

## **CURRICULUM VITAE**

### **General Research Interests:**

Biological oceanography, marine primary production, the fate of carbon and the biological pump, phytoplankton physiology and ecology, marine virus ecology and diversity, host-virus interactions, pathogen competition for the host, pathogen transmission, molecular evolution, genetic expression, genome analysis and comparison, biogeography of marine viruses, polar microorganisms and their diversity, and coral health and disease.

### **Employment:**

**October 2013 - present** Postdoctoral Research Associate at the Department of Marine and Coastal Sciences, Rutgers University, USA (with Prof. Kay D. Bidle).

**March 2013 - June 2013** Research Assistant at the Department of Plant Sciences, Oxford University, UK. Project: "CO<sub>2</sub> irrigation of commercially valuable algae and crops in desert conditions" (with Prof. Liam Dolan and Tim Kruger).

**October 2008 - May 2012** Microbiology Laboratory Teaching Assistant, Plymouth University, UK (part-time, with Dr. Colin B. Munn, retired).

**March 2000 - March 2003** Medic, Radar and Communication Officer, Israeli Navy (obligatory national service program).

### **Guest Investigator:**

**February 2014 - January 2015** Guest investigator at the Department of Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution, USA (with Prof. Benjamin Van Mooy).

### **Education:**

**2009 - 2013** PhD in Biosciences, "Ecological and functional biodiversity in a marine algal-virus system" - Plymouth Marine Laboratory (UK) & University of Nottingham (UK). Advisors: Prof. Michael J. Allen, Dr. Susan A. Kimmance & Prof. Johnathan A. Napier.

**2008 - 2009** MSc Marine Biology (awarded a Distinction) - University of Plymouth (UK) & Marine Biological Association of the United Kingdom. Advisors: Dr. Susan A. Kimmance, Dr. Colin B. Munn & Prof. Michael J. Allen.

**2005 - 2008** BSc (Hons) Marine Biology (awarded a First Class degree) - University of Plymouth (UK). Research project advisors: Dr. Colin B. Munn (University of Plymouth, UK) & Prof. Eugene Rosenberg (Tel Aviv University, Israel).

### **Teaching and Student Advisor Experience:**

**2018** Guest lecturer on "Recombinant DNA technologies", University of North Carolina, Wilmington (USA).

**2017 - present** Project advisor to Alwin Mui, a senior student in the Bidle laboratory at Rutgers University. Subject of project: "Calcification and exopolymeric particle production in *Emiliania huxleyi* at nitrate-limiting conditions." The results of this project are expected to be included in a high-profile publication.

**2017 - present** Project advisor to Kevin Ma, a senior student in the Bidle laboratory at Rutgers University. Subject of project: "Can marine viruses stimulate phytoplankton growth and survival under environmental stress?" The results of this project are expected to be included in a high-profile publication.

**2016 - 2017** Project advisor to Lauren Palena, a senior student in the Bidle laboratory at Rutgers University. Subject of project: "The impact of nitrogen and phosphorous limitation on host fitness and viral production in the *Emiliana huxleyi*-*Coccolithovirus* model system". The student graduated with excellent grades and the data from her project will be included in a manuscript.

**2014 - 2015** Project advisor to Rebecca Vandzura, a senior student in the Bidle laboratory at Rutgers University. Subject of project: "Host resistance to virus infection and phenotypic diversity and infectivity of coccolithoviruses". The student presented data at international conferences, had some of her project data included in an published Nature Microbiology publication and a submitted Environmental Microbiology manuscript, and subsequently was accepted to grad school.

**2013** Guest lecturer at the University of Edinburgh (UK), "Algal-virus interactions in the marine environment".

**2008 - 2012** University of Plymouth, School of Marine Science and Engineering, teaching assistant in the Graduate program in Marine Biology: 'Introduction to Marine Microbiological and Molecular Practice in the Laboratory' (teaching and demonstrating laboratory methods to undergraduate students in laboratory practical classes).

### **List of Publications:**

Johns CT, **Nissimov JI**, Natale F, Knapp V., Mui A, Fredricks H, Van Mooy BAS & Bidle KD 'Through the looking glass': the mutual interplay between coccolithovirus infection and cellular PIC quotas in *Emiliana huxleyi*, *Environmental Microbiology*, in review.

