

STEPHEN BLAIR HEDGES

Address

Center for Biodiversity, Temple University, Suite 502, 1925 North 12th Street, Philadelphia, Pennsylvania 19122, USA. sbh@temple.edu

Center website: www.biodiversitycenter.org

Laboratory website: www.hedgeslab.org

Degrees

Ph.D. (1988) & M.Sc. (1984), Zoology, University of Maryland

B.Sc. (1981), Biology, George Mason University

Academic positions

Laura H. Carnell Professor of Biodiversity, Temple University (2014–present)

Director, Center for Biodiversity, Temple University (2014–present)

Professor, Department of Biology, Pennsylvania State University (2002–2014)

Associate Professor, Department of Biology, Pennsylvania State University (1997–2002)

Assistant Professor, Department of Biology, Pennsylvania State University (1992–1997)

Postdoctoral Scholar and Research Assistant Professor, Department of Biology, Pennsylvania State University (1988–1992).

Selected awards, recognition, and named lectures

Oxford Bodleian Lecture (Oxford University, Oxford, UK), 2016

Yale Beinicke Lecture (Yale University, New Haven), 2014

Garrett Lecture in the History of Cartography (University of Texas), 2012

Faculty Scholar Medal (Pennsylvania State University), 2011

Elected Fellow, American Association for the Advancement of Science, 2009

Who's Who in the World, Who's Who in America

Science News of the Year, Life, Science News Magazine, 2008

Philips Distinguished Lecture (Haverford College), 2003

Karling Lecture (Mycological Society of America), 2002

Darwin Lecture (Natural History Museum, London), 2001

Faculty Associates Teaching Award (Pennsylvania State University), 1997

Recognition of published works

H-index = 89; i10-index = 246; total citations = 38,366 (Google Scholar)

Champagne Writing Award for best 'News and Views' in *Nature* (2003)

[12 Articles in the New York Times](#) on Hedges lab research

Volunteer service

Research and efforts directly led to the creation of [three national parks in Haiti](#).

Co-founded [Haiti National Trust](#), which finds hotspots of biodiversity in need of protection, creates national parks, mitigates the effects of climate change, reforests with native trees, and works closely with local communities and the government to manage land and marine protected areas.

Raised >\$3M in conservation grants from donors.

Editorial and other professional positions

Senior Editor, *Molecular Biology and Evolution* (2012–2021)

Associate Editor, *Frontiers in Bioinformatics* (2023–)

Editor-in-Chief and Publisher, *Caribbean Herpetology* (2010–)

Co-Founder, Vice-President, and Board member, *Haiti National Trust* (2015–)

Founder & Co-Chair, Evolutionary Genomics Focus Group, NASA Astrobiology Institute (2000–2016).

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Research Associate, National Museum of Natural History, Washington, DC (1998–).
Organizer and Chairman, Annual meeting of *Society for Molecular Biology and Evolution* and *American Genetic Association*, 2004.
Red List Authority, The International Union for the Conservation of Nature (IUCN) (2009–); contributed and coordinated assessments and workshops on Caribbean amphibians and reptiles (2001–)
Member, IUCN SSC Amphibian Specialist Group, 2005–
Director, Astrobiology Summer Program, Penn State (NSF-funded; 2003–2011)
Associate Editor, *BMC Evolutionary Biology* (2008–2011)
Co-Director, TimeTree Project: www.timetree.org (2005–)
Member, Editorial Board of *BMC Proceedings* (2007–)
Member, Editorial Board of *Novitates Caribaea* (2007–)
Member, NASA Astrobiology Roadmap Committee (2001–2003)

RESEARCH

Research interests

My primary research explores the patterns and mechanisms that have shaped how biodiversity has evolved, including speciation, extinction, diversification, and biogeography. I am especially interested in how the planetary environment has influenced evolution and the tree of life, such as in continental drift, sea level variation, and climatic change. I am also interested in how human disturbance has affected biodiversity, and in methods for the global conservation of biodiversity. We use evolutionary genetics and genomics, morphology, and GIS data to address these questions, often in conjunction with timetrees. Most of my current analyses on global biodiversity bring data together in new ways, involving bioinformatics. I maintain a molecular biology laboratory and a biodiversity field program.

Meetings and symposia organized

Organizer and Co-Chair, REDLIST Species Assessment Workshop for Caribbean Reptiles, 20–25 July 2015, San Juan, Puerto Rico.
Organizer, Host, and Co-Chair, International meeting on "Biodiversity Analysis" April 2015, Center for Biodiversity, Temple University (co-sponsored by *Society for Molecular Biology and Evolution*).
Organizer and Co-Chair, Society for Molecular Biology and Evolution Symposium on "Timetrees and Global Biodiversity" 8–12 June 2014, San Juan, Puerto Rico.
Organizer and Co-Chair, NASA Astrobiology AbSciCon meeting symposium on "Early Evolution of Life," 16–20 April 2012, Georgia Tech University, Atlanta, Georgia.
Organizer and Co-Host, Summit on the Conservation Strategy of Haitian Frogs, Philadelphia Zoo, Philadelphia, Pennsylvania, 26 September 2012.
Co-Chair, Penn State SMBE Symposium on "Molecular and Genomic Evolution," 19–20 March 2011, University Park, Pennsylvania.
Organizer and Chairman, Annual meeting of *Society for Molecular Biology and Evolution* and *American Genetic Association*. 17–20 June 2004, University Park, Pennsylvania. 750 participants. Meeting theme: Genomes and Evolution.
Organizer and Chair, NASA Astrobiology Meeting symposium on "Evolutionary Genomics," 10–12 February 2003, Arizona State University, Tempe, Arizona.

Taxonomic contributions

Author of 140 species names of amphibians, reptiles, and butterflies
Author of 52 genus-group names of amphibians and reptiles
Author of 30 family-group names of amphibians and reptiles
Author of 31 higher taxa of prokaryotes and animals

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Research Awards

Agency	Award	Division; Program	Role	Years
NSF	TBA	DBI; (recommended for funding)	PI	2023-2026
NSF	2326013	DEB; Biodiversity, BOCIP implementation	PI	2023–2027
NSF	1932765	DBI; Infrastructure Capacity	PI	2020–2024
Knight	contract	Consulting	PI	2019–2019
NSF	1455762	DBI; Advances in Bioinformatics	PI	2014–2016
NSF	1262481	DBI; Advances in Bioinformatics	PI	2013–2014
NSF	1455761	DEB; Dimensions of Biodiversity	Co-PI	2012–2016
CEPF	62132	Caribbean Islands	PI	2013–2015
Rescan	contract	Consulting	PI	2010–2010
NSF	0918891	DEB; Systematics and Biodiversity	PI	2009–2013
NSF	0850013	DBI; Advances in Bioinformatics	PI	2009–2013
NASA	NNA09DA76A	Astrobiology Research Center	Co-PI	2009–2015
NSF	0818796	DEB; Systematics and Biodiversity	PI	2008–2012
NSF	0649107	DEB; REU Site	PI	2007–2011
NASA	NNA04CC06A	Astrobiology Research Center supplement	PI	2006–2006
NSF	0334952	DEB; Assembling the Tree of Life	Sub	2004–2008
NASA	NNA04CC06A	Astrobiology Research Center	Co-PI	2003–2008
NSF	0139530	DEB; REU Site	PI	2002–2005
NSF	0112670	DBI; Advances in Bioinformatics	PI	2001–2004
NASA	NCC21057	Astrobiology Research Center supplement	PI	2000–2003
PSU	LSC Fund	College of Science; seed funding	Co-PI	1999–2000
NASA	NCC21057	Astrobiology Research Center	Co-PI	1998–2003
NSF	9615643	DEB; Phylogenetic Systematics	PI	1997–2001
NSF	9525775	DEB; Biodiversity	PI	1996–2000
NSF	9224926	DEB; Evolutionary Processes	Co-PI	1993–1994
NSF	8918926	DEB; Evolutionary Processes	Co-PI	1990–1992
USAID	Supplement	Supplement to NSF award	PI	1992–1993
NSF	8906325	DEB; Biodiversity	PI	1989–1993

Expeditions (*multiple)

Exploratory biodiversity research in: Antigua, Bahamas*, Barbados, Cayman Islands, Cuba*, Dominica, Dominican Republic*, Grenadines, Guadeloupe*, Haiti*, Jamaica*, Martinique*, Montserrat, Nevis, Peru, Puerto Rico*, Saint Barts, Saint Croix, Saint John, Saint Kitts, Saint Lucia*, Saint Martin, Saint Thomas, Saint Vincent, Trinidad and Tobago, Turks and Caicos, and the United States*.

