

Curriculum Vitae for Jessica Louise Ray

PERSONAL INFORMATION

Name: Ray, Jessica Louise
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Date of birth: 05.12.1976
Sex: Female
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EDUCATION

1999 BSc Biology, University of Dallas, Texas, USA
2002 MSc Microbial Biology, University of California at Berkeley, California, USA
2007 PhD, University of Tromsø The Arctic University of Norway, Norway (21.04.2007)
Title: Natural transformation with chromosomal DNA in bacteria: occurrence and determinative factors

CURRENT AND PREVIOUS POSITIONS

2007-2008 Postdoctoral Researcher, Lincoln University, New Zealand
2009-2012 Postdoctoral Researcher, University of Bergen, Norway
2012-2015 Postdoctoral Researcher, Uni Research Environment, Bergen, Norway
2016-2020 Adjunct researcher (20% Researcher II), University of Bergen, Norway
2015-2018 Researcher (Researcher II), Uni Research Environment, Bergen, Norway
2018- Senior Researcher, NORCE Norwegian Research Centre AS, Norway

FELLOWSHIPS AND AWARDS

2007 AgMARDT Postdoctoral Fellowship, Lincoln University, New Zealand
2009 RCN FRIBIO Mobility Grant ("VIPMAP" nr. 186142), 140 kNOK
2013 Meltzer Foundation travel scholarship, 26.8 kNOK
2014 COST-EU STSM, host University of Glasgow, UK, 1700 EUR
2014 COST-EU STSM, host Friedrich Schiller University of Jena, Germany, 1350 EUR
2018 RCN KLIMAFORSK Mobility Grant ("aDNAPROX" nr 268062), 124 kNOK

MOBILITY

2003 Plant Research International, The Netherlands. 3-wk research visit (J.D. van Elsas)
2004 AgResearch, Canterbury, New Zealand. 6-wk research visit (M. O'Callaghan)
2004 Plant Research Int'l, The Netherlands. 5-wk research visit (L. van Overbeek)
2009 Rutgers University, 6-month research visit (K.D. Bidle)
2010 Université Paris-Sud, Orsay, France. 3-wk bioinformatics training (M.S. Dubow)
2014 University of Glasgow, UK. 2-wk bioinformatics training (C. Quince, U.Z. Ijaz)
2014 Friedrich Schiller University Jena. 2-wk data analysis (G. Pohnert)
2017 IS-AURORA. 4-day research exchange visit to Ifremer (R. Siano, K. Mertens)
2018 University of Glasgow, Scotland, UK. 6-mo bioinformatics training (U.Z. Ijaz)

SUPERVISION OF GRADUATE STUDENTS AND RESEARCH FELLOWS

Main supervisor: 1 PhD, 2 MSc; Co-supervisor: 2 PhD, 3 MSc

MSc supervisor Anine Veronica Grønlund, University of Bergen, Norway (2016-2018); Rachel Lima, University of Bergen, Norway (2019-2023).

PhD Supervisor Danielle Grant (2019-2023)

PhD Co-Supervisor Julia Endresen Storesund, University of Bergen, Norway (2011-2016); Torill Vik Johannessen, University of Bergen, Norway (2010-2015).

MSc Co-Supervisor Arna Kazazic, Uni Research Environment (2015-2017); Heidi Osmundsen, University of Bergen (2011-2013); Helga Andersen, University of Tromsø (2004-2005); Marius Nilsen, University of Bergen (2019-2020)

RESEARCH PROJECT FUNDING AS PROJECT LEADER

2018-2021 *VIROVAC*, Research Council of Norway (RCN) project 275710, 9.9 MNOK
2017-2018 *RECNOR*, Institute of Marine Research pilot initiative, 500 kNOK
2016-2017 *ABRes*, research commission from Norwegian Environmental Agency, 500 kNOK
2021-2024 *PATHDNA*, Research Council of Norway project 236900, 12 MNOK

