

Katrina M. Pagenkopp Lohan, Ph.D.

Marine Disease Ecology Laboratory
Smithsonian Environmental Research Center
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EDUCATION

2011 Ph.D., Marine Science, The College of William and Mary
2006 M.S., Biology, American University
2004 B.S., Marine Science, Southampton College of Long Island University

PROFESSIONAL PREPARATION

2020 – present Senior Scientist, Marine Disease Ecology Laboratory, Smithsonian Environmental Research Center
2017—2020 Research Scientist, Marine Disease Ecology Laboratory, Smithsonian Environmental Research Center
2015 – 2017 Biologist, Marine Invasions Research Laboratory, Smithsonian Environmental Research Center
2012 – 2015 Smithsonian MarineGEO Postdoctoral Fellow, Marine Invasions Research Laboratory, Smithsonian Environmental Research Center & Center for Conservation Genomics, National Zoological Park
2007 – 2011 Doctoral Student, School of Marine Science, The College of William and Mary, Virginia Institute of Marine Science
2006 – 2007 Biological Science Laboratory Technician, Department of Entomology, National Museum of Natural History
2004 – 2006 Master's Student, Biology Department, American University

PUBLICATIONS: [Google Scholar page](#)

Refereed Journal Articles

20. P Duffin, D Martin, **KM Pagenkopp Lohan**, & C Ross (2020) Integrating parasite loading, host immune status, and environmental stress in a seagrass pathosystem: Assessing immune markers and a universal qPCR primer set. *Plos ONE*.
19. **KM Pagenkopp Lohan**, R DiMaria, D Martin, C Ross, & GM Ruiz (2020) Examining the diversity and habitat association of *Labyrinthula* spp. in Florida coastal waters with targeted metabarcoding. *Diseases of Aquatic Organisms*. 137: 145-157.
18. **KM Pagenkopp Lohan**, GM Ruiz, & ME Torchin (2020) Chapter 7: Invasions can alter marine disease dynamics. For *Marine Disease Ecology*. Eds: DC Behringer, BR Silliman, KD Lafferty

