

Curriculum Vitae: Michael G. Hadfield

Education:

University of Washington, Seattle, A.B., 1959, Zoology
University of Washington, Seattle, M.S., 1961, Zoology
University of Copenhagen, 1961-1962, Marine Biology
Stanford University, California, Ph.D., 1967, Biological Sciences

Fellowships:

Fulbright Fellow, 1961-1962, Danish Marine Laboratory, University of Copenhagen.
NIH Predoctoral Fellow, 1962-1966, Stanford University.

Positions:

Assistant Professor of Zoology, Pomona College, Claremont, California, 1966-1968.
Assistant Professor of Cytology and Zoology, Pacific Biomedical Research Center, University of Hawaii, 1968-1975.
Associate Professor of Cytology and Zoology, Department of Zoology and Pacific Biomedical Research Center, University of Hawaii, 1975-1979.
Professor of Cytology and Zoology, Department of Zoology and Pacific Biosciences Research Center, University of Hawaii, 1979 – 2013.
Professor of Biology Emeritus, 2013 -.
Researcher, non-compensated, Pacific Biosciences Research Center, 2013 -.
Director, Kewalo Marine Laboratory, Pacific Biosciences Research Center, University of Hawaii, 1996 - 2007.

Other Professional Experience and Activities:

Fulbright Fellow, Marine Laboratory, University of Copenhagen, studied marine invertebrate larvae with Prof. G. Thorson, 1961-62.
Participant, Stanford University "Te Vega" Expedition, Tropical Pacific, Summer 1963.
Scientist, U.S. Antarctic Program Research Ship "Eltanin", Summer 1964.
NSF Summer Institute, Chofu, Japan, Co-teaching "Environmental Biology", Summer 1971.
Visiting Professor, Invertebrate Zoology: University of Washington, Friday Harbor Labs, Summer 1981.
Visiting Professor, Advanced Invertebrate Embryology: Friday Harbor Laboratories, University of Washington, 1968, 1978, 1983, 1988, 1994, 1998; Catalina Island Marine Biological Laboratory, May 1971.
Visiting Professor, Larval Ecology: University of Washington, Friday Harbor Lab, Spring, 1984, 1986.
Visiting Professor, Cell Biology of Invertebrate Development: Hopkins Marine Station (Stanford University), Summer 1989.
Visiting Professor, Invertebrate Life Histories: University of Guam Marine Laboratory, Summer 1980, 1991, 1995.
Associate Editor, Pacific Science. 1985 – 2004.
Panelist, U. S. Department of Agriculture, Small Business Innovative Research Grants in Aquaculture. 1990.
Member, Review Committee for Smithsonian Institution, National Museum of Natural History; reviewing the Smithsonian Marine Station at Link Port, Florida. April 5-8, 1990.

Plenary Lecturer, Biology of Marine Larvae in: Biotechnology in Marine Biology, a short course sponsored by the Organization of American States, Santiago, Chile. Jan. 10-15, 1992.

Member, Animal Species Advisory Commission, State of Hawaii, appointed by Gov. John Waihee, 1988-93.

Member, National Science Foundation Task Group on Invertebrate Teaching, 1991-93.

Member, National Research Council Committee on Molecular Marine Biology, 1992-1993.

Participant, National Science Foundation, Division of Ocean Sciences, Workshop on Biological Diversity in Marine Systems (BioMar): A Proposed National Research Initiative. 1993.

Associate Editor, Journal of Experimental Zoology, 1990-1993.

Regional Editor, Marine Biology, International Journal on Life in Oceans and Coastal Waters, 1988-1993

Workshop Participant, The roles of marine laboratories in the implementation of the nation's emerging priorities for research and monitoring in the coastal zone. Sponsored by the National Association of Marine Laboratories. 1995.

Visiting Committee, Department of Organismic and Evolutionary Biology, Harvard University, 1991-1996.

Natural Area Reserves Commission, State of Hawaii, 1992-96, Chair, 1993-96.

Member, National Research Council, Working Group on New Models for Biomedical Research, 1997.

Ballast-water Task Force, Hawaii Departments of Land and Natural Resources and Agriculture, 1997- 99.

