

# Dr. François Ribalet

SENIOR RESEARCH SCIENTIST

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## Education

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### Open University

PH. D. IN BIOLOGICAL SCIENCES

London, UK

Nov 2007

### Sorbonne University

M. SC. IN BIOLOGICAL OCEANOGRAPHY AND MARINE ENVIRONMENT

Paris, FR

June 2003

### Sorbonne University

B. SC. IN POPULATION BIOLOGY AND ECOSYSTEMS

Paris, FR

June 2001

### Ecole Supérieure d'Angers

POST-SECONDARY PREPARATORY CLASSES FOR THE FRENCH GRANDES ÉCOLES

Angers, FR

June 1999

## Research Experience

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### University of Washington

SENIOR RESEARCH SCIENTIST

Seattle, USA

Sept 2015 – present

### University of Washington

RESEARCH ASSISTANT PROFESSOR

Seattle, USA

Sept 2012 – August 2015

### University of Washington

POSTDOCTORAL RESEARCH ASSOCIATE

Seattle, USA

Jan 2008 – July 2012

### Stazione Zoologica Anton Dohrn

PH. D. CANDIDATE

Naples, IT

Nov 2003 – Sept 2007

### Station Biologique de Roscoff

M. SC. STUDENT

Roscoff, FR

Sept 2002 – June 2003

## Teaching and Mentoring Experience

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### Teaching

INSTRUCTOR AT THE FRENCH OFFICE OF FAMILY ALLOCATIONS

- “Math without junk food” (K-12 students)

Paris, FR

Sept 1999 – June 2003

### Research Advisor

RESEARCH SCIENTIST

- Dr. Annette Hynes

Seattle, WA

Nov 2018 – present

POSTDOCTORAL RESEARCHER

- Dr. Mattias Cape

June 2018 – July 2020

### Student Mentoring

GRADUATE STUDENTS

- Kristof Glauninger

Seattle, WA

Nov 2019 – present

## UNDERGRADUATE STUDENTS

- Jordan Winter
- Denise Devlyn
- John MacMillan
- Grace Novacek
- Maria Hamilton
- Alex Mitchell-Morton
- Jackie Schwartzstein
- George Roth
- Chris Fox

Sept 2019 – present  
Sept 2019 – March 2020  
June 2016 – June 2018  
March 2014 – June 2015  
Sept 2012 – Jan 2014  
Jan 2011 – June 2012  
March 2011 – Nov 2011  
Sept 2010 – May 2011  
Sept 2009 – June 2010