Web resources developed (all mobile-operable)

TimeTree—www.timetree.org. Searchable resource for exploring the evolutionary timescale of life; includes smartphone applications. Contains data for 148,876 species from 4,185 published studies. Co-developed with Sudhir Kumar.

Caribherp—www.caribherp.org. Biodiversity site for information on the 1,022 species of amphibians and reptiles on Caribbean islands. Includes > 2000 images and maps, amphibian sounds, and a journal.

Caribnature—www.caribnature.org. Multimedia essays (stills, video, narration, sounds) raising conservation awareness for Caribbean biodiversity.

Caribmap—www.caribmap.org. A resource for exploring the cartographic history of Caribbean islands; includes zoomable high-resolution scans of 2,031 maps from the Renaissance to the 20th Century.

Other research interests

The interface of science, history, and art. New methods for dating artwork (Hedges 2006, *Proc. R. Soc. Lond. A: Mathematical, Physical, and Engineering Sciences* 462: 3555–3573; Hedges 2008, *Proc. SPIE* 6810: 681009) and use of art in understanding biology (Hedges 2013, *Biology Letters* 9: 20120926). The *New York Times* reported on both discoveries.

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30 selected publications (*=corresponding author; PDFs at www.hedgeslab.org)

- Luedtke J* et al. 2023. Ongoing declines for the world's amphibians in the face of emerging threats **Nature**: 622:308–314. Cover photo/story for that issue.
- Cox N*, Young BE*, Bowles P, Fernandez M, Marin J, Rapacciuolo G, Böhm M, Brooks TM, Hedges SB...et al. 2022. Global reptile assessment shows commonality of tetrapod conservation needs. **Nature** 605: 285–290.
- Hedges SB*, Cohen WB, Timyan J, Yang Z. 2018. Haiti's biodiversity threatened by nearly complete loss of primary forest. **Proc. Natl. Acad. Sci. (USA)** 115(46): 11850-11855. Cover photo/story for that issue.
- Hedges SB*, Tao Q, Walker M, Kumar S. 2018. Accurate timetrees require accurate calibrations. **Proc. Natl. Acad. Sci. (USA)**. 115(41):E9510-E9511.
- Brum FT*, Graham CH, Costa GC, Hedges SB, Penone C, Radeloff VC, Rondinini C, Loyola R, Davidson AD. 2017. Global priorities for conservation across multiple dimensions of mammalian diversity. **Proc. Natl. Acad. Sci. (USA)**. 114(29): 7641–7646.
- Hedges, SB*, Marin J, Suleski M, Paymer M & Kumar S. 2015. Tree of Life reveals clock-Like speciation and diversification. **Mol. Biol. Evol.** 32(4):835–845. Cover photo/story for that issue.
- Hoffman M*. et al. 2010. The impact of conservation on the status of the World's vertebrates. **Science** 330: 1503–1509.
- Hedges SB*, Kumar S (Eds.). 2009. **The timetree of life**. Oxford University Press, New York. 551 p.
- Heinicke MP, Duellman WE, Hedges SB*. 2007. Major Caribbean and Central American frog faunas originated by ancient oceanic dispersal. **Proc. Natl. Acad. Sci. (USA)**: 104:10092-10097. Cover photo/story for that issue.
- Fry BG*, Vidal N, Norman JA, Vonk FJ, Scheib H, Ramjan R, Kuruppu S, Fung K, Hedges SB, Richardson MK, Hodgson WC, Ignjatovic V, Summerhayes R, Kochva E. 2006. Early evolution of the venom system in lizards and snakes. **Nature** 439:584-588.
- Kumar S*, Filipowski A, Swarna V, Walker A, Hedges SB. 2005. Placing confidence limits on the molecular age of the human-chimpanzee divergence. **Proc. Natl. Acad. Sci. (USA)** 102:18842-18847.
- Hedges SB*. 2003. The coelacanth of frogs. **Nature** 425:669-670. (Champagne Writing Award for best News & Views 2003).
- Hedges SB*. 2002. The origin and evolution of model organisms. **Nature Reviews Genetics** 3:838-849.
- Hedges SB*, Kumar S. 2002. Vertebrate genomes compared. **Science** 297:1283-1285. Cover photo/story for that issue.
- Heckman DS, Geiser DM, Eidell BR, Stauffer RL, Kardos NL, Hedges SB*. 2001. Molecular evidence for the early colonization of land by fungi and plants. **Science**: 293:1129-1133.
- Hedges SB*. 2001. Afrotheria: plate tectonics meets genomics. **Proc. Nat. Acad. Sci. (USA)** 98:1-2.
- Hedges SB*. 2000. A start for population genomics. **Nature** 408:652-653.
- O'Brien SJ*, Eisenberg JF, Miyamoto M, Hedges SB, Kumar S, Wilson DE. 1999. Comparative genomics: mammalian radiations. *Genome Maps 10* (phylogenetic tree). **Science** 286:463-478. Cover photo/story for that issue.
- Hedges SB*, Kumar S. 1999. Divergence times of eutherian mammals. **Science** 285:2031.
- Hedges SB*, Poling LL. 1999. A molecular phylogeny of reptiles. **Science** 283:998-1001. Cover photo/story for that issue.
- Stanhope MJ*, Waddell VG, Madsen O, de Jong W, Hedges SB, Cleven G, Kao D, Springer MS. 1998. Molecular evidence for multiple origins of Insectivora and for a new order of endemic African insectivore mammals. **Proc. Nat. Acad. Sci. (USA)** 95:9967-9972.
- Schubart C*, Diesel R, Hedges SB. 1998. Rapid evolution to terrestrial life in Jamaican crabs. **Nature** 393:363-365.
- Kumar S, Hedges SB*. 1998. A molecular timescale for vertebrate evolution. **Nature** 392:917-920. ISI Hot Paper; article in top 1% of all-time most-cited articles in *Nature*.
- Hedges SB*, Parker PH, Sibley CG, Kumar S. 1996. Continental breakup and the ordinal diversification of birds and mammals. **Nature** 381:226-229.

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- Hedges, SB, Simmons MD, VanDikj MA, Caspers G, DeJong WW, Sibley CG*. 1995. The phylogenetic relationships of the Hoatzin, an enigmatic South American bird. *Proc. Nat. Acad. Sci. (USA)* 92:11662-11665.
- Hedges SB*, Schweitzer MH. 1995. Detecting dinosaur DNA. *Science* 268:1191-1192.
- Hedges SB, Sibley CG*. 1994. Molecules vs. morphology in avian evolution: the case of the pelecaniform birds. *Proc. Nat. Acad. Sci. (USA)* 91:9861-9865.
- Hedges SB*. 1994. Molecular evidence for the origin of birds. *Proc. Natl. Acad. Sci. (USA)* 91:2621-2624.
- Hedges SB*, Woods CA. 1993. Caribbean hot spot. *Nature* 364:375.
- Hedges SB*, Hass CA, Maxson LR. 1993. Relations of fish and tetrapods. *Nature* 363:501-502.
- Hedges SB*, Bogart JP, and Maxson LR. 1992. Ancestry of unisexual salamanders (genus *Ambystoma*). *Nature* 356:708-710.
- Hedges SB*, Hass CA, Maxson LR. 1992. Caribbean biogeography: Molecular evidence for dispersal in West Indian terrestrial vertebrates. *Proc. Natl. Acad. Sci. (USA)* 89:1909-1913.
- Hedges SB*, Kumar S, Tamura K, Stoneking M. 1992. Human origins and analysis of mitochondrial DNA sequences. *Science* 255:737-739.