Ad hoc committee on governance, Society for Integrative and Comparative Biology, 1999.

International Workshop on the Census of Marine Life, Heraklion, Crete, Nov. 2000.

Chair, Search Committee for Head of Department of Invertebrate Zoology, U.S. National Museum of Natural History, Smithsonian Institution, 2000.

Chair, Search Committee for Director, the Smithsonian Marine Station, Smithsonian Institution, U.S. National Museum of Natural History, 2001.

Board of Directors, Pacific Institutes of Marine Science (International), 2002; President 2007 - 2009.

Member, External Review Committee for the Department of Biology, University of Oregon, May 2013.

Member, Scientific Advisory Board: Biodiversity Research Center, Academia Sinica, Taipei, Taiwan, 2008 -2017.

Member, International Review Panel, Singapore Center for Environmental Life Sciences Engineering, Nanyang Technological University and National University of Singapore, 2018.

Current:

Research Associate, Bernice P. Bishop Museum, 1983 -.

Associate of Marine Biology in the Museum of Comparative Zoology, Harvard University, 1994 - .

Member, Mollusc Specialist Group, Species Survival Commission, International Union for The World Conservation Union, 1985 -.

Member. Hawaii State Alien Aquatic Species Taskforce, 2002 -.

Frontiers in Marine Science, Review Editor, 1915 - .

Member, Scientific Advisory Panel, Marine Climate Change Science Program, Singapore, 2021 – 2028.

Member, International Union for the Conservation of Nature, Mollusc Specialist Group, 2021-2025.

Membership in Professional Societies:

American Association for the Advancement of Science; American Institute of Biological Sciences; American Malacological Society; American Microscopical Society; Hawaii Academy of Science; International Society on Invertebrate Reproduction and Development; Malacological Society of London; Sigma Xi; Society for Integrative and Comparative Biology; Unitas Malacologica; Western Society of Naturalists.

Offices:

Conservation Council for Hawaii (affil. Nat. Wildlife Fed.), Oahu Chapter: President, 1981-82.
Society of Sigma Xi, Hawaii Chapter: Councilor, 1989-90, President, 1991-92.
Western Society of Naturalists: President, 1993.
American Society of Zoologists, Division of Invertebrate Zoology: Chairman 1991 and 1992.
Society for Integrative & Comparative Biology (formerly American Society of Zoologists): President, 1995 and 1996; Executive Committee, 1991 - 1998.
Western Association of Marine Laboratories, Treasurer, 1997 - 2015.
Hawaii Academy of Science. President, 2004 – 2005.
Pacific Institutes of Marine Science. President, 2007 – 2012.

Honors:

Fellow, American Association for the Advancement of Science (1985)
Matsuda Scholar, University of Hawaii (1989)
Recipient of the first M. Patricia Morse Award for Excellence and Innovation in Science Education, from the Society for Integrative and Comparative Biology (2014)

Research Interests:

Settlement and metamorphosis of marine invertebrate larvae; comparative life history studies; chemical interactions in marine animals; marine biofilm bacteria; evolutionary and conservation biology of endemic Pacific-Island tree snails.

Current Extramural Grant Support:

Office of Naval Research. 2019 – 2022. Multiple approaches for testing novel coatings in the laboratory and in Pearl Harbor: Hawaii: investigations at the microbial and macrofouler levels. \$480,000.
U.S. National Science Foundation, 2017 – 2021. REU – Environmental Biology for Pacific Islanders. \$455,848.
Leidos Inc. (DARPA). Research on larval settlement of an r-selected marine invertebrate. 2019 – 202022. \$479,677.

Invited Symposium and Seminar Lectures:

1970. Western Society of Naturalists. Symposium on Reproduction and Development of Marine Invertebrates. Honolulu. J. S. Pearse, organizer.
1974. University of Guam and Western Society of Naturalists. International Conference on Coral Reefs: Animal associates of corals. Agana, Guam. L. Eldredge, organizer.
1975. Gordon Conference on Marine Natural Products Chemistry, Santa Barbara. P. J. Scheuer, organizer.
1976. NATO Conference Series in Marine Sciences: Marine Natural Products Chemistry. Jersey, U.K., D. J. Faulkner and W. H. Fenical, organizers.
1977. Belle W. Baruch Conference in Marine Science: Reproductive Ecology of Marine Invertebrates. Baruch Institute, University of South Carolina. S. Stancyk, organizer.
1977. American Society of Zoologists. Symposium on Settlement and Metamorphosis of Marine Invertebrates. Toronto. F. S. Chia and M. E. Rice, organizers. (two papers presented)
1978. Western Society of Naturalists. Symposium on Recent Advances in Developmental Biology of Marine Invertebrates. Tacoma, WA. D. Epel, organizer.

