John A. Burns

Professional address: Bigelow Laboratory for Ocean Sciences, 60 Bigelow Drive – East Boothbay, ME 04544, US – **Phone:** Work: 207-315-2567 x304, Cell: 703-298-8612 – **E-mail:** jburns@bigelow.org

Research Summary

I am an evolutionary cell biologist, with interests in the evolution and regulation of cellular behavior and morphology in diverse microbial eukaryotes. My work combines comparative genomics and classic molecular biology to reveal both evolutionary and mechanistic aspects of those processes at molecular, cellular, organismal, and ecological scales.

Current Appointments

August 2019-present: Senior Research Scientist, Bigelow Laboratory for Ocean Sciences, East Boothbay, ME

August 2020-present: Research Faculty, Colby College, Waterville, ME

September 2018–present: Research Associate, American Museum of Natural History, NY, NY

Professional experience

December 2018-July2019: Associate Research Scientist, Lamont-Doherty Earth Observatory of Columbia University, NY
September 2015-2018: Research Scientist, American Museum of Natural History, NY, NY
September 2013–2015: Post-doctoral Fellow, American Museum of Natural History, NY, NY
September 2012–2013: Assistant Research Scientist, Department of Biology, New York University, NY, NY
September 2013–May 2014: Adjunct Professor, John Jay College, NY, NY
May 2001–October 2002: Isotope geochemical analysist, USGS, Reston, VA

Education

2006–2012: **Ph.D. in Biology, New York University, New York, NY**

Dissertation:	"RNA Polymerase II Transcription: Effects of DNA Damage and DNA Secondary Structure on Elongation and Fidelity"
Advisor:	Dr. David Scicchitano
Committee:	Dr. Edo Kussel, Dr. Nicholas Geacintov, Dr. Suse Broyde, and Dr. Bennet Van Houten

2004–2006: **M.Sc. in Biology, New York University, New York, NY**

Thesis:	"DNA Secondary Structures as Regulators of Cellular Processes"
Advisor:	Dr. David Scicchitano

1996–2001: **B.A. in Geoscience, Franklin and Marshall College, Lancaster, PA**

Scientific publications

Published articles (peer reviewed). A dagger symbol (†) on the number indicates articles where I am corresponding or co-corresponding author; dagger symbols on names indicate additional corresponding authors for each article. Underlined names indicate postdocs and students mentored in my lab.

2026

31. Cho A , **Burns JA** , Woyke T, Stepanauskas R, Poulton N, Wideman JG, 2026 "Aerobic sister lineage of Breviates has gene-rich mitochondrial genomes". *Current Biology* 36 (6), 1481-1493. e6

2025

30. Wallace SE, **Burns JA**, Hale R, Kerney RR, Mott C, Bishop CD, 2025 "High partner specificity in an algal-salamander mutualism at continental scale". *Frontiers in Amphibian and Reptile Science* 3, p.1609494.
29. Farrell SP, Petras D, Stincone P, Yiu D, **Burns JA**, Pakkir Shah AK, Hartmann AC, Brady D, Rasher DB, 2025 "Turf algae redefine the chemical landscape of temperate reefs, limiting kelp forest recovery". *Science*, 388(6749), pp.876-880. ***Article image selected for the cover of *Science* for issue 388(6749)**

2024

†28. Olivetta M, Bhickta C, Chiaruttini N, **Burns JA**† and Dudin O†, 2024. A multicellular developmental program in a close animal relative. *Nature*, pp.1-8.
†27. Genot B†, Grogan M, Yost M, Iacono G, Archer SD, **Burns JA**†, 2024. Functional stress responses in Glaucophyta: Evidence of ethylene and abscisic acid functions in Cyanophora paradoxa. *Journal of Eukaryotic Microbiology*, *71*(6), p.e13041.
†26. **Burns JA**†, Daniels J, Becker KP, Casagrande D, Roberts P, Orenstein E, Vogt DM, Teoh ZE, Wood R, Yin AH, Genot B, Wood RJ†, Katija K†, Phillips BT†, Gruber DF† 2024. Transcriptome sequencing of seven deep marine invertebrates. *Scientific Data*, *11*(1), p.679.
†25. **Burns JA**†**,** Becker KP, Casagrande D, Daniels J, Roberts P, Orenstein E, Vogt DM, Teoh ZE, Wood R, Yin AH, Genot B, Gruber DF†, Katija K†, Wood RJ†, Phillips BT†, 2024. "An in situ digital synthesis strategy for the discovery and description of ocean life". *Science Advances*, *10*(3), p.eadj4960.

