

CURRICULUM VITAE - MAX M. HÄGGBLOM

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EDUCATION:

1985, B.S., Life Sciences, University of Helsinki, Helsinki, Finland
1986, M.S., General Microbiology, University of Helsinki.
1987, Licentiate of Philosophy, General Microbiology, University of Helsinki.
1989, Ph.D., General Microbiology, University of Helsinki.

ACADEMIC APPOINTMENTS:

1985-1992, Instructor, Department of General Microbiology, University of Helsinki, Finland (on leave of absence 9/1988-12/1992).
1987-1988, Young Scientist Fellow, Department of General Microbiology, University of Helsinki.
1988-1991, Assistant Research Scientist, Department of Microbiology, New York University Medical Center, NY.
1991-1993, Research Assistant Professor, Institute of Environmental Medicine, New York University Medical Center, NY.
1993-1997, Assistant Research Professor; 1997-1998, Associate Research Professor, Biotechnology Center for Agriculture and the Environment, Rutgers University, New Brunswick NJ.
1993-2010, Member, Biotechnology Center for Agriculture and the Environment.
1998-1999, Assistant Professor; 1999-2003, Associate Professor; 2003-2011, Professor; 2011-pres., Distinguished Professor, Department of Biochemistry and Microbiology, Rutgers University.
2003-2008, Director, Undergraduate Program in Microbiology.
2008-pres., Chair, Department of Biochemistry and Microbiology.
2009-2011, Director, Graduate Program in Microbial Biology.
2009-pres., Member, Rutgers Energy Institute.
2012-2014, Member, Institute of Marine and Coastal Sciences.
2015-pres., Member, Institute of Earth, Ocean, and Atmospheric Sciences.
2017-pres., Member, Institute for Food, Nutrition, and Health (IFNH).

OTHER PROFESSIONAL APPOINTMENTS:

1991-pres., Docent (Applied Microbiology), University of Helsinki, Finland.
1993-1996, Adjunct Assistant Professor, Institute of Environmental Medicine, NYU Medical Center.
1995-2006, Member, Editorial Board, *Applied and Environmental Microbiology*.
1996-pres., Docent (Environmental Microbiology), University of Jyväskylä, Finland.
1998-2003, Member, Editorial Board, *FEMS Microbiology Ecology*.

2000-2001, Visiting Professor, Dept. of Applied Chemistry and Microbiology, University of Helsinki, Finland (sabbatical appointment).
 2004-2014, Visiting Scientist, Finnish Forest Research Institute - Rovaniemi Research Station, Finland.
 2010-pres., Visiting Professor, Chinese Academy of Sciences, Institute for Urban Environment, Xiamen, China.
 2017-2018, Visiting Scientist, Natural Resources Institute Finland
 2003-2010, Editor, *FEMS Microbiology Ecology*.
 2011-pres., Chief Editor, *FEMS Microbiology Ecology*.
 2015-2017, Member, Editorial Board, *Microbiology Spectrum*, American Society for Microbiology Press.
 2018-pres., Member, Editorial Board, *Watershed Ecology and the Environment*.
 2018-pres., Guest Distinguished Professor, Institute of Eco-environmental and Soil Sciences, Guangdong Academy of Sciences, Guangzhou, China.

HONORS AND AWARDS:

Young Scientist's Fellowship, University of Helsinki, 1987-1988.
 Rutgers University Board of Trustees Research Fellowship for Scholarly Excellence, 1999.
 Cook College / New Jersey Agricultural Experiment Station Sustained Research Excellence Award, 2003.
 American Society for Microbiology US-Indo Professorship, 2009.
 Waksman Honorary Lectureship Award, Theobald Smith Society, American Society for Microbiology New Jersey Branch, 2010.
 Visiting Professorship for Senior International Scientists of the Chinese Academy of Sciences, 2010.
 Elected Fellow, American Academy of Microbiology, 2011.
 Waksman Outstanding Teaching Award, Society for Industrial Microbiology and Biotechnology, 2014.
 Vietnam Education Foundation U.S. Faculty Scholar, Academic year 2016-2017.
 School of Environmental and Biological Sciences International Excellence Award, 2017.
 Federation of European Microbiological Societies Special Merit Award, 2021.
 Elected Fellow, American Association for the Advancement of Science, 2022.