17. A Rey, KJ Carney, LE Quinones, **KM Pagenkopp Lohan**, GM Ruiz, OC Basurko, & N Rodríguez-Ezpeleta (2019) Environmental DNA metabarcoding: a promising tool for ballast water monitoring. *Environmental Science and Technology*. DOI:10.1021/acs.est.9b01855
16. HJ Small, JP Huchin-Mian, KS Reece, **KM Pagenkopp Lohan**, MJ Butler IV, & JD Shields (2019) Prevalence of the parasitic dinoflagellate *Hematodinium perezii* in larval and juvenile blue crabs, *Callinectes sapidus*, from the coastal bays of Virginia. *Diseases of Aquatic Organisms*. 134: 215 – 222.
15. **KM Pagenkopp Lohan**, TL Campbell, J Guo, M Wheelock, RA DiMaria, & JB Geller (2019) Intact vs. homogenized subsampling: Testing impacts of pre-extraction processing of multi-species samples on invasive species detection. *Management of Biological Invasions*.10: 324-341
14. JA Darling, J Martinson, Y Gong, S Okum, E Pilgrim, **KM Pagenkopp Lohan**, KJ Carney, & GM Ruiz (2018) Ballast water exchange and invasion risk posed by intracoastal vessel traffic: An evaluation using high throughput sequencing. *Environmental Science and Technology*. doi:10.1021
13. **KM Pagenkopp Lohan**, KM Hill-Spanik, ME Torchin, RC Fleischer, & GM Ruiz (2018) Phylogeography and connectivity of molluscan parasites in Panama and beyond. *International Journal of Parasitology*. 48: 135-144.
12. **KM Pagenkopp Lohan**, RC Fleischer, KJ Carney, KK Holzer, & GM Ruiz (2017) Molecular characterization of protistan species and communities in ships' ballast water across three U.S. coasts. *Diversity and Distributions*. 23: 680-691.
11. **KM Pagenkopp Lohan**, ME Torchin, RC Fleischer, & GM Ruiz (2017) Protistan biogeography: A snapshot across a major shipping corridor spanning two oceans. *Protist*. 168: 183-196.
10. **KM Pagenkopp Lohan**, KM Hill-Spanik, ME Torchin, L Aguirre-Macedo, RC Fleischer, & GM Ruiz (2016) Richness and distribution of tropical oyster parasites in two oceans. *Parasitology*. 143: 1119-1132.
9. **KM Pagenkopp Lohan**, RC Fleischer, KJ Carney, KK Holzer, & GM Ruiz (2016) Amplicon-based pyrosequencing reveals high diversity of protistan parasites in ships' ballast water: Implications for biogeography and infectious diseases. *Microbial Ecology*. 71:530-542.
8. **KM Pagenkopp Lohan**, KM Hill, RC Fleischer, ME Torchin, EE Strong, & GM Ruiz (2015) Molecular phylogenetics reveals first record and invasion of *Saccostrea* species in the Caribbean. *Marine Biology*. 162(5): 957-968.
7. **KM Pagenkopp Lohan**, JR McDowell, JD Shields, & KS Reece (2014) Genotypic variation of *Hematodinium perezii* along the Delmarva Peninsula, Virginia. *Marine Biology*. 161: 261-273.
6. **KM Pagenkopp Lohan**, HJ Small, JD Shields, AR Place, & KS Reece (2013) Conservation in the first internal transcribed spacer (ITS1) region of *Hematodinium perezii* genotype III from *Callinectes sapidus*. *Diseases of Aquatic Organisms*.103: 65–75.
5. **KM Pagenkopp Lohan**, JR McDowell, JD Shields, J Xiao, TL Miller, & KS Reece (2012) Isolation and characterization of microsatellite loci for the parasitic dinoflagellate, *Hematodinium perezii*, a parasite of *Callinectes sapidus*. *Molecular Ecology Resources*. 12: 570-572.
4. **KM Pagenkopp Lohan**, KS Reece, TL Miller, KN Wheeler, HJ Small, & JD Shields (2012) The role of alternate hosts in the ecology and life history of *Hematodinium*, a parasitic dinoflagellate of the blue crab (*Callinectes sapidus*). *The Journal of Parasitology*. 98(1): 73-84.
3. HJ Small & **KM Pagenkopp** (2011) Alternate hosts and potential reservoirs for disease causing organisms of commercially important crustaceans. (Invited review) *Journal of Invertebrate Pathology*. 106: 153-164.
2. C Li, KS Reece, TL Miller, HJ Small, **KM Pagenkopp**, & JD Shields (2010) A real-time assay for detection and quantification of the parasitic dinoflagellate *Hematodinium spp.* in environmental water samples. *Harmful Algae*. 9: 515-521.

1. **KM Pagenkopp**, J Klicka, KL Durrant, JC Garvin, & RC Fleischer (2008) Geographic variation in malarial parasite lineages in the Common Yellowthroat (*Geothlypis trichas*). *Conservation Genetics*. 9(6): 1577-1588.

Manuscripts in Review or Preparation (available upon request)

- SA Gignoux-Wolfsohn & **KM Pagenkopp Lohan** (In review) Considering Parasites in the Biodiversity-Ecosystem Function Paradigm Requires Understanding Feedback Loops. *Diversity*
- KM Pagenkopp Lohan**, SA Gignoux-Wolfsohn, & GM Ruiz (In preparation) Community Interactions Impact Marine Disease Dynamics: Expanding the Biodiversity-Disease Relationship. *Trends in Parasitology*
- P Pappalardo, **KM Pagenkopp Lohan**, M Boyle, A Collins, K Hanson, S Truskey, W Jaekle, StreamCode Team, & K Osborn (In preparation) The power of classic taxonomic expertise to inform modern diversity survey methods. *Molecular Ecology Resources*
- SA Gignoux-Wolfsohn, M Newcomb, GM Ruiz, & **KM Pagenkopp Lohan** (in preparation) Temperature and time of day drive release of *Perkinsus marinus* from infected oysters. *Diseases of Aquatic Organisms*
- KM Pagenkopp Lohan**, I Davidson, T Mullady, & GM Ruiz (In preparation) Examination of microbial communities in biofilms of submerged ship hulls. *Methods in Ecology and Evolution*

Reports

- I Davidson, G Ashton, G Ruiz, C Scianni, C Brown, **K Pagenkopp Lohan**, & R Fleischer (2013) Richness, extent, condition, reproductive status, and parasitism of fouling communities on commercial vessels. Report to the California State Lands Commission Marine Invasive Species Program, Sacramento, California. 54pp.

