Narrissa P. Spies

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Education

University of Hawaii at Manoa
Degree: PhD, Zoology
Expected Graduation: Spring 2018

University of Hawaii at Hilo
Degree: M.S., Tropical Conservation Biology and Environmental Science
Graduated: Fall 2011

University of Hawaii at Hilo
Degree: B.A., Biology (Cell & Molecular track) and Anthropology
Graduated: Spring 2009

Academic achievements, honors, and awards

Outstanding Graduate Oral Presentation in Biological Sciences
2015 SACNAS National Conference, Washington, DC

ʻ*Ilima SACNAS Chapter Science Symposium 2014 Dr. Margaret Werner-Washburne, SACNAS President Graduate Student Award for Science Excellence*
Awarded to first place graduate student oral presentation.

Ford Foundation Fellowships Honorable Mention List 2014

NHSEMP (Native Hawaiian Science and Engineering Mentorship Program) 2013-14
Awarded to underserved students in the fields of Science, Technology, Engineering, and Mathematics (STEM) to provide assistance, opportunities, and community for students to excel.

ASLO Multicultural Program Travel Award 2014 & 2016 (Association for the Sciences of Limnology and Oceanography)
Awarded to under-represented minority students interested in the aquatic sciences. Provides full travel, housing, food, and conference registration support to participate in annual meetings of ASLO.

Graduate Professional Access Program 2013-Present
Supports under-represented minorities pursuing graduate degrees in the sciences.

Travel Scholarship 2013 (SACNAS – Society for the Advancement of Chicanos and Native Americans in Science)
Awards funding for travel and lodging for annual meetings for SACNAS.

Native American Professional Development Program at Wildlife Society National Conference
Awarded 2010 and 2011, funding to travel to National Conference in Utah and Hawaii.

TCBES MATER Club Event Coordinator 2010-2011
Co-chair of organizing committee for the 2011 Tropical Conservation Biology & Environmental Science symposium at UH Hilo, and co-chair for silent auction fundraising committee.

Aspiring Doctors of Hilo Club President 2009-10
Founding member of local pre-med, pre-PhD, club at UH Hilo.

National Society of Leadership and Success 2007
Inducted into the society with presidential status for top GPA.

International Scholar Laureate Program 2005
Selected as one of 60 students nationwide to visit Brazil and learn about tropical medicine.

Phi Theta Kappa International Honor Society 2004-05
Elected to communications chair for the Pacific Region, organized multiple regional events, assembled and wrote articles for regional newsletter. Recipient of the 2005 Regional Coordinator's Award for exceptional service to the Pacific region. Also helped to organize volunteer activities for the Alpha Psi Epsilon chapter at HawCC.

People to People Student Ambassador Program Summer 2000
Traveled to the UK and Ireland to learn about European culture, and met with British parliament members as one of 30 student representatives from Hawaii.

Research Experience

Graduate Researcher – Dr. Robert Richmond, Kewalo Marine Laboratory, Oahu, HI (December 2012 – present).
Dissertation research involves developing molecular biomarkers (protein expression via Western blot, ELISA and enzyme activity as well as gene expression via qPCR) to detect sub-lethal stress in corals, as well as characterizing the reproductive and settlement patters of the brooding coral, *Leptastrea purpurea*. Additional projects have included analyzing the effects of pesticides on coral fertilization and settlement, as well as the effects of molasses on *Pocillopora damicornis*.

Ocean Leadership Practicum- Center for Ocean Solutions, Stanford University, Monterey, CA (January 2013)
Leadership practicum focused on marine policy and climate change in the Pacific islands.

Graduate Researcher- Dr. Wen-Ming Chu, University of Hawaii Cancer Center, Oahu, HI (August 2012-December 2012)
Graduate rotation working on elucidating the relationship between inflammation and cancer using genetically modified mice (DNA-PKcs knockout, TLR9 knockout, and double knockout models), Western blot, ELISA, Co-IP, and IHC.