MAJOR RESEARCH INTERESTS:

Environmental Microbiology and Microbial Ecology: linking ecosystem functions with microbial (bacterial) diversity; microbial bioprospecting - isolation, characterization and taxonomy of novel bacteria; microbial metabolism of toxic and environmental pollutants (halogenated aromatic compounds, petroleum hydrocarbons and gasoline additives, pharmaceuticals and personal care products); bacterial respiration of selenium and arsenic; microbial ecology of Arctic tundra soils; Environmental Biotechnology: development of bioremediation methods for treatment of contaminated soil, groundwater and sediment.

SELECTED PUBLICATIONS:

Häggblom MM, Nohynek LJ, Salkinoja-Salonen MS (1988) Degradation and O-methylation of polychlorinated phenolic compounds by *Rhodococcus* and *Mycobacterium* strains. *Appl. Environ. Microbiol.* **54**:3043-3052.
 Häggblom MM (1992) Microbial breakdown of halogenated aromatic pesticides and related compounds. *FEMS Microbiol. Rev.* **103**:29-72.
 Alder AC, Häggblom MM, Oppenheimer SR, Young LY (1993) Reductive dechlorination of polychlorinated biphenyls in freshwater and marine sediments. *Environ. Sci. Technol.* **27**:530-538.
 Song B, Palleroni NJ, Häggblom MM (2000) Isolation and characterization of diverse halobenzoate-degrading denitrifying bacteria from soils and sediments. *Appl. Environ. Microbiol.* **66**:3446-3453.

- Daane LL, Harjono I, Zylstra GJ, Häggblom MM (2001) Isolation and characterization of polycyclic aromatic hydrocarbon-degrading bacteria associated with the rhizosphere of salt marsh plants. *Appl. Environ. Microbiol.* **67**:2683-2691.
- Vargas C, Fennell DE, Häggblom MM (2001) Anaerobic reductive dechlorination of chlorinated dioxins in estuarine sediments. *Appl. Microbiol. Biotechnol* **57**:786-790.
- Voordeckers J, Fennell DE, Jones K, Häggblom MM (2002) Anaerobic biotransformation of tetrabromobisphenol A, tetrachlorobisphenol A, and bisphenol A in estuarine sediments. *Environ. Sci. Technol.* **36**:696-701.
- Häggblom MM, Apetroaie C, Andersson MA, Salkinoja-Salonen MS (2002) Quantitative analysis of cereulide, the emetic toxin of *Bacillus cereus*, produced under various conditions. *Appl. Environ. Microbiol.* **68**:2479-2483.
- Häggblom MM, Bossert ID (Editors) (2003) Dehalogenation: Microbial Processes and Environmental Applications, Kluwer Academic Publishers, Boston.
- Ahn Y-B, Rhee S-K, Fennell DE, Kerkhof LJ, Hentschel U, Häggblom MM (2003) Reductive dehalogenation of brominated phenolic compounds by microorganisms associated with the marine sponge *Aplysina aerophoba*. *Appl. Environ. Microbiol.* **69**:4159-4166.
- Turpeinen R, Kairesalo T, Häggblom MM (2004) Microbial activity and community structure in arsenic, chromium and copper contaminated soils. *FEMS Microbiol. Ecol.* **47**:39-50.
- Fennell DE, Nijenhuis I, Wilson SF, Zinder SH, Häggblom MM (2004) *Dehalococcoides ethenogenes* strain 195 reductively dechlorinates diverse chlorinated aromatic pollutants. *Environ. Sci. Technol.* **38**:2075-2081.
- Tchernov D, Gorbunov MY, de Vargas C, Yadav SN, Milligan AJ, Häggblom M, Falkowski PG (2004) Membrane lipids of symbiotic algae are diagnostic of sensitivity to thermal bleaching in corals. *Proc. Natl. Acad. Sci. USA* **101**:13531-13535.
- Somsamak P, Richnow HH, Häggblom MM (2005) Carbon isotopic fractionation during anaerobic biotransformation of methyl *tert*-butyl ether and *tert*-amyl methyl ether. *Environ. Sci. Technol.* **39**:103-109.
- Männistö MK, Häggblom MM (2006) Characterization of psychrotolerant bacteria from Finnish Lapland. *Systematic and Applied Microbiology* **29**:229-243.
- Narasimharao P, Häggblom MM (2006) *Sedimenticola selenatireducens*, gen. nov., sp. nov., an anaerobic selenate-respiring bacterium isolated from estuarine sediment. *Systematic and Applied Microbiology* **29**:382-388.
- Männistö MK, Tirola M, Häggblom MM (2007) Microbial communities in Arctic fjords of Finnish Lapland are stable but highly pH dependent. *FEMS Microbiology Ecology* **59**:452-465.
- Narasimharao P, Häggblom MM (2007) Identification of anaerobic selenate-respiring bacteria from aquatic sediments. *Appl. Environ. Microbiol.* **73**:3519-3527.
- George KW, Häggblom MM (2008) Microbial O-methylation of the flame retardant tetrabromobisphenol-A. *Environ. Sci. Technol.* **42**:5555-5561.
- Ahn Y-B, Liu F, Fennell DE, Häggblom MM (2008) Biostimulation and bioaugmentation to enhance dechlorination of polychlorinated-*p*-dioxins in contaminated sediments. *FEMS Microbiology Ecology* **66**:271-281.
- Ahn Y-B, Kerkhof LJ, Häggblom MM (2009) *Desulfoluna spongiiphila* sp. nov., a dehalogenating bacterium in the *Desulfobacteraceae* from the marine sponge *Aplysina aerophoba*. *Int. J. System. Evol. Microbiol.* **59**:2133-2139.
- Männistö MK, Tirola M, Häggblom MM (2009) Effect of freeze-thaw cycles on bacterial communities of Arctic tundra soil. *Microbial Ecology* **58**:621-631.
- Youngster LKG, Kerkhof LJ, Häggblom MM (2010) Community characterization of anaerobic methyl *tert*-butyl ether (MTBE) degrading enrichment cultures. *FEMS Microbiol. Ecol.* **72**:279-288.

