

MARGRETHE “GRETТА” H. SERRES

Research Associate III
Marine Chemistry and Geochemistry
Woods Hole Oceanographic Institution

266 Woods Hole Road, MS 51
Woods Hole, MA 02543
mserres@whoi.edu
508-289-3627

EDUCATION

1995 Ph.D., University of Wisconsin-Madison, Microbiology
1987 *Candidata magisterii* (B.S.), University of Bergen, Norway (Biology)
1985 Biomedical Engineer, Bergen School of Engineering, Norway

PROFESSIONAL EXPERIENCE

2018-present Research Associate III, Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution, Woods Hole, MA
2015-present Coordinator for Community College Research Internship Summer Experience (CC-RISE) Program, Woods Hole, MA
2014-present Adjunct Faculty Cape Cod Community College, West Barnstable, MA
2017-2018 Visiting Investigator, Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution, Woods Hole, MA
2014-2017 Adjunct Faculty, Marine Biological Laboratory, Woods Hole, MA
2010-2014 Associate Research Scientist, Josephine Bay Paul Center, Marine Biological Laboratory, Woods Hole, MA
2004-2010 Assistant Research Scientist, Josephine Bay Paul Center, Marine Biological Laboratory, Woods Hole, MA
2001-2004 Staff Scientist 1, Josephine Bay Paul Center, Marine Biological Laboratory, Woods Hole, MA
1999-2001 Postdoctoral Scientist, Josephine Bay Paul Center, Marine Biological Laboratory, Woods Hole, MA
1996-1998 Forsker (Research Scientist), Department of Anatomy and Cell Biology, University of Bergen, Norway
1996 Postdoctoral Scientist, Department of Medical Microbiology and Immunology, University of Wisconsin, Madison

HONORS AND AWARDS

2018 Whelan Grant, MC&G Department, WHOI
2017 Science Department’s Adjunct Faculty Appreciation Award, Cape Cod Community College
1995 Sigma Xi Research Society
1994 Gamma Sigma Delta

PROFESSIONAL AFFILIATIONS

American Society of Microbiology, Member
Marine Biological Laboratory Society, Member

RESEARCH INTERESTS

Microbial physiology and metabolism
 Interactions in microbial communities
 Culturing of microbes from environmental samples
 Comparative genome analyses.
 Adaptation of microbes to communities based on genome analyses.

PROFESSIONAL ACTIVITIES

2020-present Mentor for S-STEM scholar program at Cape Cod Community College
 2019 Member of MBL Society Nomination Committee
 2015-present Reviewer for JGI CSP Small Scale Microbial/Metagenome program
 2008-present Member, MBL Corporation, now MBL Society
 2001-present Ad hoc reviewer for; *Applied and Environmental Microbiology*,
Biodegradation, *Bioenergy*, *Bioinformatics*, *BMC Genomics*, *BMC*
Microbiology, *Frontiers in Systems Biology*, *Genome Research*,
ISME Journal, *Journal of Applied Microbiology*, *Journal of Bacteriology*,
Microbiology, *Molecular Microbiology*, *NSF*, *PLOS ONE*.
 2008 Colloquium, American Academy of Microbiology Report: Large Scale
 Sequencing: the future of genomic sciences?
 2008 Convened Session at American Society for Microbiology General
 Meeting, Boston, MA
 2004 Hosted *Shewanella* Federation Meeting, Woods Hole, MA

PATENTS

Serres, M.H., Fladmark, K.E., Døskeland, S.O. Cyanobacterial toxin detection assay.
 WP File no: 67505.598

COVER ILLUSTRATIONS:

Applied and Environmental Microbiology. 2011. 77(14)
Nucleic Acids Research. 2006. 34 (1).

