

Clinton A. Oakley

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Professional Appointments

- 2024 **Senior Research Fellow and Principal Investigator**
School of Biological Sciences
Te Herenga Waka Victoria University of Wellington, New Zealand
- 2022 – 2024 **Teaching Fellow**
Te Herenga Waka Victoria University of Wellington
- 2013 – 2023 **Research Fellow in Marine Biology**
Te Herenga Waka Victoria University of Wellington
- 2007 **Research Assistant**
PI Johanna Schmitt, Dept. of Ecology, Evolution & Organismal Biology
Brown University
- 2006 **Field Technician**
PI James Clark, Nicholas School of the Environment
Duke University
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Education

- 2013 **Ph.D.**, Department of Plant Biology
University of Georgia, Athens, GA, USA
- 2006 **B.S.**, Biology, *magna cum laude*.
Washington and Lee University, Lexington, VA, USA
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Research Funding & Fellowships

- 2023 **Royal Society Te Apārangi Marsden Fund**, \$1,083,000NZD, Principal Investigator.
“What makes a coral ‘super’? Challenging the oxidative theory of coral bleaching to solve the coral reef crisis.” Project press release in [English](#) or [te reo Māori](#).
The success rate at the Marsden Fund is 12%.
- 2020 Strategic Faculty Research Grant, Victoria University of Wellington, \$16,700NZD.
Principal Investigator.
“Identifying target genes for intervention in the coral reef crisis.”
- 2019 **Royal Society Te Apārangi Marsden Fund**, \$1,104,000NZD, Research Fellow.
“The language of success: Inter-kingdom communication in the coral-algal symbiosis and the adaptation of coral reefs to climate change.”
- 2017 **Royal Society Te Apārangi Marsden Fund**, \$1,000,500NZD, Research Fellow.
“From parasitism to mutualism: symbiosis interaction states and the adaptability of reef corals to climate change.”
- 2017 L’Institut des Récifs Coralliens du Pacifique Grant, €4,500, Principal Investigator.
“The proteome and molecular functions of the coral surface mucus layer and its role in coral ecology.”
- 2012 University of Georgia Innovative and Interdisciplinary Research Grant, \$1,500USD
- 2010 **USA EPA Science to Achieve Results (STAR) Ph.D. Fellowship**, \$111,000USD
“Carbon fixation of the diverse coral symbiont *Symbiodinium* in a high-CO₂ ocean.”

Publications

*Supervised student, †Equal authorship

Summary

Publications:	36	Citations (Google Scholar):	1,774
As 1 st or senior author:	11	h-index:	19
Supervised student as 1 st author:	15	i10-index:	22