Books and monographs (10) (PDFs at www.hedgeslab.org)

- Köhler G*, Zimmer C, McGrath K, Hedges SB. 2019. A revision of the genus *Audantia* of Hispaniola with description of four new species (Reptilia, Squamata, Dactyloidae). *Novitates Caribaea* 14: 1–104. July 15, 2019. (#296 in *Complete List*).
- Schmid M*, Bogart JP, Hedges SB. 2018. The arboranan frogs: evolution, biology, cytogenetics. *Cytogenet Genome Res* 155 (1-4):1-326. Bound as a book (326 p, 956 figs). (#290 in *Complete List*).
- Duellman WE*, Marion AB, Hedges SB. 2016. Phylogenetics, classification, and biogeography of the treefrogs (Amphibia: Anura: Arboranae). *Zootaxa* 4104: 1–109. (#272 in *Complete List*).
- Köhler G*, Hedges SB. 2016. A revision of the green anoles of Hispaniola with description of eight new species (Reptilia, Squamata, Dactyloidae). *Novitates Caribaea* 9: 1–135. (#268 in *Complete List*).
- Hedges SB*, Marion AB, Lipp KM, Marin J, Vidal N. 2014. A taxonomic framework for typhlopoid snakes from the Caribbean and other regions (Reptilia, Squamata). *Caribbean Herpetology* 49:1–61. (#257 in *Complete List*).
- Schmid M*, Steinlein C, Bogart JP, Feichtinger W, Haaf T, Nanda I, del Pino E, Duellman WE, Hedges SB. 2012. The hemiphractid frogs: phylogeny, embryology, life history, and cytogenetics. *Cytogenet Genome Res* 138:69-384. Bound as a book (Schmid M, Bogart JP, Hedges SB, Eds). (#241 in *Complete List*).
- Hedges SB*, Conn CE. 2012. A new skink fauna from Caribbean islands (Squamata, Mabuyidae, Mabuyinae). *Zootaxa* 3288:1–244. (#235 in *Complete List*).
- Schmid M*, Steinlein C, Bogart JP, Feichtinger W, Leon P, La Marca E, Diaz LM, Sanz A, Chen S-H, and Hedges SB. 2010. The chromosomes of terraranan frogs: insights into vertebrate cytogenetics. *Cytogenet Genome Res* 2010; 130–131:1–568. (#227 in *Complete List*). Bound as a book.
- Hedges SB*, Kumar S (Eds). 2009. *The Timetree of life*. Oxford University Press. 551 p. (#208 in *Complete List*).
- Hedges SB*, Duellman WE, and Heinicke MP. 2008. New World direct-developing frogs (Anura: Terrarana): molecular phylogeny, classification, biogeography, and conservation. *Zootaxa* 1737:1–182. Bound as a book. (#196 in *Complete List*).

Complete list of publications (PDFs at www.hedgeslab.org)

319. Luedtke J et al. 2023. Ongoing declines for the world's amphibians in the face of emerging threats *Nature*: 622:308–314. Cover photo/story for that issue.
318. Craig J, Kumar S, Hedges SB. 2023. The origin of eukaryotes and rise in complexity were synchronous with the rise in oxygen. *Frontiers in Bioinformatics*: DOI: 10.3389/fbinf.2023.1233281

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317. Hedges SB. 2023. Book Review: the conservation and biogeography of amphibians in the Caribbean. *Phyllomedusa* 22: 87-93.
316. Means DB, Heincike MP, Hedges SB, MacCulloch RD, Lathrop A. 2023. Exceptional diversity of *Pristimantis* landfrogs (Anura: Terraranae) on the Wokomung Massif, Guyana, with descriptions of three new species. *Journal of Vertebrate Biology* 72: 23026.1–26.
315. Ali J, Hedges SB. 2023. The colonisation of Madagascar by land-bound vertebrates. *Biological Reviews* 85(5): 1583-1606.
314. Stanojevic M, Andjelkovic J, Kasprowicz A, Huuki L, Chao J, Hedges SB, Kumar S, Obradovic Z. 2023. Discovering research articles containing evolutionary timetrees by machine learning. *Bioinformatics* 39 (1): btad035.1–7.
313. Hedges SB. 2022. A new species of frog from the Caribbean island of Montserrat (Eleutherodactylidae, *Eleutherodactylus*). *Zootaxa* 5219: 375–387.
312. Landestoy MA, Schools M, Hedges SB. 2022. A new genus and species of Caribbean forest lizard (Diploglossidae; Celestinae) from southern Hispaniola. *Zootaxa* 5219: 201–226.
311. Kumar S, Suleski M, Craig JM, Kasprowicz AE, Sanderford M, Li M, Stecher G., Hedges SB. 2022. TimeTree 5: an expanded resource for species divergence times. *Molecular Biology and Evolution*. 39(8) msac174.
310. Schools M, Kasprowicz A, Hedges SB. 2022. Phylogenomic data resolve the historical biogeography and ecomorphs of Neotropical forest lizards (Squamata, Diploglossidae). *Molecular Phylogenetics and Evolution*. 175: 107577.1–14.
309. Ali J, Hedges SB. 2022. A review of geological evidence bearing on proposed Cenozoic land connections between Madagascar and Africa and its relevance to biogeography. *Earth-Science Reviews*. Published online 7 July 2022.
308. Yuan ML, Frederick JH, McGuire JA, Bell RC, Smith SR, Fenton C, Cassius J, Williams R, Wang IJ, Powell R, Hedges SB. 2022 Endemism, invasion, and overseas dispersal: the phylogeographic history of the Lesser Antillean frog, *Eleutherodactylus johnstonei*. *Biological Invasions*. Published online 7 May 2022.
307. Cox N, Young BE, Bowles P, Fernandez M, Marin J, Rapacciuolo G, Böhm M, Brooks TM, Hedges SB...et al. 2022. Global reptile assessment shows commonality of tetrapod conservation needs. *Nature*: 605: 285-290. (published online, open access).
306. Craig JM, Kumar S, Hedges SB. 2022. Limitations of phylogenomic data can drive inferred speciation rate shifts. *Molecular Biology and Evolution* 39: (published online, open access).
305. Díaz LM, Fong A, Salas D, Hedges SB. 2021. A new semifossorial snake of the genus *Arrhyton* (Squamata: Dipsadidae) from eastern Cuba, with taxonomic comments on other species. *Zootaxa* 5052: 406-418.
304. Ali JR, Hedges SB. 2021. Colonizing the Caribbean: new geological data and an updated land-vertebrate colonization record challenge the GAARlandia land-bridge hypothesis. *Journal of Biogeography* 48: published online (August 2021).
303. Moore RD, Hedges SB. 2021. Private conservation of remnant forest ecosystems to support sustainable development: Grand Bois privately protected area, Haiti. Pp. 50–53 in Kettunen M, Dudley N, Gorricho J, Hickey V, Krueger L, MacKinnon K, Oglethorpe J, Paxton M, Robinson JG, Sekhran N, *Building on nature: area-based conservation as a key tool for delivering SDGs* (IEEP, IUCN WCPA, The Nature Conservancy, The World Bank, UNDP, Wildlife Conservation Society and WWF).
302. Schools M, Hedges SB. 2021. Phylogenetics, classification, and biogeography of the Neotropical forest lizards (Squamata, Diploglossidae). *Zootaxa* 4974:201–257.
301. Su D, Yang L, Shi X, Ma X, Zhou X, Hedges SB, Zhong B. 2021. Large-scale phylogenomic analyses reveal the monophyly of bryophytes and Neoproterozoic origin of land plants. *Molecular Biology and Evolution* <https://doi.org/10.1093/molbev/msab106>. (published online).
300. Chapple DG, Roll U, Bohm M, Aguilar R, Amey AP, Austin CC, Baling M, Barley AJ...Hedges SB...et al. 2021. Conservation status of the world's skinks (Scincidae): taxonomic and geographic patterns in extinction risk. *Biological Conservation* 257: 109101.

