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Assistant Professor  
Department of Microbiology, University of Tennessee  
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## Education

- 2009-2013     **PhD Environmental Science**  
School of Biological Sciences, University of Essex
- 2008-2009     **MRes Mathematics in the Living Environment (with Distinction)**  
Departments of Biology and Mathematics, University of York
- 2004-2008     **MMath Mathematics**  
School of Mathematical and Physical Sciences, University of Sussex

## Professional Experience

- 2018-present   **Assistant Professor**  
Department of Microbiology and the National Institute of Mathematical and Biological Synthesis (NIMBioS), University of Tennessee
- 2020-present   **Adjunct Assistant Professor**  
Department of Ecology and Evolutionary Biology, University of Tennessee
- 2016-2018     **Research Scientist**  
Department of Earth, Atmosphere and Planetary Science, Massachusetts Institute of Technology
- 2013-2016     **Postdoctoral Associate**  
Department of Earth, Atmosphere and Planetary Science, Massachusetts Institute of Technology
- 2010-2013     **Graduate Research Assistant**  
Plymouth Marine Laboratory

## Research Interests

Microbial physiology and metabolism, microbial ecosystem interactions, marine biogeochemistry, organic matter elemental composition

## Publications

Cael, B. B., Bisson, K., Conte, M., Duret, M. T., Follett, C. L., Henson, S.A., Honda, M.C., Iversen, M.H., Karl, D.M., Lampitt, R.S., Mouw, C.B., Muller-Karger, F., Pebody, C.A., Smith, K.L., **Talmy, D.** (2021). Open ocean particle flux variability from surface to seafloor. *Geophysical Research Letters*, 48, 1-10.

Papoulis, S.E., Wilhelm, S.W., **Talmy, D.**\*, Zinser, E.R.\* (2021). Nutrient loading and viral memory drive accumulation of restriction modification systems in bloom-forming cyanobacteria. *mBio*.

\*co-corresponding authors.

Omta, A.W., **Talmy, D.**, Sher, D., Finkel, Z.V., Irwin, A.J., Inomura, K., Follows, M.J. (2020). Quantifying nutrient throughput and DOM production by algae in continuous culture. *Journal of Theoretical Biology*, 494, 1-16.

Pound, H.L., Gann, E.R., Tang, X., Krausfeldt, L. E., Huff, M., Staton, M. E., **Talmy, D.**, Wilhelm, S.W. (2020) The “neglected viruses” of *Taihu*: Abundant transcripts for viruses infecting eukaryotes and their potential role in phytoplankton succession. *Frontiers in Microbiology*, 11, 1-11.

Inomura, K., Omta, A.W., **Talmy, D.**, Bragg, J., Deutsch, C., Follows, M.J. (2020). Elemental composition and growth rate of phytoplankton governed by macromolecular allocation. *Frontiers in Microbiology*, 11, 1-22.

**Talmy, D.**, Beckett, S.J., Taniguchi, D.A.A., Weitz, J., Follows, M.J. (2019). An empirical model of carbon transfer through marine viruses and microzooplankton grazers. *Environmental Microbiology*, 21, 2171-2181.

Nissimov, J.I., **Talmy, D.**, Haramaty, L., Fredricks, H., Zelzion, U., Eren, M., Gardella, R., Laber, C., More, K.D., Bhattacharya, D., Follows, M.J., Coolen, M.J.L., Van Mooy, B.A.S., Bidle, K.D. (2019) Biochemical diversity of sphingolipid biosynthesis as a driver of algal-virus competitive ecology. *Environmental Microbiology*. 21, 2182-2197.

**Talmy, D.**, Beckett, S.J., Taniguchi, D.A.A., Weitz, J., Follows, M.J. (2019). Contrasting controls on microzooplankton grazing and viral infection of microbial prey. *Frontiers in Marine Science*. 6, 1-12.