NSF CREST Graduate Scholar- Dr. Misaki Takabayashi, University of Hawaii at Hilo, Hilo, HI (July 2009-December 2011)
Master's research examined the gene expression patterns of an organic matrix protein, as well as human bone cancer homologs found in tumorous tissue from coral skeletal growth anomalies. TaqMan RT-qPCR was used to determine relative gene expression in tumorous tissue, compared to nearby relatively healthy tissue, as well as unaffected coral *Montipora capitata* colonies. Genes were also cloned and sequenced for verification.

Kūʻula student research project- Dr. Misaki Takabayashi, University of Hawaii at Hilo, Hilo, HI (Spring 2010)

Traveled to Midway Atoll (Pihemanu) and examined the nutrient content of mulch made from the leaves of dominant plant species found on the atoll. These nutrient levels were compared to levels from dominant plant species of plants found on the West side of Hawaii Island. Nutrient analysis shows that making a traditional Hawaiian mulch using available plant species provides levels of nitrates, phosphates, and ammonium comparable to commercial fertilizers.

Conservation Biology & Environmental Science Field Techniques, University of Hawaii at Hilo, Hilo, HI with Dr. Elizabeth Stacy, Dr. Becky Ostertag, and Dr. Tracy Weigner
(August-December 2010)
Performed surveys of *Metrosideros polymorpha* at three different elevational gradients on Mauna Kea, examining the effects of elevation on leaf morphology, and tree abundance. I also did a second research project surveying algae populations along the Keaukaha coastline in Hilo, focusing on areas affected by invasive algae, including *Gracilaria salicornia,* as well as examining coral species associated with invasive algae.

Keaholoa STEM Scholar- Dr. Misaki Takabayashi, University of Hawaii at Hilo, Hilo, HI
(January 2009-July 2009)
Part of an undergraduate internship where I performed genetic analysis of microbial communities (using PCR and tRFLP) associated with diseased and non-diseased corals, to create a microbial "fingerprint" that would allow us to compare bacterial distribution and diversity among samples.

Biostatistic Techniques, University of Hawaii at Hilo, Hilo, HI with Dr. Pat Hart
(Fall 2008)
Performed water quality surveys of the Keaukaha coastline, and sampled several sites for fecal coliform indicator bacteria as well as *Staphylococcus sp.* to detect if the offshore wastewater pipeline was having an effect on water quality among sites.

Keaholoa STEM Scholar- Dr. Stephanie Molloy, University of Hawaii at Hilo, Hilo, HI (April 2008-December 2008)
Undergraduate internship that I designed looking at examining the ecology of an isolated strain of *Staphylococcus aureus* from Honoli'i, a popular surfing spot with a high incidence of staph infections. Project including isolating and culturing bacterial strains, survival assays, and performing microbial water quality analysis at multiple sites along the Hilo coast.

Teaching Experience

UH Mānoa Curriculum Research Development Group at the College of Education: Graduate Research Assistant (Fall 2015-Spring 2016)
Curriculum developer and editor of web-based high school and middle school curriculum for "Exploring Our Fluid Earth," a NOAA and Sea Grant funded project.

Nā Pua Noʻeau Summer Institute: Mālama Kanaloa Ocean Science Course (Summer 2015) UH Mānoa
Designed and taught a coursed teaching scientific lab and field techniques to Native Hawaiian high school students, in the context of Hawaiian culture.

Native Hawaiian Science & Engineering Mentorship Program and Nā Pua Noʻeau STEM Saturdays (Spring 2015-present)
Designed and implemented STEM activities for K-5 students to learn about genetics, ecology, and marine science.

Keaholoa STEM Summer Bridge Program 2010 at UH Hilo
Taught introductory chemistry course as part of Keaholoa/ Nā Pua Noʻeau's summer intensive program for Native Hawaiian high school and undergraduate students.

Water quality workshop instructor Field Methods in Geography & Environmental Sciences GEOG385 (Summers 2008, 2009, 2011) at UH Hilo
Taught a 2-day water quality field sampling workshop for the field course in Kapoho's champagne pond, and the Waiʻōpae tidepools.

Teaching Assistant/Tutor Fundamentals of Microbiology BIOL275/275L/375L (Spring 2008) at UH Hilo
Tutored twice weekly, attended lab courses, and graded course quizzes and lab assignments. Taught two sections of laboratory course.

