. Evans. What does it take to be a herbivore for a fish? Gut structure and function in sister clades of herbivorous and carnivorous minnows. South Eastern Ecology and Evolution Conference, Orlando, FL, March 2007.

INVITED SEMINARS

- Unlocking the mysteries of the inner tube of life: a gut-eyed view of nutritional ecology. Texas A&M University, Ecology & Evolutionary Biology Invited Seminar. December 2023.

- Unlocking the mysteries of the inner tube of life: a gut-eyed view of nutritional ecology. CSU San Bernardino Biological Sciences Invited Seminar. April 2023.

- Rate vs Yield: Not all herbivorous fishes are reliant on microbes to digest plant material. Gordon Research Conference on Plant-Herbivore Interactions, Ventura, CA March 2023.

- Unlocking the mysteries of the inner tube of life: a gut-eyed view of nutritional ecology. CSU Fullerton Biological Sciences Invited Seminar. September 2022.

- Unlocking the mysteries of the inner tube of life: a gut-eyed view of nutritional ecology. UC Davis Bodega Marine Laboratory Invited Seminar. June 2021.

- Unlocking the mysteries of the inner tube of life: a gut-eyed view of nutritional ecology. UC Santa Cruz, Department of Biology. April 2021.

- Unlocking the mysteries of the inner tube of life: a gut-eyed view of nutritional ecology. Queens University (Kingston, Ontario), Department of Biology. March 2021.

- It takes guts to make it in this world! How fishes make a living on diverse diets. University of California, Riverside, Department of Evolution, Ecology, and Organismal Biology. May, 2019.

- It takes guts to make it in this world! Nutritional physiology scaling from genetics to whole animal performance. University of California, Irvine, Department of Developmental and Cellular Biology. May, 2019.

- Bugs everywhere! Enteric microbiomes of sharks, fishes, and lizards. American Physiological Society Meeting, New Orleans, LA, October 2018.

- Fish Digestive Systems. Disney's Animal Kingdom: Workshop for *Ex Situ* Marine Teleost Nutrition and Health. Orlando, FL, February 2018.

- Trust your gut: using digestive physiology as a tool to understand animal ecology. University of North Texas, Department of Biological Sciences, November 2017

- Trust your gut: using digestive physiology as a tool to understand animal ecology. California State University, Long Beach, Department of Biological Sciences, April 2017

- Trust your gut: using digestive physiology as a tool to understand animal ecology. University of Georgia, Odum School of Ecology, March 2017.

- Elevated gene copy number does not always explain elevated amylase activities in fishes. University of Washington, Friday Harbor Laboratories, July 2016.

- Resource acquisition in microbes and animals: consequences and mechanisms. University of Southern California, Department of Marine and Environmental Sciences, January 2016.

- Trust your gut: using digestive physiology as a tool to understand animal ecology. University of California, Irvine, ESCAPE Summer Workshop Keynote Address, August 2015.

- My journey into ecological physiology. University of California, Irvine, Minority Science Program seminar, February 2015.

- Moving beyond diet: the importance of nutritional physiology in fish conservation. Towards a Sustainable 21st Century Conference: Ocean health, global fishing, and food security. Beckman Center of the National Academy of Sciences and Engineering, Irvine, CA November 2014.

- Digestive specialization: from genes to animal performance. University of California, Irvine, Department of Ecology and Evolutionary Biology Invited Seminar, October 2014.

- Amylase genetics and biochemistry underlie a digestive specialization in prickleback fishes (family Stichaeidae). American Physiological Society Meeting, San Diego, CA, October 2014.

- Trust your gut: using digestive physiology as a tool to understand animal ecology. University of California, Riverside, Department of Biology, Invited Seminar, May 2014.

- Trust your gut: using digestive physiology as a tool to understand animal ecology. Cornell University, Department of Ecology and Evolutionary Biology, Invited Seminar, March 2014.

- Trust your gut: using digestive physiology as a tool to understand animal ecology. California Polytechnic State University San Luis Obispo, Department of Biology Invited Seminar, November 2013.

- Trust your gut: using digestive physiology as a tool to understand animal ecology. University of Alabama, Department of Biology Invited Seminar, September 2013.

- Energy acquisition in detritivorous fishes and microbial decomposers: eatin', poopin', and external rumens. California State Polytechnic University, Pomona, Department of Biology Invited Seminar, May 2013.

- Energy acquisition in detritivorous fishes and microbial decomposers: eatin', poopin', and external rumens. Loyola Marymount University, Department of Biology Invited Seminar, April 2013.

- My journey into ecological physiology. University of California, Irvine, Minority Science Program seminar, September 2012.