Thamatrakoln, K., **Talmy, D.**, Haramaty, L., Maniscalco, C., Latham, J., Natale, F., Coolen, M.J.L., Follows, M.J., Bidle, K.D. (2018). Light-dependent regulation of coccolithophore host-virus interactions. *New Phytologist*. 221, 1289-1302.

Omta, A.W., **Talmy, D.**, Sher, D., Finkel, Z.V., Irwin, A.J., Follows, M.J. (2017). Extracting phytoplankton physiological traits from batch and chemostat culture data. *Limnology and Oceanography: Methods*, 15, 453-466.

Record, N.R., **Talmy, D.**, Våge, S. (2016). Quantifying tradeoffs for marine viruses. *Frontiers in Marine Science*, 3, 251.

Li, G., **Talmy, D.**, Campbell, D.A. (2016) Diatom responses to photoperiod and light are predictable from diel reductant generation. *Journal of Phycology*, 10.1111/jpy.12483-16-032.

Lopez, J.S., Garcia, N.S., **Talmy, D.**, Martiny, A.C. (2016) Diel variability in the elemental composition of the marine cyanobacterium *Synechococcus*. *Journal of Plankton Research*, fbv120.

**Talmy, D.**, Martiny, A.C., Hill, C.N., Hickman, A.E., Follows, M.J. (2016) Microzooplankton regulation of surface ocean POC:PON ratios. *Global Biogeochemical Cycles*, 30, 1-22.

**Talmy, D.**, Blackford, J., Hardman-Mountford, N., Polimene, L. Follows, M.J. Geider, R.J., (2014) Flexible C:N ratio enhances metabolism of large phytoplankton when resource supply is intermittent. *Biogeosciences*, 11, 601-602.

**Talmy, D.**, Blackford, J., Hardman-Mountford, N., Dumbrell, A.J., Geider, R.J., (2013) An optimality model of phytoplankton photoadaptation in contrasting aquatic light regimes. *Limnology and Oceanography*, 58, 1802-1818.

### **Invited talks**

Talmy, D. Trade-offs between resource acquisition and defense shape cyanobacteria communities. University of Southern California, USA, October 13<sup>th</sup>, 2020 Host: *Dr. Naomi Levine*.

Talmy, D. Trade-offs modify ecosystem biomass structure along trophic gradients. SIMPLEX project kick-off meeting. University of Bergen, Norway, August 22<sup>nd</sup>, 2019 Host: *Dr. Selina Vage*.

Talmy, D. Inferring phytoplankton host-virus traits and trade-offs from laboratory population dynamics. Weizmann Institute of Science, Rehovot, Israel, August 14<sup>th</sup>, 2019. Host: *Prof. Assaf Vardi*.

Talmy, D. Understanding microbial ecosystem structure and function on large scales using mathematical models. American Society for Microbiology Annual Meeting, San Francisco, California, USA, June 21<sup>st</sup> 2019.

Talmy, D. Trait-based modeling of viruses in global ocean microbial ecosystems. Gordon Research Conference: Elucidating microbial processes across spatial and temporal scales. Lucca, Italy, July 5<sup>th</sup>, 2018.

Talmy, D. What controls virus dynamics in global ocean microbial ecosystems? University of Texas, Austin, USA, March 23<sup>rd</sup>, 2018. Host: *Prof. Patrick Heimbach*.

Talmy, D. What controls microbial predator-prey ratios in the global ocean? Lamont-Doherty Earth Observatory, Columbia University, New York, USA, October 2<sup>nd</sup>, 2017. Host: *Prof. Andrew Juhl*.

Talmy, D., Martiny, A.C., Hickman, A.E., Follows, M.J. Microzooplankton regulation of particulate organic matter elemental composition. Bigelow Laboratory for Ocean Sciences, Maine, USA, March 9<sup>th</sup>, 2016. Host: *Dr. Nicolas Record*.