2023

24. Gyaltshen Y**,** Rozenberg A, Paasch A, **Burns JA**, Warring S, Larson R, Maurer-Alcala XX, Dacks J, Narechania A, Kim E, 2023. "Long-read-based genome assembly reveals numerous endogenous viral elements in the green algal bacterivore *Cymbomonas tetramitiformis*". *Genome Biology and Evolution*, *15*(11), p.evad194.
23. Garvetto A, Murua P, Kirchmair M, Salvenmoser W, Hittorf M, Ciaghi S, Harikrishnan SL, Gachon CM, **Burns JA** and Neuhauser S, 2022. "Phagocytosis underpins the biotrophic lifestyle of intracellular parasites in the class Phytomyxea (Rhizaria)". New Phytologist (https://doi.org/10.1111/nph.18828)

2022

22. Neumann JS, Tessler M, Kamm K, Osigus H-J, Eschel G, Narechania A, **Burns JA**, DeSalle R, Schierwater B. "Phylogenomics and the first higher taxonomy of Placozoa, an ancient and enigmatic animal phylum" *Frontiers in Ecology and Evolution*, 10 (2022) (https://doi.org/10.3389/fevo.2022.1016357)
†21. **Burns JA**†, Gruber DF†, Gaffney JP, Sparks JS, Brugler MR. "Transcriptomics of a Greenlandic Snailfish Reveals Exceptionally High Expression of Antifreeze Protein Transcripts." *Evolutionary Bioinformatics*. 2022 Aug;18:11769343221118347. (https://doi.org/10.1177/11769343221118347)
†20. Genot B, **Burns JA**†. "Transformation of the symbiotic alga Oophila amblystomatis: a new tool for animal-algae symbiosis studies." *Symbiosis*. 2022 Aug 4:1-9. (https://doi.org/10.1007/s13199-022-00861-0)
†19. Yang H, Genot B, Duhamel S, Kerney R, and **Burns JA**†, 2022. "Organismal and cellular interactions in vertebrate–alga symbioses." *Biochemical Society Transactions*, 50(1), pp.609-620.

(https://doi.org/10.1042/BST20210153)

2021

18. Bock NA, Charvet S, **Burns JA**, Gyaltshen Y, Rozenberg A, Duhamel S and Kim E, 2021. "Experimental identification and in silico prediction of bacterivory in green algae." *The ISME Journal*, pp.1-14. (https://doi.org/10.1038/s41396-021-00899-w)
17. Jimenez V, **Burns JA**, Le Gall F, Not F and Vaulot D, 2021. "No evidence of Phago-mixotropy in Micromonas polaris (Mamiellophyceae), the Dominant Picophytoplankton Species in the Arctic." *Journal of Phycology*, 57(2), pp.435-446. (https://doi.org/10.1111/jpy.13125)
16. **Burns JA**, Holden S, Korzec K and Dorris ER, 2021. "From intent to implementation: Factors affecting public involvement in life science research." *PLOS One*, 16(4), p.e0250023. (https://doi.org/10.1371/journal.pone.0250023)
15. Aponte A, Gyaltshen Y, **Burns JA**, Heiss AA, Kim E and Warring SD, 2021. "The Bacterial Diversity Lurking in Protist Cell Cultures." *American Museum Novitates*, 2021(3975), pp.1-14. (http://hdl.handle.net/2246/7275)

2020

†14. **Burns JA**†, Kerney R, Duhamel S, 2020. "Heterotrophic Carbon Fixation in a Salamander-Alga Symbiosis." *Frontiers in Microbiology*, 11:1815. (https://doi.org/10.3389/fmicb.2020.01815)
13. Tessler M, Brugler MR, **Burns JA**, Sinatra NR, Vogt DM, Varma A, Xiao M, Wood RJ, and Gruber DF, 2020. "Ultra-gentle soft robotic fingers induce minimal transcriptomic response in a fragile marine animal." *Current Biology*, 30(4), R157-R158. (https://doi.org/10.1016/j.cub.2020.01.032)

2019

12. Kerney RK, Leavitt J, Hill E, Zhang H, Kim E, and **Burns JA,** 2019. "Co-Cultures of Oophila amblystomatis Between Ambystoma maculatum and Ambystoma gracile Hosts Show Host-Symbiont Fidelity" *Symbiosis, 78*(1), pp.73-85. (https://doi.org/10.1007/s13199-018-00591-2)
11. Torruella G, Grau-Bové X, Moreira D, Karpov S, **Burns JA**, Sebé-Pedrós A, Völcker E, and López-García P, 2018. "A complex functional gene set for the early-branching opisthosporidian Paraphelidum tribonemae." *Communications Biology*, 1, article 231 (https://doi.org/10.1038/s42003-018-0235-z)

