

Sonia Jane Rowley Ph.D.

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My primary research focus is on the evolutionary relationships within and between the coral holobiont and its environment, focusing on gorgonian (sea fan) octocorals. I seek to understand the biological success of this group, from shallow to deeper ocean depths (>50m/164ft) of the Indo Pacific. This is achieved through integrating cross-disciplinary approaches from experimental field ecology, genomics (phylogeography, systematics, and symbiosis), to functional morphology, and physiology, in order to further understand phenotypic responses to environmental change over ecological and geological (deep) time. Currently, I am part of a team developing fluorescence techniques in the detection of organic material in ocean environments, where I am able to utilise this technology to ask questions of the influence of hydrodynamics on the phenotypic and demographic structure of marine organisms. In so doing, I see that the most powerful tool for change is to share any knowledge and experience gained from these activities. Therefore, I continuously pursue outreach (over 50 invited seminars and public presentations) and academic mentoring and instructional activities. I have been a senior project supervisor for 40 graduate and undergraduate students, and a lecturer in reef ecology, statistics, and methods in research and project design.

Appointments

2020 – Present: **Assistant Researcher, Dept. Earth Sciences, SOEST, University of Hawai'i at Mānoa, Hawai'i, USA**
2019 – 2020: **Research Biologist, SOEST, University of Hawai'i at Mānoa, Hawai'i, USA**
2019: **Research Biologist, Applied Research Lab., University of Hawai'i at Mānoa, Hawai'i, USA**
2017 – Present: **Research Affiliate, SOEST, University of Hawai'i at Mānoa, Hawai'i, USA**

Higher Education

2015 – 2017: **University of Hawai'i at Mānoa, Honolulu, Hawai'i. Post Doctoral Fellow.**
- Ecology & evolution: Bivalvia of Hawai'i, SOEST. Supervisor: Prof. S.M. Stanley.
2009 – 2015: **Victoria University Wellington, New Zealand. VUW Ph.D., + extraordinary achievement Scholarships.**
- Gorgonian Responses to environmental change on Indo-Pacific Coral Reefs. Supervisor: Prof. S. Davy.
2004 – 2008: **University of Plymouth, BSc (Hons) Marine Biology. 1st class honours with industrial placement.**
- Dissertation thesis conducted in SE Sulawesi on *Spirobranchus corniculatus* complex *s.l.* Supervisor: Prof. M Attrill
2003 – 2004: **University of Plymouth, Extended Science. GPA 4**

Professional Service

2020 – Present: **Ambassador: Divesoft Closed Circuit Rebreather technology, CZ.**
2018 – Present: **Elected Fellow National (FN), Explorers Club, USA.**
2017 – Present: **Linnean Society of London, UK. Elected Fellow (FLS).**
2016 – Present: **NOAA Okeanos Explorer Shore Based Scientist, University of Hawai'i, USA.**
2015 – 2018: **Association for Marine Exploration (AME), USA. CSO (Chief Science Officer).**
2013 – Present: **Bernice Pauahi Bishop Museum (BPBM), USA. Research Affiliate.**
2007 – Present: **Royal Society of Biology (MRSB), UK.**

Grants & Awards

Professional Awards

2016 – **Recipient: Sir David Attenborough Award for Field Work**, Systematics Association & Linnaean Society of London
2017 – **USA Green Card**, National Interest Waiver (EB2 NIW: USCIS# 207-858-574)

Grants Pending

2020 – **PI: DECoDe, Fiji: Revealing Unexplored Diversity & Ecology of Coral over Depth in Fiji. Pure Ocean \$78,637.00**
2020 – **PI: The Gorgonian Octocorals (Cnidaria: Octocorallia) of Lord Howe Island Marine Park: biogeographic comparisons with shallow & mesophotic Indo-Pacific reefs utilising AMRI collections. Australian Museum Research Institution \$7,836.00**
2019 – **Co-PI: NNH19ZDA001N-PICASSO. Compact Color Micro-Biofinder (CoCoMBi) for high-resolution non-contact detection of biological cells, fossil cells, and colonies on rocks and soils. NASA, Submission date 11.20.2019, \$963,303**

Grants Awarded

2021 – **PI: Using Collections for Mesophotic Research: A Systematic Investigation of Indo-Pacific Gorgonians within the Acanthogorgiidae Gray, 1859 (Cnidaria: Octocorallia). SYNTHESIS GB-TAF-8146: \$30,000.00**
2021 – **Session Leader. Gordon Research Conference, Mesophotic Coral Ecosystems, Ventura, USA \$4500**
2020 – **Co-PI: Revealing the Biodiversity of Corals and Associated Organisms in the Twilight Zone in the West Pacific. National Geographic Society \$40,985.00**
2020 – **Department investment Fund, British Natural History Museum, UK \$5600**
2019 – **PI: Anonymous Private Donor: Mesophotic Ecosystems of Pohnpei, Micronesia \$43,426**
2019 – **Speaker. Oztek19, Advanced Dive Conference & Exhibition, Sydney, Australia \$4850**

