Nicolas Blouin
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WORK EXPERIENCE

2013- Present **Postdoctoral Fellow.** Life-History Evolution.
University of Rhode Island, Department of Biological Sciences. Kingston, RI.
Supervisor: Christopher E. Lane
Current projects: *Red algal host/parasite comparative genomics, differential gene expression during asexual reproduction, organelle proteome evolution.*

2013 **Algal culture**. Culture and preparation of asexual source material for Joint Genome institute Community Genome Sequencing Project of *Porphyra umbilicalis.* Contract from Carnegie Institution for Science.

2010- Fall '12 **Postdoctoral Fellow.** Life-History Evolution.
University of Rhode Island, Department of Biological Sciences. Kingston, RI.

OTHER WORK EXPERIENCE

1993-2003 **Freelance Photographer**. Specializing in portraits and location photography. Clients included: Boston Magazine, Fast Company, Inc. Magazine, Men's Health Magazine, National Geographic Adventurer, Sony Music, U.S. News & World Reports, and Vanity Fair.

OTHER APPOINTMENTS

2012 – Present **Adjunct Faculty.** University of Rhode Island, Department of Biological Sciences. Kingston, RI.

EDUCATION

2010 **Ph.D. Marine Biology**
University of Maine, School of Marine Sciences. Orono, ME.
Advisor: Susan H. Brawley
Dissertation title: "Asexual reproduction in *Porphyra umbilicalis* Kützing (Rhodophyta) and its development for use in mariculture."

2005 **M.Sc. Marine Biology**
University of Maine, School of Marine Sciences. Orono, ME.

Advisor: Susan H. Brawley
Thesis title: "Asexual reproduction in *Porphyra umbilicalis* Kützing and assessment of its use in integrated multi-trophic aquaculture (IMTA)."

1993 **B.F.A. Professional Photographic Illustration**
Rochester Institute of Technology. Rochester, NY.

FELLOWSHIPS

2012 Sitka Sound Science Center Scientist in Residency Fellowship (NSF-funded**,** $5,500).
NSF EPSCoR Academy Travel Award ($1,000).
2009-2010 Chase Distinguished Research Assistantship Award ($16,000).
2004-2006 U.S Environmental Protection Agency STAR Fellowship ($77,000).

RESEARCH AND TRAVEL GRANTS

2010 University of Maine, College of Natural Sciences and Forestry Ph.D. Research Excellence Award ($1,000).
2009 NSF Research Coordination Network, Travel Award ($1,000).
Phycological Society of America, Hoshaw Award ($1,000).
University of Maine Graduate Student Government, Travel Grant ($637).
Phycological Society of America, Grant in Aid of Research ($1,000).
2008 Clayton Totman Graduate Award ($2,000).
Cold Spring Harbor, Short Course Research Stipend ($1,500).
University of Maine Graduate School, Award for Short Course.
2007 Phycological Society of America, Hoshaw Award ($850).
2005 University of Maine Association of Graduate Students, Grant in Aid of Research ($600).
2004 Nancy Dysart Memorial Fund Travel Award ($750).

PEER-REVIEWED PUBLICATIONS

Blouin N, Brawley SH. An AFLP-based test of clonality in widespread asexual populations of *Porphyra umbilicalis* (Rhodophyta) with a sensitivity analysis for bacterial contamination, 2012. *Marine Biology* 159: 2723-2729.

Chan CX, **Blouin NA**, Zhuang Y, Zäuner S, Prochnik SE, Lindquist E, Lin S, Benning C, Lohr M, Yarish C, Gantt E, Grossman AR, Lu S, Müller K, Stiller J, Brawley SH, Bhattacharya D. 2012. *Porphyra* (Bangiophyceae) transcriptomes provide insights into red algal development and metabolism. *Journal of Phycology* 48: 1328-1342.

Stiller JW, Perry J, Rymarquis LA, Green PJ, Prochnik S, Lindquist E, Chan CX, Yarish C, Lin S, Zhuang Y, **Blouin N,** Brawley SH. Major developmental regulators and their expression in two closely related species of *Porphyra* (Rhodophyta). *Journal of Phycology* 48: 883-896.