2018

10. Cádiz A, Reytor ML, Díaz LM, Chestnut T, **Burns JA**, Amato G, 2018. "The chytrid fungus, *Batrachochytrium dendrobatidis*, is widespread among Cuban amphibians." *EcoHealth*, pp.1-13 (https://doi.org/10.1007/s10393-018-1383-9)
9. Ezerskytea M, Paredesa JA, Malvezzia S, **Burns JA**, Olssona M, Scicchitano DA, Dreij K, 2018. "O6-methylguanine-induced transcriptional mutagenesis reduces p53 tumor suppressor function". *PNAS*, 115(18), pp.4731-4736. (https://doi.org/10.1073/pnas.1721764115)
†8. **Burns JA**†, Pittis AA, Kim E†, 2018. "Gene Based Predictive Models of Trophic Modes suggest Asgard Archaea are not Phagocytotic" *Nature Ecology and Evolution*, 2(4), pp.697-704. (https://doi.org/10.1038/s41559-018-0477-7)
7. **Burns JA,** Chowdhury MA, Cartularo L, Berens C, and Scicchitano DA, 2018. "Nucleotide excision repair does not contribute to the genetic instability associated with loop or stem-loop DNA located within transcription units". *Nucleic Acids Research*, 46(7), pp.3498-3516. (https://doi.org/10.1093/nar/gky110)

2017

†6. **Burns JA**†, Zhang H, Hill E, Kim E, Kerney RK†, 2017. "Transcriptome Analysis Illuminates the Nature of the Intracellular Interaction in a Vertebrate-Algal Symbiosis". *eLife*;6:e22054. (https://elifesciences.org/content/6/e22054) ***selected for an "insight" article in eLife. The insight article can be found here:** Ball, Steven G., and Ugo Cenci, 2017. "Endosymbiosis:

Gasping for air." *eLife*;6:e27004. (https://elifesciences.org/content/6/e27004)

5. Satjarak A, **Burns JA**, Kim E, and Graham LE, 2017. "Complete mitochondrial genomes of prasinophyte algae Pyramimonas parkeae and Cymbomonas tetramitiformis". *Journal of phycology*. 2017 Feb 12. (http://onlinelibrary.wiley.com/doi/10.1111/jpy.12521/full)

2016

4. Nadkarni A*, **Burns JA***, Gandolfi A, Chowdhury MA, Cartularo L, Berens C, Geacintov NE, and Scicchitano DA, 2016. "Nucleotide excision repair and transcription-coupled DNA repair abrogate the impact of DNA damage on transcription." *Journal of Biological Chemistry*, 291(2), pp.848-861. *co-first authors (http://www.jbc.org/content/291/2/848.long) ***selected by the JBC editors to be included in the virtual special issue "DNA Polymerases, damage and repair"** (http://www.jbc.org/site/vi/dna.xhtml)

2015

3. **Burns JA**, Paasch A, Narechania A, and Kim E, 2015. "Comparative genomics of a bacterivorous green alga reveals evolutionary causalities and consequences of phago-mixotrophic mode of nutrition." *Genome Biology and Evolution*, 7(11), pp.3047-306. (http://gbe.oxfordjournals.org/content/7/11/3047.full) ***selected as a featured article in the journal Genome Biology and Evolution. The feature article can be found here:** Venton, Danielle, 2015. "Highlight—What You Eat: Bacterivorous Green Algae Raises Questions about the Evolution of Eating, Photosynthesis." *Genome Biology and Evolution*, 7(11), pp.3115-3115. (https://doi.org/10.1093/gbe/evv208)

2010

2. **Burns JA***, Dreij K.*, Cartularo L, and Scicchitano DA, 2010. "O6-Methylguanine induces altered proteins at the level of transcription in human cells." *Nucleic acids research*, 38(22), pp.8178-8187. *co-first authors (http://nar.oxfordjournals.org/content/38/22/8178.full)

2008

1. Dimitri A, **Burns JA**, Broyde S, and Scicchitano DA, 2008. "Transcription elongation past O6-methylguanine by human RNA polymerase II and bacteriophage T7 RNA polymerase." *Nucleic acids research*, 36(20), pp.6459-6471. (http://nar.oxfordjournals.org/content/36/20/6459.full)

Submitted articles (under review/in revision)

2026

1. Gutierrez MFR, Krinos AI, Alcala XM, **Burns JA**, Stepanauskas R, Woyke T, and Schulz F, 2025 “Global Metagenomics Reveals Hidden Protist Diversity”. Preprint available: bioRxiv: https://doi.org/10.1101/2025.03.26.645542. In Revision
2. Van Etten J, Han S, **Burns JA**, Lhee D, Willoughby AC, Stephens TG, Chille E, Sleith RS, Bhattacharya D, and Yoon HS. “Crawling under the radar: two novel *Paulinella* species expand knowledge about the ecology of this genus and plastid primary endosymbiosis” In Review
3. Chaux F, Vojvoda Zeljko T, Branimir Vuković B, **Burns JA**, Le Perrun T, Žižek1 M, Bannerman BP, Bara Mason DT, Garrido C, Xu Z, Dorrell RG, Godrijan J. "The *Calcidiscus leptoporus* genome reveals vitamin-mediated holobiont interactions” In Review