2018 – **Speaker**. Gordon Research Conference, Mesophotic Coral Ecosystems, Maine, USA **\$4500**
 2018 – **Short Term Visitor Fellowship**, Invertebrate Department, Smithsonian Institution (USNM), USA **\$3900**
 2018 – **Speaker**. Manta Mania. Micronesian Conservation Coalition, Yap, Micronesia. **\$7000**
 2017 – 2018: **Post Doctoral Fellow**: Department of Biology, University of Hawai'i, USA OER (NSF) **\$260,377**
 2016 – **Speaker**. Marine Aquarium Conference of North America® XXVIII. San Diego, USA **\$5000**
 2015 – **Co-PI**: Understanding the Bathyal Biogeography, Western North Pacific. Schmidt Institute [Ship time].
 2015 – 2019: **Post Doctoral Fellow**. Department of Geology & Geophysics. SOEST, University of Hawai'i, USA **\$240,500**
 2015 – **Participant**. Methods in Ecological Genomics Analyses Workshop, Mote TRL, Florida, USA **\$5300**
 2015 – **Speaker**. Marine Aquarium Conference of North America® XXVII. Washington, DC, USA **\$5000**
 2015 – **Presenter**. Gordon Research Conference, Speciation. SOEST, University of Hawai'i **\$3222**
 2015 – **PI**: Twilight reef Exploration, Pohnpei, Micronesia. Systematics Research Fund: Systematics Society **\$3000**
 2015 – **PI**. Exploration of twilight coral reef diversity at Pakin Atoll, Pohnpei, Micronesia. Ocean Classrooms **\$8200**
 2015 – **PI**. Exploration of twilight coral reef diversity at Pakin Atoll, Pohnpei, Micronesia. Edmondson Trust **\$7500**
 2014 – **Contract**. Department of Biology. University of Hawai'i, USA **\$7000**
 2014 – **Participant**. Deep ocean exploration, Louisville seamount chain. NIWA, New Zealand **\$5000**
 2014 – **Young Taxonomist Fund & Speaker**. Deep Sea Coral Taxonomy Workshop, NOAA-JCM, NIWA, NZ **\$2000**
 2014 – **Young Taxonomist Fund & Speaker**. Deep Sea Coral Genomics Workshop, NOAA-JCM, Seattle, USA **\$4000**
 2014 – **Participant**: Exploration of twilight coral reef diversity at Ant Atoll, Pohnpei, Micronesia. Edmondson Trust **\$6000**
 2013 – **Participant**: Exploration of twilight coral reef diversity, Philippines. Edmondson Trust & Seaver Foundation **\$7500**
 2013 – **Doctoral Submission Scholarship**. Victoria University of Wellington, NZ **\$6000**
 2013 – **Octocoral taxonomy**. Department of Biology. University of Hawai'i, USA **\$3000**
 2012 – **Doctoral Research Award**. Victoria University of Wellington, NZ **\$4000**
 2012 – **Short Term Visitor Fellowship**: Invertebrate Department, Smithsonian Institution (USNM), USA **\$3000**
 2012 – **Martin Fellowship**. Netherlands Centre for Biodiversity (NCB) Naturalis, Netherlands **\$4000**
 2012 – **Learner Grey Award**. American Museum of Natural History (AMNH), USA **\$1500**
 2011 – **Young Taxonomist Fund**. National Institute of Water & Atmospheric Research (NIWA), NZ **\$3000**
 2010 – 2012: **Extraordinary Student Achievement Award**. Victoria University of Wellington, NZ **\$10,000**
 2009 – 2013: **Doctoral Scholarship (full)**. Victoria University of Wellington, NZ **\$50,000**
 2007 – 2009: **Student Microbiologist**. Nuffield Research Bursary, General Society of Microbiology, UK **\$2350**
 2007 – 2011: **Contract**. Scientific researcher & senior project supervisor Operation Wallacea, Indonesia. **\$23,200**
 2007 – **Participant**. Stazione Zoologica Anton Dohrn, Ischia, Italy. Royal Society London, UK **\$3500**
 2007 – Present: **Member**. Royal Society of Biology (MRSB), UK
 2004 – 2008: **Contract**. MarLIN, The Marine Biological Association, Plymouth, UK. NERC & JNCC **\$3100**

Publications

Salinas-de-León P, Martí -Puig P, Buglass S, Arnés-Urgellés C, Rastoin-Laplane E, Creemers M, Cairns S, Fisher C, O'Hara T, Ott B, Raineault NA, Reiswig H, Rouse G, **Rowley SJ**, Shank TM, Suarez J, Watling L, Wicksten MK, Marsh L (2020) Characterization of deep-sea benthic invertebrate megafauna of the Galapagos Islands. *Scientific Reports*. 10:13894, doi.org/10.1038/s41598-020-70744-1

Schramek TA, Cornuelle BD, Gopalakrishnan G, Colin PL, **Rowley SJ**, Merrifield MA, Terrill EJ (2019) Tropical Western Pacific thermal structure and its relationship to ocean surface variables: a numerical state estimate and forereef temperature records. *Oceanography*. 32(4):156–163, DOI:org/10.5670/oceanog.2019.421.

Freeman L, Freeman S, Gader P, Fick R, Kroeger N, Thode A, Thilges K, Van Uffelen LJ, **Rowley SJ**, Schindall J, Johnson A. (2019) Combined passive acoustic and video monitoring of coral reefs to better understand reef soundscapes and multi-species interactions. *The Journal of the Acoustical Society of America*. 146(4):2938

Rowley SJ, Roberts TE, Coleman RR, Joseph E, Spalding HL, Dorricott MKI (2019) *Pohnpei, Federated States of Micronesia*. In Loya Y, Puglise K, Bridge T (Ed.), Mesophotic Coral Ecosystems. Coral Reefs of the World, vol 12. Springer, Cham. DOI: 10.1007/978-3-319-92735-0_17

Sánchez JA, Dueñas LF, **Rowley SJ**, González FL, Vergara DC, Montaña-Salazar SM, Calixto-Botia I, Gómez CE, Abeytia R, Colin PL, Cordeiro RTS, Pérez CD (2019) *Gorgonian Corals*. In Loya Y, Puglise K, Bridge T (Ed.), Mesophotic Coral Ecosystems. Coral Reefs of the World, vol 12. Springer, Cham. DOI: 10.1007/978-3-319-92735-0_39

Spalding HL, Bowen B, Copus J, Kosaki R, Longenecker K, Montgomery A, Padillo-Gamino J, Parrish F, Roth M, **Rowley SJ**, Toonen R, Pyle R (2019) *The Hawaiian Archipelago*. In Loya Y, Puglise K, Bridge T (Ed.), Mesophotic Coral Ecosystems. Coral Reefs of the World, vol 12. Springer, Cham. DOI: 10.1007/978-3-319-92735-0_25

Roberts TE, Bridge TCL, Caley MJ, **Rowley SJ**, Sinniger F, Harii S, Lesser M, Slattery M, Baird AH (2018) The challenge of the deep should not preclude robust ecological analysis. *Science*. sciencemag.org/content/361/6399/281/tab-e-letters

Rowley SJ (2018) Acclimatory capacity of the Gorgonian *Isis hippuris* Linnaeus, 1758 to environmental change in SE Sulawesi, Indonesia. *Journal of Experimental Marine Biology & Ecology*. 500: 73 – 88.

Rowley SJ (2018) Environmental gradients structure gorgonian assemblages on coral reefs in SE Sulawesi, Indonesia. *Coral Reefs*. 37: 609-630.

Ekins M, Willis B, Bridge T, Srinivasan M, **Rowley SJ**, Hooper J (2017) The coral killing sponge *Terpios hoshinota* in Kimbe Bay, Papua New Guinea. *Memoirs of the Queensland Museum, Nature* 60: 174 – 175.

Wan X, Miller JM, **Rowley SJ**, Hou S, Donachie SP (2016) Draft genome sequence of a novel *Luteimonas* sp. strain from Coral Mucus, Hawai'i. *Genome Announcement*. 4(6):e01228-16. doi:10.1128/genomeA.01228-16.