GRANTS, CONTRACTS, & AWARDS

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| 2020 | University of Arkansas at Pine Buff, "DNA Barcoding of prey items from hybrid bass." (\$4,800- pending) |
| 2020 | Smithsonian Barcode Network, "Barcoding estuarine parasites." (\$2,200) |
| 2020 | Smithsonian Scholar Studies, "Complex threats to ecosystem restoration: Interactive effects of parasites and bioeroders on oyster reefs." (\$73,849) |
| 2019 | Anne Arundel County, "Identifying bacteria in Rhode and West Rivers" (\$3,200) |
| 2019 | University of Arkansas at Pine Buff, "DNA Barcoding of prey items from snakehead and other predatory fish." (\$7,959) |
| 2019 | Smithsonian Institution, "Human-mediated transfer of marine microorganisms by ships: Assessing current management gaps" (\$35,428) |
| 2019 – 2021 | NOAA Chesapeake Bay Office, "The value of shallow tributary habitats of upper Chesapeake Bay to the Summer Flounder <i>Paralichthys dentatus</i> " (\$233,058) |
| 2018 – 2020 | NOAA Chesapeake Bay Office, "Integrative Assessment of the Quality of Shallow Tributary Forage Habitats for Striped Bass in Chesapeake Bay" (\$240,011) |
| 2015 – 2016 | Grand Challenges Award, Smithsonian Institution (\$65,000) |
| 2012 – 2014 | Grand Challenges Award, Smithsonian Institution (\$100,000) |
| 2012 – 2014 | MarineGEO Postdoctoral Fellowship, Smithsonian Institution (\$110,000) |
| 2012 | Small Sequencing Award, Smithsonian Institution (\$6,000) |

2011 Student Travel Award, National Shellfisheries Association (\$250)
 2010 Snieszko Student Travel Award, International Symposium on Aquatic Animal Health (\$1,000)
 2010 Burroughs Wellcome Ecology and Evolution Travel Scholarship, Ecology and Evolution of Infectious Diseases (\$320)
 2008 Graduate Studies Fellowship in Population Genetics, Crustacean Society (\$1,000)
 2005 Graduate Student Mellon Research Grant, American University (\$470)
 2005 Graduate Student Fellowship, Smithsonian Institution (\$4,500)
 2001 – 2004 Southampton College Academic Excellence Award
 2004 Cooperative Education Senior Recognition Award
 2003 – 2004 Cooperative Education Student of the Year

SERVICE

2020 – present Co-chair of the Smithsonian American Women’s History Initiative’s Year 2 Symposium
 2019 – present Student Awards Committee, American Society of Parasitology
 2019 – present Spring Meeting Planning Committee, Helminthological Society of Washington
 2019 – present Executive committee member of the SERC Women in Science Committee
 2019 – present SERC Representative on the Smithsonian’s American Women History Initiative Curatorial Committee
 2017 – present Executive committee member of the Smithsonian Interconnected Health Initiative
 2017 – present Member of SERC Science Committee
 2017 – present SERC Representative on the Pan-Smithsonian Cryo-Initiative
 2016 – 2018 SERC Representative on Smithsonian Initiative for Biodiversity Genomics Executive Committee
 2017 – present SERC Representative on Smithsonian Initiative for Biodiversity Genomics Postdoctoral Fellowship Selection Committee
 2017 Member of George Burch Postdoctoral Fellowship Selection Committee
 2016 SERC Representative on OCIO High Performance Computing Cluster Policy Planning Committee
 2015 – present Member of SERC Ecological Genomics working group
 2015 – 2017 Member of Marine Invasions Research Laboratory Administrative team
 2010 – 2011 Graduate Student Representative on the Student Health Advisory Committee, Virginia Institute of Marine Science
 2006 Graduate Student Representative on Tenure Committee, American University