Preprints

*1. Liu J, Williams T, and **Burns JA**†, 2021. “Relating genome completeness to functional predictions.” bioRxiv. (https://doi.org/10.1101/2021.10.01.462806)

Book chapters

2. Kerney RK, **Burns JA**, and Kim E, 2017. “Investigating mechanisms of algal entry into salamander

cells". In: *Algal and cyanobacteria symbioses* (pp. 209-239).

1. Dreij K, **Burns JA**, Dimitri A, Nirenstein L, Noujnykh T, and Scicchitano DA, 2010. "DNA damage and transcription elongation: Consequences and RNA integrity." *The Chemical Biology of DNA Damage*: 399-437.

Book reviews

1. **Burns JA**, 2013. "Are We Listening to Genomic Noise?" *DNA and cell biology* 32, no. 7: 420-421

Scholarships, grants and awards

2025 Ocean Shot 2, OPRI of the Sasakawa Peace Foundation, "Innovating an Integrated in-situ Digital Holotype Strategy for Midwater Ocean Species Discovery" ($2,250,000 for 3 years – **PI: JA Burns**, co-PIs: Kakani Katija, Robert Wood, Brennan Phillips, Dhugal Lindsay, David Gruber)

2025 FY26 Kickstarter, Bigelow Laboratory for Ocean Sciences, "Revealing the Role of Intercellular Signaling in Stress Resilience in the Glaucophyte Alga Cyanophora paradoxa" ($25,000.00 for 1 year – **PI: JA Burns**)

2025 FY26 Spencer Fund, Bigelow Laboratory for Ocean Sciences, "Engineering H. pluvialis for Efficient Astaxanthin Delivery and Recovery." ($50,000.00 for 1 year – **PI: JA Burns**)

2025 South Korea Research Grant "Microscopic and genetic investigation into the endogenous viral elements in green algae" ($20,000 per year to **Co-PI JA Burns** for 5 years; PI Eunsoo Kim)

2024 NSF MRI, "Equipment: MRI: Track 1: Acquisition of a Desktop Scanning Electron Microscope for Aquatic Microbial Research and Education" ($264,912 for 3 years – Co-PI**: JA Burns,** C Mitchell, M Kamalanathan, P Countway; PI: M Lomas)

2024 FY25 Kickstarter, Bigelow, "RAD-EDGE" ($49,679.00 for 1 year – **PI: JA Burns**)

2023 FY23 Spencer Fund, Bigelow "Optimizing astaxanthin accessibility from the green alga *Haematococcus*" ($30,000 for 1 year – PI: JA Burns)

2021 William Procter Scientific Innovation Fund, "Drug discovery from a mutually beneficial biological interaction." ($150,000 for 3 years – **PI: JA Burns**, co-PIs: Ryan Kerney, R. Thomas Williamson, W. Strangman)

2020 Gordon and Betty Moore Foundation, "Plankton Photosymbiosis on Chip (SYMBIOCHIP)" ($605,000 for 30 months – Co-PI: **JA Burns**, Johan Decelle, Ian Probert, Georg Pohnert, PI: Fabrice Not)

2017 Gordon and Betty Moore Foundation, "Solar Salamanders: Investigating the only known vertebrate-alga intracellular partnership." ($1,031,671.07 for 3 years – **Co-PI: JA Burns**, Solange Duhamel, David Matus, PI: Ryan Kerney)

2016 Simons Foundation, Life Sciences-Project Awards, award # 488335: "Ancient metabolism: Austerity and the art of the steal." ($521,384.00 for 2 years – **Co-PI: JA Burns**, A Narechania, PI: Rob DeSalle)

2014 NSF EAGER award #1428065: "Mechanisms of Establishing and Maintaining an Algal Endosymbiont in a Vertebrate Host " ($176,582.00 for 2 years – **Co-PI: JA Burns**, E Kim, PI: Ryan Kerney)

2011 Gladys Mateyko Research Award for Excellence in Biology *(Awarded by NYU Biology: This*

award is given annually to a PhD student who demonstrates excellence in research, academic achievement, involvement and participation in departmental affairs and cooperation with fellow workers.)