ORGANISATION OF SCIENTIFIC MEETINGS

2011 Session Co-Chair at ASLO Aquatic Sciences Meeting, San Juan, Puerto Rico
2018 Co-organizer, 2nd Workshop on eDNA for Fisheries Mgmt, Tromsø, Norway
2019 Co-organizer, 3rd Workshop on eDNA for Fisheries Mgmt, Bergen, Norway

INSTITUTIONAL RESPONSIBILITIES

2013 Member of PhD appointment committee, University of Bergen, Norway
2013 External sensor for evaluation of MSc thesis, University of Tromsø, Norway
2013 Member of PhD appointment committee, University of Bergen, Norway
2013 External sensor for evaluation of MSc thesis, University of Tromsø, Norway
2014 Member of committee for laboratory renovation, Uni Research Environment
2016 Member of PhD appointment committee, University of Bergen, Norway
2018 Member of Postdoctoral appointment committee, University of Bergen, Norway
2019 External sensor for evaluation of MSc thesis, University of Tromsø, Norway
2022 External sensor for evaluation of MSc thesis, University of Tromsø, Norway

COMMISSIONS OF TRUST

Scientific Advisory Board, Hjort Centre for Marine Ecosystem Dynamics, Bergen, Norway (2015-2017)
Invited Round Table Participant, eDNA Workshop, Woods Hole Oceanographic Institute, USA (2018-present)
Co-Editor, NOAA and IMR internal white paper on eDNA as a tool for fisheries stock assessments and ecosystem-based fisheries management (2020)
Reviewer for Journals: Environmental Microbiology, Aquatic Microbial Ecology, Journal of Phytoplankton Research, Nature Scientific Reports, FEMS Microbiology Ecology, Viruses, Nature Ecology and Evolution, Marine Ecology Progress Series, Antibiotics, Water, Environmental Pollution

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

2009 Association for the Sciences of Limnology and Oceanography (ASLO), regular member
2010 American Association for the Advancement of Science (AAAS), regular member

SEA-GOING EXPEDITIONS AND FIELD WORK

2012 Participant in 3-wk RCN PHAEONIGMA mesocosm experiment, Bergen, Norway
2013 Participant on 8-day RCN PHAEONIGMA cruise from Norway to Barents Sea
2014 Participant on 8-day RCN MicroPolar cruise from Norway to Svalbard
2015 Participant in 2-wk RCN MicroPolar mesocosm expt, Ny Ålesund, Svalbard, Norway
2018-2021 Cruise leader for day cruises funded by RCN Project VIROVAC, Vestlandet, Norway
2021 Participant in 2-wk ERC AGENSI cruise to Fram Strait and Yermak Plateau
2021 Cruise leader for water sampling campaign at Hywind Scotland offshore wind farm
2022 Participant in 10-day Arctic sea ice cruise to Svalbard

COURSES AND CERTIFICATION

2019 Cruise Leader Course, Institute of Marine Research, Bergen, Norway
2019 Survival Suit Course, RelyOnNutec, Bergen, Norway
2021 Seafarer's Health Certificate, Bergen, Norway

MAJOR COLLABORATIONS

Ruth-Anne Sandaa, **Gunnar Bratbak**, University of Bergen: marine microbial food web; **Stijn De Schepper**, NORCE Climate and Bjerknes Centre for Climate Research, molecular palaeoceanography - sedimentary ancient DNA as sea ice proxy (aDNAPROX and AGENSI). **Kay D. Bidle**, Rutgers University, USA: programmed cell death in marine phytoplankton; **Janice Lawrence**, University of New Brunswick, Canada: role of appendicularians (Chordata:Tunicata)

in marine viral ecology; **Umer Z. Ijaz**, University of Glasgow: bioinformatic and statistical analysis of high-throughput sequencing data; **Olav Kjesbu, Martina Stiasny**, Institute of Marine Research, Bergen, Norway: molecular quantification of predation pressure on Norwegian spring-spawning herring (RECNOR); **Anders Lanzén**, AZTI, Spain: bioinformatic and statistical analysis of sediment metabarcoding for environmental monitoring (MetaMon); **Eric Thompson**, University of Bergen: metabarcoding for environmental monitoring and appendicularian trophic ecology; **Kristi Miller-Saunders**, Fisheries and Oceans Canada: quantitative molecular monitoring of fish pathogen eDNA/eRNA in association with sea-based open aquaculture