**Nissimov JI**, Talmy D, Gardella R, Fredricks H, Zelzion U, Laber C. Schieler B, Coolen MJL, Bhattacharya D, Follows M, Van Mooy BAS & Bidle KD 'Survival of the slowest: Biochemical diversity of Coccolithovirus-derived serine palmitoyltransferase and its impact on host demise' in prep for *PNAS*.

Laber CP, Hunter JE, Carvalho AF, James R. Collins JR, Hunter E, Schieler B, Boss E, More K, Frada M, Thamatrakoln K, Brown CM, Haramaty L, Ossolinski J, Fredricks H, **Nissimov JI**, Gardella R, Sheyn U, Lehahn Y, Chant RJ, Martins AM, Coolen MJL, Vardi A, DiTullio GR, Van Mooy BAS & Bidle KD (2018) 'Coccolithovirus stimulation of carbon export in the North Atlantic', *Nature Microbiology*, 10.1038/s41564-018-0128-4.

**Nissimov JI**, Vandzura R, Johns CT, Haramaty L, Natale F & Bidle KD (2018) 'Transparent exopolymeric particle production, and cell aggregation during viral infection of the coccolithophore, *Emiliana huxleyi*', *Environmental Microbiology*, in press.

Thompson LR *et al.* and **The Earth Microbiome Project Consortium** (2017) 'A communal catalogue reveals Earth's multiscale microbial diversity' *Nature*, 551, 457-463.

**Nissimov JI** & Bidle KD 'Stress, death, and the biological glue of sinking matter' (2017) *Journal of Phycology*, 53 (2), 241–244.

**Nissimov JI**, Pagarete A, Ma F, Cody S, Dunigan DD, Kimmance SA & Allen MJ (2017) 'Coccolithoviruses: a review of genomic thievery and metabolic thuggery' *Viruses*, 9 (3), 52; doi:10.3390/v9030052.

**Nissimov JI**, Napier JA, Allen MJ & Kimmance SA (2016) 'Intragenus competition between coccolithoviruses: an insight on how a select few can come to dominate many' *Environmental Microbiology*, 18(1), 133–145.

**Nissimov JI**, Napier JA, Kimmance SA & Allen MJ (2014) 'Permanent draft genomes of four new coccolithoviruses: EhV-18, EhV-145, EhV-156 and EhV-164' *Marine Genomics*, 15: 7-8.

**Nissimov JI**, Jones M, Napier JA, Munn CB, Kimmance SA & Allen MJ (2013) 'Functional inferences of environmental coccolithovirus biodiversity' *ViroSin*, 28 (5): 291-302.

Sperling M, Piontek J, Gerdtts G, Wichels A, Schunck H, Roy A-S, La Roche J, Gilbert J, **Nissimov JI**, Bittner L, Romac S, Riebesell U & Engel A. (2013) 'Effect of elevated CO<sub>2</sub> on the dynamics of particle-attached and free-living bacterioplankton communities in an Arctic fjord' *Biogeosciences*, 10: 181-191.

Roy A-S, Gibbons SM, Schunck H, Owens S, Caporaso JG, Sperling M, **Nissimov JI**, Romac S, Bittner L, Riebesell U, LaRoche J & Gilbert JA (2013) 'Ocean acidification shows negligible impacts on high-latitude bacterial community structure in coastal pelagic mesocosms' *Biogeosciences*, 10: 555-566.

Allen MJ, Tait K, Mühling M, Weynberg K, Bradley C, Trivedi U, Gharbi K, **Nissimov JI**, Mavromatis K, Jensen CN, Grogan G & Ali ST (2012) 'Genome Sequence of *Stenotrophomonas maltophilia* PML168, Which Displays Baeyer-Villiger Monooxygenase Activity' *Journal of Bacteriology*, 194 (17): 4753-4754.

**Nissimov JI**, Worthy CA, Rooks P, Napier JA, Kimmance SA, Henn MR, Ogata H & Allen MJ (2012) 'Draft genome sequence of the coccolithovirus EhV-202' *Journal of Virology*, 86 (4): 2380-2381.

**Nissimov JI**, Worthy CA, Rooks P, Napier JA, Kimmance SA, Henn MR, Ogata H & Allen MJ (2012) 'Draft genome sequence of four coccolithoviruses: EhV- 88, EhV- 201, EhV-207 and EhV-208' *Journal of Virology*, 86 (5): 2896-2897.