2006 NYU McCracken Graduate Fellowship

Scientific presentations

Invited seminars

Burns JA, " Protist Genomics", Earth Biogenome Project Assembly Group, January 2026

Burns JA, " Accessing a near-shore, predictable bloom to sequence the first complete radiolaria genome: preliminary data and collaborative potential", Life of Retaria Community Presentation, January 2026

Burns JA, " Innovating *In-Situ* Digital Synthesis Strategies for Ocean Species Discovery", Tohoku University, December, 2025

Burns JA, "Development, Symbiosis, and the Hidden Architecture of Life", UMD Horn Point Laboratory, November 2025

Burns JA, "Symbiosis and Deep Sea Exploration through genomics", EWHA, July 2025

Burns JA, " Development, Symbiosis, and the Hidden Architecture of Life", University of Tokyo Departmental Seminar, June 2025

Burns JA, "A Generalist's View of Form and Function Across Eukaryotic Life", University of Puerto Rico Mayaguez Departmental Seminar, December 2024

Burns JA, "Green eggs, green bodies: Multiple interactions in a vertebrate-alga symbiosis", International Endocytobiology Meeting, Chicago, IL, September 2023

Burns JA, "Beyond the Genome: Emergent Properties and the Elusive Connection to Cellular Behavior", Arcadia Science, Berkeley, CA, April 2023

Burns JA, "Linking cellular dynamics to genomes through the study of cell signaling in protists", Arizona State University, Phoenix, AZ, February 2023

Burns JA, "Linking cellular dynamics to genomes through the study of cell signaling in protists", University of Arizona, Tuscon, AZ, February 2023

Burns JA, "Big data linking small things: Microbial systems from organisms to oceans", Station biologique de Roscoff (SBR), Roscoff, France, November 2021

Burns JA, "Harnessing diversity to reveal the genomic basis of complex traits", Smith College, Nothampton, MA, March 23, 2020

Burns JA, " I am the same as a fish: A tour of life's diversity" Public Seminar, Sango Kura, Delaware Water Gap, PA, March 16, 2019

Burns JA, "Big data linking small things: Microbial systems from organisms to oceans", Bigelow Laboratory for Ocean Sciences, East Boothbay, ME, March 4, 2019

Burns JA, " I asked for oxygen and got an alga: A systems biology approach to symbioses", University of Cincinnati, Cincinnati, OH, February 7, 2019

Burns JA, "Big data linking small things" University of Liverpool, Liverpool UK, March 26, 2018

Burns JA, "Something old and something new, the eukaryotic mold and a symbiotic milieu" Departmental seminar, Gettysburg College, Gettysburg, PA, March 19, 2018

Burns JA, Cadiz T, "Amphibian Tales with a Cuban Flair" public seminar at Kettle Creek Environmental Center, East Stroudsburg, PA, July 15, 2017

Burns JA, "Amazing Amphibians" public seminar at Kettle Creek Environmental Center, East Stroudsburg, PA, April 24, 2016

Burns JA, "Green for good? Exploration of a vertebrate-alga endosymbiosis" Zoology Departmental

Seminar, Jagiellonian University, Krakow, Poland, June 19, 2016

Burns JA, "From green eggs to green bodies; probing the intracellular association of a salamander host and a green algal symbiont." BioColloquium Series, East Stroudsburg University, May 1, 2015

Burns JA, "Probing the relationship between transcription, nucleotide excision repair and DNA stem loops in human cells." Seminar talk at Dept. of Microbiology, Institute of Biomedical Sciences, University of São Paulo, Brazil, November 11, 2011

Professional presentations

Talks

Burns JA, V Tonigold, S Greenlee, R Sleith. Seasonal Bloom Dynamics of the nasselarian radiolarian *Plagiacantha arachnoides* in a Coastal Maine Estuary. International Congress of Protistology, Seoul, South Korea, June 2025

Burns JA. Functional stress responses in Glaucophyta: Evidence of ethylene and abscisic acid functions in *Cyanophora paradoxa*. European Congress of Protistology, Vienna, Austria, July 2023

Burns JA. Genomics and cell biology of hormone signaling in a glaucophyte alga. Genotype to Phenotype: Bridging Comparative Genomics and Cell Biology, East Sussex, UK, November, 2022

Burns JA. Evidence of algal virus gene expression during a salamander-alga symbiosis. ISS Holobiont 2022, Lyon, France, July, 2022

Burns JA. Lineage specific patterns of bacterial gene transfer across eukaryotic metabolism. ISEP virtual seminar series, July, 2020

Burns JA, Kerney R, Adikes R, Matus D, Duhamel S. Thinking about metabolite transfer from symbiont to host in a vertebrate algal endosymbiosis. ISS 2018, Corvallis, OR, July, 2018 (session chair)

Burns JA, Pittis A, Kim E. To eat or absorb? Predicting phagocytosis from genomes. ICOP 2017, Prague, Czech Republic, August, 2017