- 2023 CA Oakley, GI Newson*, L Peng, SK Davy. [The *Symbiodinium* proteome under thermal and nutrient stress](#). *Plant and Cell Physiology* pccac175.
- 2023 AG Mashini*, CA Oakley, S Beepat, L Peng, VM Weis, AR Grossman, SK Davy. [The influence of symbiosis on the proteome of the *Exaiptasia* endosymbiont *Breviolum minutum*](#). *Microorganisms* 11:2 292.
- 2023 M Wuerz*, CA Lawson, CA Oakley, M Possell, SP Wilkinson, AR Grossman, VM Weis, DJ Suggett, SK Davy. [Symbiont identity impacts the microbiome and volatilome of a model cnidarian–dinoflagellate symbiosis](#). *Biology* 12:1014.
- 2023 SW Davies, ... CA Oakley, *et al.* [Building consensus around the assessment and interpretation of Symbiodiniaceae diversity](#). *PeerJ* 11:e15023.
- 2022 C Pogoreutz, CA Oakley, N Rådecker, Anny Cárdenas, G Perna, L Peng, SK Davy, DK Ngugi, CR Voolstra. [Coral holobiont cues prime *Endozoicomonas* to a symbiotic lifestyle](#). *The ISME Journal* 16: 1883–1895.
- 2022 E Camp, T Kahlke, B Signal, CA Oakley, A Lutz, D Suggett, W Leggat. [Proteome, metabolome and transcriptome data for three Symbiodiniaceae under ambient and heat stress conditions](#). *Scientific Data* 9: 153.
- 2022 CA Oakley, S Pontasch, PL Fisher, SP Wilkinson, RA Keyzers, T Krueger, S Dove, O Hoegh-Guldberg, W Leggat, SK Davy. [Thylakoid fatty acid composition and response to short-term cold and heat stress differs between high-latitude Symbiodiniaceae](#). *Coral Reefs* 41: 343–353.
- 2022 IM Ashley*, SA Kitchen, LM Gorman*, AR Grossman, CA Oakley, DJ Suggett, VM Weis, SL Rosset, SK Davy. [Genomic conservation and putative downstream functionality of the phosphatidylinositol signalling pathway in the cnidarian–dinoflagellate symbiosis](#). *Frontiers in Microbiology* 10.3389/fmicb.2022.1094255.
- 2022 M Wuerz*, CA Lawson, M Ueland, CA Oakley, AR Grossman, VM Weis, DJ Suggett, SK Davy. [Symbiosis induces unique volatile profiles in the model cnidarian *Aiptasia*](#). *Journal of Experimental Biology* doi/10.1242/jeb.244600.
- 2022 AG Mashini*, CA Oakley, AR Grossman, VM Weis, SK Davy. [Immunolocalisation of metabolite transporter proteins in a model cnidarian–dinoflagellate symbiosis](#). *Applied and Environmental Microbiology*, e00412–22.
- 2022 LM Gorman*, G Cui, M Aranda, CA Oakley, AR Grossman, VM Weis, SK Davy. [Symbiosis with dinoflagellates alters cnidarian cell-cycle gene expression](#). *Cellular Microbiology* 3330160.
- 2022 MR Nitschke, SL Rosset, CA Oakley, SG Gardner, EF Camp, DJ Suggett, SK Davy. [The diversity and ecology of Symbiodiniaceae: a trait-based review](#). *Advances in Marine Biology* 92: 55–127.
- 2022 G Tortorelli, CA Oakley, SK Davy, MJH van Oppen, GI McFadden. [Cell wall proteomic analysis of the coral photosymbionts *Breviolum minutum* and *Cladocopium goreaui*](#). *Journal of Eukaryotic Microbiology* 69:e12870.
- 2022 JL Matthews*, R Cunning, R Witson-Williams, CA Oakley, A Lutz, U Roessner, AR Grossman, VM Weis, RD Gates, SK Davy. [The metabolic significance of symbiont community composition in the coral-algal symbiosis](#). *Applied Env Metabolomics* 211–229.