Rowley SJ, Pochon X, Watling L (2015) Environmental influences on the Indo-Pacific gorgonian *Isis hippuris* Linnaeus, 1758 (Alcyonacea: Isididae): genetic fixation or phenotypic plasticity? *PeerJ* 3:e1128; DOI 10.7717/peerj.1128

Beaton J, Cowan H, Davies T, Pyle RL, **Rowley SJ**, Rowley MR, Woombs M (2015) *Closed circuit rebreather course: Poseidon Se7en addendum instructor manual*. British Sub-Aqua Club, London, UK. pp. 149.

Rowley SJ (2014) *Gorgonian responses to environmental change on coral reefs in SE Sulawesi, Indonesia*. Doctoral thesis, Victoria University Wellington, New Zealand, pp. 213.

Rowley SJ (2014) Refugia in the 'twilight zone': discoveries from the Philippines. *The Marine Biologist*. 2: 16-17.

Ransome E, **Rowley SJ**, Thomas S, Munn CB, Tait K (2014) Disturbance to conserved bacterial communities in the cold water gorgonian coral *Eunicella verrucosa*. *FEMS Microbial Ecology*. 90(2): 404-416.

Watling L, **Rowley SJ**, Guinotte SJ (2013) The world's largest known gorgonian. *Zootaxa*. 3630(1):198–199.

Hall-Spencer JM, Rodolfo-Metalpa R, Martin S, Ransome E, Fine M, Turner SM, **Rowley SJ**, Tedesco D, Buia MC (2008) Volcanic carbon dioxide vents show ecosystem effects of ocean acidification. *Nature*. 454: 96-99.

Martin S, Rodolfo-Metalpa R, Ransome E, **Rowley SJ**, Gattuso JP, Hall-Spencer JM (2008) Effects of naturally acidified seawater on seagrass calcareous epibionts. *Biological Letters*. doi:10.1098/rsbl.2008.0412.

Rowley SJ (2008) A critical evaluation of the symbiotic association between tropical tubicolour Polychaetes and their Hermatypic coral hosts, with a focus on *Spirobranchus giganteus* (Pallas, 1766). *Plymouth Student Scientist*. 1(2): 335-353.

Publications in Review

Lupi F, **Rowley SJ**, Chyba M, Lanzetta (in review). Surface modeling and metrics from free form, branched, and incomplete point clouds: A mesophotic gorgonian coral case study. *Computers & Graphics*.

Versteegen E, Macher JM, **Rowley SJ**, Renema W (in review). Changes in the symbiont community composition of the mesophotic *Cycloclipeus* (Foraminifera, Nummulitidae). *J. Foraminiferal Research*.

Rowley SJ, Melbourne-Thomas J, Attrill MJ (in review). Coral-host morphology structures the distribution of *Spirobranchus corniculatus* complex s.l. on Indonesian coral reefs. *Marine Biology*.

Rowley SJ, McFadden CS (in prep.). Molecular diversity of the mesophotic gorgonians of the Senyavin Islands, FSM. *Scientific Reports*.

Rowley SJ, Mokuahi AC (in prep.). New methods in gorgonian octocoral curation: effective preservation and storage. *PeerJ*

Rowley SJ (in prep.) Adaptive Capacity of Gorgonians to Environmental Change. *Marine Pollution Bulletin*.

Rowley SJ, Thomas S, Ransome E, Hall-Spencer JM, Munn CB (in prep.) Environmental and temporal variability on *Eunicella verrucosa* and associate microbial communities. *Marine Ecology Progress Series*.

Technical Reports

Rowley SJ, Roberts TE, Coleman RR, Spalding HL, Joseph E, Dorricott MK (2018) Mesophotic Coral Ecosystems of Pohnpei, Federated States of Micronesia. Conservation Society of Pohnpei Technical Report. pp. 38.

Rowley SJ, Roberts TE, Coleman RR, Spalding HL, Joseph E, Dorricott MK (2018) Lay-Summary: Mesophotic Coral Ecosystems of Pohnpei, Federated States of Micronesia. Conservation Society of Pohnpei Technical Report. pp. 15.

Rowley SJ (2017) Voyage Report: Rapid Assessment of the Geologist and Lō'īhi Seamounts. *Conservation International & HURL Technical Report*. pp. 27.

Rowley SJ (2016) Exploration and Systematics of Deep-Reef Gorgonian Corals at Pakin Atoll, Micronesia. *Systematic Research Fund. Technical Report*. pp. 9.

Clark M, Anderson O, Bowden O, Chin C, George S, Glasgow D, Guinotte J, Hererra S, Osterhage D, Pallentin A, Parker S, **Rowley SJ**, Stewart R, Tracey D, Wood S, Zeng C (2014) Vulnerable Marine Ecosystems of the Louisville Seamount Chain: voyage report of a survey to evaluate the efficacy of preliminary habitat suitability models. *NIWA Technical Report*. pp.83.

Relevant Experience

Cruise and Field Experience

2019: **PI: University of Hawai'i at Manoa, USA, British Sub-Aqua Club (BSAC), UK, Naturalis Biodiversity Center, Netherlands, University of the Azores, Portugal.**

- Mesophotic reef expedition to the Pohnpei Island, Ant & Pakin Atolls, FSM as the PI, gorgonian coral scientist, and conservation research. Collaborators include Prof. M. Chyba (Mathematics, VR & UAV), Prof. H. Dulai (Geochemist), Dr. M. de Frietas Prazeres, Dr. W. Renema (Foraminifera), 5 students.

2019: **Naval Undersea Warfare Center (NUWC), US Navy, Applied Research Laboratory (ARL), University of Hawai'i at Manoa, Scripps College, California, University of Florida, USA**

- Passive Acoustic Detection of Reef Ecological Soundscapes (PADRES): DARPA reef acoustic experimentation (CCR and freediving) on the Island of Hawai'i with Drs. L & S. Freeman, Prof. P. Gader, Dr. A. Thode.

2018: **PI: University of Hawai'i at Manoa, USA, British Sub-Aqua Club (BSAC), UK, University of the Azores, Portugal.**

- Mesophotic reef expedition to the Pohnpei Island, Ant & Pakin Atolls, FSM as the PI, gorgonian coral scientist, supervisor, Mr. F. Butschek (UA), graduate student, coral scientist.

2018: **Micronesian Conservation Coalition. PI: J. Hartup MSc.**

- Event speaker & instructor in Yap & Ulithi Atoll, Federated States of Micronesia. Mesophotic exploration, characterisation, & octocoral research.