- Park J-W, Krumins V, Kjellerup BV, Fennell DE, Rodenburg LA, Sowers KR, Kerkhof LJ, Häggblom MM (2011) The effect of co-substrate activation on indigenous and bioaugmented PCB-dechlorinating bacterial communities in sediment microcosms. *Appl. Microbiol. Biotechnol* **89**:2005-2017.
- Rauschenbach I, Yee N, Häggblom MM, Bini E (2011) Energy metabolism and multiple respiratory pathways revealed by genome sequencing of *Desulfurispirillum indicum* strain S5. *Environmental Microbiology* **13**:1611-1621.
- McCormick JM, Van Es T, Cooper KR, White LA, Häggblom MM (2011) Microbially mediated O-methylation of bisphenol A and the toxicity of bisphenol A, and bisphenol A monomethyl ether and dimethyl ethers in the developing zebrafish (*Danio rerio*) embryo. *Environ. Sci. Technol.* **45**:6567-6574.
- Rawat S, Männistö MK, Bromberg Y, Häggblom MM (2012) Comparative genomic and physiological analysis provides insights into the role of *Acidobacteria* in organic carbon utilization in Arctic tundra soils. *FEMS Microbiology Ecology* **82**:341-355.
- Männistö MK, Kurhela E, Tirola M, Häggblom MM (2013) *Acidobacteria* dominate the active bacterial communities of sub-Arctic tundra with widely divergent winter-time snow accumulation and soil temperatures. *FEMS Microbiology Ecology*. **84**:47-59.
- Liu H, Park J-W, Fennell DE, Rodenburg LA, Verta M, Häggblom MM (2013) Microbially mediated reductive dechlorination of weathered polychlorinated dibenzofurans in Kymijoki sediment mesocosms. *Chemosphere* **91**:212-221.
- Tuorto SJ, Darias P, McGuinness LR, Panikov N, Zhang T, Häggblom MM, Kerkhof LJ (2014) Bacterial genome replication at subzero temperatures in permafrost. *ISME Journal* **8**:139-149.
- Kuokka S, Rantalainen A-L, Häggblom MM (2014) Anaerobic reductive dechlorination of 1,2,3,4-tetrachlorodibenzofuran in polychlorinated dibenzo-*p*-dioxin- and dibenzofuran-contaminated sediments of the Kymijoki River, Finland. *Chemosphere* **98**:58-65.
- Liu T, Ahn H, Sun W, McGuinness LR, Kerkhof LJ, Häggblom MM (2016) Identification of a *Ruminococcaceae* species as the methyl tert-butyl ether (MTBE) degrading bacterium in a methanogenic consortium. *Environ. Sci. Technol.* **50**:1455-1464.
- Sohn SY, Häggblom MM (2016) Reductive dehalogenation activity by indigenous microorganism in sediments of the Hackensack River, New Jersey. *Environmental Pollution* **214**:374-383.
- Nikrad MP, Kerkhof LJ, Häggblom MM (2016) The subzero microbiome: Microbial activity in frozen and thawing soils. *FEMS Microbiol. Ecol.* **92**:fiw081.
- Liu J, Lopez N, Ahn Y, Goldberg T, Bromberg Y, Kerkhof LJ, Häggblom MM (2017) Novel reductive dehalogenases from the marine sponge associated bacterium *Desulfoluna spongiiphila*. *Environmental Microbiology Reports* **9**:537-549
- Dam HT, Vollmers J, Kaster AK, Häggblom MM (2017) Reconstructed genomes of novel *Dehalococcoides mccartyi* strains from 1,2,3,4-tetrachlorodibenzo-*p*-dioxin-dechlorinating enrichment cultures reveal divergent reductive dehalogenase gene profiles. *FEMS Microbiology Ecology* **93**:fix151.
- Atashgahi S, Häggblom MM, Smidt H (2018) Organohalide respiration in pristine environments: implications for natural halogen cycle. *Environmental Microbiology* **20**:934-948.
- Liu J, Häggblom MM (2018) Genome guided identification of organohalide-respiring *Deltaproteobacteria* from the marine environment. *mBio* **9**:e02471-18.
- Dam HT, Sun W, McGuinness L, Kerkhof LJ, Häggblom MM (2019) Identification of a tetrachlorodibenzo-*p*-dioxin dechlorinating *Dehalococcoides* spp. by stable isotope probing. *Environ. Sci. Technol.* **53**:14409-14419.
- Gadkari P, McGuinness L, Männistö MK, Kerkhof LJ, Häggblom MM (2020) Arctic tundra soil bacterial communities active at subzero temperatures detected by stable isotope probing. *FEMS Microbiology Ecology* **96**:fiz192.