TRACK RECORD

Scientific Experience and Achievements

Since the completion of my PhD in 2007 I have worked to establish competence in the field of molecular microbial ecology, first in terrestrial ecosystems and now in aquatic environments. In addition to my project leader role in two research projects (VIROVAC and PATHDNA), I am work package leader for two research projects, including the ERC Consolidator Grant *AGENS!* (818449) (see Major Collaborations above) and the Norway-Poland collaborative project *NEEDED*. My role in these projects is to oversee the development and implementation of molecular biological research tools for the investigation of basic and applied ecology in aquatic environments. In the Molecular Ecology Research Group at NORCE Environment I am also participating in national and international initiatives to map, benchmark and utilize eDNA for the purposes of environmental monitoring.

In the track record, please list:

1. The total number of publications during the career: 25

Publications (source for number of citations: Publons and GoogleScholar)

2004. Koenig RL, **Ray JL**, Maleki SJ, Smeltzer MS, Hurlburt BK. *Staphylococcus aureus* AgrA binding to the RNAIII-agr regulatory region. *Journal of Bacteriology* 15, 7549-7555. (123 citations)

2009. **Ray JL**, Harms K, Wikmark O-G, Johnsen PJ and Nielsen KM. 2009. Sexual isolation in *Acinetobacter baylyi* is locus-specific and varies 10,000-fold over the genome. *Genetics* 182, 1165-1181. (23 citations)

2009. Clough TJ, **Ray JL**, Buckthought LE, Calder J, Baird D, O'Callaghan M, Sherlock RR and Condron LM. The mitigation potential of hippuric acid on bovine urine N₂O emissions: an *in situ* determination of its effect. *Soil Biology and Biochemistry* 41, 2222-2229. (39 citations)

2011. Ogata H, **Ray JL**, Toyoda K, Sandaa R-A, Nagasaki K, Bratbak G and Claverie J-M. Two new subfamilies of DNA mismatch repair proteins (MutS) specifically abundant in the marine environment. *ISME Journal* 5, 1143-1151. (40 citations)

2012. **Ray JL**, Dondrup M, Modha S, Steen IH, Sandaa R-A and Clokie MJ. Finding a needle in the virus metagenome haystack - micro-metagenome analysis captures a snapshot of the diversity of a bacteriophage armoire. *PLoS One* 7, e34238. doi: 10.1371/journal.pone.0034238. (17 citations)

2012. **Ray JL**, Töpper B, An S, Silyakova A, Spindelböck J, Thyrhaug R, DuBow MS, Thingstad TF and Sandaa R-A. Effect of increased pCO₂ on bacterial assemblage shifts in response to glucose addition in Fram Strait seawater mesocosms. *FEMS Microbiology Ecology* 82, 713-723, doi: 10.1111/j.1574-6941.2012.01443.x. (13 citations)

2014. **Ray JL**, Haramaty L, Thyrhaug R, Fredricks H, Van Mooy B, Larsen A, Bidle KD and Sandaa R-A. Virus infection of *Haptolina ericina* and *Phaeocystis pouchetii* implicates evolutionary conservation of programmed cell death induction in marine haptophyte-virus interactions. *Journal of Plankton Research* 36, 943-955. (6 citations)

2016. **Ray JL**, Skaar KS, Simonelli P, Larsen A, Sazhin A, Jakobsen HH, Nejstgaard JC, Troedsson CT. Molecular gut content analysis demonstrates that *Calanus* grazing on *Phaeocystis pouchetii* and *Skeletonema marinoi* is sensitive to bloom phase but not prey density. *Marine Ecology Progress Series* 542: 63-77. (5 citations)