1979. American Society of Zoologists. Symposium on Life-History Strategies of Marine Organisms. Tampa. S. Woodin, organizer.
1982. U.S. Sea Grant Program. International Conference on Recent Innovations in Cultivation of Pacific Molluscs. La Jolla. D. E. Morse, K. Chew, and R. Mann, organizers.
1983. American Malacological Union. Symposium on Extinction in Molluscs. Seattle. G. Vermeij, organizer.
1984. Gordon Conference on Marine Natural Products Chemistry. Santa Barbara. J. Sims, organizer.
1984. Tokai University Marine Science Center and Western Society of Naturalists. International Conference on Marine Plankton. Symposium on Factors Affecting Recruitment of Larvae from the Plankton. Shimizu, Japan. D. E. Morse, organizer.
1985. The Larval Biology Workshop. Friday Harbor, Washington. Member: Convening Committee. Author: Summary paper on settlement and recruitment.
1986. Symposium on the Biology of Opisthobranchia in Honor of Dr. Eveline D.R. Marcus. American Malacological Union. Monterey, CA. Dr. T. Gosliner, organizer.
1986. Symposium: "Molluscs as threatened species: their exploitation and conservation." International Malacological Union, Edinburgh, Scotland. Dr. E. A. Kay, convener.
1987. Donald P. Abbott Memorial Symposium on Marine Biology. Member of the Organizing Committee. Asilomar, California.
1988. Symposium: "Chemical factors that influence the settlement and metamorphosis of marine invertebrate larvae." Co-chairman and participant. American Society of Zoologists. Dec. 1988, San Francisco, California.
1989. Symposium: "Mechanisms of reproduction in marine invertebrates." Co-convener and participant. International Society for Invertebrate Reproduction. Nagoya, Japan. July 24-29, 1989.
1989. Symposium/Workshop: "New Models for Aging Research." Invited speaker and participant. National Institute on Aging, National Institutes of Health. Bethesda, MD. December 5-6, 1990.
1990. Symposium: "Non-polluting anti-fouling biosurfaces." Invited paper. Office of Naval Research. Buffalo, New York. June 29-July 1, 1990.
1991. Pacific Science Congress; symposium on detrimental effects of introduced organisms. Hono-lulu. May 28 - June 2, 1991
1991. Society for the Study of Evolution; invited paper for a symposium on evolutionary biology of Hawaiian plants and animals. Hilo. July 28 - Aug. 3, 1991
1991. Symposium: "International Symposium on Marine Biofouling." Invited paper. Aurangabad, India. August 12 - 16, 1991.
1992. Symposium: "Marine Biotechnology." Invited lecture on "Progress in Anti-fouling." Santiago, Chile. January 13, 1992.
1992. Symposium: "Indo-U. S. Conference on Recent Advances in Non-polluting Biofouling Research," Bangalore, India, July 1992.
1992. Symposium: Ecological Society of America. Invited paper, "Ecology and conservation of endemic Hawai`ian tree snails." Honolulu, HI. August 10, 1992.
1992. Symposium: "Gerontology of Fungi and Invertebrates," Gerontological Society of America. Invited paper, "Flexible lifespans in sea slugs and sea hares." November 19, 1992.
1992. Symposium: American Society of Zoologists, "The Crisis in Invertebrate Conservation." Organizer and speaker. Vancouver, BC. December 1992.
1993. ONR, 3rd Annual Investigator's Meeting: Olfactory Discrimination Program. "Chemosensory pathways in an adult nudibranch gastropod." B. F. Murphy and M. G. Hadfield. St. Augustine, FL, April 1993.
1994. International *Partula* Workshop. London. Feb. 11-13, 1994.
1994. University of Washington: Dimensions of Invertebrate Biodiversity. Seattle, WA. March 1994.
1994. State of Hawaii: Habitat regeneration and restoration. Honolulu, HI. July 1994.
1994. Biotic and abiotic interactions during larval and adult stages of marine benthic invertebrates. Nice, France. September 18-24, 1994.