- 2022 JK Kihika, SA Wood, L Rhodes, KF Smith, MR Miller, X Pochon, L Thompson, J Butler, J Schattsschneider, **CA Oakley**, KG Ryan. Cryopreservation of six Symbiodiniaceae genera: assessment of fatty acid profiles in response to increased salinity treatments. *Scientific Reports* 12:12408.
- 2022 TC LaJeunesse, J Wiedenmann, P Casado de Amezúa, I D'Ambra, K Turnham, M Nitschke, **CA Oakley**, C Spano, V Cubillos, SK Davy, DJ Suggett. Revival of *Philozoon* Geddes for host-specialized dinoflagellates, 'zooxanthellae', in animals from coastal temperate zones of Northern and Southern Hemispheres. *Eur J Phycol* 57: 2 166–180.
- 2021 SL Rosset, **CA Oakley**, C Ferrier-Pagès, DJ Suggett, VM Weis, SK Davy. The molecular language of the cnidarian–dinoflagellate symbiosis. *Trends in Microbiology* 4: 320–333.
- 2021 Beepat S, SK Davy, **CA Oakley**, A Mashini, L Peng, JJ Bell. Increased cellular detoxification, cytoskeletal activities and protein transport explain physiological stress response mechanisms in a lagoon sponge. *Journal of Experimental Biology* 224: jeb242820.
- 2020 LM Gorman*, SP Wilkinson, **CA Oakley**, AR Grossman, VM Weis, SK Davy. Phylogenetic analysis of cell-cycle regulatory proteins within the Symbiodiniaceae. *Scientific Reports* 10:20473.
- 2020 JL Matthews*, R Cunning, R Ritson-Williams, **CA Oakley**, A Lutz, U Roessner, AR Grossman, VM Weis, RD Gates, SK Davy. Metabolite pools of the reef-building coral *Montipora capitata* are unaffected by Symbiodiniaceae community composition. *Coral Reefs* 39 (6), 1727–1737.
- 2020 AE Sproles*, **CA Oakley**, T Krueger, AG Grossman, VM Weis, A Meibom, SK Davy. Sub-cellular imaging shows reduced photosynthetic carbon and increased nitrogen assimilation by the heterologous endosymbiont *Durusdinium trenchii* in the model cnidarian *Aiptasia*. *Environmental Microbiology* 22:9 3741–3753.
- 2019 AE Sproles*†, **CA Oakley**†, JL Matthews*, L Peng, VM Weis, JG Owen, AR Grossman, SK Davy. Proteomics quantifies protein expression changes in a model cnidarian colonized by a thermally tolerant but suboptimal symbiont. *The ISME Journal* 13: 2334–2345.
- 2018 JL Matthews*, **CA Oakley**, A Lutz, KE Hillyer, U Roessner, AG Grossman, VM Weis, SK Davy. Partner switching and metabolic flux in a model cnidarian–*Symbiodinium* symbiosis. *Proceedings of the Royal Society B: Biological Sciences* 285: 20182336.
- 2018 **CA Oakley**, SK Davy. Cellular Biology of Coral Bleaching. In: MJH van Oppen, JM Lough, editors. *Coral bleaching: Patterns, processes, causes and consequences*. 2nd ed. Berlin: Springer-Verlag Berlin Heidelberg.
- 2018 AE Sproles*, NL Kirk, SA Kitchen, **CA Oakley**, AR Grossman, VM Weis, SK Davy. Phylogenetic characterization of transporter proteins in the cnidarian-dinoflagellate symbiosis. *Molecular Phylogenetics and Evolution* 120: 307–320.
- 2017 JL Matthews*, CM Crowder, **CA Oakley**, A Lutz, VM Weis, AR Grossman, E Meyer, U Roessner, SK Davy. Optimal nutrient exchange and immune responses operate in partner specificity in the cnidarian-dinoflagellate symbiosis. *Proceedings of the National Academy of Sciences of the United States of America* 114:50 13194–13199
- 2017 **CA Oakley**, E Durand, S Wilkinson, L Peng, VM Weis, AR Grossman, SK Davy. Thermal shock induces host proteostasis disruption and endoplasmic reticulum stress in the model cnidarian *Aiptasia*. *Journal of Proteome Research* 16: 2121–2134
- 2016 **CA Oakley**, MF Ameismeier, L Peng, VM Weis, AR Grossman, SK Davy. Symbiosis induces widespread changes in the proteome of the model cnidarian *Aiptasia*. *Cellular Microbiology* 18:7 1009–1023

- 2015 JL Matthews*, AE Sproles*, **CA Oakley**, AR Grossman, VM Weis, SK Davy. Menthol-induced aposymbiosis rapidly and effectively provides experimental cnidarians for symbiosis investigations. *Journal of Experimental Biology* 219: 306–310
- 2014 **CA Oakley**, BM Hopkinson, GW Schmidt. Mitochondrial terminal alternative oxidase and its enhancement by thermal stress in the coral symbiont *Symbiodinium*. *Coral Reefs* 33:2 543–552
- 2014 **CA Oakley**, GW Schmidt, BM Hopkinson. Thermal responses of *Symbiodinium* photosynthetic carbon assimilation. *Coral Reefs* 33:2 501–512
- 2013 JL Dimond, BL Bingham, G Muller-Parker, **CA Oakley**. Symbiont physiology and dynamics before and during symbiont shifts in a flexible algal-cnidarian symbiosis. *Journal of Phycology* 49:6 1074–1083
- 2013 **CA Oakley**, JS Knox. Plant species richness increases resistance to invasion by non-resident plant species during grassland restoration. *App. Vegetation Science* 16:1 21–28
- 2012 **CA Oakley**, BM Hopkinson, GW Schmidt. A modular system for the measurement of photosynthetic CO₂ and O₂ gas flux and electron transport in microalgae. *Limnology and Oceanography: Methods* 10: 968–977
- 2011 DW Kemp, **CA Oakley**, DJ Thornhill, LA Newcomb, GW Schmidt, WK Fitt. Catastrophic mortality on inshore coral reefs of the Florida Keys due to severe low-temperature stress. *Global Change Biology* 17: 11 3468–3477
- 2010 RJ Newton, LE Griffin, KM Bowles, C Meile, S Gifford, CE Givens, EC Howard, E King, **CA Oakley**, CR Reisch, JM Rinta-Kanto, S Sharma, S Sun, V Varaljay, M Vila-Costa, JR Westrich, MA Moran. Genome characteristics of a generalist marine bacterial lineage. *The ISME Journal* 1:10 1–15

