

Carolina Bonin Lewallen, Ph.D.

(f.k.a. Carolina Aimoré Bonin)

Assistant Professor

Departments of Marine and Environmental Sciences

Hampton University, 3 Shore Road, Hampton, VA 23668

Office phone: (757)728-6044 | e-mail: carolina.bonin@hamptonu.edu

RESEARCH INTERESTS

Population Genetics ▪ Marine Mammal Ecology ▪ Mating Systems/Pedigrees ▪ Genomics

ACADEMIC EDUCATION & TRAINING

Postdoctoral (2013-2015) Mayo Clinic, Rochester, MN — Molecular Biology & Orthopedic Surgery
Ph.D. (2007-2012) Scripps Institution of Oceanography, San Diego, CA — Marine Biology
M.Sc. (1999-2001) Federal University of Paraná, Brazil — Zoology
B.S. (1994-1997) Federal University of Paraná, Brazil — Biology

APPOINTMENTS

2017- Assistant Professor, Department of Marine and Environmental Sciences
Hampton University

2016 Adjunct Faculty, Department of Biology
University of Saint Thomas, Saint Paul, Minnesota

2003-2007 Senior Laboratory Technician/ Research Assistant
Southwest Fisheries Science Center; NOAA

2002-2003 Satellite Imagery Specialist
Southwest Fisheries Science Center; NOAA

PEER REVIEWED PUBLICATIONS

Bonin CA, van Wijnen AJ, Lewallen, EA (2019). MicroRNA applications in marine biology. *Molecular Biology Reports*. DOI 10.1007/s40610-019-00124-w

Bonin CA, Lewallen EA, van Wijnen AJ, Cremer MJ, Simões Lopes PC: Habitat preference and behavior of the Guiana dolphin (*Sotalia guianensis*) in a well preserved estuary off Southern Brazil. *P. J. Zoology* 49(6): 2235-2242.
DOI: <http://dx.doi.org/10.17582/journal.pjz/2017.49.6.2235.2242>

Lewallen EA, van Wijnen AJ, Bonin CA, Lovejoy NR (2017): Flyingfish (Exocoetidae) species diversity and habitats in the eastern tropical Pacific Ocean. *Marine Biodiversity* DOI: 10.1007/s12526-017-0666-7.

Lewallen EA, Bohonak AJ, Bonin CA, van Wijnen AJ, Pitman RL, Lovejoy NR (2017): Phylogenetics and biogeography of the two-wing flyingfishes (Exocoetidae: *Exocoetus*). *Ecology and Evolution* DOI 10.1002/ece3.2786.