Talmy, D., Martiny, A.C., Hickman, A.E., Hill, C.N., Follows, M.J. Microzooplankton regulation of surface ocean POC:PON ratios. Rutgers University, New Jersey, USA, December 15<sup>th</sup>, 2015. Host: *Dr. Jozef Nissimov*.

Talmy, D., Martiny, A.C., Hickman, A.E., Follows, M.J. Zooplankton regulation of particulate organic matter elemental composition. National Oceanography Center, Southampton, UK, November 10<sup>th</sup>, 2015. Host: *Dr. Anna Hickman*.

### **Selected Oral Presentations**

Talmy, D., Vage, S., Cael, B.B., Follows, M.J. Trade-offs modify ecosystem biomass structure along trophic gradients. 4<sup>th</sup> workshop on trait-based approaches to ocean life, Buckinghamshire, UK, Aug 18<sup>th</sup>, 2019.

Hinson, A., Talmy, D. What controls algal-virus population dynamics in diverse systems? Aquatic Sciences Meeting, San Juan, Puerto Rico, Feb 26<sup>th</sup>, 2019.

Talmy, D., Bidle, K.D., Kranzler, C., Thamatrakoln, K. Inferring nutrient and light sensitivity of phytoplankton host-virus metabolism from laboratory population dynamics. 9<sup>th</sup> Aquatic Virus Workshop, Lincoln, Nebraska, USA, June 20<sup>th</sup>, 2018.

Talmy, D., Zakem, E., Follows, M.J. Modeling competitive interactions among viruses and microzooplankton grazers in the global ocean. Ocean Sciences Meeting, Portland, Oregon, USA, February 15<sup>th</sup>, 2018.

Talmy, D., Follett, C.L., Follows, M.J. Does viral lysis influence dissolved organic matter elemental composition? Aquatic Sciences Meeting, Honolulu, Hawaii, USA, February 28<sup>th</sup>, 2017.

Talmy, D., Thamatrakoln, K., Bidle, K.D., Follows, M.J. How does viral infection of *Emiliana huxleyi* depend on ambient irradiance? Monteiro group meeting, University of Bristol, Bristol, UK, July 26<sup>th</sup>, 2016.

Talmy, D., Hussain, F., Follows, M.J. The influence of lytic vs. lysogenic viral reproduction on host-virus populations. 8<sup>th</sup> Aquatic Virus Workshop, Plymouth, UK, July 11<sup>th</sup>, 2016.

Talmy, D., Martiny, A.C., Hickman, A.E., Hill, C.N., Follows, M.J. Microzooplankton regulation of surface ocean POC:PON ratios. Ocean Sciences Meeting, New Orleans, Louisiana, USA, February 25<sup>th</sup>, 2016.

Talmy, D., Hussain, F., Follows, M.J. The influence of viral reproduction strategies on marine microbial community dynamics. Trait-based approaches to ocean life workshop, New Hampshire, USA, October 5<sup>th</sup>, 2015.

Talmy, D., Hussain, F., Follows, M.J. The influence of viral reproductive strategies on marine microbial community dynamics. Aquatic Sciences Meeting, Granada, Spain, February 27<sup>th</sup>, 2015.

Talmy, D., Hardman-Mountford, N.J., Blackford, J.C., Geider, R.J. Phytoplankton photoadaptation in contrasting aquatic light regimes. Ocean Sciences Meeting, Honolulu, Hawaii, USA, February 27<sup>th</sup>, 2014.

Talmy, D., Hardman-Mountford, N.J., Blackford, J.C., Polimene, L., Hill, C.N., Follows, M.J., Geider, R.J. Phytoplankton photoadaptation in contrasting aquatic light regimes. Sack Lunch Seminar Series, Department of Earth, Atmosphere and Planetary Sciences, Massachusetts Institute of Technology, Massachusetts, USA, October 23<sup>rd</sup>, 2013.

Talmy, D., Blackford, J., Hardman-Mountford, Geider, R.J. Adaptation to variable light determines resource allocation in phytoplankton. Ocean Sciences Meeting, Salt Lake City, Utah, USA, February 23<sup>rd</sup>, 2012.