2016. **Ray JL**, Althammer J, Skaar KS, Simonelli P, Larsen A, Stoecker D, Sazhin A, Ijaz UZ, Quince C, Nejstgaard JC, Frischer M, Pohnert G, Troedsson CT. Metabarcoding and metabolome analysis of copepod grazing reveals feeding preference and linkage to metabolite classes in dynamic microbial plankton communities. *Molecular Ecology* 216: 5585-5602. (18 citations)

2018. Lawrence J, Töpper JP, Petelenz-Kurdziel E, Bratbak G, Larsen A, Thompson E, Troedsson C, **Ray JL**. Viruses on the menu: The appendicularian *Oikopleura dioica* efficiently removes viruses from seawater. *Limnology & Oceanography* 63(S1): S244-S253. (4 citations)

- 2019.** De Schepper S, **Ray JL**, Skaar KS, Sadatzki H, Ijaz UZ, Stein R, Larsen A. The potential of sedimentary ancient DNA for reconstructing past sea ice evolution. *The ISME Journal*, doi:10.1038/s41396-019-0457-1. (4 citations)
- 2020.** Brown TA, Rad-Menéndez C, **Ray JL**, Skaar KS, Thomas N, Ruiz-Gonzalez C, Leu E. Influence of nutrient availability on Arctic sea ice diatom HBI lipid synthesis. *Organic Geochemistry* 20: 103977. doi: <https://doi.org/10.1016/j.orggeochem.2020.103977>. (1 citation)
- 2020.** Kutti T, Johnsen IA, Skaar KS, **Ray JL**, Husa V, Dahlgren TG. Quantification of eDNA to map the distribution of cold-water coral reefs. *Frontiers in Marine Science* 7: 446. doi: 10.3389/fmars.2020.00446.
- 2020.** **Ray JL**, Strom M, Johansen T, Goodwin K (eds.) UNIG (U.S.–Norway Intergovernmental Group on eDNA Implementation for Fisheries Stock Assessments and Management). Implementation of Environmental DNA (eDNA) as a Tool for Ecosystem-Based Fisheries Management. U.S. Department of Commerce, NOAA White Paper NMFS- NWFSC-WP-2020-01. doi: <https://doi.org/10.25923/e736-vn83>.
- 2021.** Allan BJM, **Ray JL**, Tiedemann M, Stiasny MH, Skaar KS, Folkvord A, Nash RDM, Stenevik EK, Komyakova V, Vikebø F, Kjesbu OS. Quantitative molecular detection of Atlantic herring (*Clupea harengus*) identifies regions of high predation pressure by Atlantic mackerel (*Scomber scombrus*) along the Northern Norwegian continental shelf. *Scientific Reports* 11, 5095 (2021). <https://doi.org/10.1038/s41598-021-84545-7>
- 2021.** Ævarsson A et al. Going to extremes - a metagenomic journey into the dark matter of life. *FEMS Microbiology Letters*, in press.
- 2021.** Mayers KMJ, Lawrence J, Skaar KS, Töpper JP, Petelenz E, Saltvedt MR, Sandaa R-A, Larsen A, Bratbak G, **Ray JL**. Impacts of feeding by the appendicularian *Oikopleura dioica* on large virus abundance and dispersal during *Emiliana huxleyi* bloom conditions. *Limnology & Oceanography*, in press. doi: 10.1002/lno.11935.
- 2021.** Dunshea G, Martell L, Bakken T, Budaeva N, Ekrem T, Tandberg AHS, Baussant T, De Boer H, Hestetun JT, Hobæk A, Kallioniemi EP, Larsen A, Markussen SS, Mauvisseau Q, **Ray JL**, Yoccoz N and Willassen E. Kunnskapstatus for bruk av molekylære verktøy i kartlegging og overvåkning av biologisk mangfold i marine miljø. Norwegian Environmental Agency, report M-2062.