- Vertebrate nutritional physiology: an integrative approach. University of California, Irvine, Department of Ecology and Evolutionary Biology Invited Seminar, January 2011.

- Energy acquisition in detritivorous fishes and microbial decomposers: eatin', poopin', and external rumens. California State University Northridge, Department of Biology Invited Seminar, November 2010.

- Beavers of the fish world: can wood-eating catfishes actually digest wood? California State University Fullerton, Department of Biological Sciences Invited Seminar, September 2009.

- Beavers of the fish world: can wood-eating catfishes actually digest wood? University of San Diego, Department of Biology Invited Seminar, March 2009.

- Beavers of the fish world: can wood-eating catfishes actually digest wood? University of Florida, Department of Zoology Exit Seminar, December 2008.

- Beavers of the fish world: can wood-eating catfishes actually digest wood? University of California, Irvine, Department of Ecology and Evolutionary Biology Invited Seminar, April 2008.

- Evaluating the "plug-flow reactor" model of digestive physiology: do all herbivores rely on microbial fermentation? University of Florida, Department of Zoology Invited Seminar, September 2007.

- Digestive physiology of herbivorous and carnivorous fishes. University of San Diego, Department of Marine and Environmental Sciences Invited Seminar, November 2002.

SELECTED POSTER PRESENTATIONS

- **German, D.P.,** M.J. Herrera, J. Heras. Can you stomach it? Comparative transcriptomics and biochemistry of the stomachs of prickleback fishes (Stichaeidae) consuming different diets. American Physiological Society Summit, Long Beach, CA, April 2023.

- **German, D.P.**, F. Chaabani*, D. Gevorgyan*, A. Sung*, and C. Fawcett*. A test of the "Temperature Constraint Hypothesis": little variation in the digestive biochemistry of prickleback fishes (family Stichaeidae) from California and Washington. Society of Integrative and Comparative Biology meeting, West Palm Beach, FL, January 2015.

- **German, D.P.**, A. Sung*, P. Jhaveri*, and R. Agnihotri*. Digestive physiology varies among prickleback fishes (family Stichaeidae) with different diets and evolutionary histories. Society of Integrative and Comparative Biology meeting, Austin, TX, January 2014.

- Sosa, A.E.*, and **D.P. German**. Evolution of herbivory in the family Stichaeidae (Teleostei). Society of Integrative and Comparative Biology meeting, San Francisco, CA, January 2013.

- Marcelo, K.R.B.*, **D.P. German**, M.S. Stone*, and S.D. Allison. The effects of temperature on the dynamics of soil organic matter decomposition. UCI University Research Opportunity Program Symposium, Irvine, CA, May 2010.

- **German, D.P.**, and D.H. Evans. Plasticity of gastrointestinal tract structure and function in the invasive fish *Pterygoplichthys disjunctivus* (Teleostei: Loricariidae). Experimental Biology Annual Meeting, Anaheim, CA, April 2010.

- Chacon, S.S.*, **D.P. German**, and S.D. Allison. Soil organic matter concentration as a constraint on microbial decomposition. American Association for the Advancement of Science Annual Meeting, San Diego, CA, February 2010.

- **German, D.P.**, B.C. Nagle, and D.H. Evans. Evolution of herbivory in a carnivorous clade of minnows (Teleostei: Cyprinidae): effects on gut structure and function. International Congress on the Biology of Fishes, Portland, OR, July 2008.