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299. Köhler G, Hedges SB. 2020. A replacement name for the Hispaniolan anole formerly referred to as *Anolis chlorocyanus* Duméril & Bibron, 1837. *Caribbean Herpetology* 70: 1–3.
298. McCranie JR, Matthews AJ, Hedges SB. 2020. A morphological and molecular revision of lizards of the genus *Marisora* (Squamata: Mabuyidae) from Central America and Mexico, with descriptions of four new species. *Zootaxa* 4763: 301–353.
297. Hedges, SB. 2020. Molecular clocks, flotsam, and Caribbean islands. Pp. 349–351 in Cox, CB, Laddie RJ, & Moore PD, *Biogeography: an ecological and evolutionary Approach. 10th Edition* (John Wiley & Sons, Inc., Hoboken, New Jersey).
296. Köhler G, Zimmer C, McGrath K, Hedges SB. 2019. A revision of the genus *Audantia* of Hispaniola with description of four new species (Reptilia, Squamata, Dactyloidae). *Novitates Caribaeae* 14: 1–104.
295. Hedges SB, Powell R, Henderson RW, Hanson S, and Murphy JC. 2019. Definition of the Caribbean Islands biogeographic region, with checklist and recommendations for standardized common names of amphibians and reptiles. *Caribb. Herpetol.* 67:1-53.
294. Hedges SB, Cohen WB, Timyan J, Yang Z. 2019. Reply to Wampler et al.: Deforestation and biodiversity loss should not be sugarcoated. *Proc. Natl. Acad. Sci. USA.* 116 (12):1-2.
293. Hedges SB, Lorvelec O, Barré N, Vidal N, Pavis C. 2019. On the taxonomic recognition of skinks from the Guadeloupe Archipelago (Squamata, Mabuyidae, *Mabuya*). *Caribb. Herpetol.*, 64:1-7.
292. Rapacciuolo G, Graham CH, Marin J, Behm JE, Costa GC, Hedges SB, Helmus MR, Radeloff VC, Young BE, Brooks TM. 2018. Species diversity as a surrogate for conservation of phylogenetic and functional diversity in terrestrial vertebrates across the Americas. *Nature Ecol. Evol.* 3:53-61.
291. Hedges SB, Cohen WB, Timyan J, Yang Z. 2018. Haiti's biodiversity threatened by nearly complete loss of primary forest. *Proc. Natl. Acad. Sci. USA* 115(46):11850-11855.
290. Schmid M, Bogart JP, Hedges SB. 2018. The arboranan frogs: evolution, biology, and cytogenetics. *Cytogenet. Genome Res.* 155(1–4):1-326p, 956 fig.
289. Hedges SB, Tao Q, Walker M, Kumar S. 2018. Accurate timetrees require accurate calibrations. *Proc. Natl. Acad. Sci. USA.* 115(41):E9510-E9511.
288. Miralles A, Marin J, Markus D, Herrel A, Hedges SB, Vidal N. 2018. Molecular evidence for the paraphyly of Scolecophidia and its evolutionary implications. *J Evol Biol.* 31(12): 1782-1793.
287. Marin J, Hedges SB. 2018. Undersampling genomes has biased time and rate estimates throughout the tree of life. *Mol. Biol. Evol.* 35: 2077–2084.
286. Landestoy MA, Turner DB, Marion AB, Hedges SB. 2018. A new species of Caribbean toad (Bufonidae, *Peltophryne*) from southern Hispaniola. *Zootaxa* 4403: 523–539.
285. Marin J, Rapacciuolo G, Costa GC, Graham CH, Brooks TM, Young BE, Radeloff VC, Behm JE, Helmus MR, Hedges SB. 2018. Evolutionary time drives global tetrapod diversity. *Proc. R. Soc. B* 285: 20172378.
284. Holt BG, Costa GC, Penone C, Lessard J-P, Brooks TM, Davidson AD, Hedges SB, Radeloff V, Rahbek C, Rondinini C, Graham CH. 2017. Environmental variation is a major predictor of global trait turnover in mammals. *Journal of Biogeography* 45: 225–237. <https://doi.org/10.1111/jbi.13091>.
283. Heinicke MP, Lemmon AR, Lemmon EM, McGrath K, Hedges SB. 2017. Phylogenomic support for evolutionary relationships of New World direct-developing frogs (Anura: Terraranae). *Molec. Phylogenet. Evol.* 118: 145-155.
282. Lorvelec O, Barré N, Chalifour J, Teynié A, Pisanu B, Hedges SB. 2017. Discovery of a population of *Spondylurus powelli* (Squamata: Mabuyidae) on Île Tintamarre (Saint-Martin, French Antilles) and comments on relationships among skinks of the Anguilla Bank. *Caribbean Herpetology*, 59, 1–8.
281. Brum FT, Graham CH, Costa GC, Hedges SB, Penone C, Radeloff VC, Rondinini C, Loyola R, Davidson AD. 2017. Global priorities for conservation across multiple dimensions of mammalian diversity. *Proc. Natl. Acad. Sci. USA* 114: 7641–7646.
280. Kumar S, Stecher G, Suleski M, Hedges SB. 2017. TimeTree: A resource for timelines, timetrees, and divergence times. *Mol. Biol. Evol.* 34: 1812–1819.

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279. Tucker DB, Hedges SB, Colli GR, Pyron RA, Sites JW, Jr. 2017. Genomic timetree and historical biogeography of Caribbean island ameiva lizards (*Pholidoscelis*: Teiidae). *Ecology and Evolution*.
278. Rapacciuolo G, Marin J, Costa GC, Helmus MR, Behm JE, Brooks TM, Hedges SB, Radeloff VC, Young BE, Graham CH. 2017. The signature of human pressure history on the biogeography of body mass in tetrapods. *Global Ecology and Biogeography* 26: 1022–1034.
277. Marin J, Battistuzzi FU, Brown AC, Hedges SB. 2017. The Timetree of prokaryotes: new insights into their evolution and speciation. *Mol. Biol. Evol.* 34: 437–446.
276. Penone C, Weinstein BG, Graham C, Brooks TM, Rondinini C, Hedges SB, Davidson AD, Costa GC. 2016. Global mammal betadiversity show parallel assemblage structure in similar but isolated environments. *Proc. Roy. Soc. London B* 283:
275. Tucker DB, Colli GR, Giugliano LG, Hedges SB, Hendry CR, Lemmon EM, Lemmon AR, Sites JW Jr, Pyron RA. Methodological congruence in phylogenomic analyses with morphological support for teiid lizards (Sauria: Teiidae). *Molec. Phylogenet. Evol.* 103: 75-84.
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24. Hedges, S. B., K. D. Moberg, and L. R. Maxson. 1990. Tetrapod phylogeny inferred from 18S and 28S ribosomal RNA sequences and a review of the evidence for amniote relationships. *Mol. Biol. Evol.* 7:607-633.
23. Hedges, S. B., and K. L. Burnell. 1990. The Jamaican radiation of *Anolis* (Sauria: Iguanidae): an analysis of relationships and biogeography using sequential electrophoresis. *Caribb. J. Sci.* 26:31-44.
22. Burnell, K. L., and S. B. Hedges. 1990. Relationships of West Indian *Anolis* (Sauria: Iguanidae): an approach using slow-evolving protein loci. *Caribb. J. Sci.* 26:7-30.
21. Hedges, S. B. 1990. Species concepts and speciation. (Review of Speciation and its Consequences; Otte, D., and J. A. Endler, eds.). *Syst. Zool.* 39:95-96.
20. Hedges, S. B. 1990. A new species of *Phrynopus* (Anura, Leptodactylidae) from Peru. *Copeia* 1990:108-112.
19. Hedges, S. B. 1989. Evolution and biogeography of West Indian frogs of the genus *Eleutherodactylus*: slow-evolving loci and the major groups. Pp 305-370 in Woods, C. (ed.), Biogeography of the West Indies: Past, Present, and Future. Sandhill Crane Press, Gainesville, Florida.
18. Hedges, S. B. 1989. An island radiation: allozyme evolution in Jamaican frogs of the genus *Eleutherodactylus* (Anura, Leptodactylidae). *Caribb. J. Sci.* 25:123-147.
17. Thomas, R., and S. B. Hedges. 1989. A new *Celestus* (Sauria: Anguidae) from the Chaine de la Selle of Haiti. *Copeia* 1989:882-887.
16. Hedges, S. B., C. A. Hass, and T. K. Mauge. 1989. Physiological color change in snakes. *J. Herpetology* 23:450-455.
15. Hedges, S. B. 1989. Geographic protein variation in the Jamaican blind snake, *Typhlops jamaicensis* (Serpentes: Typhlopidae). *Caribb. J. Sci.* 25:93-96.
14. Hedges, S. B., and R. Thomas. 1989. A new species of *Anolis* (Sauria: Iguanidae) from the Sierra de Neiba, Hispaniola. *Herpetologica* 45:330-336.
13. Hedges, S. B., and R. Thomas. 1989. Supplement to West Indian Amphibians and Reptiles: A Checklist. *Milwaukee Public Mus. Contr. Biol. Geol.* 77:1-11.