## Publications

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- [33] Carlson, M. C. G., **Ribalet, F.**, Maidanik, I., Durham, B. P., Hulata, Y., Ferrón, S., Weissenbach, J., Shamir, N., Goldin, S., Baran, N., Cael, B. B., Karl, D. M., White, A. E., Armbrust, E. V., Lindell, D., “Viruses affect picocyanobacterial abundance and biogeography in the North Pacific Ocean,” *Nature Microbiology*, vol. 7, no. 4, pp. 570–580, Apr. 2022. doi: 10.1038/s41564-022-01088-x.
- [32] Follett, C. L., Dutkiewicz, S., **Ribalet, F.**, Zakem, E., Caron, D., Armbrust, E. V., Follows, M. J., “Trophic interactions with heterotrophic bacteria limit the range of *Prochlorococcus*,” *Proceedings of the National Academy of Sciences*, vol. 119, no. 2, e2110993118, Jan. 2022. doi: 10.1073/PNAS.2110993118.
- [31] Mattern, J. P., Glauninger, K., Britten, G. L., Casey, J. R., Hyun, S., Wu, Z., Armbrust, E. V., Harchaoui, Z., **Ribalet, F.**, “A Bayesian approach to modeling phytoplankton population dynamics from size distribution time series,” *PLOS Computational Biology*, vol. 18, no. 1, e1009733, Jan. 2022. doi: 10.1371/JOURNAL.PCBI.1009733.
- [30] Boysen, A. K., Carlson, L. T., Durham, B. P., Groussman, R. D., Aylward, F. O., **Ribalet, F.**, Heal, K. R., White, A. E., Delong, E. F., Armbrust, E. V., Ingalls, A. E., “Particulate Metabolites and Transcripts Reflect Diel Oscillations of Microbial Activity in the Surface Ocean,” *MSystems*, vol. 6, no. 3, pp. 00896–20, 2021. doi: 10.1128/mSystems.00896-20.
- [29] Coesel, S. N., Durham, B. P., Groussman, R. D., Hu, S. K., Caron, D. A., Morales, R. L., **Ribalet, F.**, Armbrust, E. V., “Diel transcriptional oscillations of light-sensitive regulatory elements in open-ocean eukaryotic plankton communities,” *Proceedings of the National Academy of Sciences*, vol. 118, no. 6, e2011038118, Feb. 2021. doi: 10.1073/pnas.2011038118.
- [28] Heal, K. R., Durham, B. P., Boysen, A. K., Carlson, L. T., Qin, W., **Ribalet, F.**, White, A. E., Bundy, R. M., Armbrust, E. V., Ingalls, A. E., “Marine Community Metabolomes Carry Fingerprints of Phytoplankton Community Composition,” *MSystems*, vol. 6, no. 3, Jun. 2021. doi: 10.1128/MSYSTEMS.01334-20.
- [27] Jones, C., Clayton, S., **Ribalet, F.**, Armbrust, E. V., Harchaoui, Z., “A kernel-based change detection method to map shifts in phytoplankton communities measured by flow cytometry,” *Methods in Ecology and Evolution*, vol. 12, pp. 1687–1698, Jun. 2021. doi: 10.1111/2041-210X.13647.
- [26] Connell, P., **Ribalet, F.**, Armbrust, E., White, A., Caron, D., “Diel oscillations in the feeding activity of heterotrophic and mixotrophic nanoplankton in the North Pacific Subtropical Gyre,” *Aquatic Microbial Ecology*, vol. 85, pp. 167–181, Dec. 2020. doi: 10.3354/ame01950.
- [25] Gradoville, M. R., Farnelid, H., White, A. E., Turk-Kubo, K. A., Stewart, B., **Ribalet, F.**, Ferrón, S., Pinedo-Gonzalez, P., Armbrust, E. V., Karl, D. M., John, S., Zehr, J. P., “Latitudinal constraints on the abundance and activity of the cyanobacterium UCYN-A and other marine diazotrophs in the North Pacific,” *Limnology and Oceanography*, vol. 65, no. 8, pp. 1858–1875, Mar. 2020. doi: 10.1002/lno.11423.