1995. Symposium on Sensory Ecology and Physiology of Zooplankton. Honolulu, HI. January 1995.
1995. American Malacological Union, Symposium on Molluscan Conservation. Hilo, HI June 1995. Symposium address: Conservation biology of Hawaiian tree snails.
1995. 5th International Polychaete Conference, Keynote Address. Qingdao, China. July 1995. Keynote address to the symposium, Polychaetes as model organisms in marine biofouling and pollution and research.
1995. The Larval Biology Meeting. Ft. Pierce, FL, August 1995. Settlement of *Hydroides elegans*: the role of bacteria.
1995. National Association of Marine Laboratories, Workshop on roles of coastal laboratories in the implementation of the nation's emerging priorities for research in the coastal zone. Invited chair: working session on Fostering development and implementation of interdisciplinary research.
1996. 8th International Coral Reef Symposium, Panama City, Panama, June 1996. Special symposium on Early development and larval biology of invertebrate coral reef organisms, invited paper: The settlement response to biofilms in the common tropical serpulid *Hydroides elegans*.
1996. International symposium: Settlement and Metamorphosis of Marine Invertebrate Larvae, Plymouth, UK, July 1996. The D. P. Wilson Memorial Lecture: Larval settlement and metamorphosis: past, present and future.
1996. American Association of Zoos and Aquaria, Honolulu, HI, Sept. 1996. Invited symposium address: The fate of endangered Hawaiian tree snails in the field and lab.
1997. Office of Naval Research, International Symposium: Emerging nonmetallic materials for the marine environment. Honolulu, March 1997. Keynote address: Surface-microbe-invertebrate interactions in marine biofouling.
1997. Society for Conservation Biology, Victoria, British Columbia, June 1997. Invited symposium address: Invasions and extinctions: Case histories from Hawaiian tree snails.
1997. Society for Conservation Biology, Victoria, BC, June 1997. Invited symposium address: Coastal disturbances and recruitment of benthic marine invertebrates: A future or present problem?
1997. International Society of Chemical Ecology, 14th Annual Meeting, Vancouver, BC. July 1997. Invited keynote address: Chemical interactions in invertebrate larval settlement.
1998. The Larval Biology Meetings, Melbourne, Australia. Jan. Evidence that the anterior sensory organ of a gastropod larva contains the receptor for an external metamorphic signal.
1998. Duke University Marine Laboratory, invited seminar, Mar. 25, Settlement signals: how invertebrate larvae detect and process them. Department of Zoology, Duke University, Durham, NC, March 26, Insular evolution, invasions, and extinctions: case histories from Hawaiian tree snails.
1999. Society for Integrative and Comparative Biology, Past Presidential Address, January 1999. "To save a snail," Denver, CO.
1999. 10th International Congress on Marine Biocorrosion and Biofouling, Keynote Address, Feb. 1999. Melbourne, Australia. Macrofouling Processes: settlement processes in the ubiquitous fouler *Hydroides elegans*.
1999. Harvard University, Department of Organismic and Evolutionary Biology, seminar, Feb. 25, 1999. Settlement Signals: How Invertebrate Larvae Detect and Process them.
1999. Marine Coatings Research Institute, Qingdao, China. Sept. 6-7, 1999. Three lectures on biofouling, anti-fouling technology, and marine models for biomedical research.
2000. University of California at San Diego. Department of Biology, invited seminar, March 2, 2000. "Insular evolution, invasions and extinctions: case histories from Hawaiian tree snails."
2000. Scripps Institution of Oceanography, La Jolla, CA, invited seminar, March 3, 2000. "Settlement Signals: how invertebrate larvae detect and process them."
2000. Invited symposium address, Recruitment of an invertebrate larva in response to a dissolved cue in wave-driven flow. The Larval Biology Meetings, Santa Cruz, CA, June 24 - 28, 2000.
2000. Invited symposium address, Larval behavior in response to a dissolved settlement cue aids recruitment on coral reefs. 9th International Coral Reef Symposium, Bali, Oct. 23, 2000.