- Liu J, Adrian L, Häggblom MM (2020) Transcriptomic and proteomic response of the organohalide respiring bacterium *Desulfoluna spongiiphila* to growth with 2,6-dibromophenol as electron acceptor. *Applied and Environmental Microbiology* **86**:e02146-19.
- Qiang L, Cheng J, Mirzoyan S, Kerkhof LJ, Häggblom MM (2021) Characterization of microplastics-associated biofilm development along an estuarine gradient. *Environ Sci Technol* **55**:16402-16412. doi.org/10.1021/acs.est.1c04108

MAJOR RESEARCH GRANTS:

Current:

- Linking the microbiome to brown adipose tissue to enhance warfighter health, Office of Naval Research, 3/2019-3/2022, \$499,042, Campbell SC (PI), Häggblom MM, Kerkhof LJ, Vatner SF.
- Sources of cytokines: the role of obesity. Rutgers University Busch Biomedical Grants Program, 10/2020-20/2022, \$40,000 Shapes S (PI), Häggblom MM, Onishi J.
- Collaborative Research: Dimensions US-China-South Africa: Establishing genetic, phylogenetic and functional mechanisms that shape microbiome diversity of polar and alpine soils, National Science Foundation, 10/21-9/26, \$1,494,294, PI.

Completed:

- Anaerobic degradation of chlorophenols and microbial interactions. U.S. EPA CR-820686. 10/91-9/94, \$195,000. Co-Principal Investigator with L.Y. Young (PI).
- PCB degradation by anaerobic microorganisms. General Electric Company. 2/1992-1/1993, \$75,000. Co-Principal Investigator with L.Y. Young (PI).
- Biodegradation of aromatic contaminants by nitrogen-fixing *Rhizobium* species. Hazardous Substance Management Research Center of N.J. BICM-40. 7/1/94-6/30/97, \$145,036. Co-Principal Investigator with L.Y. Young (PI).
- Anaerobic degradation of chlorinated benzoic acid herbicides coupled to denitrification. U.S. EPA R 822487-01-0. 10/1/94-9/30/98, \$347,810. PI.
- Integrated Lake Water-Landscape Restoration and Sustainable Management. Finnish Academy of Sciences 6/1996-5/1998. FIM 1,472,000. Co-Investigator with T. Kairesalo (PI), M. Salkinoja-Salonen, and P. Manninen.
- Diversity of anaerobic dehalogenation in estuarine and marine sediments. Office of Naval Research. N00014-94-1-04340. 5/1/94-10/31/97, \$318,425. Principal Investigator.
- Stimulating Dehalogenation by Diverse Anaerobic Microbial Populations in Marine Sediments. Office of Naval Research. 11/97-10/98, \$60,000. Principal Investigator.
- Characterization of a 4-Chlorophenol Dehalogenating Sulfidogenic Consortium. Office of Naval Research. 5/98-12/98, \$40,000. Principal Investigator.
- Anaerobic biotransformation of pesticides in near coastal environments. U.S. EPA. 10/1/95-9/30/98, \$324,000. Co-Principal Investigator with L.Y. Young (PI) and G. Taghon.
- Phytoremediation of Dredge Spoils Using Living Plants and Associated Micro-organisms. New Jersey Commission on Science and Technology 1/1/97-12/31/00, \$744,206. Principal Investigator with Co-PIs R. Smith (PI to 9/97), I. Raskin, L. Young, G. Zylstra, J. Gallagher, W. Librizzi, and B. Ensley.
- Enhanced microbial dechlorination of PCBs and dioxins in contaminated dredge spoils. Northeast Hazardous Substance Research Center. R-68, 1/15/97-1/31/00. \$132,000. PI.
- Development of NJ specific bioaccumulation factors for risk assessment modeling. NJDEP, \$76,989, 7/1/00-9/30/01, Co-PI with K. Cooper.

In situ detoxification of PAH and PCB contaminated sediments in the rhizosphere of salt marsh plants. Hazardous Substance Management Research Center. 7/1/00-6/30/01, \$34,978, Co-Principal Investigator with J. Kukor.

In Situ Degradation of Petroleum Hydrocarbons and PAHs in Contaminated Salt Marsh Sediments. Northeast Hazardous Substance Research Center. R-82, 9/1/99-6/30/01. \$110,221. PI.

Microbial Bioprospecting and High-Throughput Screening in Support of New Jersey Agriculture and Industry Strategic Resource and Opportunity Analysis Program (SROA-6). 7/01-6/02 \$120,000. PI J. Kukor, Co-PIs T. Barkay, D. Eveleigh, M. Häggblom, L. Kerkhof, D. Kobayashi, C. Pray, J. White, L. Young, G. Zylstra.

Development of NJ specific bioaccumulation factors for risk assessment modeling. NJDEP, \$74,927, 7/1/01-6/30/02, Co-PI with K. Cooper.

Molecular tracking of microbial contaminants in paper machines, TAPPI, \$39,988, 7/1/01-8/31/02. Principal Investigator.

Molecular and Biochemical Characterization of dehalogenating consortia in marine sediments, Office of Naval Research, N00014-99-1-0761, 5/1/99-09/30/02, \$423,311. Principal Investigator.

Development of a biocomplexity research program for the analysis of ecosystem structure and dynamics in urban salt marshes. NSF, 10/01/01-9/30/02, \$31,755 (sub-contract) Co-PI (PI, M. Levandowsky, Pace Univ).

University-industry partnership to enhance biotechnology education for a high tech workforce. New Jersey Commission on Higher Education 9/00-8/03, \$1,335,250. G.J. Zylstra (PI), B.A. Zilinskas, M.M. Häggblom, A. Artuso.

Mechanisms of halobenzoate degradation by denitrifying bacteria. US Department of Agriculture. 9/1/00-6/30/04, \$180,000. Principal Investigator with G. Zylstra.

Microbial bioprospecting in support of New Jersey Agriculture and Industry. NJAES Program Enhancement Grants Initiative 11/00-6/04, \$199,714. PI J. Kukor, Co-PIs T. Barkay, D. Eveleigh, M. Häggblom, L. Kerkhof, D. Kobayashi, C. Pray, J. White, L. Young, G. Zylstra.

Discovery of arctic microorganisms for biotechnical applications. EU Regional Development Funds, TEKES National Technology Agency of Finland, 7/1/01-8/31/04, € 840,000, PI (Rovaniemi Region Development Agency).