2018: **ARC Centre of Excellence for Coral Reef Studies, James Cook University, Australia.**

- Mesophotic exploration, Scleractinian coral, & Octocoral research with PI: Prof. A. Baird, Dr. T. Bridge, Dr. F. Benzoni. Balls Pyramid, Lord Howe Island, followed by the Coral Sea, Australia.

2017: **PI: Association for Marine Exploration, University of Hawai'i at Manoa, Bishop Museum, Honolulu, Old Dominion University, USA, James Cook University, Queensland Museum, Australia, Coral Reef Research Foundation, Palau, Rolex, Europe, Stone Aerospace, USA**

- Mesophotic reef expedition to the Pohnpei Island and Pakin Atoll, FSM as the PI, gorgonian coral scientist, & Poseidon MKVIII test pilot with Dr. R. Pyle, Mr. B. Greene, (AME, BPBM), Dr. D. Barshis (ODU), Prof. A. Baird, Mr. TE. Roberts (JCU), Dr. T. Bridge (JCU, QM), Dr. S. Lindfield (CRRF), Ms. M. Dorricott, Mr. F. Butschek (Rolex), Mr. J. Brown (SA).

2016: **James Cook University, Queensland Museum, Australia, Mahonia Na Dari & Walindi Nature Centre, PNG.**

- Mesophotic reef expedition to Kimbe Bay, Papua New Guinea. Gorgonian coral scientist, & Poseidon MKVIII test pilot with Prof. A. Baird, Mr. TE. Roberts (JCU), Dr. T. Bridge (JCU, QM), Dr. M. Ekins (QM).

2016: **Conservation International, Hawai'i Undersea Research Laboratory (HURL), USA**

- First submersible dives on the 'Geologist Seamounts' as the Octocoral & benthic marine organism scientist, with Dr. G. Stone, Dr. M. Sanjayan, Dr. A. Eustace, & Dr. L. Teneva.

2016: **PI: Association for Marine Exploration, Bishop Museum, Honolulu, California Academy of Sciences, USA**

- Mesophotic reef expedition to the Pohnpei Island and Pakin Atoll, FSM as the PI, gorgonian coral scientist, & Poseidon MKVIII test pilot with Dr. R. Pyle, Mr. B. Greene, Dr. K. Longenecker (BPBM), Dr. L. Rocha (CAS).

2016 – Present: **NOAA Okeanos Explorer Shore Based Scientist, University of Hawai'i, USA**

- Deep-sea shore based Octocoral scientist, taxonomic identification of benthic marine organisms.

2015: **PI: Association for Marine Exploration, Bishop Museum, Honolulu, University of Hawai'i, USA**

- Mesophotic reef expedition to the Pohnpei Island and Pakin Atoll, FSM as the PI, gorgonian coral scientist, & Poseidon MKVIII test pilot with Dr. R. Pyle, Mr. B. Greene.

2015 - Present: **Post Doctoral Fellow: Association for Marine Exploration, University of Hawai'i, USA**

- Geology & evolution: Bivalvia of O'ahu, Hawai'i, with Prof. S. M. Stanley.

2014: **Bishop Museum, Honolulu, HIMB & the Seaver Foundation, USA**

- Mesophotic reef expedition to the Pohnpei, FSM as the gorgonian coral scientist & Poseidon MKVIII test pilot with Dr. R. Pyle, Mr. B. Greene.

2014: **National Institute of Water & Atmospheric Research (NIWA), New Zealand**

- Deep Ocean expedition to the Louisville seamount Chain for 5 weeks, assessing VME (Vulnerable Marine Ecosystems) for fisheries management using multibeam sonar, DTIS videography, CTD & benthic sleds with Dr. M. Clark & Dr. A. Rowden.

2013 & 2014: **Bishop Museum, Honolulu, HIMB & the Seaver Foundation, USA**

- Two mesophotic reef expeditions to the Philippines as the gorgonian coral scientist & Poseidon MKVIII test pilot with Dr. R. Pyle, B. Bowen (HIMB) & L. Rocha (California Academy).

2013: **Bishop Museum, Honolulu, and Hawai'i Undersea Research Laboratory (HURL), USA**

- Mesophotic reef benthic invertebrate scientist principally working on Cnidaria in the Pisces V submersible with Dr. R. Pyle & K. Longenecker.

2009: **Papahānaumokuākea Marine National Monument, NWHI, Hawai'i Undersea Research Laboratory (HURL).**

- Deep-sea research scientist principally working on cnidaria and both their associate & microbial communities from Pisces IV submersible and ROV dives on the NOAA ship Kaimikai-o-Kanaloa (KOK).

2007 – 2009: **Nuffield Research Bursary, General Society of Microbiology and University of Plymouth, UK.**

- Ecological videographic survey, study on the CITES protected gorgonian *Eunicella verrucosa*.

2007: **Stazione Zoologica Anton Dohrn, Ischia, Naples, Italy. Research, project design and taxonomist.**

- Pioneer research expedition led by Dr J Hall-Spencer on natural CO₂ vents. Funded by the Royal Society London.

2007 – 2011: **Operation Wallacea, Indonesia. Scientific researcher and senior project supervisor.**

- Independent research (to PhD) on gorgonian ecology, morphological complexity and physiological responses to environmental variables with taxonomic descriptions of host and associate taxa.
- Scientific supervisor of graduate and undergraduate students in cnidarian, invertebrate and fish ecology, physiology & disease from subtidal, intertidal and marginal habitats. Main focus Cnidaria.
- Lecturer in Coral Reef Ecology, statistics, methodological design and research assistant coordinator

2006: **Operation Wallacea, Indonesia. Expedition research volunteer; BSc(hon) project.**

- Field and taxonomic dissertation project on the serpulid *Spirobranchus corniculatus* complex *s.l.* and coral-host.

2005 – 2006: **National Marine Aquarium, Plymouth. Volunteer tank diver. Public presentations.**

2004 – 2008: **MarLIN, The Marine Biological Association, Plymouth. Information Research Assistant.**

- Initially voluntary, subsequent bursary funding (NERC, JNCC), involving temperate marine organism and habitat research, report and review writing for the MBA database and MarLIN website. Public and in house presentation. Research focus on Cnidaria.

2004: **Oonas Dive Centre, Egypt. Dive master and assistant instructor.**

1988 – 1994, 2003 – 2008: **Maureen of Dart Diving Charters.** Extensive experience in charter boat diving, shipwreck exploration (particularly WWII D-Day landings, Bay de Seine), dive guiding, soft and hard boat handling and navigational skills (see below), compressor operation and NITROX/gas mixing.