- Lewallen EA, Bohonak AJ, **Bonin CA**, van Wijnen AJ, Pitman RL, Lovejoy NR (2016): Population genetic structure of the tropical two-wing flyingfish (*Exocoetus volitans*). *PLOS ONE* 11(10):e0163198. DOI:10.1371/journal.pone.0163198.
- Lewallen EA*, **Bonin CA***, Li X, Smith J, Karperien M, Larson AN, Lewallen DG, Cool SM, Westendorf JJ, Krych AJ, Leontovich AA, Im H, van Wijnen AJ (2016): The synovial microenvironment of osteoarthritic joints alters RNAseq expression profiles of human primary articular chondrocytes. *Gene* 591:456-64. DOI:10.1016/j.gene.2016.06.063.
* *Equal contribution*
- Lin Y, Lewallen EA, Camilleri ET, **Bonin CA**, Jones DJ, Dudakovic A, Galeano-Garces C, Wang W, Karperien MJ, Larson AN, Dahm DL, Stuart MJ, Levy BA, Smith J, Ryssman DB, Westendorf JJ, Im H-J, van Wijnen AJ, Riester SM, Krych AJ: RNA-seq analysis of osteochondral allografts reveals activation of early response genes and reduced expression of extracellular matrix related genes. *Journal of Orthopaedic Research* 2016. DOI: 10.1002/jor.23209.
- Bonin CA**, Goebel ME, O'Corry Crowe GM, Burton RS (2016): Impacts of ecology and behavior on Antarctic fur seal remating and relatedness. *Journal of Experimental Marine Biology and Ecology* 476:72-77. DOI:10.1016/j.jembe.2015.12.008.
- Bonin CA**, Lewallen EA, Baheti S, Bradley EW, Stuart MJ, Berry DJ, van Wijnen AJ, Westendorf JJ (2015): Identification of differentially methylated regions in new genes associated with knee osteoarthritis. *Gene* 576:312-318. DOI:10.1016/j.gene.2015.10.037.
- Getzlaf MA, Lewallen EA, Kremers HM, Jones DL, **Bonin CA**, Dudakovic A, Thaler R, Cohen RC, Lewallen DG, van Wijnen AJ (2016): Multi-disciplinary antimicrobial strategies for improving orthopaedic implants to prevent prosthetic joint infections in hip and knee. *Journal of Orthopaedic Research* 34:177-186. DOI:10.1002/jor.23068.
- Lewallen EA, Riester SM, Bonin CA, Kremers HM, Dudakovic A, Kakar S, Cohen RC, Westendorf JJ, Lewallen DG, van Wijnen AJ (2014): Biological strategies for improved osseointegration and osteoinduction of porous metal orthopedic implants. *Tissue Engineering Part B* 21:218-230. DOI:10.1089/ten.teb.2014.0333.
- O'Corry-Crowe G, Gelatt T, Rea L, **Bonin CA**, Rehberg M (2014): Crossing to safety: dispersal, colonization and mate choice in evolutionarily distinct populations of Steller sea lions, *Eumetopias jubatus*. *Molecular Ecology* 23: 5415-5434. DOI:10.1111/mec.12944.
- Bonin CA**, Goebel ME, Hoffman JI, Burton RS (2014): High male reproductive success in a low-density Antarctic fur seal (*Arctocephalus gazella*) breeding colony. *Behavioral Ecology and Sociobiology* 68:597-604. DOI:10.1007/s00265-013-1674-7.
- Bonin CA**, Goebel ME, Forcada J, Burton RS, Hoffman JI (2013): Unexpected genetic differentiation between recently recolonized populations of a long-lived and highly vagile marine mammal. *Ecology and Evolution* 3:3701-3712. DOI:10.1002/ece3.732.
- Bonin CA**, Goebel ME, O'Corry Crowe GM, Burton RS (2012): Twins or not? Genetic analysis of putative twins in Antarctic fur seals, *Arctocephalus gazella*, on the South Shetland Islands. *Journal of Experimental Marine Biology and Ecology* 412:13. DOI:10.1016/j.jembe.2011.10.010.
- Monteiro-Filho ELA, **Bonin CA**, Rautenberg M (1999): Interspecific interactions of marine mammals in the Guaratuba Bay region of Paraná state in southern Brazil. *Biotemas* 12:119-132.

CURRENT RESEARCH SUPPORT

NSF (Role: Co-Principal Investigator) 08/15/18 – 07/31/21

Title: *REU: Association for the Sciences of Limnology and Oceanography Multicultural Program*

NOAA LMRCSC (Role: Principal Investigator) 01/01/2020- 05/30/2022

Title: *Genetic approaches for monitoring the effects of climate change on leopard seals in the Antarctic Peninsula.*

NOAA LMRCSC (Role: Co-Principal Investigator) 07/01/18 - 07/01/20

Title: *Genetic assessment of feeding ecology in the Pacific lamprey*

NOAA LMRCSC (Role: Co-Principal Investigator) 07/01/18 - 07/01/20

Title: *Examining ecosystem health through contaminant analysis of common bottlenose dolphins (*Tursiops truncatus*)*

HU Faculty Research Award (Role: Principal Investigator) 02/01/18 - 02/01/19

Title: *MicroRNAs as biomarkers for the health of the blue crab, *Callinectes sapidus*, in Chesapeake Bay.*

HONORS AND AWARDS

- 2013-2015 Fellowship, Supplemental Diversity SF242*, National Institutes of Health (\$100,000)
2012 Internship grant, CMBC/ SIO (\$10,000)
2012 Research Grant, Professional association of diving instructors PADI/ CMBC (\$ 3,000)
2011 Group Research Grant, Center for Marine Biodiversity and Conservation (CMBC), Scripps Institution of Oceanography (SIO)/ Integrative Graduate Education and Research Award (IGERT), National Science Foundation (NSF) Interdisciplinary Research (\$15,000)
2010-2012 Fellowship, IGERT/ NSF (\$84,000)
2008-2009 Fellowship, EW Scripps, SIO (\$18,000)
2007-2008 Fellowship, Alliance for Graduate Education and the Professoriate, NSF (\$18,000)
1999-2001 Fellowship, Coordination for the Improvement of Higher Education Personnel, Brazil (R\$36,000)
1997 Fellowship, Scientific Initiation, Brazilian National Research Council (R\$2400)