Presentations

- *13th International Coral Reef Symposium 2016, Honolulu, HI, USA, Oral Presentation*: Reef Scent: How brooded coral larvae from a tough coral smell their way to a new home (June 2016)
- *ASLO Ocean Sciences Meeting 2016, New Orleans, LA, Poster Presentation:* Reef Scent: How brooded coral larvae from a tough coral smell their way to a new home
- *ASLO Ocean Sciences Meeting 2016, New Orleans, LA, Session Chair:* Implications of Global Climate Change on the Health of Coral Reef Ecosystems
- SACNAS National Conference 2015, Washington, DC, Oral Presentation: Larval release and settlement patterns of the brooding coral, *Leptastrea purpurea*
- *Hawaii Conservation Conference 2015, Hilo, HI,* Oral presentation: Reef Scent: How brooded coral larvae from a tough coral smell their way to a new home
- *Hawaii Conservation Conference 2014, Honolulu, HI,* Oral presentation: Using molecular tools to identify stress in corals in a changing reef environment
- *ʻIlima SACNAS Chapter Science Symposium 2014, Honolulu, HI,* Oral presentation: Larval settlement and reproductive patterns in the brooding coral, *Leptastrea purpurea*
- *ASLO Ocean Sciences Meeting 2014, Honolulu, HI,* Poster presentation: Development of molecular biomarkers to detect sublethal stress in the coral *Porites lobata*
- *SACNAS National Conference 2013, San Antonio, TX,* Oral Presentation: Development of molecular biomarkers for the detection of sublethal stress in the coral, *Porites lobata*
- *12th International Coral Reef Symposium 2012, Cairns, Queensland, Australia,* Poster presentation: The effect of skeletal growth anomalies on the expression of organic matrix gene *galaxin* and oncogene homologs, in the coral *Montipora capitata*
- *The Wildlife Society National Conference 2011, Waikoloa, HI,* Oral presentation: Galaxin expression in the endemic Hawaiian coral *Montipora capitata*, afflicted with skeletal growth anomalies.
- *TCBES Symposium at UHH 2011, Hilo, HI,* Poster presentation: "E waele a e hoʻokīpulu"… To weed and to fertilize: Combining traditional methods with nutrient analysis to apply to modern agricultural practices.
- *Hawaii Conservation Conference 2010*, Honolulu, HI, Panel/Oral presentation: Hawaiian Science 2010: Lessons from the Kuʻula class at UH Hilo.
- *TCBES Symposium at UHH 2010, Hilo, HI,* Poster presentation: Quantitative analysis and the effects of skeletal growth anomalies on calcium binding protein expressions in the coral, *Montipora capitata*.

- *Western Society of Naturalists 2009, Monterey, CA,* Poster presentation: Quantitative analysis and the effects of skeletal growth anomalies on calcium binding protein expressions in the coral, *Montipora capitata*.

Academic, extra-curricular, and community service activities

Expand Papahānaumokuākea (2016)
Oahu Science liaison for Native Hawaiian monument expansion initiative

13th International Coral Reef Symposium 2016 (2015-16)
Organizing committee for 2016 ICRS in Honolulu, HI

SACNAS Ilima Chapter President (Summer 2015-present), former Vice-President (2014-15), and Outreach Coordinator (Spring 2013-present)
Organize various chapter outreach events including "Science Alive" at the Bishop Museum, World Ocean's Day, Pūkoʻa council day at the state capitol building, and numerous other community activities. Coordinate outreach activities at the Kalaeloa unit of the Pearl Harbor National Wildlife Refuge, in a partnership with the USFWS.

Na Pua Noʻeau (Spring 2014-Present)
Coordinated multiple field trips for the Oahu Summer STEM institute, Lead a science activity for Super STEM Day on Kauai, Planned and lead activity for "Haunted Holmes" STEM day.

NOAA Marine Sanctuary Whale Count (Spring 2014-15)
Participated in humpback whale counts at Diamond head lookout.