Price DC, Chan CX, Yoon HS, Yang EC, Qiu H, Weber APM, Schwacke R, Gross J, **Blouin N**, Lane CE, Reyes-Prieto A, Durnford D, Neilson JAD, Lang BF, Burger G, Steiner JM, Löffelhardt W, Meuser JE, Posewitz MC, Ball S, Arias MC, Henrissat B, Coutinho PM, Rensing SA, Symeonidi A, Doddapaneni H, Green BR, Rajah VD, Boore J, Bhattacharya D. 2012. *Cyanophora paradoxa* genome elucidates origin of photosynthesis in algae and plants. *Science* 335: 843-847.

Blouin N, Lane CE. 2012. Red algal parasites: Models for a life history evolution that leaves photosynthesis behind again and again. *BioEssays* 34: 226-235.

Chan CX, Zäuner S, Wheeler G, Grossman AR, Prochnik SE, **Blouin N**, Zhuang Y, Benning C, Berg M, Yarish C, Eriksen R, Klein A, Lin S, Levine I, Brawley SH, Bhattacharya D. Analysis of *Porphyra* membrane transporters demonstrates gene transfer among photosynthetic eukaryotes and numerous sodium-coupled transport systems. *Plant Physiology* 158: 2001-2012.

Blouin N, Brodie J, Grossman AC, Xu P. Brawley SH. 2011. *Porphyra*: The organism and the crop. *Trends in Plant Science* 16: 29-37.

Blouin N, Brawley SH. 2009. Culture techniques & reproduction in *Porphyra umbilicalis* Kützing (P.um1, JGI sequencing project): Insights from amplified fragment length polymorphisms (AFLPs). *Phycologia* 48(4s): 9.

Blouin N, Fei XG, Peng J, Yarish C, Brawley SH. 2007. Seeding nets with neutral spores of the red alga *Porphyra umbilicalis* (L.) Kützing for use in integrated multi-trophic aquaculture (IMTA) *Aquaculture* 270: 77-91.

Blouin N, Calder B, Perkins L, Brawley SH. 2006. Sensory and fatty acid analysis of two Atlantic species of *Porphyra*. *Journal of Applied Phycology* 18: 79-85.

BOOK CHAPTERS

Gantt E, Berg GM, Bhatacharya D, **Blouin N**, Brodie J, Chan CX, Collen J, Cunningham FX, Gross J, Grossman AR, Karpowicz S, Kitade Y, Klein AS, Levine IA, Lin S, Lu S, Lynch M, Minchoa SC, Muller K, Neefus CD, deOliviera MC, Rymarquis L, Smith A, Stiller JW, Wu W-K, Yarish C, Zhuang Y, Brawley SH. 2010. *Porphyra*: Complex life histories in a harsh environment. In: J. Seckbach and D. Chapman (eds.) *Red Algae in the Genomic Age*. Volume 13 of Cellular Origins, Life in Extreme Habitats and Astrobiology. Springer, 410p.

PUBLICATIONS (NON- PEER REVIEWED)

Vadas RL, Beal B, **Blouin N**, Brawley SH, Wright W. 2010. Rockweed harvesting: a recipe for sustainability. *Bangor Daily News*.

INVITED PRESENTATIONS

2013 **Blouin N.** Comparative evolution of parasitic algae and their free-living relatives. School of Biology and Ecology, University of Maine. Orono, ME.

2012 **Blouin N.** Genomic adventures in life history evolution with parasitic algae. Joint Genome Institute (U.S. Department of Energy). Walnut Creek, CA.
Blouin N. Gene expression workshop. NSF *Porphyra* RCN Meeting. Charleston, SC.

2011 **Blouin N.** From Paris to Parasites. Maine Maritime Academy. Castine, Maine.

2010 Brawley SH, **Blouin N**, Zhang Y, Yarish C, Lin S, Stiller JW, Chan CX, Bhattacharya D, Grossman AC. *Porphyra*: Crop to Model System. XXth International Seaweed Symposium. Ensenada, Mexico.
Blouin N. Nucleic acid preparation for the DOE Joint Genome Institute's community-sequencing project: 99175 *Porphyra umbilicalis.* NSF *Porphyra* RCN user's meeting. University of Connecticut.

2008 **Blouin N**, Brawley SH, Bartlett C. The use of molecular tools to develop *P. umbilicalis* for mariculture through asexual reproduction. Maine Sea Grant meeting, Orono, ME.