AD HOC REVIEWS

Peer-reviewed Journals: *Parasitology*, *Journal of Parasitology*, *Marine Biology*, *Journal of Sea Research*, *Diseases of Aquatic Organisms*, *Marine Biology Research*, *Marine Biodiversity*, *Environmental Science and Technology*, *Environmental Science and Technology Letters*, *Bioinvasions Records*, *Biological Invasions*, *Journal of Invertebrate Pathology*, *Journal of Eukaryotic Microbiology*, *Frontiers in Ecology and the Environment*, *Marine Pollution Bulletin*, *FEMS Microbiology Ecology*, *Environment International*

Proposals: North Pacific Research Board, NOAA Saltonstall-Kennedy Grant Program, National Science Foundation (Biological Oceanography, Ecology and Evolution of Infectious Disease)
Participant in international conference examining utility of high throughput sequencing for biosecurity, Cawthron Institute, Nelson, New Zealand, May 2017

EDUCATION & OUTREACH

2020 Presenter, Disease Detectives, NMNH
2019 Volunteer, Earth Optimism Event, FOOD!, NMNH
2018 – present Lab Twitter account, @SERCMarDisease
2018 Co-star, Short film for Smithsonian Channel
2012 – present Contributor to SERC travel blog, Shorelines (<http://sercblog.si.edu>)
2012 – present Contributor to the Ocean Portal blog, National Museum of Natural History
2012 – 2013 Volunteer, “The Scientist is In”, National Museum of Natural History
2012 Volunteer, Chesapeake Bay Bowl at George Mason University
2009 Volunteer, Marine Science Day at the Virginia Institute of Marine Science
2005 Volunteer, Chesapeake Bay Bowl at American University
2003 – 2004 Volunteer, Wildlife Rescue Center of the Hamptons

PRESENTATIONS (*denotes invited lectures, § denotes undergraduate intern)

2019 M Newcomb§, SA Gignoux-Wolfsohn, & **KM Pagenkopp Lohan** "Evaluation of the Daily Release of *Perkinsus marinus* in the Water Column" 25th Biennial CERF Conference, Mobile, AL.
SA Gignoux-Wolfsohn, GM Ruiz, DL Breitburg & **KM Pagenkopp Lohan** “Salinity alters the effects of host community diversity on oyster microbial communities” 25th Biennial CERF Conference, Mobile, AL.
CW Bangle, EK Atkins, **KM Pagenkopp Lohan**, R Aguilar, MB Ogburn & RA Rulifson. "Exploring the origin of juvenile Bull Sharks (*Carcharhinus leucas*) in Pamlico Sound, NC using acoustic telemetry and population genetics.” 27th Annual meeting of the southern division of the American Fisheries Society, Galveston, TX.
P Pappalardo, **KM Pagenkopp Lohan**, M Boyle, A Collins, K Hanson, & K Osborn "Improving the outcome of metabarcoding methods with taxonomic expertise" 100th AGU Meeting, San Francisco, CA.
SA Gignoux-Wolfsohn, GM Ruiz, DL Breitburg & **KM Pagenkopp Lohan** “Biodiversity in a Changing Ocean: Salinity Alters the Effects of Host Diversity and Density on Oyster Parasite Prevalence”, 94th Annual American Society of Parasitology Conference, Rochester, MN.
KM Pagenkopp Lohan, R DiMaria, DL Martin, C Ross, & GM Ruiz “Diversity and microhabitat associations of *Labyrinthula* spp. in the Indian River Lagoon System” 721st meeting of the Helminthological Society of Washington, Winchester, VA.
KM Pagenkopp Lohan, S Gignoux-Wolfsohn, K Heggie, R DiMaria, P Santos-Ciminera, & MB Ogburn “Using parasites to investigate habitat quality for striped bass (*Morone saxatilis*) across the Chesapeake Bay”, American Society of Parasitology, Rochester, MN. (*poster*)
J Darling, J Martinson, **KM Pagenkopp Lohan**, KJ Carney, & GM Ruiz “Metabarcoding reveals deep diversity in ballast water” International Conference on Aquatic Invasive Species, Montreal, Canada.
2018 J Darling, J Martinson, S Okum, E Pilgrim, **KM Pagenkopp Lohan**, KJ Carney, & GM Ruiz “DNA