2001. Invited symposium address: Metamorphic competence as a major adaptive convergence in marine invertebrate larvae." Society for Integrative & Comparative Biology, symposium on: Ontogenetic Strategies of Invertebrates in Aquatic Environments, Jan. 4, 2001.
2001. Invited research seminar, Factors influencing settlement of marine invertebrate larvae. Bodega Marine Laboratory, University of California at Davis, May 17, 2001.
2001. Invited Plenary Lecture, The capacity to metamorphose, metamorphic induction and mechanisms of response in (at least some) invertebrate larvae. 9th International Congress on Invertebrate Reproduction and Development. Rhodes University, Grahamstown, South Africa. July 17, 2001.
2001. Invited symposium address: Contributions of *ex situ* propagation and molecular genetics to the conservation of Hawaiian tree snails. UCLA Biodiversity Conference 2001: Experimental Approaches to Conservation Biology. Los Angeles, CA. Sept. 11 - 14, 2001.
2001. Invited research seminar, Factors Affecting the Settlement and Metamorphosis of Marine Invertebrate Larvae: Data from the Field and Lab. Oregon Institute of Marine Biology, University of Oregon, Oct. 5, 2001.
2002. Two invited symposium talks for the Opening Ceremony of the Coastal Marine Laboratory at Hong Kong University of Science and Technology: Research Activities at the Kewalo Marine Laboratory, and Induction of Metamorphosis in Invertebrate Larvae by Dissolved Environmental Cues: Does it Work in Turbulent Moving Water? May 22 - 23, 2002.
2002. Invited research seminars, Induction of Metamorphosis in Invertebrate Larvae by Dissolved Environmental Cues: does it work in turbulent moving water? Issues in Biofouling Research. The Tropical Marine Science Institute, National University of Singapore, May 29, 30, 2002.
2002. 5th International Larval Biology Meeting. Vigo, Spain. Do settling larvae make mistakes? Sept. 18, 2002.
2002. Invited lecture. Life Histories of Marine Invertebrates - A Symposium in Honor of Mary E. Rice, Sponsored by the Smithsonian Institution. Fort Pierce Laboratory. November 14 and 15, 2002.
2002. Invited lecture, Hawaii State Foundation on Culture and the Arts: A scientist looks at art: dissecting, sorting and moralizing. October 19, 2002.
2003. Invited lectures (3), Autonomous University of Baja California, Mexico, March 24-28, 2003.
2003. Invited lecture, Department of Biology, San Diego State University, California, Mar. 27, 2003.
2003. Invited Plenary Lecture. Australian Marine Science Association, Brisbane. July 10, 2003.
2003. Invited lecture, Centennial Symposium, Friday Harbor Laboratories, University of Washington, August 26, 2003.
2003. Invited lecture, American Society of Microbiology, Special Symposium on Biofilms, Victoria, British Columbia, November 2003.
2004. Plenary Lecture (invited), International Larval Biology Conference, Hong Kong, June 2004.
2004. Invited Symposium talk, International Society for Microbial Ecology, Cancun, Mexico, August 2004.
2005. Invited symposium contribution. Symposium on Endemic Land Snails of the Pacific, American Malacological Society, Asilomar, California, June, 2005
2005. Invited symposium contribution: From development to extinction: molluscan neontology and paleontology. American Malacological Society, Asilomar, June 2005.
2005. Invited seminar-lecture, National Institute of Oceanography. Goa, India. August 2005.
2005. Invited departmental seminar. Department of Integrative Biology, University of California, Berkeley, California. November 2005.
2005. Invited seminar, Hopkins Marine Station of Stanford University, Pacific Grove, CA, November 2005.
2006. Invited seminar to the Department of Conservation, Newport, New Zealand, April 2006.
2006. Tribute (invited). Symposium honoring John S. Pearse, Univ. California Santa Cruz, June 2006.
2006. Plenary Lecture (invited). Symposium on Recent Advances in Marine Antifouling Technology, National Institute of Ocean Technology, Chennai, India. November 2006.
2006. Invited lecture, Biodiversity Centre, Singapore Department of National Parks. November 2006.