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12. Hedges, S. B. 1988. A new diminutive frog from Hispaniola (Leptodactylidae, *Eleutherodactylus*). *Copeia* 1988(3):636-641.
11. Thomas, R., and S. B. Hedges. 1988. Two new geckos (*Sphaerodactylus*) from the southern Dominican Republic. *Herpetologica* 44(1):96-104.
10. Hedges, S. B. 1987. Vocalization and habitat preference of the Jamaican treefrog, *Hyla marianae* (Anura, Hylidae). *Caribb. J. Sci.* 23:380-384.
9. Hedges, S. B., R. Thomas, and R. Franz. 1987. A new species of *Eleutherodactylus* (Anura:Leptodactylidae) from the Massif de la Hotte, Haiti. *Copeia* 1987:943-949.
8. Hedges, S. B., and R. Thomas. 1987. A new burrowing frog from Hispaniola with comments on the *inoptatus* group of the genus *Eleutherodactylus* (Anura:Leptodactylidae). *Herpetologica* 43:269-279.
7. Hedges, S. B. 1986. An electrophoretic analysis of Holarctic hylid frog evolution. *Syst. Zool.* 35(1):1-21.
6. Hedges, S. B. 1985. The influence of size and phylogeny on life history variation in reptiles: a response to Stearns. *Amer. Nat.* 126(2):258-260.
5. Busack, S. D., and S. B. Hedges. 1984. Is the peninsular effect a red herring? *Amer. Nat.* 123(2):266-275.
4. Hedges, S. B. 1982. Caribbean biogeography: implications of recent plate tectonic studies. *Syst. Zool.* 31(4):518-522.
3. Mitchell, J. C., and S. B. Hedges. 1980. *Ambystoma mabeei* (Caudata: Ambystomatidae): an addition to the salamander fauna of Virginia. *Brimleyana* 3:119-121.
2. Zug, G. R., S. B. Hedges, and S. Sunkel. 1979. Variation in reproductive parameters of three neotropical snakes, *Coniophanes fissidens*, *Dipsas catesbyi*, and *Imantodes cenchoa*. *Smithsonian Contr. Zool.* 300:1-20.
1. Hedges, S. B. 1977. The presence of the scarlet kingsnake, *Lampropeltis triangulum elapsoides* Holbrook (Reptilia, Serpentes, Colubridae), in the Florida Keys. *Herpetol. Rev.* 8(4):125-126.

Invited lectures

1. Villanova University, Philadelphia, Pennsylvania. 24 April 2023.
2. A Week On Haiti Expo and Conference, Washington D.C., 30 September 2022.
3. University of Connecticut, Natural Resources and the Environment, Storrs, 25 September 2020.
4. University of Pennsylvania, English Department, Philadelphia, 20 April 2020.
5. University of Pennsylvania, Earth and Environmental Science, Philadelphia, October 2019.
6. Society for Molecular Biology and Evolution, Annual Meeting, Yokohama, Japan, 12 July 2018.
7. Bahamas Natural History Conference, Biannual Meeting, Nassau, Bahamas, 19 March 2018.
8. BioMed Central (BMC) meeting on *Evolution and Genomics*, Philadelphia, 16 December 2017.
9. Academy of Natural Sciences (ANSP), Philadelphia, 20 October 2017.
10. Society for Molecular Biology and Evolution, Satellite Meeting honoring Masatoshi Nei, 16 September 2017, Philadelphia, Pennsylvania.
11. Society for Molecular Biology and Evolution, Annual Meeting, Austin, Texas, 2 July 2017.
12. Oxford University, U.K., General public lecture in the Bodelian Library, 10 May 2017 (covered by News story in *Science* 25 July 2017 with article and podcast).
13. Renaissance Society of America, annual meeting, Chicago, April 2017, invited symposium lecture.
14. Oxford University, U.K., Bodelian Lectureship, 17 June 2016.
15. International Society for Biological and Environmental Repositories, Annual Meeting, Berlin, Germany, 6 April 2016.
16. Renaissance Society of America, annual meeting, Boston, 1 April 2016.
17. University of Pennsylvania, Philadelphia, January 2016.
18. University of Michigan, May 22nd 2015, Systematic Biology Debate on molecular clocks.
19. University of Puerto Rico, San Juan, 5 February 2015.

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20. Yale University, New Haven, Connecticut, 5 November 2014, Beinicke Lecture.
21. Society for Molecular Biology and Evolution, Annual Meeting, San Juan, Puerto Rico, 14 April 2014. Two lectures.
22. History of Material Texts Program, Department of English, University of Pennsylvania, Philadelphia, 14 April 2014.
23. The Royal Society, London, England, 10 March 2014.
24. College of Science and Technology, Temple University, Philadelphia, 6 March 2014.
25. University of the West Indies, Kingston, Jamaica, 12 November 2013.
26. Department of Agriculture, Port-au-Prince, Haiti, 11 June 2013.
27. Material Text Lecture Series, College of Liberal Arts, Penn State, 14 March 2013.
28. Ecosystem Science and Management Program, Penn State, 30 January 2013.
29. Rensselaer Polytechnic Institute, New York, 19 November 2012.
30. University of Delaware, 22 October 2012.
31. University of Texas, Arlington, Virginia Garrett Lectures on the History of Cartography, 5 October 2012.
32. Philadelphia Zoo, Philadelphia, Pennsylvania, 26 September 2012.
33. Evolution Society of Japan, Tokyo, Japan, Plenary Lecture, 20 August 2012.
34. National Institute of Genetics, Mishima, Japan, 17 August 2012.
35. World Herpetology Conference, Vancouver, Canada, 12 August 2012.
36. Early Evolution of Life Symposium, Astrobiology Science Conference 2012, Georgia Institute of Technology, Atlanta, Georgia, 16–20 April 2012.
37. Phylomedicine Symposium, Biodesign Institute, Arizona State University, 23–24 March 2012.
38. Department of Agriculture, Port-au-Prince, Haiti, 24 November 2011.
39. Philadelphia Zoo, Philadelphia, Pennsylvania, 2 September 2011.
40. Department of Agriculture, Port-au-Prince, Haiti, 30 July 2011.
41. Assisted Reproductive technologies and Genetic Resources Banking Symposium, Minneapolis, Minnesota, 8 July 2011.
42. U.S. National Academy of Sciences, National Research Council, Washington D.C., 3 March 2011.
43. Pennsylvania State University, Huck Institute Lecture, 22 February 2011.
44. Island Biodiversity International Symposium, Martinique, 8–10 November 2010.
45. Amphibian Ark Biobanking Symposium and Workshop, London, 6–8 September 2010.
46. Drexel University, Philadelphia, Pennsylvania, 18 February 2010.
47. World Universities Network (WUN), 10 February 2010.
48. North Carolina State University, Raleigh, North Carolina, 5 October 2009.
49. University of Puerto Rico, Biology, Rio Piedras, P.R., 6 June 2009.
50. Library of Congress, Washington, D.C., 15 May, 2009. Waldseemüller International Symposium.
51. Latin American Congress of Herpetology, Varadero, Cuba, 24–29 November 2008.
52. University of Leiden, The Netherlands, 13 November 2008.
53. North Carolina State University, Raleigh, North Carolina, 6 November 2008.
54. University of Kansas, Lawrence, Kansas, 11 September 2008.
55. University of Würzburg, Würzburg, Germany, 21 August, 2008.
56. Villanova University, Villanova Pennsylvania, 3 April, 2008. Two talks.
57. The International Society for Optical Engineering (SPIE), symposium on Computer Image Analysis in the Study of Art, San Jose, California, 27–31 January, 2008.
58. Joint meeting of Ichthyologists and Herpetologists, St. Louis, Missouri, 11–16 July 2007.
59. Washington Map Society, Library of Congress, Washington, D.C., April 19, 2007.
60. International Meeting on West Indian Biodiversity and Biogeography, Punta Cana, Dominican Republic (sponsored by NSF–NESCent), July 5–9, 2006.
61. Genomes, Evolution, and Bioinformatics (International Meeting), Arizona State University,