2006 **Blouin N**. Development of native seaweed (*Porphyra umbilicalis*) for integrated polyculture in the Gulf of Maine and other stories. Carnegie Institution of Washington. Stanford, CA.
Blouin N. Progress in the Development of native seaweed species *Porphyra* spp. for use in Integrated Multi-trophic Aquaculture (IMTA) and future directions. 5-year National Sea Grant Review Board. Orono, ME.
Blouin, N. Intertidal ecology in mid-coast Maine, with special emphasis on community structure. *National Park Service Training Workshop*. Bar Harbor, ME.

2004 **Blouin N.** Use of Native Seaweeds for Bioremediation of Coastal Waters in the Gulf of Maine. *EPA Graduate Fellowship Conference*. Washington, D.C. (Presentation selected for presentation to U.S. Congressional event on graduate science funded by the EPA).

SELECTED CONTRIBUTED CONFERENCE PRESENTATIONS

2013 **Blouin N,** Sullivan E, Lane CE. The *Gracilariopsis andersonii* plastid: conservation in red algal plastid evolution. *52nd Northeast Algal Symposium*. Mystic, CT

2012 **Blouin N,** Lane CE. Organellar interactions in red algal host/parasite heterokaryon cells. *Protist 2012: Joint meeting of the International Society of Protistologists and The International Society for Evolutionary Protistology*. Oslo, Norway.
Blouin N, Lane CE. Red algal parasite contributions to heterokaryon organellar proteomes. Annual *Phycological Society of America Meeting*. Charleston, SC.
Blouin N, Lane CE. Red algal host/parasite differences in nuclear contribution to organellar proteomes. *51th Northeast Algal Symposium*. Schoodic Environmental Research Center, Acadia National Park, ME.

2011 **Blouin N,** Lane CE. Photosynthetic genes: early casualties in an evolving parasite? *Gordon Research conference: Ecological & Evolutionary Genomics.* Biddeford, ME.
Blouin N, Lane CE. Have red algal parasites lost their nuclear-encoded plastid genes? *50th Northeast Algal Symposium. Woods* Hole, MA.

2009 **Blouin N**, Brawley SH. Culture techniques & reproduction in *Porphyra umbilicalis* Kützing (P.um1, JGI sequencing project). *International Phycological Congress 9.* Tokyo, Japan.
Blouin N, Brawley SH. Reproduction in *Porphyra umbilicalis* Kützing: Insights from amplified fragment length polymorphisms (AFLPs). *Joint American Society of Plant Biology/ Phycological Society of America* meeting. Honolulu, HI.

2007 **Blouin N**, Brawley SH, Grossman AR. The use of cDNA libraries to investigate asexual reproduction in *Porphyra umbilicalis*. *International Seaweed Symposium*. Kobe, Japan.

2005 **Blouin N**, Brawley SH, Yarish C. Seasonality and environmental effects on *Porphyra umbilicalis* from Maine, USA. *45th Northeast Algal Symposium*. Rockland, ME.
Blouin N, Calder B, Perkins L, Brawley SH. Taste preference and fatty acid content in *Porphyra* spp. *45th Northeast Algal Symposium*. Rockland, ME.

2004 **Blouin N,** Brawley SH. Use of native seaweeds (*Porphyra* spp.) in integrated polyculture in Cobscook Bay, Maine, USA. *New England Fisheries Health 13*. Eastport, ME.
Blouin N. Asexual spore production in *Porphyra umbilicalis. International Seaweed Symposium*, Bergen, Norway.
Blouin N, Brawley SH. Sensory taste test of *Porphyra* spp. *Northeast Aquaculture Conference and Exposition*.

RESEARCH PROJECTS (NOT PI OR CO-PI)

2008-2013	National Science Foundation Research Coordination Network, "The *Porphyra* genome: Resource development and integrative research in algal genomics."
2007- present	Department of Energy's Joint Genome Institute Community Sequencing Project, "The genome of *Porphyra umbilicalis* (a marine red alga)."
2006-2009	NOAA/Maine Sea Grant, "Integrated mariculture with *Porphyra* ("nori") to achieve sustainable aquaculture and new food products."
2005	Maine Technology Institute Seed Grant, "Pilot integrated mariculture with native *Porphyra*."
2003-2005	NOAA/Maine Sea Grant, "Enhanced spore production for net-seeding of native New England *Porphyra* in integrated finfish/seaweed aquaculture."

OTHER RESEARCH EXPERIENCE

Data collection. Survey of intertidal zone during peak visitor months to determine level of intertidal usage by visitors to ANP as part of Dept. of Interior (USA) grant, "Characterize rocky intertidal shorelines at newly acquired Navy base lands, Acadia National Park." (2007-2008).