Burns JA, "Green for good? A snapshot of a vertebrate-alga endosymbiosis by dual RNA-Seq" Invited talk at Gordon Research Conference on animal-microbe symbioses, West Dover, VT June 14, 2017

Burns JA, Zhang H, Hill E, Kim E, Kerney RK. The green alga and the salamander: a suffocating love story. Protist2016, Moscow, Russia, June 6-10, 2016

Paasch A, **Burns JA**, Kim E. Retention of bacterivory in the dominantly photoautotrophic green alga *Cymbomonas tetramitiformis* is influenced by phosphate limitation. Protist2016, Moscow, Russia, June 6-10, 2016

Burns JA, Zhang H, Hill E, Kim E, Kerney RK. Algal-Salamander symbiosis and single cell transcriptome. Plankton symbiosis and Radiolaria, Roscoff, France, October 16, 2015

Burns JA, Paasch A, Narechania A, Kim E. Comparative genomics of a bacterivorous green alga reveals evolutionary causalities and consequences of phago-mixotrophic mode of nutrition. Phycological Society of America (PSA) meeting, Drexel PA, August 12, 2015

Posters

Morrison E, **Burns JA**, "Inferring ancestry of three eukaryotic lineages using linked lateral transfers" Poster at Simons Conference on Theory and Biology, New York, NY, April 13, 2018

Burns JA, "Green for good? A snapshot of a vertebrate-alga endosymbiosis by dual RNA-Seq" Poster at Gordon Research Conference on animal-microbe symbioses, West Dover, VT, July 10, 12-13 2017

Burns JA, Chowdhurry M, Scicchitano DA. "Simple repeat polymorphisms are not simply induced by DNA repair." Poster at Protist2016 meeting, Oslo, Norway, July 29-August3 2012

Burns JA, Gordon Research Conference on DNA Damage, Mutation & Cancer, March 21-26, 2010, Ventura, CA

Burns JA, Gordon Research Conference on DNA Damage, Mutation & Cancer, March 5-10, 2006, Ventura, CA

Dimitri A, **Burns JA**, Broyde S, Geacintov NE, Farley SA, Guengerich F, Rizzo C, Goodenough AK, Scicchitano DA. "Transcriptional bypass of modified guanine bases and unpaired regions of DNA: Biochemical and modeling studies." 9th International Conference on Environmental Mutagens. San Francisco, CA, September 2-8 2005

Campus or Departmental Talks

Burns JA. "*Big data linking small things*" Presented to the Science Senate, American Museum of Natural History, June 2018

Burns JA. "*Genomics at the museum*" Presented to the Board of Trustees, American Museum of Natural History, May 2017

Burns JA. "*Green algal origins and a modern green alga-vertebrate symbiosis*" RGGS Comparative Biology Seminar, American Museum of Natural History, September 2015

Teaching and mentoring

Teaching

2026 Instructor for "Evolutionary Cell Biology". 200-level biology elective for the biology department at Colby College, Fall Semester. Colby College, Waterville, ME.

2025 Instructor for "Evolutionary Cell Biology". Added field component to course; now fulfills field requirement as 200-level biology elective. Spring Semester. Colby College, Waterville, ME.

2023 Instructor for "Evolutionary Cell Biology". Developed new 200-level biology elective teaching cell biology from the perspective of the tree of life. Fall Semester. Colby College, Waterville, ME.

2020 Co-instructor for "Transcriptome Data Processing and Analysis" – Richard Gilder Graduate School, American Museum of Natural History, NY, NY.

2019 Co-instructor for Environmental Biology II. I taught a section (1/3 of the course) on "Physiology at Different Scales". Defined as the evolution of the long-term carbon cycle; the flow of materials and energy within and between organisms and their environments, from microbes to the biosphere. – Columbia University, NY, NY

2017 Lecturer for the AMNH Ph.D. Program Richard Gilder Graduate School. Lectures on genome and transcriptome data filtering and on hidden Markov models.

2016 Co-instructor for "Transcriptome Data Processing and Analysis" – Richard Gilder Graduate School, American Museum of Natural History, NY, NY. I designed this course to guide students through large datasets. The course includes study design, basic statistics, and differential expression analysis in R as well as lessons on transcriptome assembly and read mapping and the tools and theory therein.

2014 Adjunct professor for "Paced Modern Biology I-B-LECTURE " – John Jay College of Criminal Justice, NY, NY

2013 Adjunct professor for "Modern Biology I-LAB" – John Jay College of Criminal Justice, NY, NY

2008-2010 Teaching assistant for "Molecular and Cell Biology II" – New York University, New York, NY. Designed and presented supplemental lectures to add depth to the main course material;

lectures were mandatory.

2006-2010 Teaching assistant for "Molecular and Cell Biology I" – New York University, New York, NY. Designed and presented supplemental lectures to add depth to the main course material; lectures were mandatory.