US Fish & Wildlife Service (Spring 2013-Present)
Coordinate and lead outreach events at the Kalaeloa Unit of the Pearl Harbor National Wildlife Refuge.

Native Hawaiian Center of Excellence JABSOM (Fall 2012-Fall 2013)
Interact with Native Hawaiian high school students about pursuing a career in science, and share my educational experiences.

Kīpuka Native Hawaiian Student Center, UH Hilo (Fall 2009-Spring 2012)
Peer tutor for chemistry ad biological sciences.

Recent Scholarships and Grants

Charles H. and Margaret B. Edmondson Research Grant 2015-16 ($1200.00)

Office of Hawaiian Affairs Higher Education Scholarship 2012-Present
Need-based scholarship awarded to Native Hawaiian students seeking a degree in higher education.

Starr Foundation Science and Technology Scholarship 2014-15
The purpose of this fund is to assist students of Native Hawaiian ancestry who are enrolled in a program in the fields of science and/or technology at the University of Hawai'i at Manoa.

Graduate Professional Access Program 2013-Present
Awarded to graduate degree seeking students in STEM disciplines.

Richard Smart Scholarship Fund 2012-present

Awarded to first generation college degree seeking students from the Waimea area of Hawaii Island until the completion of their degree.

Liko Aʻe Native Hawaiian Leadership Program 2009-11 and 2014-15
Awarded to Native Hawaiian students to build leaders in communities throughout Hawaii and the mainland US.

Kamehameha Schools ʻImi Na'auao Scholarship 2012-14
Merit-based scholarship awarded to Native Hawaiian post-baccalaureate students seeking a degree in higher education, with the requirement of 150 hours of community service to benefit the Native Hawaiian community or affiliated organizations.

Publications

Spies N & Takabayashi M. Quantitative analysis and the effects of skeletal growth anomalies on calcium binding protein expressions in the coral, *Montipora capitata*. 2010. Agric. Nat. Resour. Vol 2:37-42. Abstracts of TCBES symposium

Spies N, Maioho I, Aiona K, "E waele a e hoʻokīpulu"... To weed and to fertilize: Combining traditional methods with nutrient analysis to apply to modern agricultural practices. 2011. Pacific Agriculture and Natural Resources, In press

Spies NP. The effects of skeletal growth anomalies on the expression of organic matrix gene galaxin and oncogene homologs, in the endemic Hawaiian coral *Montipora capitata*. University of Hawaii at Hilo. 2011. 44 pages. UMI 1507556

Spies NP & Takabayashi M. Expression of galaxin and oncogene homologs in growth anomaly in the coral, *Montipora capitata*. 2013. Diseases of Aquatic Organisms. Vol 104:249-256

Ma C, Spies NP, Gong T, Jones CX, Chu WM. Involvement of DNA-PKcs in the type I IFN response to CpG-ODNs in conventional dendritic cells in TLR9-dependant and -independent manners. 2015. PLoS ONE 10(3): e0121371. doi:10.1371/journal.pone.0121371

Spies NP, Murphy JWA, Seneca FO, Lyman A, Martinez J, Richmond R. Larval settlement and reproductive patterns in the brooding coral, *Leptastrea purpurea*. In Prep

Spies NP & Cabiglio C, TMT on Mauna Kea: Where science, culture, and community collide. 2016. SACNAS News Magazine Winter/Spring 2016 Vol. 18 No. 2

Kerr J, DeSalles P, Earle SA, Kikiloi KS, McCauley D, MacPherson R, Maxwell S, Richmond R, Roberts C, Spies NP, Sumaila UR, Villagomez A. Pu'uhonua A Place of Sanctuary: The cultural and biological significance of the proposed expansion for the Papahānaumokuākea Marine National Monument. 2016. In prep.

Publication Acknowledgements

Walsh WJ, Cotton S, Jackson L, Lamson M, Martin R, Osada-D'avella K, Preskitt L. First record of *Acropora gemmifera* in the main Hawaiian Islands. 2014. Coral Reefs 33:57

Murphy JWA, Richmond RH. (2016) Changes to coral health and metabolic activity under oxygen deprivation. PeerJ 4:e1956 https://doi.org/10.7717/peerj.1956