- [24] Henderikx Freitas, F., Dugenne, M., **Ribalet, F.**, Hynes, A., Barone, B., Karl, D., White, A., “Diel variability of bulk optical properties associated with the growth and division of small phytoplankton in the North Pacific Subtropical Gyre,” *Applied Optics*, vol. 59, no. 22, pp. 6702–6716, Jun. 2020. doi: 10.1364/ao.394123.
- [23] Juranek, L. W., White, A. E., Dugenne, M., Henderikx Freitas, F., Dutkiewicz, S., **Ribalet, F.**, Ferrón, S., Armbrust, E. V., Karl, D. M., “The Importance of the Phytoplankton “Middle Class” to Ocean Net Community Production,” *Global Biogeochemical Cycles*, vol. 34, no. 12, e2020GB006702, Dec. 2020. doi: 10.1029/2020GB006702.
- [22] Mruwat, N., Carlson, M. C., Goldin, S., **Ribalet, F.**, Kirzner, S., Hulata, Y., Beckett, S. J., Shitrit, D., Weitz, J. S., Armbrust, E. V., Lindell, D., “A single-cell polony method reveals low levels of infected *Prochlorococcus* in oligotrophic waters despite high cyanophage abundances,” *ISME Journal*, vol. 15, pp. 41–54, Sep. 2020. doi: 10.1038/s41396-020-00752-6.
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- [19] Hamilton, M., Hennon, G., Morales, R., Needoba, J., Peterson, T., Schatz, M., Swalwell, J., Armbrust, E., **Ribalet, F.**, “Dynamics of *Teleaulax* -like cryptophytes during the decline of a red water bloom in the Columbia River Estuary,” *Journal of Plankton Research*, vol. 39, no. 4, 2017. doi: 10.1093/plankt/fbx029.
- [18] Heal, K., Qin, W., **Ribalet, F.**, Bertagnolli, A., Coyote-Maestas, W., Hmelo, L., Moffett, J., Devol, A., Armbrust, E., Stahl, D., Ingalls, A., “Two distinct pools of B12 analogs reveal community interdependencies in the ocean,” *Proceedings of the National Academy of Sciences of the United States of America*, vol. 114, no. 2, 2017. doi: 10.1073/pnas.1608462114.
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- [15] Hyrkas, J., Clayton, S., **Ribalet, F.**, Halperin, D., Armbrust, E. V., Howe, B., “Scalable clustering algorithms for continuous environmental flow cytometry,” *English, Bioinformatics*, vol. 32, no. 3, pp. 417–423, 2016. doi: 10.1093/bioinformatics/btv594.
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- [13] **Ribaleat, F.**, Bastianini, M., Vidoudez, C., Acri, F., Berges, J., Ianora, A., Miralto, A., Pohnert, G., Romano, G., Wichard, T., Casotti, R., “Phytoplankton cell lysis associated with polyunsaturated aldehyde release in the northern Adriatic Sea,” *PLoS ONE*, vol. 9, no. 1, 2014. DOI: 10.1371/journal.pone.0085947.
- [12] Halperin, D., Weitz, K., Howe, B., **Ribaleat, F.**, Saito, M., Virginia Armbrust, E., “Real-time collaborative analysis with (almost) pure SQL: A case study in biogeochemical oceanography,” in *ACM International Conference Proceeding Series*, 2013. DOI: 10.1145/2484838.2484880.
- [11] Howe, B., Halperin, D., **Ribaleat, F.**, Chitnis, S., Armbrust, E., “Collaborative science workflows in SQL,” *Computing in Science and Engineering*, vol. 15, no. 3, 2013. DOI: 10.1109/MCSE.2013.42.
- [10] Palevsky, H. I., **Ribaleat, F.**, Swalwell, J. E., Cosca, C. E., Cokelet, E. D., Feely, R. A., Armbrust, E. V., Quay, P. D., “The influence of net community production and phytoplankton community structure on CO<sub>2</sub> uptake in the Gulf of Alaska,” *Global Biogeochemical Cycles*, vol. 27, no. 3, pp. 664–676, 2013. DOI: 10.1002/gbc.20058.
- [9] **Ribaleat, F.**, Schruth, D., Armbrust, E. V., “flowPhyto: Enabling automated analysis of microscopic algae from continuous flow cytometric data,” *Bioinformatics*, vol. 27, no. 5, 2011. DOI: 10.1093/bioinformatics/btr003.
- [8] Swalwell, J. E., **Ribaleat, F.**, Armbrust, E. V., “Seaflow: A novel underway flow-cytometer for continuous observations of phytoplankton in the ocean,” *Limnology and Oceanography: Methods*, vol. 9, no. OCTOBER, 2011. DOI: 10.4319/lom.2011.9.466.
- [7] **Ribaleat, F.**, Marchetti, A., Hubbard, K. A., Brown, K., Durkin, C. J., Morales, R., Robert, M., Swalwell, J. E., Tortell, P. D., Armbrust, E. V., “Unveiling a phytoplankton hotspot at a narrow boundary between coastal and offshore waters,” *Proceedings of the National Academy of Sciences of the United States of America*, vol. 107, no. 38, 2010. DOI: 10.1073/pnas.1005638107.
- [6] Marchetti, A., Parker, M. S., Moccia, L., Lin, E. O., Arrieta, A. L., **Ribaleat, F.**, Murphy, M., Maldonado, M., Armbrust, E. V., “Ferritin is used for iron storage in bloom-forming marine pennate diatoms,” *Nature*, vol. 457, no. 7228, pp. 467–470, 2009. DOI: 10.1038/nature07539.
- [5] **Ribaleat, F.**, Vidoudez, C., Cassin, D., Pohnert, G., Ianora, A., Miralto, A., Casotti, R., “High Plasticity in the Production of Diatom-derived Polyunsaturated Aldehydes under Nutrient Limitation: Physiological and Ecological Implications,” *Protist*, vol. 160, no. 3, 2009. DOI: 10.1016/j.protis.2009.01.003.
- [4] **Ribaleat, F.**, Intertaglia, L., Lebaron, P., Casotti, R., “Differential effect of three polyunsaturated aldehydes on marine bacterial isolates,” *Aquatic Toxicology*, vol. 86, no. 2, 2008. DOI: 10.1016/j.aquatox.2007.11.005.
- [3] **Ribaleat, F.**, Berges, J. A., Ianora, A., Casotti, R., “Growth inhibition of cultured marine phytoplankton by toxic algal-derived polyunsaturated aldehydes,” *Aquatic Toxicology*, vol. 85, no. 3, pp. 219–227, 2007. DOI: 10.1016/j.aquatox.2007.09.006.
- [2] **Ribaleat, F.**, Wichard, T., Pohnert, G., Ianora, A., Miralto, A., Casotti, R., “Age and nutrient limitation enhance polyunsaturated aldehyde production in marine diatoms,” *Phytochemistry*, vol. 68, no. 15, pp. 2059–2067, 2007. DOI: 10.1016/j.phytochem.2007.05.012.
- [1] Vardi, A., Formiggini, F., Casotti, R., De Martino, A., **Ribaleat, F.**, Miralto, A., Bowler, C., “A stress surveillance system based on calcium and nitric oxide in marine diatoms,” *PLoS Biology*, vol. 4, no. 3, pp. 0411–0419, 2006. DOI: 10.1371/journal.pbio.0040060.