TECHNICAL REPORTS AND BOOK CHAPTERS

- Bonin CA (2019).** Conservation genetics of Pinnipeds. In: Behavioral Ecology of Otariids and the walrus. Harcourt. R. & Campagna, C. eds. Springer. In review
- Goebel ME, Burner R, Buchheit, R, Pussini N, Krause D, **Bonin CA**, Vazquez Del Mercado R, Van Cise AM (2011): Pinniped Research at Cape Shirreff, Livingston Island, Antarctica. In: Antarctic Marine Living Resources Field Season Report 2009/2010. AM Van Cise ed. NOAA National Marine Fisheries Service 470. 66 pp.
- Goebel ME, Krause D, Freeman S, Burner R, **Bonin CA**, Vazquez Del Mercado Van Cise AM, Gafney J (2009): Pinniped Research at Cape Shirreff, Livingston Island, Antarctica. In: Antarctic Marine Living Resources Field Season Report 2008-2009. AM Van Cise ed. NOAA National Marine Fisheries Service 445. 97 pp.
- O’Corry-Crowe G, Lucey W, **Bonin CA**, Henniger E (2006) The ecology and genetic identity of Yakutat beluga whales. Report presented to the US Marine Mammal Commission. 20 pp.
- Bonin CA**, Barlow J, Kahru M, Ferguson M, Mitchell B (2005): Delphinoid biomass and satellite-estimated primary productivity. Southwest Fisheries Science Center Administrative Report LJ0503. 18 pp.
- O’Corry-Crowe G, **Bonin CA** (2004): The molecular ecology of marine mammals in the Bering Strait: A pilot investigation of ribbon seals, *Phoca fasciata*. Alaska Department of Fish and Game, Fairbanks, AK. 5 pp.
- Bonin CA**, Filla GF, Oliveira LV, Monteiro-Filho ELA (2008): Population density methods and implications. In: Biology, Ecology and Conservation of the Grey Dolphin. ELA Monteiro-Filho & K Monteiro eds. Paginas & Letras. São Paulo. 277 pp.