PARTICIPATION IN EDUCATIONAL PROGRAMS

2014-present Lecturer Microbiology (BIO281), Cape Cod Community College
 2015-present Lecturer General Biology (BIO151), Cape Cod Community College
 2015-present Coordinator for Community College Comprehensive Research Experience
 in Woods Hole, CC-CREW (previously CC-RISE), Woods Hole, MA
 2021 Marine Biology Internships career panel (STEM) for Massachusetts
 STEM week October 2021
 2020 Presenting our CC internship in Webinar for Massachusetts
 STEM week October 2020
 2019 Chikarmane, H.M, Serres M.H. “Microbiology course for Community
 College level”. E-textbook at Open Educational Resources (OER)
 Commons. www.oercommons.org
 2019 Presenter at Cape Cod Community College Professional Development
 “The Human Microbiome”
 2017 Presenter at Massachusetts Community College Teaching, Learning

- and Student Development Conference “200 Level Microbiology Course for Healthcare Majors”
- 2016 Long term substitute Lecturer Molecular Genetics (BIO242), Cape Cod Community College, West Barnstable, MA
- 2016 Speaker at Cape Cod Regional STEM network meeting “Exploring Life in the Deep: Current Research and Summer Internships”
- 2016 Go Open Grant from MA Community College Go Open Education Council to create an OER Microbiology Text
- 2016 Long term substitute Lecturer Cell Biology (BIO241), Cape Cod Community College, West Barnstable, MA
- 1989 Instructor, Introductory Bacteriology Lab Section, UW, Madison
- 1989 Teaching Assistant, Advanced Bacterial Physiology, UW, Madison

SUPERVISION

Ph.D. Thesis Defense	Michael Driscoll, Boston University (2014)
Postdoctoral Researcher	Linda A. Nahum (2007-2008)
Postdoctoral Researcher	Ragu P.R. Metpally (2008-2009)
Postdoctoral Researcher	Erica Del Castillo (2010-2011)
Research Assistant	Daniella Wilmot (2003-2007)
Summer Intern	Juanita Villa Jaramilla (Community College of Rhode Island)
Summer Intern	Gabriella Brianna Kearns (Quinsigamond Community College, 2022)
Summer Intern	Emma Camara (Bristol Community College, 2021)
Summer Intern	Molly Gilson (Bristol Community College, 2021)
Summer Intern	Josianne Joseph (Cape Cod Community College, 2021)
Summer Intern	Lan Thuy Nguyen (Bunker Hill Community College, 2021)
Summer Intern	Morgan Michael (Cape Cod Community College, 2021)
Summer Intern	Anthony Mase (Cape Cod Community College, 2019)
Summer Intern	Fernanda Munari (Mount Wachusett Community College, 2019)
Summer Intern	Sarah Travers (Cape Cod Community College, 2019)
Summer Intern	Scott Buresh (Massasoit Community College, 2018)
Summer Intern	Patrick Carter (Cape Cod Community College, 2018/2019)
Summer Intern	Ben McKenzie (Cape Cod Community College, 2018)
Summer Intern	Meagan Perry (Cape Cod Community College, 2018)
Summer Intern	Tom Rizzitano (Cape Cod Community College, 2017)
Summer Intern	Renan Vianna (Cape Cod Community College, 2017)
Summer Intern	Emily Clark (Cape Cod Community College, 2017)
Summer Intern	Kyle Bryson (Cape Cod Community College, 2016)
Summer Intern	Joy Gomes (Cape Cod Community College, 2016)
Summer Intern	Thomas Scudder (Cape Cod Community College, 2016)
Summer Intern	Cierra Armstrong (Cape Cod Community College, 2015/2016; Bridgewater State University, 2018)
Summer Intern	Nick O'Sadcia (Cape Cod Community College, 2015)

PUBLICATIONS (reverse chronological order)

[27] Skoog EJ, Huber JA, **Serres MH**, Levesque A, Zeigler Allen L. Draft Genome Sequence of *Desulfurobacterium* sp. Strain AV08, a Thermophilic Chemolithoautotroph Isolated from a Deep-Sea Hydrothermal Vent. *Microbiol Resour Announc*. 2021 Aug 26;10(34):e0061521. doi: 10.1128/MRA.00615-21.Epub 2021 Aug 26. PMID: 34435861; PMCID: PMC8388535.