Laboratory Experience

2019 – 2020: **Hawai'i Institute of Geophysics and Planetology, University of Hawai'i at Mānoa, Hawai'i.**

- Research includes: spectroscopy, microscopy, flow cytometry, metagenomics, and bioinformatics in the PICASSO "Search for Life" project, NASA #80NSSC17k0127.

2017 – Present: **Managing laboratory at the University of Hawai'i at Manoa.**

- Research includes: Molecular and classical systematics, phylogenetics, microbiology, microscopy, and geochemistry.

2017: **Friday Harbor Laboratories, University of Washington.**

- Micro-CT Scan analysis & CFD modelling assessing the functional morphology & biomechanics of Octocoral microstructures with Prof. A. Summers.

2017 – Present: **University of Hawai'i at Mānoa, Hawai'i.**

- Metagenomic sequencing of deep-sea & MCE gorgonian coral & sediment microbial communities using Illumina MiSeq technology with Dr. X Wan, Dr. S. Hou & Prof. S. Donachie.

2016: **Harvey Mudd College, Claremont, California, USA.**

- Molecular genotyping of Mesophotic Octocoral taxa with Prof. C. McFadden.

2015 – 2017: **Waikiki Aquarium, University of Hawai'i at Mānoa, Hawai'i.**

- Mesophotic octocoral husbandry and research.

- 2015: **Mote Tropical Research Laboratory, Florida, & University of Texas at Austin, Texas, USA.**
- Ecological Genomics Analyses: 2b RAD & RNAseq genomic analyses with Dr. M. Matz.
- 2010 – 2011: **Hawaiian Institute of Marine Biology. Visiting Scientist.**
- Molecular characterization of gorgonian *Isis hippuris* endosymbionts with Dr. R Gates & Dr. X Pochon.
- 2009 – Present: **University of Hawai'i at Mānoa, Hawai'i. Research Affiliate.**
- Deep-sea & MCE gorgonian coral associated microbial communities with Prof. S Donachie.
 - *Porites lobata* associate bacterial single cell transcriptome analysis with Prof. S Donachie.
 - Octocoral & associate taxonomy (incl. SEM) with Prof. L Watling.
 - Octocoral, sediment & plankton Stable isotope analyses with Associate Prof. J Drazen.
- 2008 – 2009: **Plymouth Marine Laboratory & University of Plymouth, UK. Visiting Scientist.**
- Associate microbial community analyses from diseased and healthy colonies of the CITES listed gorgonian *Eunicella verrucosa* Pallas 1766 using molecular and quorum sensing techniques.
- 2007 – 2009: **Nuffield Research Bursary, General Society of Microbiology & University of Plymouth, UK.**
- Ecological videographic survey, molecular and culture-based study on the CITES protected gorgonian *E. verrucosa* with Dr. C Munn & Dr. J Hall-Spencer.
- Coral taxonomy**
- 2018 – **Queensland Museum Network, Australia. Visiting Scientist**
- Mesophotic & shallow reef octocoral taxonomy with Dr. T. Bridge.
- 2014 & 2015 **California Academy of Sciences (CAS), USA. Visiting Scientist.**
- Deep & shallow reef octocoral taxonomy with Dr. G. Williams.
- 2014 – **National Institute of Water and Atmospheric Research (NIWA), New Zealand. Young Taxonomist Fund.**
- Deep ocean coral workshop Speaker & participant with Dr. G. Williams & Dr. P. Alderslade.
- 2012 – Present: **Bishop Museum (BPBM), USA. Research Affiliate.**
- Deep, mesophotic & shallow water octocoral taxonomist & field researcher.
 - Taxonomist & Zoobank database contributor with Dr. R. Pyle.
- 2012 & 2018 **Smithsonian Institution (USNM), USA. Short Term Visitor Fellowship.**
- Deep, mesophotic, & shallow water octocoral taxonomy working with Dr. S. Cairns.
- 2012 – **Netherlands Centre for Biodiversity (NCB) Naturalis, Netherlands. Martin Fellowship.**
- Shallow water octocoral taxonomy working with Dr L. van Ofwegen & B. Hoeksema.
- 2012 – **American Museum of Natural History (AMNH), USA. Learner Grey Grant.**
- Deep & shallow water octocoral taxonomy working with Dr. E. Rodríguez.
- 2011 – **National Institute of Water and Atmospheric Research (NIWA), New Zealand. Visiting Scientist.**
- Deep & shallow water octocoral identification working with Prof. L. Watling, S. Cairns & G. Williams.
- 2011 – **Raffles Museum of Biodiversity Research (RMBR), Singapore. Visiting Scientist.**
- Deep & shallow water octocoral identification.
- 2011 – **Indonesian Institute for Sciences (LIPI), Indonesia. Visiting Scientist.**
- Deep & shallow water octocoral identification working with Y. Tuti Hermanlimianto.
- 2009 – 2017 [6 visits]: **British Natural History Museum (BNHM), UK. Visiting Scientist.**
- Deep & shallow water octocoral identification.

Relevant Courses & Qualifications

- 2020 **F.I.I, L2 Freediver**, Freediving Instructors International, Hawai'i, USA
- 2018 **IAINTD CCR Liberty** crossover extended range, D. Sammons, Hawai'i, USA
- 2017 **F.I.I, L1 Freediver**, Freediving Instructors International, Hawai'i, USA
- 2017 **USA Green Card**, National Interest Waiver (EB2)
- 2017 **Introduction to Programming & Statistics in R**, University of Hawai'i at Mānoa, USA
- 2016 **Poseidon, Regulator & Rebreather Service Technician Course**, Hawai'i, USA
- 2015 **Coral corer operations**, NOAA & Lawrence Livermore Lab., USA
- 2015 **Methods in Ecological Genomics Analyses** Workshop, Mote TRL, Florida, USA
- 2014 **Deep Sea Coral Genomics Workshop**, NOAA-JCM, Seattle, USA.
- 2013 - 2018 **Piedra-Sombra Corporation, Inc., Poseidon MKVIII Rebreather** Test Pilot.
- 2012 **JEOL JSM-648OLV Scanning Electron Microscope**, Naturalis Biodiversity Center, Netherlands.
- 2012 **JEOL JSM-7600F Scanning Electron Microscope**, Naturalis Biodiversity Center, Netherlands.