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- Tempe, Arizona, 26 May, 2006.
62. Annual Meeting, American Society of Ichthyologists and Herpetologists, Tampa, Florida, 11 July 2005.
 63. NASA Astrobiology Institute General Meeting Plenary, University of Colorado, Boulder, Colorado, 13th April 2005.
 64. Cornell University, Ithaca, New York, 4th November 2004.
 65. Missouri Botanical Garden, Annual Systematics Symposium on Latin American Biogeography, St. Louis, Missouri, 8–10 October 2004.
 66. PSU Alumni Association, Faculty Huddle Lecture, 4 September 2004.
 67. Genomes and Evolution 2004 (International Meeting), Pennsylvania State University, University Park, Pennsylvania, 18 June, 2004.
 68. University of Nevada Annual Bios Lecture, Las Vegas, 1st April, 2004.
 69. Geological Society of America Annual Meeting, Seattle, Washington, 5th November 2003.
 70. NASA Astrobiology Institute Executive Council Retreat, Jackson Hole, Wyoming, 24th October 2003.
 71. Gordon Research Conference, “Origin of Life,” Bates College, Maine, 15th July 2003.
 72. National Museum of Natural History Special Lecture, Paris, France.
 73. Philips Distinguished Lecturer, Haverford College, Haverford Pennsylvania, 24 March 2003.
 74. NASA Astrobiology Institute General Meeting, Arizona State University, Tempe, Arizona, 12th February 2003.
 75. Arizona State University Geosciences & Biology Special Lecture, Tempe, Arizona, 7 November 2002.
 76. DOE-Genome International Workshop on Beyond the Identification of Transcribed Sequences Vienna, Virginia, October 25–28th, 2002.
 77. Bioastronomy 2002 International Meeting, Great Barrier Reef, Australia, 8–12 July 2002.
 78. Karling Lecture, Mycological Society of America, Annual Meeting, 25 June 2002.
 79. Joint Meeting of International Society of Molecular Evolution and Molecular Biology and Evolution, Sorrento, Italy, 14 June 2002.
 80. Naval Research Laboratory, Washington DC, April 18th, 2002.
 81. University of Michigan, NIH–Genetics Lecture Series on Genomics, March 5th, 2002.
 82. University of Michigan, NIH–Genetics Lecture Series on Genomics, March 5th, 2002.
 83. University of Georgia, Winter Evolutionary Biology Lecture Series, February 11, 2002.
 84. University of Georgia, Winter Evolutionary Biology Lecture Series, February 10, 2002.
 85. DOE-Genome International Workshop on Beyond the Identification of Transcribed Sequences, Reston, Virginia, November 9–12th, 2001.
 86. Duke University, North Carolina, 26 October 2001.
 87. Systematics Association Third Biennial Meeting Keynote Lecture, Imperial College, London, England, September 3–7, 2001.
 88. Caribbean Biodiversity: An International Conference Integrating Science and Policy, Punta Cana, Dominican Republic, July 26–29, 2001.
 89. Earth System Processes Global Meeting, Edinburgh, Scotland, June 24th–28th, 2001. Two talks.
 90. Primate Evolutionary Genetics, American Genetic Association Symposium, San Diego, California, May 19–20th, 2001.
 91. NASA Astrobiology Institute General Meeting, Carnegie Institute, Washington, D.C., April 10–12th, 2001.
 92. Human Genetics and Genomics, Keystone Symposium, Breckenridge, Colorado, March 31–April 6th, 2001.
 93. Darwin Lecture, Natural History Museum, London, England, February 8th, 2001.
 94. DOE-Genome International Workshop on Beyond the Identification of Transcribed Sequences, Keynote Lecture, Heidelberg, Germany, October 28–31, 2000.

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95. International Symposium on Flora of the West Indies, New York Botanical Garden, New York, NY, 23 June 2000.
96. National Science Foundation, Biotic Surveys and Inventories Workshop, Orcas Island, Washington, May 18th–21, 2000.
97. University of New York at Stony Brook, 27 April 2000.
98. NASA Astrobiology Science Conference, Ames Research Center, Moffet Field, California, April 2–5th, 2000.
99. University of Pennsylvania, Biology Department, Philadelphia PA, 21 March 2000.
100. Evolution 2000 International Symposium, Japan National Institute of Genetics, Tokyo, Japan, 5–7 March 2000.
101. Penn State Lectures of the Frontiers of Science, 19 February 2000.
102. British Museum of Natural History, London, 8–9 April 1999.
103. University of Iowa, Iowa City, Biology Department, 26 October 1998.
104. Texas A & M University, College Station, Genetics Program, 1 October 1998.
105. University of California, Santa Barbara, Marine Biology, Ecology, and Evolution department, 6 April 1998.
106. Gordon Research Conference on Molecular Evolution, Harbortown Resort, Ventura, California, 25–30 January 1998.
107. University of Georgia, Genetics Department, 5 November 1997.
108. International Symposium on Molecules and Morphology in Systematics, Paris, France, 24–28 March 1997.
109. McMaster University, Ontario, Canada, Department of Biology, 17 March 1997.
110. Inter-American University, Puerto Rico, 17 April 1996.
111. University of California, Santa Barbara, Biological Sciences department, 9 March 1995.
112. Duquesne University, Biological Sciences department, 7 April 1995.
113. University of Tennessee, Knoxville, Zoology Department, 1996.
114. Inter-American University, Puerto Rico, Biological Sciences Department, 17 April 1996.
115. American Museum of Natural History/City University of New York (CUNY), New York City, 4 April 1996.
116. Third Annual Meeting, International Society for Molecular Biology and Evolution, Hayama, Japan, 23 August 1995.
117. Montana State University, Biology department, 6 October 1994.
118. Joint meeting, Society for the Study of Amphibians and Reptiles and Herpetologist's League, Athens, Georgia, 28 July–1 August 1994.
119. Third International Zoology Symposium, Havana, Cuba, 21–24 June 1994. Two lectures.
120. Yale University, Biology department, 3–5th March, 1994.
121. World Congress of Herpetology, Adelaide, Australia, 29th Dec. 1993–6th Jan. 1994.
122. University of Guelph, Ontario, Canada, 17 February 1993.
123. American Society of Ichthyologists and Herpetologists, University of Illinois, 6 June 1992.
124. New York University, Biology Department, 10 March 1992.
125. Florida International University, Biology Department, 20 February 1992.

SERVICE

Teaching

Evolution (upper-level undergraduate course, each fall), 1992–present (PSU and Temple U). Enrollment 150–200 students. Students acquire a strong foundation in evolutionary biology, including its historical development and basic concepts such as the origin of life, natural selection, adaptation,

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population genetics, speciation, phylogeny, coevolution, taxonomy, and biogeography. Students who successfully complete the course will also have a broad understanding of the planetary environment, the fossil and molecular records of life, conservation of biodiversity, and astrobiology.
Graduate seminar, 1992–present (PSU and Temple U). Enrollment 5–10 students.