Edited Volumes

- 2022 **Coral Reef Ecosystems Theme Issue**, Guest Editor. *Emerging Topics in Life Sciences* 6:1 1-136.

Manuscripts in Review

A Mashini*, **CA Oakley**, AR Grossman, L Peng, AR Grossman, VM Weis, SK Davy. The proteome of dinoflagellate symbionts during symbiosis establishment in a model cnidarian. *The ISME Journal*.

Honors and Awards

- 2012 University of Georgia Foreign Travel Award, \$2,200
- 2012 University of Georgia Innovative and Interdisciplinary Research Grant, \$1,500
- 2009 & 2012 Plant Biology Graduate Student Research Assistance Award, \$200 & \$500
- 2007 University of Georgia Graduate School Award, \$28,000
- 2005 Thomas G. Nye Field Biology Research Fellowship, \$3,000
- 2003 – 2006 Biology Research Scholar, Washington and Lee University, \$5,000

Teaching Experience

Teaching evaluations available on request.

- 2023 & 2024 **Global Change Biology** (300 level, 100 students), Instructor of Record, Course co-Coordinator. Victoria University of Wellington (VUW).
Covers the physics of climate change, the effects of climate change on specific ecosystems such as alpine forests and coral reefs, climate projections, and other anthropogenic impacts (e.g. light pollution) on organisms. Includes a series of group-based research skills workshops, student-led discussions, policy writing to advise government, and a research thesis as the primary assessment.
- 2022—2024 **Animal Diversity** (200 level, 140 students), Instructor of Record for lectures and laboratory. VUW.
Covers the physiology, diversity, evolution, form, and function of animal taxa. Lectures detail how animal forms are a product of and reflect their evolutionary history, function, and environment, as well as their ecological roles. Laboratory sessions include live presentations and dissections.
- 2024 **Biology of Animals** (100 level, 350 students), Laboratory Coordinator and Instructor. VUW.
A comprehensive introduction to animal structure, function, and ecology, primarily focused on mammalian and human biology. Laboratories include physiology demonstrations, experiments and dissections.
- 2022 **Senior Tutor**, School of Biological Sciences, VUW.
A multifaceted role focused on student and faculty support across multiple courses, assisting dual delivery, online teaching, and Blackboard/Canvas.
- 2018 **Intro. Marine Ecology** (200 level, 120 students), Instructor of Record. VUW.
Covers the diversity and physiology of marine organisms, biological and physical oceanography, structure of of marine ecosystems, and marine conservation.
- 2014 & 2015 **Tropical Marine Conservation Practice** (MS, 20 students), Course co-Coordinator, Lecturer and Field Instructor. VUW.
MS-level field course encompassing the biology, ecology, and conservation of tropical and sub-tropical environments, including the Great Barrier Reef.
- 2009 & 2010 **Biology of Protists** (300 level), Laboratory Instructor. University of Georgia.
- 2008 & 2011 **Tropical Marine Invertebrate Zoology** (400 level), Field Instructor. UGA.
- 2009 & 2010 **Plant Taxonomy** (MS), Laboratory Instructor. UGA.
- 2008 & 2009 **Principles of Plant Biology** (100 level), Laboratory Instructor. UGA.

Advising and Mentorship

Students whom I have formally advised, including sitting on thesis committees:

Ph.D. Completed (6): Drs. Jennifer Matthews, Ashley Sproles, Lucy Gorman, Bobby Lust, Amirhossein Mashini, and Maggie Wuerz.
In progress (3): Imogen Ashley, Marina Botana, and Andrea Gamba.