2012 **Philips XL-30 Environmental Scanning Electron Microscope**, Smithsonian Institute, USA.
 2012 **BSAC, IANTD, AAUS, TDI Close Circuit Rebreather Inspiration & Evolution, TRIMIX.**
 2011 **Geneious** bioinformatic software operation incl. PAUP, MrBayes, PHYML.
 2011 **DAN Oxygen Administration**, University of Hawai'i at Mānoa, USA.
 2009 **Hitachi S4800-I Field Emission Scanning Electron Microscope** & ancillary equipment, University of Hawai'i at Mānoa, USA.
 2009 **PRIMER-E, PERMANOVA** workshop, MBA, Plymouth, UK; Massey University, Albany, New Zealand.
 2008 **Deep Sea Coral Symposium, Coral Taxonomy Workshop**, NIWA, Wellington, New Zealand.
 2007 **UK Marine Protected Areas Centre Workshop**, York, UK
 2005 **HSE 4 Professional SCUBA: Diving & Sailing Centre Plymouth.**
HSE First Aid at Work, RYA Sea Survival, RYA VHF/GMDSS, HSE B.6.5 Oxygen Administration.
 2005 **BSAC & IANTD Advanced NITROX:** Maureen of Dart, UK.
 2004 **Motor Cycle License**, DVLA, UK.
 2004 **PADI Divemaster, Rescue Diver, PADI EFR.** Oonas Dive Centre, Egypt.
 2004 **Marine Mammal Medic:** Diving & Sailing Centre, Plymouth, UK.
 1992 **BSAC Dive leader**, Maureen of Dart, UK.
 1992 - 1994 **RYA/D.O.T Coastal skipper, Yachtmaster Offshore Ocean, RYA Astronavigation & Sat. Navigation:** Dartmouth Community College, UK.
 1990 **Full Drivers License**, DVLA, UK.
 1987 **BSAC Boat handling**, Anglesey, UK.

Presentations

Rowley SJ, Misra AK, Acosta-Maeda TE, Zhou J, Dasilveira LA 2020. The Biofinder: Detection of Biological Material on Igneous Rock. *The 51st Lunar and Planetary Science Conference (LPSC)*. Houston, Texas. (Abstract)

Acosta-Maeda TE, Misra AK, **Rowley SJ**, Zhou J, Dasilveira LA, Porter JN, McKay CP 2020. Compact Colour Micro-Biofinder (CoCoMBi) for high-resolution non-contact detection of biological cells, fossil cells and colonies on rocks and soils. *The 51st Lunar and Planetary Science Conference (LPSC)*. Houston, Texas. (Abstract)

Rowley SJ 2019. Shallow & Deep-Reef Research: Pohnpei, Ant & Pakin. *Australian Embassy Pohnpei*, FSM. (Invited Presentation).

Rowley SJ 2019. Using CCR for Mesophotic Ecosystem Research & Exploration. *Oztek19, Advanced Dive Conference & Exhibition, Sydney* (Invited Presentation).

Rowley SJ 2019. Applying Advanced Closed Circuit Rebreather (CCR) Technology for Passive Acoustic Detection of Reef Ecological Soundscapes. *MANTAS III, Applied Research Lab, University of Hawai'i at Manoa*, USA.

Rowley SJ 2019. Mesophotic Gorgonian Corals of the Indo-Pacific. *Exploration by the Seat of your Pants!* (Invited Presentation).

Rowley SJ 2018. Mesophotic Gorgonian Corals of the Indo-Pacific. *Zoology Dept. of the Smithsonian Natural History Museum*. (Invited Presentation).

Rowley SJ 2018. Exploring the Deep Coral Reefs of Pohnpei: Narrated Video Presentation. *Invertebrate Zoology Dept. of the Smithsonian Natural History Museum*. (Invited Presentation).

Rowley SJ 2018. Advanced Closed Circuit Rebreather (CCR) Technology. *MANTAS II, Applied Research Lab, University of Hawai'i at Manoa*, USA. (Invited Presentation).

Rowley SJ 2018. Mesophotic Research in the Senyavin Islands: 2014-2018. *Australian Embassy Pohnpei*, FSM. (Invited Presentation).

Rowley SJ 2018. Mesophotic Research in the Senyavin Islands: 2014-2018. *Cross-View Event, Conservation Society of Pohnpei*, FSM. (Invited Presentation).

Rowley SJ 2018. Mesophotic Research in the Senyavin Islands: 2014-2018. *Conservation Society of Pohnpei*, FSM. (Invited Presentation).

Rowley SJ 2018. Exploring the Deep Coral Reefs of Pohnpei. *College of Micronesia-FSM, Palikir Campus*, FSM. (Invited Presentation).

Rowley SJ 2018. Mesophotic gorgonian corals: case study in Micronesia. *Centre of Excellence, James Cook University*, Australia. (Invited Presentation).

Baird A, Benzoni F, **Rowley SJ** 2018. Deep-water coral research in Lord Howe Island Marine Park. Lord Howe Island Museum & Visitor Centre, Australia. (Invited Presentation).

Rowley SJ 2018. Mesophotic Coral Ecosystems (MCEs): Gorgonian Corals. *Kalaheo High School*, Hawai'i USA. (Two Invited Presentations).

Rowley SJ 2017. Exploring the Deep Coral Reefs of Pohnpei. *College of Micronesia-FSM, Kolonia Campus*, FSM. (Invited Presentation).

Rowley SJ, Baird A, Hartup J, Lindfield S. 2017. Exploring the Deep Coral Reefs of Pohnpei. *College of Micronesia-FSM, Palikir Campus*, FSM. (Invited Presentation).

Rowley SJ. 2017. Exploration into the Biodiversity & Evolutionary Mechanisms of Deep-Reef Gorgonian Corals. *British Natural History Museum*, UK (Invited Presentation).

Colin PL, Schramek T, Powell B, Terrill E, Rudnick D, **Rowley SJ**. 2017. Why Palau Did Not Have Coral Bleaching in 2015-2016: A preliminary Assessment. *AAAS Pacific Division*, USA.

Rowley SJ. 2016. Unveiling the Mysteries of Twilight Reefs. *Distinguished Lecture Series, Waikiki Aquarium & Punahou School*, USA (Invited Presentation).

Rowley SJ. 2016. Gorgonian Responses to Environmental Change. *Dept. Biology. Harvey Mudd College*, CA, USA (Two Invited Presentations).

Rowley SJ. 2016. Hitchhikers Guide to the Twilight Zone: Sea-Fans & Selection. *Marine Aquarium Conference of North America® XXVIII*, USA (Invited Presentation).