University service (Penn State)

Senator, University Faculty Senate, 2011–2014
Chair, University Faculty Scholar Medal Committee, Life and Health Sciences, 2012–2014
Chair, Marker Lecture Series in Evolution Committee, 1999–2014
Chair, College of Science Promotion and Tenure Committee, 2004–2005
Chair, University Faculty Scholar Medal Committee, Life and Health Sciences, 1999–2001
Chair, Paul Berg Prize Committee, 1994–1995

University service (Temple University)

Department of Biology Faculty Mentoring, 2018–present
Department of Biology Qualifying Exam Committee, 2018–present
Department of Biology Faculty Oversight committees, various
Department of Biology Graduate Research committees, various
College of Science & Technology Merit Review Committee, 2018–2019
College of Science & Technology Promotion and Tenure Committee, 2021–2023
Department of Biology People & Policies Committee, 2022–2024

Professional service

Senior Editor, *Molecular Biology and Evolution* (2012–2021)
Editor-in-chief, *Caribbean Herpetology* (2010–present)
Associate Editor, *Molecular Biology and Evolution* (2012–2021)
Associate Editor, *BMC Evolutionary Biology* (2008–2011)
Associate Editor, *Caribbean Naturalist* (2013–2017)
Member, Editorial Board, *BMC Evolutionary Biology* (2005–2008)
Member, Editorial Board, *BMC Proceedings* (2007–present)
Member, NASA Astrobiology Roadmap Committee (2001–2003).
Founder and Co-Chair, *Evolutionary Genomics Focus Group*, NASA Astrobiology Institute (2000–2016).
Reviewer of approximately 40–50 manuscripts per year for various journals.
Reviewer of approximately 5–10 NSF and NASA proposals per year.
Reviewer of approximately 5 International grant proposals per year.
Site Visit Panelist, Science Foundation of Ireland (June, 2009).
Site Visit Panelist, Purdue University-IUPUI, Biology Academic Program Review (April, 2006).
Panelist (occasional) on NSF and NASA grant proposal review panels.

OUTREACH

Documentary film

Extinction in progress (2013). Produced by S. Blair Hedges and Jurgen Hoppe. Directed by Jurgen Hoppe. *Caribemotion Films*. A one-hour documentary on the biodiversity crisis in Haiti. Screened at Environmental Film Festival, Washington DC, 19 March 2014); placed in top 5 of >100 films. Released to the public freely. Available at: https://www.youtube.com/watch?v=Lo5Ls89pJ_4.

Hedges lab research described in college textbooks

Cox, C. B., Liddle RJ, and P. D. Moore. 2020. *Biogeography: an ecological and evolutionary approach*. 10th Ed. John Wiley & Sons, Hoboken NJ. [Hedges authored an invited, guest essay, “Molecular

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- clocks, flotsam, and Caribbean islands”].
- Zimmer C, Emlen DJ. 2012. Evolution: making sense of life. Roberts & Company, Greenwood Village, Colorado. [Hedges research with Fry, published in *Nature*, on reptile venoms cited and discussed, p. 294–298].
- Minelli, A. 2009. *Perspectives in Animal Phylogeny and Evolution*. Oxford University Press, Oxford. [Hedges research on animal phylogeny discussed].
- Cox, C. B., and P. D. Moore. 2009. *Biogeography: an ecological and evolutionary approach*. 8th Ed. Blackwell Publishing, Malden, Massachusetts. [Hedges authored an invited, guest essay “Molecular clocks, flotsam, and Caribbean islands”].
- Strickberger, M. W. 2008. *Evolution. Fourth Edition*. Jones and Bartlett. Sudbury, Massachusetts. [Hedges research cited and discussed].
- Campbell, N., and J. Reece. 2007. *Biology*. Benjamin Cummings Publishing. [Hedges article #133 discussed in chapter 34].
- Patthy, Lazlo. 2007. *Protein Evolution*. Blackwell Publishing, Malden, Massachusetts. [Hedges article #140 and figures discussed].
- Cain, M. L., H. Damman, R. A. Lue, and C. K. Yoon. 2007. *Discover Biology*. W. W. Norton & Company, New York. [Hedges article #120 discussed on pages D7-D8, Unit 4].
- Freeman, S., and J. C. Herron. 2007. *Evolutionary Analysis, 4th Edition*. Prentice Hall, Inc. [Hedges research discussed on pages 760 and 780-81].
- Starr, Cecie. 2005-2006. Biology textbooks (various) (Thomson Higher Education, Brooks Cole). (Hedges article 133 discussed with illustration).
- Cox, C. B., and P. D. Moore. 2005. *Biogeography: an ecological and evolutionary approach*. 7th Ed. Blackwell Publishing, Malden, Massachusetts. [Hedges research in general discussed in chapter 9].
- Lewin, R. and R. A. Foley. 2004. *Principles of Human Evolution*. Blackwell Publishing, Malden, Massachusetts. [Hedges research discussed on p. 408].
- Pough, F. H., R. M. Andrews, J. E. Cadle, M. L. Crump, A. H. Savitsky, and K. D. Wells. 2004. *Herpetology. Third Edition*. Prentice Hall, Upper Saddle River, New Jersey. [Hedges research discussed throughout].
- Ridley, M. 2004. *Evolution. Third Edition*. Blackwell Publishing, Malden, Massachusetts.
- Pevsner, J. 2003. *Bioinformatics and Functional Genomics*. J. Wiley & Sons. [Hedges article #108 and figure discussed]
- Campbell, A. M., and L. J. Heyer. 2002. *Discovering Genomics, Proteomics, and Bioinformatics*. Benjamin Cummings, San Francisco. [Hedges article #120 discussed in Chapter 2; p. 46].
- Klein, J., and N. Takahata. 2002. *Where do we come from?* Springer, Berlin. 462 pp. [Hedges articles #99 and #108 discussed in Chapter 9; p. 246-247].
- Poirier, F. E., and J. K. McKee. 1999. *Human Evolution. Fourth Ed*. Prentice Hall. [Hedges research discussed on p. 302].

Hedges lab research described in other books

Elementary and Middle School textbooks: *Mathematics* (2004–, McDougal/Houghton-Mifflin, English and Spanish editions), *Mathematics* (Scott Foresman, English and Spanish editions). (Discovery of smallest amniote vertebrate discussed and photo used). Middle School Reader Series (McGraw-Hill, Australia).

Children’s books on animals: *Animal*, 2nd Edition, 2011 (Dorling Kindersley, London). *Biggest vs. Smallest Slimy, Scaly Creatures* by Susan K. Mitchell (*Cover Photo*; Bailey Books, Enslow Publishers, Inc., Berkeley Heights, NJ, 2010). *Illustrerad Vetenskap, 2008* (A book about important events and discoveries of 2008; Hedges' research on p. 69; Bonnier Publications; language looks Swedish). *Extreme Nature* (Harper-Collins, London, 2006), *Animal Minis* (Northword Books, 2005), *Strange New Species* by Elin Kelsey (Maple Tree Press, 2005), *Dokeo Environnement, Protéger la Terre* (Editions Nathan, France, 2006), *3D Animals Book#4 Teeny Tiny Animals* (Scholastic Press, New York), *Incredible Reptile Records* (Guinness World Records), *Mighty Micro Records* (Guinness World Records), *Children’s Book on Lizards* (Weldon Owen Publications, New Zealand, 2002), *children’s book* (Franklin Watts, 2002), *children’s book in Dominican Republic* (Capstone Press,

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2003), Reptiles: Do They have a Future? (Zaner-Bloser Publisher, 2003).

Other books: TED Book on de-extinction (2014, by Christine Gordon; visited Penn State to interview about Hedges' research on cryobanking biodiversity, to include in book). Life Books. 2010. *The Wonders of Life*. Life, New York. [Section on "Relativity" pp 104–105 covers Hedges' discovery of the smallest snake and lizard; photos]; *Everybody Up Level 4 Student Book* (English Language Teaching, Oxford University Press, 2011, global distribution). Ellie, Jennifer. 2011. *Visualizing Biology, Lab Manual* (include image and mention of Timetree of life research; John Wiley & Sons, print run: 100,000 copies). Ackerman, Diane. 2004. *An Alchemy of Mind*. Scribner, New York [chapter 2 details Hedges' discovery of the smallest amniote vertebrate]. Reddish, P. 1996. *Spirits of the Jaguar*. Book on Caribbean Natural history accompanying BBC television program (discusses Hedges' research on p. 33, 52).

Consulting and advising (unpaid) for museums and other exhibits (since 2012)

Royal Zoo of Amsterdam; consultant for a large, 3D tree of life exhibit, and provided graphical materials (contact, Sandra Rendgen; 1/2013).

The Science of Ripley's Believe it Or Not, a traveling exhibit; consulted for size extremes of animals and provided graphical materials (contact, Jessica Holdcroft; 7/2012).