**Nissimov JI**, Worthy CA, Rooks P, Napier JA., Kimmance SA, Henn MR, Ogata H & Allen MJ (2011) 'Draft genome sequence of the coccolithovirus EhV-84' *Standards in Genomic Sciences*, 5: 1-11

**Nissimov JI**, Worthy CA, Rooks P, Napier JA, Kimmance SA., Henn MR, Ogata H & Allen MJ (2011) 'Draft Genome Sequence of the Coccolithovirus *Emiliana huxleyi* Virus 203' *Journal of Virology*, 85 (24): 13468–13469.

**Nissimov J**, Rosenberg E & Munn CB (2009) 'Antimicrobial properties of resident coral mucus bacteria of *Oculina patagonica*' *FEMS Microbiology Letters*, 292: 210–215.

#### **Competitive Funding Awards and Successful Grant Applications:**

**2015** NSF Biological Oceanography grant in collaboration with MIT: "Collaborative Research: Elucidating algal host-virus dynamics in different nutrient regimes- mechanistic interactions and biogeochemical impact": **\$808,437** (shared between Rutgers and MIT).

**2011** Natural Environmental Research Council (NERC) NBAF competitive award for the sequencing and annotation of four new algal viruses: **\$ 4061**.

**2011** Travel and accommodation grant to attend and speak at the Aquatic Virus Workshop 6 (AVW6) in the Netherlands, provided by the Broad Institute in the US: **\$ 1000**.

**2010** Travel and accommodation grant from the Society for General Microbiology (SGM) to attend their annual spring conference in Edinburgh, UK: **\$ 630**.

**2010** Travel grant from the International Society for Microbial Ecology (ISME) to attend and present at the ISME13 conference in Seattle, US: **\$ 650**.

**2010** Travel grant from the Challenger Society for Marine Science to attend and present at the ISME13 conference in Seattle, US: **\$ 400**.

**2010** Travel grant from the SGM society to attend and present at the ISME13 in Seattle, US: **\$ 800**.

**2010** Collaborative Gearing Scheme pilot study with the British Antarctic Survey (BAS) (CGS-66): a two-month pilot study in Antarctica was fully subsidized by BAS.

#### **Ad Hoc Journal Reviewer:**

PNAS, PlosOne, Environmental Microbiology, FEMS Microbiology, Journal of Plankton Research, Viruses, Virologica Sinica, Virus Genes.

### **Editorial:**

Review Editor for *Frontiers in Microbiology* and *Frontiers in Marine Science*.

### **Funding Agencies Reviewer:**

NSF's Bio-OCE (USA).

### **Outreach:**

**2015 - present** Development of short videos about marine science as an educational tool for children aged 12-18 (as part of a 2015 NSF funded grant and the national Next Generation Teaching Standards). <http://toolsforscience.org/index.html>

**2014 & 2018** Science judge for the annual Shore Bowl competition in New Jersey (a regional academic competition for high school students in NJ, NY, and PA that focuses on ocean-related topics).

**2011 - 2013** Committee member of a discussion panel funded by the MOORE foundation regarding the development of the online science resource- VERVE Net (the Viral Ecology Research and Virtual Exchange Network, <https://www.protocols.io/g/verve-net>).

**2011** Annual lecture series at the University of Edinburgh, UK.

**2011** Nissimov J. "With James Cook on the Atlantic Meridian" *Objects* 9 (27): 10-14 (article in a Bulgarian popular science magazine).

**2010** Nissimov J. "Moments from the country of the midnight sun" *Objects* 11(17): 54-59 (article in a Bulgarian popular science magazine).

**2009** Marine Biological Association of the UK public science days.

### **Scientific Cruise and Fieldwork Experience:**

**2017 (May-June)** Mesocosm experiment in the Norwegian fjord near Bergen, Norway. The projects aims were to investigate host-virus interactions (in particularly *E. huxleyi* and its viruses) at different nutrient and light regimes. Sampling included FlowCam imaging of aggregates, filtration for transparent exopolymeric particles (TEP), biomass collection from different depths for protein and nucleic acid extraction, flow cytometry, particulate inorganic and organic (PIC/POC) samples, filters for scanning electron microscopy (SEM) imaging, dissolved nutrient analysis, scuba diving for sediment trap material, polar lipid analysis etc.; in addition to land based incubations.