Rowley SJ. 2016. Acclimatory Capacity of the Gorgonian *Isis hippuris* Linnaeus, 1758 to Environmental change in SE. Sulawesi, Indonesia. *13th International Coral Reef Symposium*, Hawai'i, USA.

Rowley SJ. 2016. Gorgonian corals in the Twilight Zone: exploration and environmental change. *Dept. Biology, University of Hawai'i at Mānoa*, Hawai'i, USA (Invited Presentation).

Dituri J, **Rowley SJ**, Robertson J. 2015. Rebreather Night at Kauai Rebreather & Technical. *Kaua'i Marriott*, Hawai'i, USA (Invited Presentation).

Rowley SJ. 2015. Gorgonian corals in the Twilight Zone: exploration and environmental change. *Dept. Geology & Geophysics, University of Hawai'i at Mānoa*, Hawai'i, USA (Invited Presentation).

Rowley SJ. 2015. Gorgonian corals in the Twilight Zone: exploration and discovery. *Interdepartmental UH Faculty, University of Hawai'i at Mānoa*, Hawai'i, USA (Invited Presentation).

Rowley SJ. 2015. Gorgonian Responses to Environmental change: Bathymetry and Biogeography. *Dept. of Biology, University of Hawai'i at Mānoa*, Hawai'i, USA (Invited Presentation).

Rowley SJ. 2015. Gorgonian corals in the Twilight Zone: exploration and discovery. *Marine Aquarium Conference of North America® XXVII*, USA. (Invited Presentation).

Rowley SJ. 2015. Advanced Rebreather Technology in deep coral Discovery, *Applied Research Lab, University of Hawai'i at Manoa*, USA. (Invited Presentation).

Rowley SJ, Pyle RL, Greene BD. 2015. Twilight Zone of Pakin, Ant and Pohnpei. *US Embassy Consulate*, FSM. (Invited Presentation).

Rowley SJ, Pyle RL, Greene BD. 2015. Twilight Zone of Pakin, Ant and Pohnpei. *Conservation Society of Pohnpei*, FSM. (Invited Presentation).

Rowley SJ, Pyle RL, Greene BD. 2015. Twilight Zone of Pakin, Ant and Pohnpei. *Micronesian Islands Conservation Inc. (MICI), College of Micronesia-FSM, National Campus*, FSM. (Invited Presentation).

Rowley SJ. 2015. Gorgonian Responses to Environmental change: Bathymetry and Biogeography. *MEGA 2015 Genomics Workshop, Mote Tropical Research Laboratory*, Florida, USA. (Two Invited Presentations).

Rowley SJ. 2015. Where Science Can Take You! *Snorkelling Assessments and New Discoveries (SAND), NOAA, Pacific Islands Region Office*, Hilo, Hawai'i, USA (Invited Speaker)

Rowley SJ. 2015. Deep Coral Discovery in the Twilight Zone. *Waikiki Aquarium*, Hawai'i, USA (Invited Presentation).

Rowley SJ. 2015. Gorgonian Responses to Environmental Change on Coral Reefs in SE Sulawesi, Indonesia. *University of Hawai'i at Mānoa*, Hawai'i, USA (Invited Presentation).

Rowley SJ. 2015. Environmental Influences on the Indo-Pacific Octocoral *Isis hippuris* Linnaeus 1758: Genetic Fixation or Phenotypic Plasticity? *Gordon Research Conference: Speciation*, LA, USA.

- Pyle RL, **Rowley SJ**. 2015. Exploring Deep Coral Reefs. *Bernice P. Bishop Museum Hawaiian Hall Atrium*. Hawai'i, USA (Invited Joint Presentation).
- Pyle RL, **Rowley SJ**. 2014. Exploring Deep Coral Reefs. *Bernice P. Bishop Museum Hawaiian Hall Atrium*. Hawai'i, USA (Invited Joint Presentation).
- Rowley SJ**, Pyle RL. 2014. Gorgonian Bathymetry and Biogeography. *1st Deep-Sea Coral Genomics Workshop*. Seattle, USA. (Invited Presentation).
- Rowley SJ**, Watling L. 2014. Gorgonian (sea fan) Corals: the basics & Chrysogorgiidae. *2nd Deep-Sea Coral Workshop*. Wellington, New Zealand (Invited Presentation).
- Bowen BW, Rocha LA, Pyle RL, **Rowley SJ**, Whitton R. 2013. Coral Reef Diversity and Exploration. *Bureau of Fisheries and Aquatic Resources*. Philippines (Invited Presentation).
- Rowley SJ**, Pochon X, Gates RM, Watling L. 2012. Characterising Gorgonian Responses to Environmental Change on Coral Reefs in SE Sulawesi, Indonesia. *37th Tester Symposium*. Hawai'i, USA (Presentation).
- Rowley SJ**, Pochon X, Gates RM, Watling L. 2012. Gorgonian Responses to Environmental Change on Coral Reefs in SE Sulawesi, Indonesia. *Hawaiian Institute of Marine Biology*. Hawai'i, USA (Invited Presentation).
- Rowley SJ**. 2012. Gorgonian Responses to Environmental Change on Coral Reefs in SE Sulawesi, Indonesia. *Netherlands Centre for Biodiversity, Naturalis*, Leiden, Netherlands (Invited Presentation).
- Burns S, **Rowley SJ**, Saw, J, Watling L, Donachie S. 2012. Bacterial Communities Associated with Deep-Sea Corals. *ARCS* Hawai'i, USA (Poster)
- Watling L, France SC, **Rowley SJ**, Heestand E. 2012. When is a bamboo coral not a bamboo coral? A revision of the octocoral family Isididae. *Proc. 5th Int. Deep Sea Coral Symposium*. Amsterdam, Netherlands (Presentation).
- Watling L, **Rowley SJ**, Lapointe A. 2012. Deep coral stories from the Northwestern Hawaiian Islands. *5th Annual Hawaiian Islands Symposium*. Hawai'i, USA (Presentation).
- Rowley MR, **Rowley SJ**. 2012. Exploration of the HMS Victoria, A Deep Wreck off Lebanon. *23rd Annual Symposium on the Maritime Archaeology and History of Hawai'i and the Pacific*. Hawai'i, USA (Invited Presentation).
- Rowley SJ**, Watling L, Pochon X, Gates RM, Smith DJ, Bell JJ. 2011. Gorgonian Responses to Environmental Change on Coral Reefs in SE Sulawesi, Indonesia. *22nd Pacific Science Conference*. Kuala Lumpur, Malaysia (Presentation).
- Barker J, **Rowley SJ**, Speight MR. 2009. Host specificity and environmental parameters structure the distribution of *Spirobranchus corniculatus* complex s.l. on coral reefs in SE Sulawesi, Indonesia. *12th Annual Meeting RCUK*, London, UK (Presentation & Poster).
- Norman-Walker O, **Rowley SJ**, Weaver R. 2009. Morphological variability of the gorgonian (Cnidaria: Octocorallia) *Isis hippuris* (L 1758) across habitat gradients in SE Sulawesi, Indonesia. *12th Annual Meeting RCUK*, London, UK (Poster).
- Rowley SJ**. 2009. Morphological diversity and abundance in the tube-dwelling polychaete *Spirobranchus giganteus* (Pallas, 1766) in the Indo-Pacific: adaptations to its coral host? *Operation Wallacea*. SE. Sulawesi, Indonesia (Invited Presentation).
- Rowley SJ**. 2008. Morphological diversity and abundance in the tube-dwelling polychaete *Spirobranchus giganteus* (Pallas, 1766) in the Indo-Pacific: adaptations to its coral host? *Operation Wallacea*. Sulawesi, Indonesia (Invited Presentation).
- Hall-Spencer JM, Pike J, **Rowley SJ**, Thomas S, Hiscock K, Ticehurst R, Munn CB. 2008. Cold water coral disease. *Proc. 4th Int. Deep Sea Coral Symposium*. Wellington, New Zealand (Poster).
- Rowley SJ**. 2008. My Placement: MarLIN, Italian CO₂ volcanic vents, *Eunicella verrucosa* disease, Indonesian Gorgonians. *University of Plymouth*, UK (Invited Presentation).
- Rowley SJ**. 2007. Volunteering for the MarLIN – Marine Life Information Network. *My Future Exhibition, Marine Biological Association*, Plymouth, UK (Invited Presentation).