[26] Beliaev AS, Romine MF, **Serres M**, Bernstein HC, Linggi BE, Makillie LM, Isern NG, Chrisler WB, Kucek LA, Hill EA, Pinchuk GE, Bryant DA, Wiley SH, Fredrickson JK, Konopka A. 2014. Inference of interactions in cyanobacterial-heterotrophic co-cultures via transcriptome sequencing. *ISME Journal* 8:2243-2255. PubMed PMID: 24781900; PubMed Central PMCID: PMC4992078; DOI: 10.1038/ismej.2014.69.

- [25] Ong WK, Vu TT, Lovendahl KN, Llull JM, **Serres MH**, Romine MF, Reed JL. Comparisons of *Shewanella* strains based on genome annotations, modeling, and experiments. 2014. *BMC Systems Biology* 8: 31. PubMed PMID: 24621294; PubMed Central PMCID: PMC4007644; DOI: 10.1186/1752-0509-8-31.
- [24] Sadler NC, Melnicki M, **Serres MH**, Merkley E, Chrisler WB, Hill, EA, Romine, MF, Kim S, Zink EM, Datta S, Smith RD, Beliaev AS, Konopka, A, Wright, AT. 2014. Live cell chemical profiling of temporal redox dynamics in a photoautotrophic cyanobacterium. *ACS Chemical Biology* 9:291-300. PubMed PMID: 24168666; DOI: 10.1021/cb400769v.
- [23] Taylor RC, Webb Robertson BM, Markillie LM, **Serres MH**, Linggi BE, Aldrich JT, Hill EA, Romine MF, Lipton MS, Wiley HS. 2013. Changes in translational efficiency is a dominant regulatory mechanism in the environmental response of bacteria. *Integrative Biology (Cambr)* 5:1393-406. PubMed PMID: 24081429; PMCID: PMC3968953; DOI: 10.1039/c3ib40120k.
- [22] Beg, QK, Zampieri M, Klitgord N, Collins SB, Altafini C, **Serres MH**, Segre, D. 2012. Detection of transcriptional triggers in the dynamics of microbial growth: applications to the respiratorily versatile bacterium *Shewanella oneidensis*. *Nucleic Acids Research* 40:7132-49. PubMed PMID: 22638572; PubMed Central PMCID: PMC3424579; DOI: 10.1093/nar/gks467.
- [21] Rodrigues, JL, **Serres, MH**, Tiedje, JM. 2011. Large scale comparative phenotypic and genomic analyses reveal ecological preferences of *Shewanella* species and identify metabolic pathways conserved at genus level. *Applied and Environmental Microbiology*. 77:5352-60. PubMed PMID: 21642407; PubMed Central PMCID: PMC3147445; DOI: 10.1128/AEM.00097-11.
- [20] Karpinets, TV, Romine, MF, Schmoyer, D.D, Kora, GH, Syed, MH, Leuze, MR, **Serres, MH**, Park, BH, Samatova, NF, and Uberbacher, EC. 2010. *Shewanella* knowledgebase: integration of the experimental data and computational predictions suggests a biological role for transcription of intergenic regions. *Database* Vol. 2010. PubMed PMID: 20627862; PubMed Central PMCID: PMC2911847; DOI: 10.1093/database/baq012.
- [19] Karpinets TV, Obraztsova AY, Wang Y, Schmoyer DD, Kora GH, Park BH, **Serres MH**, Romine MF, Land ML, Kothe TB, Fredrickson JK, Nealson KH, Uberbacher EC. 2009. Conserved synteny at the protein family level reveals genes underlying *Shewanella* species cold tolerance and predicts their novel phenotypes. *Functional Integrated Genomics* 10:97-110. PubMed PMID: 19802638; PubMed Central PMCID: PMC2834769; DOI: 10.1007/s10142-009-0142-y.
- [18] **Serres MH**, Kerr AR, McCormack TJ, Riley M. 2009. Evolution by leaps: gene duplication in bacteria. *Biology Direct* 4:46. PubMed PMID: 19930658; PubMed Central PMCID: PMC2787491; DOI: 10.1186/1745-6150-4-46.