2007. Invited seminar and discussions with graduate students. Dept. of Biology, University of Southern California, Los Angeles, February 2007.
2007. Invited speaker and participant. NSF-National Evolutionary Synthesis Center, Catalysis conference on Origin and Evolution of Chemoreception. Durham, NC, June 2007.
2008. Keynote speaker (invited), "Recruitment on Rocks, Reefs and Rafts: why invertebrate larvae settle when and where they do." International Conference on Biofouling and Ballast Water Management. Goa, India. February 2008.
2008. Chair and speaker, symposium on Conservation Status of Hawaiian Native Land Snails, "The Conservation Status of Hawaii's Severely Endangered Achatinelline Tree Snails." AAAS Pacific Division, Waimea, HI. June 2008.
2009. Keynote speaker. Academia Sinica, Taipei, Taiwan. "Larval-substrate interaction in the settlement of marine invertebrate larvae and its significance for biofouling." April 2009.
2009. Keynote speaker. Pacific Biosciences Annual Symposium, University of Hawaii. "Multiple approaches to conserving Hawaii's severely endangered tree snails." May 2009.
2009. Keynote speaker. Asia Pacific Association of Chemical Ecologists. Honolulu, HI. "Recruitment in the sea: why invertebrate larvae settle when and where they do?" October 2009.
2010. Speaker, Society for Integrative and Comparative Biology. Annual meeting, Seattle, WA. "Formation and Fate of the Musculature in larvae of the nudibranch *Phestilla sibogae*." January 2010.
2010. Invited seminar. Department of Conservation, Hokitika, New Zealand. "The importance of genetic data in the conservation of Pacific Island land snails." November 2010.
2011. Invited symposium speaker. Biodiversity Research Center, Academia Sinica, Taipei, Taiwan, ROC. "Extinction & conservation of Pacific Islands land snails." March 2011.
2011. Invited speaker. National Museum of Marine Biology and Aquarium, Checheng, Taiwan. "Why do marine invertebrate larvae settle where they do? Soluble and absorbed cues to settlement." March 2011.
2011. Invited seminar speaker. Department of Natural Resources and Environmental Studies, National Dong Hwa University, Hualien, Taiwan. "Extinction & conservation of Pacific Islands land snails." March 2011.
2011. Co-PI and organizer, NSF-National Center for Evolutionary Synthesis (NESCent), catalysis workshop: "The origin and evolution of animal-microbe interactions." October 24 – 27, 2011.
2011. Invited seminar. Duke University Marine Laboratory, Beaufort, NC. "Larval-substrate interactions in the settlement of marine invertebrate larvae and its significance for biofouling: why larvae settle when and where they do." Oct. 28, 2011.
2012. Invited symposium speaker. Canadian Society of Zoologists, New Brunswick. "External stimulants and internal transitions in metamorphosis of marine invertebrate animals." May 11, 2012.
2012. Invited symposium speaker. American Society for Microbiology, San Francisco. "Nested ecosystems: the many layers of animal-bacterial interactions." June 18, 2012.
2012. Invited symposium speaker. International Conference on Marine Corrosion and Fouling, Seattle, WA. "A common theme in bacterial induction of macrofouling." June 26, 2012.
2012. Invited symposium speaker. 10th International Larval Biology Symposium, Berkeley, CA. "Why larvae settle where they do: the importance of bacteria." July 30, 2012.
2012. Invited keynote lecture. National University of Singapore, Tropical Marine Science Institute 10th anniversary celebration. September 30, 2012.
2014. Invited keynote lecture; "The Bacterial Basis of Biofouling." International Conference on Marine Biofouling and Biocorrosion. Chennai, India. March 5, 2014
2014. Invited faculty participant: Symbiomics 2, a ten-day workshop on marine symbiosis, sponsored by the EU program "Symbiomics," at the Marine Microbiology Institute, Max Planck Inst., Bremen, Germany. Held at the Hydra Laboratory, Isle of Elba, Italy, May 27 – June 7, 2014. Presented two lectures and led projects.