2005-2006 Teaching assistant for "Principals of Biology Labs I&II" – New York University, New York, NY.

Mentoring

SMCC undergraduate semester student: Valerie Tonigold (Fall 2024; BLOS)
Summer REU: Brooks Osborne (Summer 2024; BLOS)
Colby College undergraduate semester student: Caroline Alexander (Fall 2022; BLOS)
Summer REU: Tyler Bauersfeld (Summer 2022; BLOS)
Summer REU: Margaret Grogan (Summer 2022; BLOS)
Summer REU: Matthew Yost (Summer 2021; BLOS)
Colby College undergraduate semester student: Charis Li (Fall 2020; BLOS)
Summer REU: Tre'Andice Williams (Summer 2020; BLOS)
Summer REU: Jessica Liu (Summer 2020; BLOS)
Postdoctoral researcher: Baptiste Genot (2020-2023; BLOS)
Postdoctoral researcher: Dr. Erin Morrison (2017–2019; AMNH)

Outreach

July 2, 2024: "Nature's Partnership: How Algae and Salamanders Team Up in Our Vernal Pools" Public presentation to Merryspring Nature Center, Camden, Maine
October 25, 2023: Career presentation to AP Biology class of Boothbay Region High School, Boothbay, ME
September 28, 2022: "Look, Listen, Explore" presentation to the August Nature Club.
April 9, 2022: Night hike for spotted salamanders at the Hidden Valley Nature Preserve with the Rise and Shine Youth Retreat
March 24, 2022: "Exploration of the deep sea" presentation to the Windsor Park Elementary School Science Blitz 2022 event in Edmonton, Alberta, Canada.
April 11, 2021: Night hike for spotted salamanders in East Boothbay with the Rise and Shine Youth Retreat
November 2, 2018: Organized a community "science night" with the CYTC group. Brought three microscopy experts and many microscopes for a hands-on session introducing the community to the microbial world around them.
(https://www.facebook.com/CYTCEastStroudsburg/videos/1203953746421469/)
May 2018: Co-authored a "Science Breaker" article to introduce non-experts to our vertebrate-alga symbiosis system. (https://doi.org/10.25250/thescbr.brk101)
April 22, 2018: Organized a citizen science event for the CYTC community mentoring group. Had young community members participate in a scientific study by putting on waders and collecting salamander egg clutches. (https://www.youtube.com/watch?v=8OuLO1FEv_g)
January 2018: Selected as an eLife ambassador, a group of over 150 scientists around the world committed to implementing strategies to promote responsible practices in science and science publishing. I joined the diversity initiative.
December 2017: Joined outreach group CYTC, "Challenge Yourself To Change", in my hometown of Stroudsburg, PA. My role will be to bring my passion for science to troubled youths to provide positive examples of what they can do in life.

June 2017-February 2018: Participated in an art-science collaboration through the NYC based organization LIGO (https://www.ligoproject.org/about). Teamed up with audio artist John Roach to develop an art project from his experiences working with me in the lab (http://johnroach.net/ligo-the-art-of-science/). The work was displayed in a public exhibition in February of 2018.
April 25-26, 2017: Participated in the Biological and Ecological Sciences Coalition's "Congressional Visits Day". Met with congressional offices to discuss federal funding for the sciences.
January 28, 2017: Provided a lab tour and arranged scientific lectures for Boy Scout Troop 14 from Little Falls, NJ at the AMNH.
October 5, 2016: Arranged and gave a museum labs tour to students in the Research Aligned Mentorship (RAM) Program from Farmingdale State College, New York.
2015: Helped make a video in the AMNH "Shelf Life" series on our salamander-alga endosymbiosis project. Link: http://www.amnh.org/shelf-life/episode-11-green-grow-the-salamanders.
June 11, 2015: Communicated research activities to social media leaders in a "Speed Science" Tumblr event at the AMNH.
March 15, 2014: Communicated research activities to local middle school students as part of the Fordham University Career Education Mentoring Program (CEMP).
March 22, 2013: Abstract Art Gallery: FACSalad (Fluorescent Activated fruit Sorting) Installation. Science-art outreach project 2.
March 1, 2013: Abstract Art Gallery: Exploring the Role of Branched DNA Structures in Human Disease. Science-art outreach project 1.