Data collection. Collection of fucoid eggs (brown seaweed) from intertidal zone on Schoodic Point, Acadia National Park in support of NSF grant, "Hydrodynamic regulation of reproduction in fucoid algae: A regional model and consequences for population structure." (2003-2004).

Livestock care. Feeding and care of Atlantic cod and halibut stocks at the University of Maine's Center for Cooperative Aquaculture Research. Responsibilities included: feeding and systems maintenance (*e.g.* dissolved oxygen measurements, pH and temperature regulation, pump maintenance, and water testing). (2004-2005).

SYNERGISTIC ACTIVITIES

2013	**Short course. "**Marine Ecological & Evolutionary Genomics", Station Biologique Roscoff, Roscoff, France
2011-2013	**Fellow.** NSF-funded fellow in the FIRST IV (Faculty Institutes for Reforming Science Teaching). Competitive program designed to help postdoctoral fellows develop student-centered, inquiry-based undergraduate biology courses. Co-PIs: Diane Ebert-May & Terry Derting.
2011	**Professional Development**. COSEE Ocean Systems (Centers for Ocean Science Education Excellence) and NEOSEC New England Ocean Science Education Collaborative) Workshop: "Strategies for Engaging in Broader Impact Programs".
2008- present	**Collaborator** NSF Research Coordination Network The *Porphyra* genome: Resource development and integrative research in algal genomics."

SYNERGISTIC ACTIVITIES (CONT.)

2008 **Short course.** "Programming for Biology." Cold Spring Harbor Laboratory, Cold Spring Harbor, New York.

2007- present **Collaborator.** Joint Genome Institute's (DOE) Community Sequencing Project, "The genome of *Porphyra umbilicalis* (a marine red alga)."

2006 **Training.** RNA and phage library preparation. Carnegie Institution of Washington, Stanford, California.

2004 **Survey of nori mariculture practices in China**. This involved collaboration with the Ocean University of Qingdao to visit nori farms, processing plants, and distribution in eastern China to develop a model for mariculture in the US using native nori species.

OUTREACH & SERVICE

2012 **Outreach Instructor**. Mt. Edgcumbe High School. Sitka, AK. "Using phylogenetics and phenology to understand ecologically important and food-producing seaweeds in Southeast Alaska". Four-unit class for Biology students attending Mount Edgcumbe High School, a public boarding high school serving underserviced rural populations.
Educational Outreach, Dr Jorge Alvarez High School. Providence, RI.
Textbook Review. Mechanisms of Life History Evolution: The Genetics and Physiology of Life History Traits and Trade-Offs. Flatt T & Heyland A. 504 pp. Oxford University Press. New York City. For the *Journal of Human Biology*.
Communications Committee, Phycological Society of America.

2011 **Nominations Committee**, Phycological Society of America.
Grants Committee, Phycological Society of America (through 2013).

2011-2013 **Peer Reviewer**, Molecular Phylogenetics & Evolution, Evolutionary Ecology, Journal of Phycology, Phycologia, Planta, Protist, American Journal of Human Biology, Insects.
Chair Nominations Committee, Northeast Algal Society.

2010 **Expert Panelist**, Maine Sea Grant "Rockweed Research Priorities Symposium."
Outreach Instructor, 4-H "GET WET!" (well water educational program) weekend.

2009- 2012 **Webmaster,** National Science Foundation-funded *Porphyra* Research Coordination Network (*www.porphyra.org*).

2009 & 2010 **Outreach Instructor**, "Introduction to the Marine Environment." University of Maine Cooperative Extension 4-H youth development program entitled: "Connecting Kids to Campus."

2008- present **Webmaster**, Northeast Algal Society (*www.e-neas.org*).

2008- 2010 **Coordinator**, NSF-funded *Porphyra* Research Coordination Network.

OUTREACH & SERVICE (CONT.)