SELECTED CONFERENCE ABSTRACTS

- Bonin CA, Goebel ME, Krause, D, Lewallen, E, Milton I, Smith N, Cleary A, Hoffman L. Leopard seal, *Hydrurga leptonyx*, genetic relatedness in Livingston Island, Antarctica. International Polar Meeting. Davos, Switzerland. June 19-23, 2018.
- Lewallen EA, Jones DJ, Dudakovic A, **Bonin CA**, Getzlaf MA, Thaler R, Riester SM, Camilleri ET, Westendorf JJ, Dietz AB, Cohen RC, Lewallen DG, van Wijnen AJ. Mesenchymal cell-based biological enhancement of porous titanium orthopedic implants. American Society for Bone and Mineral Research, Seattle, WA, October 8-12, 2015.
- Lewallen EA, Riester SM, Lin Y, **Bonin CA**, Jones DL, Camilleri ET, Galeano Garces C, Qu W, Smith J, Larson AN, Karperien MJ, Stuart MJ, Westendorf JJ, Kakar S, Im H J, Krych A, van Wijnen AJ. Molecular approaches to the screening and optimization of osteochondral allograft cartilage. International Cartilage Repair Society. Chicago, IL, May 8-11, 2015.
- McGee Lawrence ME, **Bonin CA**, Dudakovic A, Wetjen NM, Kumar R, van Wijnen AJ, Westendorf JJ. Molecular and epigenetic regulators of cranial suture development and craniosynostosis. Structural Birth Defects Meeting, National Institute of Child Health and Human Development. Washington, DC, December 9, 2014.
- Lewallen EA, Riester SM, **Bonin CA**, Dudakovic A, Camilleri ET, Larson AN, Krych AJ, Smith J, Kakar S, Westendorf JJ, Sampen HJ, van Wijnen AJ. A high-resolution musculoskeletal gene expression atlas for characterizing bone and cartilage diseases. American Society for Bone and Mineral Research. Houston, TX, September 12-15, 2014.
- Bonin CA**, Goebel ME, O’Corry Crowe GM, Burton RS. Mate fidelity in a polygynous marine mammal: the Antarctic fur seal. Society for the Study of Evolution. Ottawa, Canada, June 6-10, 2012.*
- Bonin CA**, Goebel ME, O’Corry Crowe GM, Burton RS. High genetic diversity after a local extinction: the role of mating strategies in Antarctic fur seals. Society for the Study of Evolution. Norman, OK, June 17-21, 2011.*
- Bonin CA**, Goebel ME, O’Corry Crowe GM, Burton RS. Relatedness and reproductive success of Antarctic fur seals, *Arctocephalus gazella*, in recently re-colonized areas at Cape Shirreff, Antarctica. Society for the Study of Evolution. Moscow, ID, June 12-16, 2009.
- O’Corry-Crowe G, Lucey W, **Bonin CA**, Henniger, E. Ecology and status of beluga whales, *Delphinapterus leucas*, in Yakutat Bay, Alaska. Alaska Park Science Symposium. Denali, AK, September 12-14, 2006.*
- Bonin CA**, O’Corry-Crowe G, Suydam R. Temporal analysis of a beluga whale population, *Delphinapterus leucas*, in relation to climate change as revealed by molecular genetic analysis. XVI Biennial Conference on Marine Mammals. San Diego, CA, December 12-16, 2005.
- Bonin CA** et al. Habitat use of *Sotalia fluviatilis guianensis* in an estuarine area in southern Brazil”. XIV Biennial Conference on Marine Mammals. Vancouver, Canada, November 28-December 3, 2001.
- Bonin CA** et al. Core areas of *Sotalia fluviatilis guianensis* distribution in the northern Paranagua Bay estuarine complex, PR, Brazil. South American Society of Specialists on Aquatic Mammals. Buenos Aires, Argentina, October 30-November 3, 2000.
- Bonin CA** et al. Considerations on *Sotalia fluviatilis guianensis* (Delphinidae) distribution in Guaratuba Bay waters, Parana, Brazil. South American Society of Specialists on Aquatic Mammals. Viña del Mar, Chile, October 22-25, 1996.

TEACHING

Hampton University

BIO 105 Introduction to Biology I; MES 304 Senior Thesis I; MES 404 Senior Thesis II; MES 405 Senior Thesis III; MES430 Ecology; BIO 520 Biological Techniques; UN 291 Marine Mammals

Other teaching

- 2015 Adjunct Faculty, University of Saint Thomas, St Paul, MN
Course: *Immunology Laboratory* (BIOL 363).
- 2008-2010 Teaching Assistant, University of California San Diego
Course: *Biodiversity* (BIEB 140); *Introduction to Marine Biology* (SIO 132)
- 2002-2003 Marine Science Instructor, Birch Aquarium, Scripps Institution of Oceanography
- 2002 Marine Science Instructor, Education Department, SeaWorld San Diego
- 1996 Teaching Assistant, Federal University of Paraná, Brazil
Course: *Invertebrate Zoology III*

INVITED TALKS

- Oct 10th, 2019 East Carolina University. Department of Biology. *Marine mammal behavior, ecology and evolution revealed by traditional and novel molecular genetic markers.*
- Jun 15th, 2018 Institute of Marine and Environmental Technology. Baltimore, MD. *The remarkable recovery of a severely exploited marine mammal.*
- Feb 10th, 2018 Association for the Sciences of Limnology and Oceanography- Multicultural Program. Portland, OR. Keynote speaker. *From molecules to Marine Mammals.*
- Apr 16th, 2012 Universität de Bielefeld. Bielefeld, Germany. *Mating Strategies and population genetics of Antarctic fur seals at the South Shetland Islands, Antarctica.*
- Nov 28th, 2009 R/V Ary Rongel. Punta Arenas, Chile. *Antarctic fur seal genetic studies in the South Shetland Islands.*
- Oct 28th, 2009 Southwest Fisheries Science Center, San Diego, California. *Genetic studies of Antarctic fur seals, *Arctocephalus gazella*, in recently founded colonies.*

EDITORIAL SERVICE

Associate editor: *Gene; Molecular Biology Reports*

Reviewer: *PLOS One; Nature communications; Frontiers in Marine Science*

PROFESSIONAL AFFILIATIONS

Society for the Study of Evolution • Society for Conservation Biology • Association for the Sciences of Limnology and Oceanography • Association of Polar Early Career Scientists