* Denotes undergraduate research assistant

MEDIA COVERAGE

- *10 Discoveries from 2021 that may lead to new inventions.* Smithsonian Magazine. Ten Scientific Discoveries From 2021 That May Lead to New Inventions | Innovation | Smithsonian Magazine
- *Take a 3-D Journey Inside a Shark's Guts.* New York Times July 2021.** Take a 3-D Journey Inside a Shark's Guts - The New York Times (nytimes.com)
- *Veggie-loving monkeyface prickleback may be future sustainable protein.* UPI Science News, February 2020.**
- https://www.upi.com/Science_News/2020/02/19/Veggie-loving-monkeyface-prickleback-may-be-future-sustainable-protein/3801582139617/ (spread by countless other science-based blogs).
- *El 'pez picudo cara de mono' que puede convertirse en un alimento sostenible para los humanos.* Univision. February 2020.** https://www.univision.com/noticias/ciencia/el-pez-picudo-cara-de-mono-que-puede-convertirse-en-un-alimento-sostenible-para-los-humanos
- *First known omnivorous shark species identified.* The Guardian. September 2018.** https://www.theguardian.com/environment/2018/sep/05/bonnethead-omnivorous-shark-species-identified?CMP=share_btn_tw
- *The omnivorous sharks that eat grass*. New York Times. September 2018.** https://www.nytimes.com/2018/09/06/science/omnivorous-sharks-seagrass.html
- *Meet the world's first salad-eating shark*. Science Magazine. January 2018. http://www.sciencemag.org/news/2018/01/meet-world-s-first-salad-eating-shark (spread by countless other science-based blogs, including IFL Science).
- *More than one way to be an herbivore:* Elsevier STM Digest Spotlight. August 2015. https://medium.com/@STMDigest/more-than-one-way-to-be-an-herbivore-a418bd2d9590
- *New Scientist* Zoologger: The fish with no stomach for its prey. 27 January 2011. http://www.newscientist.com/article/dn20040-zoologger-the-fish-with-no-stomach-for-its-prey.html
- *National Geographic* Daily News, Pictures: New armored, wood-eating catfish found in the Amazon. 21 September 2010 http://news.nationalgeographic.com/news/2010/09/photogalleries/100921-new-species-science-armored-wood-eating-catfish-amazon-pictures/
- *Practical Fishkeeping Magazine* News and Analysis: Do catfishes need to eat wood? Oct 2009 http://www.practicalfishkeeping.co.uk/pfk/pages/backissue.php?issue_id=113
- *Tropical Fish Hobbyist Magazine* Catfish Corner, Coming Attractions: Interesting talks at the 2008 American Society of Ichthyologists and Herpetologists meeting—Digestive enzyme activities in wood-eating catfishes: sources and consequences. http://www.tfhdigital.com/tfh/200809/?pg=49
- *Explore Magazine*: Spice-ing up science. Program pairs science graduate students with middle schoolers. Sept 2005 http://www.research.ufl.edu/publications/explore/v10n3/story2.html

** These studies were covered by numerous domestic and international news outlets.

PEER REVIEW (MULTIPLE TIMES FOR MOST)

Physiological and Biochemical Zoology
Marine Ecology Progress Series
Marine Biology
Journal of Comparative Physiology B
Global Change Biology
Comparative Biochemistry and Physiology
Journal of Experimental Mar. Biol. and Ecol.
Helgoland Marine Research

Journal of Herpetology
Environmental Biology of Fishes
Journal of Geophysical Research
Aquatic Conservation
Soil Biology and Biochemistry
Coral Reefs
Biogeochemistry
Diversity
Acta Zoologica
Proceedings of the Royal Society B
Journal of Fish Biology
Ecological Monographs
Acta Ichthyologica
J of Animal Biol & Animal Nutrition
Molecular Ecology
Journal of Zoology
BMC Genomics
PeerJ
Phil Trans Royal Soc
Current Biology
iScience
Journal of Experimental Biology
Nature Communications
Frontiers in Marine Science
Journal of Morphology
Marine and Freshwater Research
Fish Physiology and Biochemistry
Aquaculture Research
Frontiers in Aquatic Physiology
Environmental Microbiology
Rapid Communications in Mass Spectrometry
Journal of Experimental Zoology A
Functional Ecology
PLoS One
Hydrobiologia
American Biology Teacher
Evolution
Marine Biodiversity Records
Freshwater Biology
BMC Evolution
Zoology
PNAS
Journal of Animal Ecology
American Journal Physiol. – Reg, Int. Com. Physiol
Scientific Reports
Fishes
Journal of Microbiological Methods

EDITORIAL RESPONSIBILITIES

Comparative Biochemistry and Physiology A—Special Edition Editor (2021-2022)
Oecologia— Handling Editor, Aquatic Ecology Section (2017-present)
Integrative and Comparative Biology—Division of Comparative Physiology and Biochemistry Editor (2016-2019)
Comparative Biochemistry and Physiology B—International Editor (2015-2019)
Frontiers in Aquatic Physiology—Review Editor (2012-present)

GRANT PROPOSAL REVIEW

Canadian National Science and Engineering Research Council Ad Hoc reviewer (January 2021)
Croatian Science Foundation Ad Hoc reviewer (September 2020)
UC-HBCU Grant proposal onsite review panel (June 2015)
UC President's Postdoctoral Fellowship Program off-site reviewer (January 2012-present)
UC-MEXUS on-site proposal review panel (November 2012)
NSF, Integrative Organismal Systems Ad Hoc reviewer (September 2012)
Fundação para a Ciência e Tecnologia, Portugal, Ad Hoc reviewer (September 2012)

SOCIETY MEMBERSHIPS

Comparative Nutrition Society, Society for Integrative and Comparative Biology, American Physiological Society, Sigma Xi, American Fisheries Society, Southern California Academy of Sciences