**2015 (April)** Science cruise sampling for marine virus fingerprinting off the coast of Hawaii (Station ALOHA) onboard the R/V Kilo Moana, in collaboration with the Centre for Microbial Oceanography: Research and Education (CMORE) at the University of Hawaii at Manoa.

**2014 (July-August)** Central California Current System (CCS) diatom cruise, onboard the R/V Melville. Duties included flow cytometry, deck-board Fe and Si enrichment incubation experiments, sample collection from CTDs and GeoFISH trace-metal clean water for DNA, RNA and Protein analysis of diatoms and associated viruses, and tangential flow filtration (TFF) for total viral community concentration for downstream analysis.

**2010 (December) - 2011 (February)** Collaborative project with the British Antarctic Survey (BAS) at Rothera research station, Adelaide Island, Antarctica (water filtration for virus and host DNA isolation).

**2010 (October-November)** Atlantic Meridional Transect 20 (AMT 20). A 46-day research cruise from Southampton (UK) to Punta Arenas (Chile) onboard the NERC ship RRS James Cook. Duties included water collection from CTD rosette bottles, filtration for virus and host DNA extraction, preservation of live samples in fixatives for flow cytometry, and the isolation of

new algal viruses.

**2010 (May-July)** European Project on Ocean Acidification (EPOCA): Arctic Campaign. Mesocosm experiment in the Fjord near Ny-Alesund Research Station, Svalbard, conducted in collaboration with scientists from more than 30 countries. Duties included experimental setup, and sample filtration, biomass capture and eventually the isolation of bacterial and archaeal DNA and RNA for metagenomics and metatranscriptomics.

### **Skills:**

**Laboratory:** DNA, RNA and protein extraction and quantification, protein 3D modelling and structure prediction, total lipid extraction from cultures and analysis on LCQ mass-spectrometry, C14 enzyme specific activity assays, PCR, qPCR, polony method for detection and identification of viruses and their hosts, DGGE, microarrays, clone libraries, primer design, scanning electron microscopy, light microscopy, algal and bacterial culturing, chemostat operation, bacterial antibiotic assays, virus plaque assays, most probable number method for virus titre, flow cytometry (BD Accuri & FACSCAN), virus isolation from field samples, virus concentration by TFF and FeCl precipitation, virus purification by CsCl gradients and PEG precipitation, virus particle preparation for transmission electron microscopy, FIRE (Fluorescence Induction and Relaxation) analysis of algal cultures and field samples for photosynthetic activity and efficiency, PIC/POC/PON and DOC analysis of field and culture samples, FlowCam imaging of particles and cells, transparent exopolymeric particle (TEP) analysis and quantification, etc.

**Bioinformatics and software:** WinMDI 2.9, ODV, BLAST, EMBI, IMG/ER, GOS, Artemis, ACT, DNA plotter, BioEdit, TreeView, DNA dotplot, MEGA6, SEQUIN, MAUVE, Pregap4, JalView, Imagene9, Spotfinder, Jmol, Strap, Swiss PDB viewer 4.1.0, Chimera (protein structure analysis tool), Xcalibur lipid analysis tool, etc.

### **Professional Memberships:**

**2013 - present** The International Society for Viruses of Microorganisms (ISVM).

**2012 - present** Association for the Sciences of Limnology and Oceanography (ASLO).

**2010 - 2013** International Society for Microbial Ecology (ISME).

**2009 - 2011** Society for General Microbiology (SGM).

**2009 - 2011** Challenger Society for Marine Sciences.

**2007 - 2009** Marine Biological Association of the United Kingdom.

### **Oral and Poster Presentations:**

**2018** Invited lecture at the University of North Carolina, Wilmington (USA). Oral presentation- "Microbial interactions and arms races at sea, and their interplay with ocean biogeochemistry"

**2018** Invited lecture at the Southern University of Science and Technology, Shenzhen (China). Oral presentation- "Microbial interactions and arms races at sea, and their interplay with ocean biogeochemistry"

**2018** Rutgers Microbiology Symposium, Rutgers, NJ (USA). Poster presentation- "Transparent exopolymeric particle production and cell aggregation during viral infection of the coccolithophore, *Emiliana huxleyi*".