2014. Invited lecture: "The natural and biological resources of Pagan Island (and their fate on a "target" island)." Forum: Preserving the Planet for Posterity through Partnerships, the Pagan Preferred Alternative. October 3, 2014, Garapan, Saipan, CNMI.
2015. Invited symposium address: "The bacterial basis of marine biofouling: a case study, *Hydroides elegans*." Biodiversity Research Center, Academia Sinica. April 2015. Taipei, Taiwan.
2015. Invited symposium address: "The bacterial basis of marine larval settlement." Canadian Institute for Advanced Research symposium on "Integrated Microbial Biodiversity," May 27 – 29, 2015, Victoria, British Columbia.
2016. Invited address: "The Intrinsic Value of In-the-Lab Internships for Training Pacific Islanders for Life in the 21st Century Environment." In, Coral Reef Conservation through Transformational Learning." International Coral Reef Symposium. June 2016. Honolulu, HI.
2016. Invited seminar: "How Bacterial Films Influence Larval Recruitment of Marine Invertebrates." Singapore Centre for Environment Life Sciences Engineering, Nanyang Technological University, and Tropical Marine Science Institute and Department of Biology, National University of Singapore. August 5, 2016.
2017. Invited participant: "Symbiotic Interactions in the Oceans," January 23 – 27, 2017, Maui, HI. A workshop sponsored by the Canadian Institute for Advanced Research and the Gordon and Betty Moore Foundation; Maui, Hawaii.
2017. Organizer and Speaker, "Multiple microbes, multiple mechanisms: bacterial induction of *Hydroides* settlement," in symposium on "Bacterial-Larval Interactions," part of the International Larval Biology Conference, Honolulu, HI August 10 – 17, 2017.
2017. Invited speaker and discussant: "Patchy Anthropocene: Frenzies and Afterlives of Violent Simplifications," September 8-14, 2017, Sintra, Portugal, a symposium supported by the Wenner-Gren Foundation.
2018. Invited seminar: "Metamorphosis of Marine Invertebrates: a primer." Tropical Marine Science Institute, Singapore National University, Singapore. April 5, 2018.
2018. Invited seminar: "The bacterial basis of larval settlement: a case study, *Hydroides elegans*." Smithsonian Marine Station, Ft. Pierce, FL. June 2018.

Peer-reviewed publications:

- Hadfield, M. G. 1963. The biology of nudibranch larvae. *Oikos*, 14(1):85-95.
- Hadfield, M. G. 1963. *Coryphella parva* n. sp., a new nudibranch from the Oresund. *Vidensk. Medd. Dansk naturh. Foren.* 125: 371-376.
- Hadfield, M. G. 1964. Opisthobranchia: The veliger larvae of the Nudibranchia. *Zooplankton Sheet No. 106. Fiches d'Identification, Conseil Intern. L'Exploration Mer.* 2 pp.
- Hadfield, M. G. and R. H. Karlson. 1969. Externally induced metamorphosis in a marine gastropod. *Amer. Zool.* 9(4): 1122.
- Hadfield, M. G. 1970. Observations on the anatomy and biology of two vermetid gastropods. *The Veliger* 12(3): 301-309.
- Hadfield, M. G., E. A. Kay, M. U. Gillette, and M. G. Lloyd. 1972. The Vermetidae (Mollusca: Gastropoda) of the Hawaiian Islands. *Marine Biology* 12(1): 81-98.
- Hadfield, M. G. 1974. Chapter 7, Hemichordata. Pp. 185-240, in: "Reproduction of Marine Invertebrates, Vol.2," A. C. Giese and J. S. Pearse, eds. Academic Press.
- Bonar, D. B. and M. G. Hadfield. 1974. Metamorphosis of the marine gastropod *Phestilla sibogae*. I. Light and electron microscopic analysis of larval and metamorphic stages. *J. Exp. Mar. Biol. Ecol.* 16: 227-255.
- Hadfield, M. G. 1975. Continuous laboratory culture of two *Aplysia* species. (Progress in Mariculture). *Lab Animal* 4(3): 17.
- Hadfield, M. G. 1976. Molluscs associated with living tropical corals. *Micronesica* 12(1): 133-148.