Fieldwork

2026

- **Designing The Future 3,** Co-chief scientist, Schmidt Ocean Institute research cruise, from Salvador, Brazil

2024

- **7-day Radiolarian sampling,** University of Puerto Rico Mayaguez, Magueyes Island, Puerto Rico

2023

- **7-day Radiolarian sampling,** Bermuda Institute of Ocean Sciences, St. George's, Bermuda

2021

- **Designing The Future 2,** Schmidt Ocean Institute research cruise, from San Diego, CA

2020

- **Trinidad head line sampling and collections research,** Humboldt State University, Arcata, CA
- **10-day Radiolarian sampling with international team,** Sognefjord, Norway (Canceled due to Covid-19)

2015

- **10-day road trip for sampling of *Ambystoma gracile* egg masses,** Oregon and Washington states, USA

2013-2014

- **Local sampling of *Ambystoma maculatum* egg masses,** Pennsylvania and New York states, USA

2012

- **One week plankton net sampling for Radiolaria,** Villefranche-sur-Mer, France

2012

- **One week plankton net sampling for Radiolaria,** Songdalfjord, Norway

Professional activities

Editorial board member of the journal Symbiosis since 2021.

Literature reviews
Journals: PLOS ONE; Symbiosis; Journal of Phycology; Mitochondrial DNA Part B; Toxicological Sciences, eLife, Current Biology, Harmful Algae, Microbial Ecology, Journal of Eukaryotic Microbiology, New Phytologist, Scientific Reports, Current Opinion in Insect Science, Science Advances, ISME

Institutional activities
Member of the Safety Committee at BLOS, 2025-present
Member of the Personnel Committee at BLOS, 2025-present
Chair of the Search Committee at BLOS, 2022-2025
Member of the Search Committee at BLOS, 2020-2022
Member of the ORCA committee on research commercialization at BLOS, August 2019-2022.
Presented research to AMNH Board of Trustees, Science Policy Committee meeting, May 2017.

Conference activities
Session chair, ICOP2025, June 2025
Session chair, International Symbiosis Society meeting, July 2018

Other

Societies
- International Society of Protistologists (ISOP, https://protistologists.org/) member
- International Society for Evolutionary Protistology (ISEP, https://www.isep-protists.com/) member
- International Symbiosis Society (ISS, http://iss-symbiosis.org/) member
- American Institute for the Biological Sciences (AIBS, https://www.aibs.org/) member
- *eLife* ambassador (selected for 2018), early career researchers committed to open source publishing and helping other researchers in their careers around the world (https://elifesciences.org/inside-elife/912b0679/early-career-advisory-group-elife-welcomes-150-ambassadors-of-good-practice-in-science).

Popular press
- Orf D, “It’s Official: The Egg Came Before the Chicken”, November 19, 2024 (https://www.popularmechanics.com/science/animals/a62940858/egg-chickin-mitosis/)
- Sitterly L, “Maine lab explores whether stressed-out algae could help replace plastics”, September 27, 2024 (https://www.pressherald.com/2024/09/26/maine-lab-explores-whether-stressed-out-algae-could-help-replace-plastics/)
- Pennisi E, “New undersea robot digitally captures the sea’s most delicate life”, January 17, 2022 (https://www.science.org/content/article/new-undersea-robot-digitally-captures-sea-s-most-delicate-life)
- Strickland A, “Tiny glowing fish is full of antifreeze to help it survive Greenland's icy waters”, August 17, 2022 (https://www.cnn.com/2022/08/17/world/antifreeze-protein-fish-greenland-scn/index.html)
- Frazer J, "Algae living inside salamanders aren't happy about the situation", May 18, 2018 (https://blogs.scientificamerican.com/artful-amoeba/algae-living-inside-salamanders-arent-happy-about-the-situation/)
- Hays B, "New phagocytosis model predicts which cells can eat other cells", Feb 20, 2018

(https://www.upi.com/New-phagocytosis-model-predicts-which-cells-can-eat-other-cells/1571519154785/)

- Campbell P, "Algae lives inside salamander", Pocono Record (front page), May 29, 2017 (http://www.poconorecord.com/news/20170529/algae-lives-inside-salamander)
- Dvorsky G, "Scientists Just Found a Completely New Kind of Symbiotic Relationship" Gizomodo, May 2, 2017 (http://gizmodo.com/scientists-just-found-a-completely-new-kind-of-symbioti-1794811939)
- McRae M, "We Have Weird New Details on The Strangest Symbiotic Relationship Ever Found" Science Alert, May 3, 2017 (http://www.sciencealert.com/researchers-dig-into-the-genes-of-a-one-of-a-kind-of-symbiotic-relationship)
- Norman A, and Galeon D "We Have a New Understanding of the Rarest Symbiotic Relationship in Nature" Futurism.com, May 4, 2017 (https://futurism.com/we-have-a-new-understanding-of-the-rarest-symbiotic-relationship-in-nature/)
- Horowitz K, "These Algae Live Inside Growing Baby Salamanders", Mental Floss, May 3, 2017 (http://mentalfloss.com/article/500575/these-algae-live-inside-growing-baby-salamanders)