## Funding

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## Life Science Project award (\$891,769)

Computational Flow Cytometry Analysis of Marine Phytoplankton

PRINCIPAL INVESTIGATOR

Simons Foundation

2021-2024

## Life Science Project award (\$756,007)

Computational Flow Cytometry Analysis of Marine Phytoplankton

PRINCIPAL INVESTIGATOR

Simons Foundation

2018-2021

## Interdisciplinary Research in Earth Science (\$291,379)

Signatures of the multiple scales of motion in shaping marine phytoplankton biogeography

CO-INVESTIGATOR

National Aeronautics and  
Space Administration

2017-2021

## Fieldwork

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2016 SF-Gradient cruise (14 d), 2015 SF-SCOPE Diel cruise (12 d), 2015 HOT cruise (4 d), 2015 SF-SCOPE transit cruise (8 d), 2013 CMOP survey (2 d) and pilot project (7d), 2013 UW transit cruise (8 d), 2013 UW Senior thesis cruise (8 d), 2012 UW transit cruise (9d), 2012 GeoMICS cruise (6 d), 2011 UW transit cruise (9 d), 2011 PRISM cruise (2 d), 2010 UW transit cruise (9 d), 2010 MBARI-CANON cruise (12 d), 2010 CMOP cruise (5 d), 2009 PRISM cruise (3 d), 2008 PRISM cruise (3d), 2006 INTERREG spring cruise (7 d), 2005 INTERREG summer cruise (7d), 2004 INTERREG summer cruise (7 d), 2004 INTERREG spring cruise (7 d).

Total of **149** fieldwork days

## Reviewer Activity

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**Agencies** National Science Foundation (8), Spanish National Agency for Scientific Evaluation (4), French National Research Agency (1).

**Journals** Advances in Oceanography & Limnology (1), Applied Sciences (1), Aquatic Botany (4), Aquaculture International (1), Aquatic Toxicology (1), Bioinformatics (1), BMC Bioinformatics (2), Biogeosciences (1), Continental Shelf Research (1), Frontiers in Ecology and Evolution (1), Frontiers in Microbiology (1), Geophysical Research Letters (2), Global Biogeochemical Cycles (4), Harmful Algae (3), ISME Journal (3), Journal of Experimental Marine Biology and Ecology (1), Journal of Geophysical Research (2), Journal of Marine Biology & Oceanography (2), Journal of Marine Systems (2), Journal of Phycology (2), Journal of Sea Research (2), Limnology & Oceanography (13), Limnology & Oceanography Methods (6), Marine Drugs (3), Marine Environmental Research (2), Methods in Ecology and Evolution (1), Microbial Ecology (5), Proceedings of the National Academy of Sciences USA (1), Oceanography (1), Oceanological and Hydrological Studies (1), Peer Journal (1), PLoS One (7), Progress in Oceanography (4).

Total of **83** reviewed articles

## Languages

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- French (native)
- English (fluent)
- Italian (proficient)

## Activities

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Director of Vashon Island Rowing Club  
PADI Master scuba diver

2022 - present  
2007

## References

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- **Dr. Virginia E. Armbrust**

Professor at the School of Oceanography  
University of Washington  
armbrust@uw.edu

- **Dr. Mick Follow**

Professor at Department of Earth, Atmospheric and Planetary Sciences  
Massachusetts Institute of Technology  
mick@ocean.mit.edu

- **Dr. Debbie Lindell**

Professor at the Faculty of Biology  
Technion – Israel Institute of Technology  
dlindell@technion.ac.il

- **Dr. Joshua Weitz**

Professor at Department of Biological Sciences  
Georgia Institute of Technology  
jsweitz@gatech.edu