- metabarcoding for ballast water monitoring: an evaluation for three major United States ports” 10th International Conference on Marine Bioinvasions, Puerto Adryn, Argentina.
- J Geller, T Campbell, AL Chang, RA DiMaria, J Guo **KM Pagenkopp Lohan**, M Wheelock, & GM Ruiz “Metagenetics of Plankton: Detection of Non-Indigenous Marine Species and Community Composition in California Bays (2013-2015).” 10th International Conference on Marine Bioinvasions, Puerto Adryn, Argentina.
- C Ross, P Duffin, D Martin & **KM Pagenkopp Lohan** “Seagrass Wasting Disease: The Infection Dynamics of a *Labyrinthula* sp. – Turtlegrass Pathosystem.” Southeastern Estuarine Research Society, St. Augustine, FL.
- 2017 **KM Pagenkopp Lohan**, R DiMaria, D Martin, C Ross, V Paul, E Duffy, D Harvell, M Torchin, & G Ruiz “Host and habitat differences of *Labyrinthula* parasites: A metabarcode approach.” Global Biodiversity Genomics Conference, Washington, DC.
- 2016 **KM Pagenkopp Lohan**, KM Hill-Spanik, ME Torchin, L Aguirre-Macedo, RC Fleischer, & GM Ruiz “Biogeography of oyster parasites in two tropical oceans.” 715th Meeting of the Helminological Society of Washington, Washington, DC.
- *KM Pagenkopp Lohan** “Hunting Marine Parasites with Genomics.” Castle Lecture Series, Smithsonian Institution, Washington, DC. (for general audience; see video of “Hunting for Marine Parasites with Genomics” [here](#))
- 2014 ***KM Pagenkopp Lohan** “A Tale of Two Parasites: From a Regional to a Global Perspective.” Evening Lecture Series, Smithsonian Environmental Research Center, Edgewater, MD. (for general audience)
- KM Pagenkopp Lohan**, RC Fleischer, KK Holzer, KJ Carney, & GM Ruiz “Amplicon-based pyrosequencing reveals protistan parasite diversity in ships’ ballast water.” Joint Aquatic Sciences Meeting, Portland, Oregon.
- KM Pagenkopp Lohan**, RC Fleischer, KM Hill, ME Torchin, KK Holzer, KJ Carney, & GM Ruiz “Anthropogenic influences on the biogeography of marine protistan parasites.” International Symposium on the Ecology and Evolution of Marine Parasites and Diseases, Den Burg, Texel, Netherlands.
- 2013 ***KM Pagenkopp Lohan** “From crustaceans to bivalves: using molecular tools to examine disease ecology.” Invited seminar for the Smithsonian Conservation Biology Institute Seminar Series, Washington, DC.
- *KM Pagenkopp Lohan** “Assessing microbial populations in different aquatic habitats.” Invited lecture for Noninvasive Genetics Course, Smithsonian Conservation Biology Institute, Washington, DC.
- KM Pagenkopp Lohan**, RC Fleischer, KK Holzer, KJ Carney, & GM Ruiz “Protistan diversity in ballast water revealed by amplicon-based 454 pyrosequencing.” The 88th Annual Meeting of the American Society of Parasitologists, Quebec City, Canada.
- 2012 HJ Small, KS Reece, GD Stentiford, J Xiao, **KM Pagenkopp Lohan**, K Bateman, W Xu, JD Shields “Global diversity and distribution of *Hematodinium* spp.- significant pathogens of commercially exploited crustaceans.” The 87th Annual Meeting of the American Society of Parasitologists, Richmond, VA.
- 2011 **KM Pagenkopp**, JD Shields, Terrence Miller, HJ Small, Allen Place, & Kimberly Reece “Strain variation of *Hematodinium*, a parasitic dinoflagellate of the blue crab (*Callinectes sapidus*) along the Delmarva Peninsula, VA”. The 103rd Annual Meeting of the National Shellfisheries Association, Baltimore, MD.
- KM Pagenkopp**, KS Reece, TL Miller, KN Wheeler, HJ Small, & JD Shields “The role of alternate hosts in the ecology and life history of *Hematodinium*, a parasitic dinoflagellate of the blue crab (*Callinectes sapidus*)”. The 103rd Annual Meeting of the National Shellfisheries Association, Baltimore MD. *poster*