Consulting and advising (unpaid) for films and television programs

BBC Worldwide (BBC One); "Super Small Animals," TV shows. Consulted early 2017.

Earth Unplugged TV (BBC worldwide); contributed Barbados snake discovery, images, to their top ten list of snakes for production (contact, Nalini Crack; February, 2014).

Free Spirit Films; consultant for "Wild Brazil" 5-part series, regarding information on species of reptiles (contact, Tom Rowland; February, 2014).

Windfall Films; consultant (credited) for television program on Channel 4 in the U.K., about animal reproduction and eggs (contact, Laura Voak; aired April, 2013).

Sir David Attenborough's "Rise in Animals" 2-hour movie, released 9/2013. Atlantic Productions; consultant (credited) on timetree of life subject and provided graphical material (contact, Alex-Baines-Buffery; 11/2012). 2 million viewers in U.K. on first day of release. The movie, which is framed by a CGI timetree used throughout, every 10 minutes, won an Emmy Award in 2016.

1000 Days For the Planet; A TV documentary series produced by the Convention on Biological Diversity, and Montreal's nature museums; consulted on the tree of life and provided graphical materials (contact, Felix Pharand-Deschenes; 11/2012).

Decade of Discovery; BBC; consultant; a documentary on scientific discoveries; features Caribbean species discovered by Hedges; 2011.

60 Minutes, CBS: consultant; episode hosted by Leslie Stahl, about dinosaurs, cloning whole animals, Jack Horner, and ancient biomolecules (aired Fall 2009 & Fall 2010). Worked with Producer Meghan Frank.

Cuba: Wild Island of the Caribbean, PBS; consultant; a one-hour television program on the natural history of Cuba; featured species discovered by Hedges; aired January/February in 2005. Produced by Free Spirit Films.

Spirits of the Jaguar, BBC: consultant; a documentary film produced by Paul Reddish about Caribbean Natural History; aired 1996. Accompanying book by the same name, published by BBC Books.

MENTORSHIP

Graduate students—mentored (15)

Dr. Solny Adalsteinsson (M.Sc. Biology, 2008; PhD, U Delaware; PI Tyson Research Center, Wash U).
Dr. Fabia Battistuzzi (PhD Biology and Astrobiology, 2007; Assistant to Associate Professor & Associate Dean, Oakland U).
Dr. Jaime E. Blair (PhD Biology and Astrobiology, 2005; Assistant to Full Professor & Associate Chair of Biology, Franklin and Marshall College).
Tiffany L. Cloud (MSc, Biology, 2013).
Melissa S. Frye (MSc Biology, 1996).
Dr. Matthew Heinicke (PhD Biology, 2009; Assistant to Associate

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Professor, U Michigan). Patrick H. Parker (MSc Biology, 1996). Dr. Laura L. Poling (MSc Genetics, 2001; PhD, Genetics, Harvard, 2007; Oncology Drug Discovery Scientist, Aveo Pharma, Cambridge, MA). Dr. Daniel L. Rabosky (MSc Biology, 2003; PhD, Cornell; Assistant to Associate Professor, U Michigan). Dr. Molly Schools (PhD Biology, Temple University, 2023). Dr. Christoph Schubart (PhD Biology, 1997, U. Bielefeld, co-advised; Prof., Biology, U. Regensburg, Germany). Ms Prachi Shah (MSc Computer Science, 2002; computer scientist, Stanford). Dr. Michael R. Tracy (MSc Biology, 1999; M.D., Wake Forest, N.C.). Dr. Marcel van Tuinen (PhD Biology, 2000; Associate Professor, U. North Carolina).

Graduate students—membership on committee

Kyung-Eui Han (PhD, Biology, PSU, 1995), Philip J. Heise (MSc, Biology, PSU, 1995), Ilya Ruvinsky (MSc, Biology, PSU, 1995), Karen A. Kellog (PhD, Ecology, PSU, 1996), Tatyana Sitnikova (PhD, Genetics, PSU, 1998), Anne C. Stone (PhD, Anthropology, PSU, 1996), George Zhang (PhD, Genetics, PSU, 1998), Barry N. Campbell (PhD, Biology, Queen's University, Canada, 1996), Judith E. Mank (MSc, Genetics, PSU, 2001), Yumiko Watanabe (PhD, Geosciences, PSU, 2002), Jozsef Gemnl (PhD, Plant Pathology, PSU, 2003), Pushker Kharecha (PhD, Geosciences, PSU, 2005), David Vuletich (PhD, Astrobiology and Chemistry, PSU, 2004–present), and Drew Wham (PhD, Biology, PSU 2013–present); QiQing Tao (PhD, Biology, Temple, 2016–Present); Nicholas Huron (PhD, Biology, Temple, 2017–2022); Sudip Sharma (PhD, Biology, Temple, 2018–2023); Melissa J. Betters (PhD, Biology, Temple, 2020–present).

Undergraduate research students (~80)

Honors theses supervised: 38.

Undergraduate coauthors of publications: 20 students in 15 articles, including *Science* (5 students in 2 articles), *PNAS* (1), *Proc. R Soc.* (1), and *Biology Letters* (1).

External grant support obtained for undergraduate research: \$695,000 (NSF-REU Sites & Supplements)

After students graduated:

Postgraduate degrees*, 16 PhDs, 14 MDs, 2 DDSs, 1 DVM, 7 MS, 1 ME, 1 JD.

Postgraduate Institutions: include Harvard (2), Princeton (1), MIT (1), Stanford (1), Brown (1), Penn (5), Johns Hopkins (3), UC Berkeley (2), UC San Diego (1), Michigan (1), among others.

*includes some currently in degree programs

Solny A. Adalsteinsson (2008), Anna Azvolinsky (2002), Claire Baldeck (2004), Rituparna Basu (2011), David N. Boone (2003), Lana Brahmakulam (2000), Laura J. Bruce (2015), Aidan Buehler (2022), Erin Cain (2016), Alicja A. Chechla (2008), Hsiong Chen (2001), Haley E. Chutz (2005), Tiffany L. Cloud (2010), Tiffany L. Cole (2014), Caitlin E. Conn (2011), Alexis Crane (2003), Jessica C. Czankner (1999), Cierra Danko (2009), Jaanki Dave (2015), Stephanie L. Dennison (2010), Sarah C. Duncan (1995), Allison R. Durica (1996), Elizabeth C. Eck (2010), Brooke Eidell (2000), Andreia Feijão (2002), Andrea E. Feller (1996), Jennifer R. Grubb (2000), Bethany L. Hafer (1996), Morgan Harrell (2009), Lauren M. Harter (2012), Daniel S. Heckman (2001), Lindsey M. Hower (2002), George A. Inglis (2014), Natalie L. Kardos (2004), Kelly Keegan (2003), Lori Kern (1995), Shannon G. Kindl (2000), Anne O. Krichten (2015), Claire C. Landgren (2005), Eliza Ledwell (2008), Alyssa R. Liguori (2011), Kelly M. Lipp (2012), Joanna R. Marlow (2008), Ashley M. Martin (2005), Amy J. Matthew (2016), Amy Maya (2010), Daniel McAllister (1991), Kristin K. Nastase (1997), Emily E. Norder (2002), Ranjani Padmanabhan (1999), Madeline Paymer (2009), Amy K. Pepperney (1999), Amanda R. Pfaff (2001), Nicholas Plummer (1992), Laura L. Poling (1998), Sonja J. Pyott (1999), Mackenzy M. Radolec (2012), Riya Raju (2015), Claire E. Richardson (2005), Rebecca L. Ruskin (2001), Amy Rutter (2014), Jennifer Sander (2004), Jason L. Shoe (2001), Melitta D. Simmons (1996), Ericca Stamper (2004), Rebecca L. Stauffer (2001), Heather R. Stone (2005), Amy Strafalone (1995), Jessica K. Templeton (2010), Amanda S. Thompson (2001), Jennifer R. Thompson (2000), Daniel B. Turner (2016), Maraliz Vazquez (2002), Maria L. Venturi (2002), Nicki Viall (2003), Daniel Y. Wang (1999), Andrew J. Weiss (2006), Alan C. Wong (1996), April Wright (2008), Cecelia L. Youngblood (1995).

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