[17] Konstantinidis KT, **Serres MH**, Romine MF, Rodrigues JLM, Auchtung, J, McCue LA, Lipton MS, Obraztsova A, Giometti CS, Nealson KH, Fredrickson JK, Tiedje JM. 2009. Comparative systems biology across an evolutionary gradient within the *Shewanella* genus. *Proceedings of the National Academy of Sciences USA* 106:15909-14. PubMed PMID: 19805231; PubMed Central PMCID: PMC2747217; DOI: 10.1073/pnas.0902000106

[16] Nahum LA, Goswami S, **Serres MH**. 2009. Protein families reflect the metabolic diversity of organisms and provide support for functional prediction. *Physiological Genomics* 38:250-260. PubMed PMID: 19491149; DOI: 10.1152/physiolgenomics.90244.2008.

[15] Fredrickson JK, Romine MF, Beliaev AS, Auchtung JM, Driscoll ME, Gardner TS, Nealson KH, Osterman AL, Pinchuk G, Reed JL, Rodionov DA, Rodrigues JL, Saffarini DA, **Serres MH**, Spormann AM, Zhulin IB, Tiedje JM. 2008. Towards environmental systems biology in *Shewanella*. *Nature Review of Microbiol.* 6:592-603. PubMed PMID: 18604222; DOI: 10.1038/nrmicro1947.

[14] Driscoll ME, Romine MF, Juhn FS, **Serres MH**, McCue LA, Beliaev AS, Fredrickson JK, Gardner TS. 2007. Identification of diverse carbon utilization pathways in *Shewanella oneidensis* MR-1 via expression profiling. *Genome Informatics* 18:287-298. PubMed PMID: 18546496.

[13] **Serres, MH**, Riley M. 2006. Genomic analysis of carbon source metabolism of *Shewanella oneidensis* MR-1: Predictions vs. experiments. *Journal of Bacteriology* 188:4601-9. PubMed PMID: 16788168; PubMed Central PMCID: PMC1482980; DOI: 10.1128/JB.01787-05.

[12] Riley M, Abe T, Arnaud MB, Berlyn MKB, Blattner FR, Chaudhuri RR, Glasner JD, Horiuchi T, Keseler IM, Kosuge T, Mori H, Perna NT, Plunkett III G, Rudd KE, **Serres MH**, Thomas GH, Thomson NR, Wishart D, Wanner BL. 2006. *Escherichia coli* K-12: a cooperatively developed annotation snapshot - 2005. *Nucleic Acids Research* 34:1-9. PubMed PMID: 16397293; PMCID: PMC1325200; DOI: 10.1093/nar/gkj405.

[11] Kolker E, Picone AF, Galperin MY, Romine MF, Higdon R, Makarova KS, Kolker N, Anderson GA, Qiu X, Auberry KJ, Babnigg G, Beliaev AS, Edlefsen P, Elias DA, Gorby YA, Holzman T, Klappenbach JA, Konstantinidis KT, Land ML, Lipton MS, McCue LA, Monroe M, Pasa-Tolic L, Pinchuk G, Purvine S, **Serres MH**, Tsapin S, Zakrajsek BA, Zhu W, Zhou J, Larimer FW, Lawrence CE, Riley M, Collart FR, Yates JR 3rd, Smith RD, Giometti CS, Nealson KH, Fredrickson JF, Tiedje JM. 2005. Global profiling of *Shewanella oneidensis* MR-1: Expression of 'hypothetical' genes and improved functional annotations. *Proceedings of the National Academy of Sciences USA* 102:2099-104. PubMed PMID: 15684069; PMCID: PMC548307; DOI: 10.1073/pnas.0409111102.