M.S. Completed (4): Jacquie Bown, Agustina Giovagnoli, Grace Newson, and Andrew Cornwall.

Students mentored:

Ph.D. Completed (3): Drs. Yasmin Gabay, Nora Kandler, and Sandeep Beepat.
In progress: Evan Raymond and Rianna Collins.

M.S. Completed(2): Evan Heit, Lauren Fracasso

Visiting Students: Michael Ameismeier (Uni. of Munich), Elysanne Durand (Université Pierre et Marie Curie), Carole Duchene (École Normale Supérieure), Lucie Munns (University of Southampton), Chloé Carbonne (Université de Bretagne Occidentale).

Service and Professional Organizations

Maunuhanga Wellington Postdoctoral Society, Founding Committee Member and Chair

School of Biological Sciences Ecology and Evolution Seminar Series Coordinator

Royal Society of New Zealand Te Apārangi, Professional Member (MRSNZ)

International Coral Reef Society, Member

International Symbiosis Society, Member

American Academy of Underwater Scientists

Grant/manuscript reviewer for:

National Science Foundation USA (OCE, ad hoc), *Nature Communications*, *Global Change Biology*, *The ISME Journal*, *Trends in Ecology and Evolution*, *Proceedings of the Royal Society B*, *Molecular Ecology*, *Communications Biology*, *Coral Reefs*, *Scientific Reports*, *Frontiers in Marine Science*, *Algal Research*, *BMC Ecology*, *Microbiome*, *Oceanologia*, *PLOS One*, *Journal of Experimental Biology*, *PeerJ*, *Bulletin of Marine Science*.

Selected Presentations

- 2022 Multi-omics comparison of thermal stress and the regulation of gene expression in three Symbiodiniaceae genera. 15th International Coral Reef Symposium, Bremen, Germany.
CA Oakley, MR Nitschke, EF Camp, T Kahlke, MT Ros, W Leggat, SK Davy, DJ Suggett.
- 2018 Multiple -omics investigations of thermal stress and symbiont diversity in the cnidarian-dinoflagellate symbiosis. Invited talk, Climate Change Cluster at University of Technology, Sydney. **CA Oakley**, SK Davy.
- 2018 The host proteome reveals nutrient exchange and cell recognition mechanisms altered by a novel cnidarian-*Symbiodinium* symbiosis. 9th International Symbiosis Society Congress. **CA Oakley**, AE Sproles*, JL Matthews*, L Peng, VM Weis, AR Grossman, SK Davy.
- 2016 Thermal shock induces host proteostasis disruption and endoplasmic reticulum stress in the model cnidarian *Aiptasia*. 13th International Coral Reef Symposium. **CA Oakley**, E Durand*, S Wilkinson, L Peng, VM Weis, AR Grossman, SK Davy.
- 2015 The effects of symbiotic state on the proteome of the model cnidarian *Aiptasia*. **CA Oakley**, M Ameismeier, L Peng, VM Weis, AR Grossman, SK Davy. 8th International Symbiosis Society Congress.
- 2013 Evidence for a mitochondrial alternative terminal oxidase in *Symbiodinium*. **Oakley CA**, BM Hopkinson, GW Schmidt. Australian Coral Reef Society Conference
- 2013 Alternative oxidases in dinoflagellate-cnidarian symbioses. **Oakley CA**, BM Hopkinson, GW Schmidt. Symbiofest 2013, University of Georgia.
- 2012 *Symbiodinium* carbon limitation: parameters and feedback with thermal stress. **Oakley CA**, BM Hopkinson, GW Schmidt. 12th International Coral Reef Symposium.

- 2011 A modular system for the simultaneous, real-time measurement of photosynthetic CO₂ and O₂ gas flux and electron transport in microalgae.
Oakley CA, GW Schmidt. 2011 EPA Science to Achieve Results Fellowship Conference.
- 2010 Temperature effects on photosynthetic and respiratory CO₂ and O₂ exchange of *Symbiodinium*: evidence of functional diversity.
Oakley CA, WK Fitt, GW Schmidt. Benthic Ecology Meeting 2010.
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References

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