2010 **KM Pagenkopp**, JD Shields, J Xiao, TL Miller, HJ Small, A Place, & KS Reece “The frequency and distribution of genetic strains of *Hematodinium*, a parasitic dinoflagellate of the blue crab (*Callinectes sapidus*) along the Delmarva Peninsula, VA.” The 6th International Symposium on Aquatic Animal Health, Tampa, FL.

KM Pagenkopp, JD Shields, TL Miller, HJ Small, A Place, & KS Reece “Strain variation, frequency, and distribution of *Hematodinium*, a parasitic dinoflagellate of the blue crab (*Callinectes sapidus*) along the Delmarva Peninsula, VA”. Ecology and Evolution of Infections and Disease, Cornell University, Ithaca, NY. *poster*

KM Pagenkopp, KS Reece, TL Miller, KN Wheeler, HJ Small, & JD Shields “The role of alternate hosts in the ecology and life history of *Hematodinium*, a parasitic dinoflagellate of the blue crab (*Callinectes sapidus*)”. Ecology and Evolution of Infectious Disease-PI meeting, Atlantic City, NJ. *poster*

Invited seminars at Salisbury University, Estuary and Ocean Science Center, Horn Point Laboratory, the Virginia Institute of Marine Science, and the Institute of Marine and Environmental Technology

CO-AUTHORS & COLLABORATORS

Robert Fleischer (SCBI-NZP), Gregory Ruiz (SERC), C. Drew Harvell (Cornell), Valerie Paul (SMSFP), Cliff Ross (U North Florida), Dan Martin (U North Florida), Jonathan Geller (MLML), Colleen Burge (IMET, UMD), J. Emmett Duffy (SERC, VIMS), Kristina Hill (College of Charleston), Matthew Ogburn (SERC), Kimberly Holzer (SERC), Ian Davidson (SERC), Whitman Miller (SERC), Denise Breitburg (SERC), John Darling (EPA), Katharine Carney (SERC), Mark Torchin (STRI), Ellen Strong (NMNH), Leopoldina Aguirre-Macedo (CINVESTAV-IPN), Victor Vidal Martinez (CINVESTAV-IPN), Ryan Carnegie (VIMS), Kim Reece (VIMS), Jeffrey Shields (VIMS), Hamish Small (VIMS), Jie Xiao (VIMS), Terrence Miller (James Cook University), Kersten Wheeler (Old Dominion University), Caiwen Li (Chinese Academy of Sciences), Jan McDowell (VIMS), Allen Place (UMBI), Ted Schultz (NMNH), Sean Brady (NMNH), John Klicka (University of Nevada, Las Vegas), Julie Garvin (Maui Forest Bird Recovery Project, HI), Kate Durrant (University of Nottingham)

ADVISORS

Robert Fleischer (SCBI-NZP, MS & Postdoctoral advisor), Kimberly Reece (VIMS, Ph.D. advisor), Jeffrey Shields (VIMS, Ph.D. advisor), Gregory Ruiz (SERC, Postdoctoral advisor)

MENTEES

Undergraduate Interns: Matilda Newcomb (2018, 2019), Annette Curry (2018), Miguel Aguirre-Morales (2018), Madison Miller (2017), Nancy Sealover (2016), Emily Bulger (2014)

Post-Baccalaureate Interns: Alicia Flores (2019)

Graduate Students: Alexandria Murphy (MPH, 2018-2019)

Post-doctoral Fellows/Researchers: Sarah Gignoux-Wolfsohn (Smithsonian Burch Fellow 2018-2019, Smithsonian Environmental Research Center Fellow 2019-2020)