2008- 2009 **Grant Committee**, Phycological Society of America.
2006-2010 **Fundraiser** for cancer research as part of "The Mad Scientists."
2006 **Outreach Instructor**, Orono Middle School Science Day. Orono, ME.
2005-2006 **Grants Officer**, University of Maine Association of Graduate Students. Functioned as an NSF-styled program officer for three peer-reviewed competitive grant categories.
2005 **Outreach Instructor,** National Parks Service Employee Training. "Intertidal ecology in Maine with a special emphasis on community structure."
2005 **Maine State Legislature Bus Tour**, Travelled with Maine legislators on a bus tour of the state to introduce legislators to research the University of Maine conducts in coastal waters.
2004-2006 **Outreach Instructor**. Instructional talks to local school and visiting groups at the University of Maine's Center for Cooperative Aquaculture Research.
2003-2006 **Chair Publications Committee**, Northeastern Algal Society.
2003 **Volunteer**, Science Fair Bradley Elementary School. Bradley, ME.

TEACHING EXPERIENCE

Instructor, University of Rhode Island Department of Biological Sciences. *Science and Society* (BIO 396, Spring Semester 2012).
Invited lecturer, University of Rhode Island, "Glaucophytes and the Red Algae" (*Diversity of Plants* BIO 321, Spring Semester 2012).
Invited lecturer, University of Rhode Island, "Transcriptome analysis without a reference genome" (*Practical Tools for Molecular Sequence Analysis* MIC/BPS 450, Fall Semester 2011).
Co-Instructor, RITES (Rhode Island Technology Enhanced Science Program). *Reproduction & Inheritance*. Course centered around providing educators with information, tools, and activities to run a student-centered genetics module in their science curriculum to meet learning outcome expectations for public school students in Rhode Island (2011).
Teaching Assistant, University of Maine, *Algae in the Ecosystem: Phytoplankton and Seaweeds* (SMS 373, SMS 473, 2008).

MENTORING (GRADUATES)

2013 Eric Salomaki (PhD expected 2016) Population structure of host/parasite communities
2010-2012 Megan O'Brien (MSc 8/12) *De novo* assembly and annotation of 2 oomycete mitochondrial genomes.
Ian Misner (PhD 8/12). The genome sequences of *Achlya hypogyna* and *Thraustotheca clavata*: insights on oomycete parasite evolution.
Thea Popolizio (PhD expected 2013) Red algal biodiversity study in Bermuda using molecular assisted alpha taxonomy.

MENTORING (UNDERGRADUATES)

* Students who have gone on to pursue higher degrees in science.

2012 Melissa Curran (Providence College, EPSCoR Fellow). Bridging the gap between free-living taxa and parasites using comparative evolutionary genomics
Alyssa Rogers (URI, EPSCoR Fellow). Molecular phylogenetics of the Bermuda marine brown macroalgae.
Elizabeth Sullivan (URI, INBRE Fellow). The plastid genome sequence of the red macroalga *Gracilariopsis andersonii* (through 2013).

2011 Thomas Shamp (URI). DNA barcoding of Bermuda red algae (through 2012).
Brooke Kunkle (URI). Parasite isolation from field collections, algal culturing.
Tiffany Lewis (URI). Intern, trained in basic molecular techniques including DNA extraction, PCR, & cesium chloride DNA fractionation.

2010 Wesley Culver (U. Maine). Laboratory study into the affects of nutrients on phycobilin depletion and recovery in cultured red algae.

2009 Mike Goede (U. Maine). Laboratory study into the antibiotic resistance of juvenile *Porphyra umbilicalis*.

2007 Sarah Tepler* (U. Maine). Laboratory training in the use of taxonomic keys to identify field specimens of algae as well as DNA extraction and manipulation techniques.

2006 Joseph Stachelek* (U. Maine). Floristic study of the algae of Acadia National Park. Project involved collection, identification, and preservation of algal species native to the park.

2005 Matt Houston (U. Maine). Differential algal spore recruitment on calcareous substrates (shells) based on tidal height, Schoodic Point, Acadia National Park.
Missy Wells (U. Maine). Seasonal floristic comparison of *Porphyra umbilicalis* growth and reproduction, Schoodic Point, Acadia National Park.

PROFESSIONAL MEMBERSHIP

American Academy for the Advancement of Science, 2006-2008
American Society of Plant Biologists, 2008
Northeast Algal Society, 2002-present
Phycological Society of America, 2002-present

SKILLS

Proficient in various phylogenetic, molecular, and statistical analysis software packages; laser capture microdissection (LCM); Illumina HiSeq library preparation; basic knowledge of Python, Perl, and UNIX programming; extensive knowledge of experimental design, algal culture techniques, and molecular techniques; SCUBA certified; beekeeper; mushroom forager.