Talmy, D., Blackford, J., Hardman-Mountford, Geider, R.J. Modeling phytoplankton growth in non steady-state environments. Marine Sciences Seminar, Plymouth Marine Laboratory, Plymouth, UK, May 26<sup>th</sup>, 2011.

Talmy, D., Blackford, J., Hardman-Mountford, Geider, R.J. Modeling phytoplankton productivity in the open ocean: including the effects of adaptation to different light regimes. Marine Science and Environmental Microbiology Seminar, University of Essex, January 26<sup>th</sup>, 2011.

Talmy, D., Blackford, J., Hardman-Mountford, Geider, R.J. Optimality in phytoplankton growth models and the link with satellite data. NCEO Ocean Carbon Cycle Meeting, Plymouth, UK, July 15<sup>th</sup>, 2010.

### **Poster Presentations**

McCullough, D.K., Calfee, B., Zinser, E.R., Talmy, D. Connecting hydrogen peroxide damage and nutrient limitation controls on marine cyanobacterial growth. 4<sup>th</sup> workshop on trait-based approaches to ocean life, Buckinghamshire, UK, Aug 19<sup>th</sup>, 2019.

Papoulis, S.E., Wilhelm, S.W., Talmy, D., Zinser, E.R. Environmental nutrients explain the distribution of restriction modification systems in prokaryotic genomes. 4<sup>th</sup> workshop on trait-based approaches to ocean life, Buckinghamshire, UK, Aug 20<sup>th</sup>, 2019.

Talmy, D., Follett, C.L., Follows, M.J. Viral regulation of dissolved organic matter elemental composition. Viruses of Microbes Meeting, Liverpool, UK, July 19<sup>th</sup>, 2016.

Talmy, D., Blackford, J., Hardman-Mountford, Geider, R.J. Phytoplankton optimal resource allocation in response to variable light intensity. Advances in Marine Ecosystem Modelling Research (AMEMR) Symposium, Plymouth, UK, June 28<sup>th</sup>, 2011.

Talmy, D., Blackford, J., Hardman-Mountford, Geider, R.J. Optimality in phytoplankton growth models and the link with satellite data. Advanced School on Complexity, Adaptation and Emergence in Marine Ecosystems, Trieste, Italy, October 21<sup>st</sup>, 2010.

### **Workshops and Summer Schools**

2020	NIMBioS/SCMB Investigative Workshop on Quantitative Education in Life Sciences Graduate Programs, Virtual
2019	4 <sup>th</sup> workshop on trait-based approaches to ocean life, Buckinghamshire, UK
2018	9 <sup>th</sup> Aquatic Virus Workshop, Lincoln, Nebraska, USA
2016	8 <sup>th</sup> Aquatic Virus Workshop, Plymouth, UK
2015	Trait-Based Approaches to Ocean Life Workshop, Waterville Valley, New Hampshire, USA
2015	Workshop for Development of macromolecular models of marine algae, Sackville, New Brunswick, Canada

- 2014 The Gordon and Betty Moore Foundation Research Associate and Postdoctoral Scholar Summit, Dorado, Puerto Rico
- 2014 North Atlantic Virus Infection of Coccolithophores Expedition (Na-VICE) post cruise meeting, Woods Hole Oceanographic Institution, Falmouth, Massachusetts, USA
- 2013 Trait and Resource Allocation Based Modeling of Microbial Communities, University of Exeter, UK
- 2013 Workshop for Understanding Microbial Macromolecular Composition, Haifa, Israel
- 2010 Advanced School on Complexity, Adaptation and Emergence in Marine Ecosystems, Trieste, Italy
- 2010 Earth System Science Spring School, Scarborough, UK
- 2010 Modeling Evolutionary and Ecological Processes in Biogeochemical Cycles, University of East Anglia, UK