- [10] **Serres, MH**, Riley M. 2005. Gene fusions and gene duplications; relevance to genomic annotation and functional analysis. *BMC Genomics*: 6:33. PubMed PMID: 15757509; PubMed Central PMCID: PMC555942; DOI: 10.1186/1471-2164-6-33.
- [9] **Serres, MH**, Riley M. 2004. Structural domains, protein modules, and sequence similarities enrich our understanding of the *Shewanella oneidensis* MR-1 proteome. *OMICS A Journal of Integrative Biology* 8:306-21. PubMed PMID: 15703478; DOI: 10.1089/omi.2004.8.306.
- [8] **Serres, MH**, Goswami S, Riley M. 2004. GenProtEC: an updated and improved analysis of functions of *Escherichia coli* K-12 proteins. *Nucleic Acids Research* 32 Database issue: D300-2. PubMed PMID: 14681418; PubMed Central PMCID: PMC308821; DOI: 10.1093/nar/gkh087.
- [7] **Serres MH**, Gopal S, Nahum LA, Liang P, Gaasterland T, Riley M. 2001. A functional update of the *Escherichia coli* K-12 genome. *Genome Biology* 2:RESEARCH0035. PubMed PMID: 11574054; PubMed Central PMCID: PMC56896; DOI: 10.1186/gb-2001-2-9-research0035.
- [6] **Serres, MH**, Riley M. 2000. MultiFun, a multifunctional classification scheme for *Escherichia coli* K-12 gene products. *Microbial and Comparative Genomics* 5:205-22. PubMed PMID: 11574054; PubMed Central PMCID: PMC56896; DOI: 10.1186/gb-2001-2-9-research0035.
- [5] Riley, M, **Serres MH**. 2000. Interim report on genomics of *Escherichia coli*. *Annual Review of Microbiology* 54:341-411. PubMed PMID: 11018132; DOI: 10.1146/annurev.micro.54.1.341
- [4] **Serres, MH**, Riley, M. 2000. Genomics and metabolism in *Escherichia coli*. In M. Dworkin et al., eds. *The Prokaryotes: An Evolving Electronic Database for the Microbiological Community*, 3rd edition (release 3.2), New York, Springer-Verlag [www.prokaryotes.com]
- [3] **Serres, MH**, Fladmark, KE, Døskeland, SO. 2000. An ultrasensitive competitive binding assay for the detection of toxins affecting protein phosphatases. *Toxicon* 38:347-60. PubMed PMID: 10669024; DOI: 10.1016/s0041-0101(99)00163-4.
- [2] Fladmark, KE, **Serres, MH**, Larsen, NL, Yasumoto, T, Aune, T, Døskeland, SO. 1998. Sensitive detection of apoptogenic toxins in suspension cultures of rat and salmon hepatocytes. *Toxicon* 36:1101-14. PubMed PMID: 9690778; DOI: 10.1016/s0041-0101(98)00083-x.
- [1] **Serres MH**, Ensign JC. 1996. Endogenous ADP-ribosylation of proteins in *Mycobacterium smegmatis*. *Journal of Bacteriology* 178:6074-7. PubMed PMID: 8830711; PubMed Central PMCID: PMC178471; DOI: 10.1128/jb.178.20.6074-6077.1996.

PRESENTATIONS

- 2019 The Human Microbiome. Cape Cod Community College Professional Development, West Barnstable, MA
- 2018 Straddling two worlds: Experiencing CC-RISE as community college educator and research scientist. C-DEBI Annual Meeting. Marina, CA.
- 2017 CCBY 200-level Microbiology Course for Healthcare Majors. Massachusetts Community College Teaching, Learning and Student Development Conference. Brockton, MA.
- 2011 Metabolic interactions in microbial communities. MBL Scientist Meeting. Woods Hole, MA
- 2010 Integrated Genome-Based Studies of Shewanella Eco-physiology, Josephine Bay Paul Center Seminar Series, MBL, Woods Hole, MA
- 2008 Protein Families Provide Support for Functional Annotation and Reflect Metabolic Diversity of Organisms, American Society for Microbiology General Meeting, Boston, MA
- 2006 Function Predictions: Moving away from unknown territory. Department of Energy's Genomics: GTL Contractor Meeting, Bethesda, MD
- 2004 Genome analysis, making use of paralogous protein groups. Departmental Seminar, University of New Hampshire, Durham, NH