Public & Education Outreach

Popular Articles & Blogs

- Rowley SJ** & Chyba M. 2019. Pohnpei 360°: Aerial to the Mesophotic. National Geographic Open Explorer.
- Bridge TL, **Rowley SJ**, Roberts TE. 2017. *Twilight Reefs of Kimbe Bay*. Karai Bilong Solwara, Mahonia Na Dari, 2-3
- Rowley SJ**. 2016. *Twilight Times: An Age of Discovery*. Kilo i'a, Waikiki Aquarium, 7-9.
- Rowley SJ**. 2015. *Land of the Holy Places*. 20th August 2015.
- Rowley SJ**. 2015. *Pohnpei & Pakin 2015*. Association for Marine Exploration. 22nd June 2015.
- Rowley SJ**, Pyle RL. 2014. *Notes From the Field: SE7EN Rebreathers in Pohnpei*. Poseidon. 8th August 2014.

Rowley SJ. 2014. *The Greene Green Grass of Pohnpei!* Bernice P. Bishop Museum. 27th July 2014.
Rowley SJ. 2014. *Rings and Branches.* Bernice P. Bishop Museum. 17th July 2014.
Rowley SJ. 2014. *SE7ENth Heaven at Ant Atoll.* Bernice P. Bishop Museum. 14th July 2014.
Rowley SJ. 2014. *Gorgonians élixir de vie!!* Bernice P. Bishop Museum. 8th July 2014.
Rowley SJ. 2014. *Stealth, Strength & Deep Phototrophic Gorgonians.* Bernice P. Bishop Museum. 2nd July 2014.
Rowley SJ. 2014. *Atolls & Islands.* Bernice P. Bishop Museum. 2nd July 2014.
Rowley SJ, Pyle RL. 2014. *Anilao: Searching for New Species on Deep Philippine Reefs.* Poseidon. 6th June 2014.
Pyle RL, Rowley SJ. 2014. *Notes From the Field: Into the Twilight Zone.* Poseidon. 2nd May 2014.
Pyle RL, Rowley SJ. 2014. *Notes From the Field: Welcome.* Poseidon. 16th April 2014.

Interviewee

Diver Magazine. Deep Sonia, by Petra Pruden. 28-31/84, December 2020.
Divesoft DIVETALKS LIVE. #11 Dr. Sonia J. Rowley. 2020. Florida, USA
Mesophotic Reefs of Pohnpei, FSM. 2017. Likable Science, ThinkTech Hawai'i, USA
An In-Depth Look at Corals. 2017. All Things Marine, Schmidt Ocean Institute. Hawai'i, USA
Gorgonian Coral Discoveries. 2016. Likable Science, ThinkTech Hawai'i, USA
Into the Twilight Zone. 2016. With L. Rocha, B. Shepherd, Steinhart Aquarium, California Academy of Sciences, USA.
Diving into the Twilight Zone (Episode 313). 2014. With Richard L. Pyle. Bytemarks Cafe, Hawai'i Public Radio, USA.

Event Speaker

Aqua Explorers. 2015. Exploration into the Twilight Zone: sea fans & fishes. **Waikiki Aquarium, Hawai'i, USA.**
Science Alive. 2014. Natural history of Pacific reef coral biodiversity. **Bernice P. Bishop Museum, Hawai'i, USA.**
US Army. 2014. Natural history of Pacific coral reef biodiversity. **Bernice P. Bishop Museum, Hawai'i, USA.**
Seashore Safari. 2004-2008. Public outreach of UK shores. **MarLIN, Marine Biological Association, UK**

Additional Experience and Qualifications

1997 – 2001: **Naturopath, Nutritionist, Colonic Hydrotherapist, Iridologist.** 140 Harley Street, London, UK.
1997 – 2000: **Naturopath, Nutritionist, Colonic Hydrotherapist, Iridologist.** Health & Yoga, Balham, London, UK.
1998 – 2000: **Naturopath, Nutritionist, Colonic Hydrotherapist, Iridologist.** St. Johns Wood, London, UK.
1998 – 1999: **Naturopath, Nutritionist, Colonic Hydrotherapist, Iridologist.** Balance, S. Kensington, London, UK.
1997 – 1998: **Naturopath, Nutritionist, Iridologist.** Wild Oats Health Store, Notting Hill, London, UK.
1996 – 1997: **Advanced Practitioner Scholarship (P.Dip.N.N),** B. Wren, Regent's University London, UK.
1996: **Colonic Hydrotherapist (R.C.T., M.C.I.A),** Dr. M. Siewert, Dorset Natural Health Clinic, UK
1994: **Iridologist (D.Iridol),** Dr. L. Plaskett, Imperial College, London, UK
1993 – 1996: **Nutritionist & Naturopath (D.N.Med),** Dr. L. Plaskett, Kings College, London, UK

References

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