- Hadfield, M. G. 1977. Chemical interactions in larval settling of a marine gastropod. Pp. 403-413, in: "Marine Natural Products Chemistry," D. J. Faulkner and W. H. Fenical, eds., Plenum, N. Y.
- Manen, C.-A., M. G. Hadfield, and D. H. Russell. 1977. Polyamine biosynthesis and accumulation during the early development of the nudibranch, *Phestilla sibogae*. *Develop. Biol.* 57: 454-459.
- Switzer-Dunlap, M., and M. G. Hadfield. 1977. Observations on development, larval growth and metamorphosis of four species of Aplysiidae (Gastropoda, Opisthobranchia) in laboratory culture. *J. Exp. Mar. Biol. Ecol.* 29: 245-261.
- Hadfield, M. G. 1978. Metamorphosis in marine molluscan larvae: an analysis of stimulus and response. Pp. 165-175, in: "Settlement and Metamorphosis of Marine Invertebrate Larvae," F.-S. Chia and M. E. Rice, eds. Elsevier.
- Hadfield, M. G. 1978. Growth and metamorphosis of planktonic larvae of *Ptychodera flava* (Hemichordata: Enteropneusta). Pp. 247-254, in: "Settlement and Metamorphosis of Marine Invertebrate Larvae," F.-S. Chia and M. E. Rice, eds. Elsevier.
- Hadfield, M. G. and L. S. Ciereszko. 1978. Action of cembranolides derived from octocorals on larvae of the nudibranch *Phestilla sibogae*. Pp. 145-159, in: "Drugs and Food from the Sea," P. N. Kaul and C. J. Sinderman, eds. Univ. of Oklahoma Press, Norman.
- Switzer-Dunlap, M., and M. G. Hadfield. 1979. Reproductive patterns of Hawaiian aplysiid gastropods. In: "Reproductive Ecology of Marine Invertebrates," S. Stancyk, ed., B. W. Baruch Library of Marine Sciences, Vol. 9: 199-210.
- Hadfield, M. G. 1979. Aplacophora. Chapter 1. Pp. 1-25, in: "Reproduction of Marine Invertebrates Vol. V," A. C. Giese and J. S. Pearse, eds. Academic Press.
- Austin, W. C. and M. G. Hadfield. 1980. Ophiuroidea. Pp. 144-159, in: "Marine Invertebrates of California Shores," R. H. Morris and D. P. Abbott, eds. Stanford University Press.
- Hadfield, M. G. and C. N. Hopper. 1980. Ecological and evolutionary significance of pelagic spermatophores of vermetid gastropods. *Marine Biology* 57: 315-325.
- Hadfield, M. G. and B. S. Mountain. 1980. A field study of a vanishing species, *Achatinella mustelina* (Gastropoda, Pulmonata), in the Waianae Mountains of Oahu. *Pac. Sci.* 34: 345-358.
- Switzer-Dunlap, M. F. and M. G. Hadfield. 1981. Laboratory culture of *Aplysia*. Pp. 199-216, in: "Marine Invertebrates, Laboratory Animal Management," R. E. Hinegardner and R. Fay, eds. *Natl. Acad. Sci.*
- Hadfield, M. G. and R. E. Young. 1983. Planctosphaera (Hemichordata: Enteropneusta) in the Pacific Ocean. *Marine Biology* 73: 151-153.
- Hadfield, M. G. and M. F. Switzer Dunlap. 1984. Reproduction in Opisthobranchs. Pp. 209-350, in: "The Mollusca, Vol. 7, Reproduction," K. Wilbur, ed. Academic Press, N.Y.
- Hadfield, M. G. 1984. Settlement requirements of molluscan larvae: new data on chemical and genetic roles. *Aquaculture* 39: 283-298.
- Kempf, S. C. and M. G. Hadfield. 1985. Planktotrophy in the lecithotrophic larvae of a nudibranch, *Phestilla sibogae* (Gastropoda). *Biol. Bull.* 169: 119-130.
- Hadfield, M. G. and D. Scheuer. 1985. Evidence for a soluble metamorphic inducer in *Phestilla*: ecological, chemical and biological data. *Bull. Mar. Sci.* 37(2): 556-566.
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