### **Teaching Experience**

- 2020 Lecturer, Introduction to Microbiology (103 students), University of Tennessee, Knoxville
- 2018-2019 Graduate journal club in computational biology, University of Tennessee, Knoxville
- 2016 Invited lecturer, Hjort Summer school in Bergen, Norway: Complexity vs. simplicity in microbial ecology
- 2008 Associate Tutor, University of Sussex, UK. Courses taught: Linear algebra II and Introduction to Matlab
- 2007 High school classroom assistant as part of the Student Associate Scheme, Worthing High School, Worthing, East Sussex, UK

### **Mentorship**

#### *Undergraduates*

- 2020 Umang Joshi, Stephanie Westaway, Michael Lin, NIMBioS Research Experiences for Undergraduates, 6-week summer group research project.
- 2018-2019 Maitraya Ghatak, 401R, Undergraduate Research in Microbiology.
- 2019 Lucas Fiet, Margie Knight, Priscilla Cho, NIMBioS Research Experiences for Undergraduates, 10-week summer group research project.
- 2019 Aaron Lin, NSF Research Experiences for Undergraduates, 10-week summer research placement
- 2018 Brielle Shortreed, NSF Research Experiences for Undergraduates, 10-week summer research placement.

#### *Graduate students*

- 2018-present Katie McCullough, Microbiology Graduate Student, Project TBD
- 2018-present Kyla Linn, Genome Science and Technology Graduate Student, Project TBD

#### *Postdoctoral researchers*

2020-present Dr. Harshana Rajakaruna  
 2020-present Dr. Spiro Papoulis  
 2018-2020 Dr. Audra Hinson

### Professional Service and Outreach

Ongoing Reviewer, *Nature Communications*, *Nature Ecology and Evolution*, *Science Advances*, *The ISME Journal*, *The American Naturalist*, *Limnology and Oceanography*, *Global Biogeochemical Cycles*, *Biological Invasions*, *Biophysical Journal*, *New Biotechnology*, *Journal of Theoretical Biology*, *Marine Ecology Progress Series*, *PLOS ONE*, *Frontiers in Marine Science*, *Journal of Marine Systems*

2016-2018 Volunteer, development of an interactive web app for high school students to learn about scientific modeling, with Janice McDonnell and Carrie Ferraro in the Department of Marine and Coastal Sciences (DMCS) at Rutgers University

2019 NSF Biological Oceanography, mail-in reviewer

2017 NASA panelist, EXPORTS program

2015-2016 Interviewee for outreach movie for high school students to learn about scientific modeling, collaboration between Tilapia Film (Los Angeles) and scientists in the DMCS at Rutgers University

2016 Demonstrator, The 6<sup>th</sup> Annual John Carlson Lecture, New England Aquarium

2016 Demonstrator, Oceans Alive! Display for MIT Open House

2014 Demonstrator, Nautical Night at the MIT Museum

2011-2012 STEMNET (Science, Technology and Engineering Network) Ambassador (various locations)

2011 Researcher in Residence, Ridgeway School (now Plympton Academy), Plympton, UK

### Grants and Awards

2020-2024 NSF Principle Investigator award (\$913,189) “*Characterizing the effects of exogenous reactive oxygen species on marine microbial ecosystem dynamics*” ID number: OCE-2023680

2020-2023 Simons Early Career Investigator in Marine Microbial Ecology and Evolution Award (\$666,000). ID number: 690671

2018-2020 Burroughs Wellcome Fund (\$150,000): “*Enhancing Quantitative and Data Science Education for Graduate Students in Biomedical Science at the University of Tennessee, Knoxville*” ID number: 1018963

2015-2019 NSF Co-Principle Investigator award (\$326,864): “*Elucidating algal host-virus dynamics in different nutrient regimes - mechanistic interactions and biogeochemical impact*. ID number: OCE-1536521.

2009-2013 National Centre for Earth Observation PhD studentship

2009 NERC subsidy to attend Earth System Science Spring School

2008-2009

NERC Masters studentship