**2018** Ocean Sciences, Portland, Oregon (USA). Oral presentation- "The Competitive Ecology of Coccolithoviruses".

**2018** Ocean Sciences, Portland, Oregon (USA). Poster presentation- "Transparent exopolymeric particle production and cell aggregation during viral infection of the coccolithophore, *Emiliana huxleyi*".

**2016** Viruses of Microbes, Liverpool, UK. Poster presentation- “The impact of biochemical diversity on info-chemical production and viral demise of *Emiliana huxleyi*”.

**2016** Aquatic Virus Workshop (AVW8), Plymouth, UK. Oral presentation- “The impact of biochemical diversity on info-chemical production and viral demise of *Emiliana huxleyi*”.

**2015** Association for the Sciences of Limnology and Oceanography (ASLO), Granada, Spain. Oral presentation- “The impact of biochemical diversity on infochemical production and viral demise of *Emiliana huxleyi*”.

**2013** Aquatic Virus Workshop (AVW7), St. Petersburg, USA, Poster presentation- “Infection dynamics of coccolithoviruses: the virus fight-club”

**2013** DMCS, Rutgers University seminar series, oral presentation- “Ecological and functional biodiversity in a marine-algal-virus system”.

**2013** Association for the Sciences of Limnology and Oceanography (ASLO), New Orleans, USA. Oral presentation: “Protein fold differences in the coccolithovirus-encoded serine palmitoyltransferase and its possible implications for the demise of *Emiliana huxleyi*.”

**2011** University of Nottingham (UK) annual postgraduate symposium. Poster presentation: “The genetic diversity of Coccolithoviruses and their biogeography”.

**2011** British Antarctic Survey, 10<sup>th</sup> Antarctic Funding Initiative Workshop. Oral presentation: “The genetic diversity of Coccolithoviruses and their biogeography”.

**2011** Aquatic Virus Workshop (AVW6), Netherlands. Oral presentation - “Coccolithovirus genomes: same, same but different”.

**2010** SGM spring conference in Edinburgh, UK. Poster presentation: “Host-virus dynamics within the *Emiliana huxleyi* system: the effects of host fitness, phosphate availability and virus strain variability”.

**2010** International Symposium on Microbial Ecology 13, Seattle, USA. Oral presentation: “Ecological and functional biodiversity in a marine algal virus system”.

### **Other Training and Course Participation:**

**2018** Science Communication course at Rutgers University.

**2017** PADI rescue diver and first aid.

**2015** “Polony” workshop on the development and implementation of liquid phase PCR techniques, Technion University, Israel.

**2014** Gordon and Betty Moore foundation workshop in Puerto Rico for establishing collaborations among postdoctoral associates in the field of marine sciences.

**2012** EU-US Training in Marine Bioinformatics (Bremen, Germany).

**2011** Mesocosms in Aquatic Ecology: use, problems and potentials (MESOAQUA PhD course, Kiel, Germany).

**2009** Introduction to Bioinformatics (Edinburgh University, UK).

**2009** Environment Yes (Bio-entrepreneur course and competition, Oxford, UK).

**Languages:**

English (fluent), Bulgarian (mother tongue), Hebrew (as fluent as mother tongue) and Russian (elementary).

**References:**

Prof. Kay D. Bidle (bidle@marine.rutgers.edu), Rutgers University, USA; current Postdoctoral advisor.  
Prof. Michael J. Allen (mija@pml.ac.uk), Plymouth Marine Laboratory, UK; PhD advisor.  
Prof David D. Dunigan (ddunigan2@unl.edu), Nebraska Center for Virology, USA; collaborator.  
Prof. Mick Follows (mick@mit.edu), Massachusetts Institute of Technology, USA; NSF grant collaborator.  
Prof. Benjamin Van Mooy (bvanmooy@whoi.edu), Woods Hole Oceanographic Institution, USA; collaborator.  
Dr. Susan A. Kimmance (sukim@pml.ac.uk), Plymouth Marine Laboratory, UK, PhD advisor.  
Dr. Colin B. Munn (C.Mun@plymouth.ac.uk) University of Plymouth, UK; BSc and MSc advisor (retired).