Discovery of arctic microorganisms for biotechnical applications. EU Regional Development Funds, TEKES National Technology Agency of Finland, 9/1/04-9/30/05, € 322,000, PI (Finnish Forest Research Institute).

In situ enhancement of anaerobic microbial dechlorination of polychlorinated dibenzo-p-dioxins and dibenzofurans in marine and estuarine sediments. DoD/SERDP, \$556,975, 03/01/01-08/31/05. PI.

Microbially mediated cycling of organohalides in marine sponges. NSF, \$610,163, 03/01/05-02/31/09, Principal Investigator.

Developing tools for monitored natural attenuation of methyl tert-butyl ether. New Jersey Department of Environmental Protection Spill Research Fund, \$100,000, 7/07-6/09. PI

Quantifying Enhanced Microbial Dehalogenation Impacting the Fate and Transport of Organohalide Mixtures in Contaminated Sediments. DoD/SERDP, \$1,883,300, 03/06-2/11. PI.

Assessing the potential for anaerobic microbial dechlorination of PCDD/Fs in River Kymijoki sediments. Maj and Tor Nessling Foundation. Euro 87,498, 1/09-12/11, PI (University of Helsinki).

Impact of climate fluctuations on microbial communities responsible for carbon and nitrogen cycling in Arctic soils, Academy of Finland, Euro 422,400, 1/08-12/11. PI (Finnish Forest Research Institute).

IPY Microbial subzero activity and its impact on biogeochemical processes in frozen tundra and permafrost, NSF, \$538,647, 1/08-12/11, Co-PI (PI L. Kerkhof).

Physiological, ecological and chemical characterization of novel bacteria dominating forest and tundra soils of Arctic Finland (BIOARMI), Academy of Finland #128870, Euro 269,280, 1/2009-12/2012, Co-Investigator/Collaborator (PI P. Vuorela, Åbo Akademi University, Finland).

Molecular studies of dissimilatory selenium reduction by subsurface microorganisms. NSF EAR, \$399,712, 08/31/2009, 10/01/09 - 09/30/13; Co-PI (PI N. Yee).

Applying innovative diagnostic tools at New Jersey publicly funded sites. New Jersey Department of Environmental Protection. \$83,500. 06/30/2011 - 07/15/2013, Co-PI (PI: DE Fennell).

Constructing an Annotated Metabolic Map of Earth's Coupled Microbial Redox Reactions. The Gordon and Betty Moore Foundation \$1,070,915, 4/11-3/14. Lead PI: Paul Falkowski, CoPIs: Debashish Bhattacharya, Yana Bromberg, David Case, Max Haggbloom, Vikas Nanda, Nathan Yee.

Mitigating pesticide pollution in the Mekong delta. VLIR-UOS Flemish Institutional University Cooperation, Euro 99,820 (~\$135,000), 4/2010-4/2014, Co-Investigator/Collaborator (10% effort) with PI Vi Thi Guong (Cantho University, Vietnam), D. Springael, R. Merckx (K.U.Leuven).

REU Site: The Biogeography of Biotransformations for Halogenated Organic Compounds, a Comparison of the Tropics, Temperate and Sub-Arctic Environments. NSF, \$375,000, 03/01/11 - 02/28/14, Co-PI, (PI: LY Young) NSF EEC 1062477.

The ecological role of Acidobacteria in carbon cycling in Arctic tundra soil ecosystems. Academy of Finland, 01/2012-12/2015, 641,305 Euro, PI.

Environmental Microbiology in a Changing World- Graduate Course at Cantho University. Vietnam Education Foundation, \$43,664, 06/2016-06/2017. PI.

Natural Attenuation and Enhanced Biodegradation of Methyl tert-Butyl Ether in Anoxic Aquifers. NSF CBET 1335824, 09/2013-10/2018, \$330,000. PI.

Fate and Ecotoxicity of Pharmaceuticals and Personal Care Products, Emerging Contaminants in the Hudson River Ecosystem. Hudson River Foundation, 7/2015-6/2018, \$168,886. PI.

Below-ground colors of Arctic vegetation greening: How shifts in soil microbial life strategies influence soil carbon stocks, Academy of Finland, 9/17-8/21, Euro 614,800, Co-Investigator (PI: Minna Männistö).

Genome Sequencing Projects:

Whole-genome sequencing, assembly and initial annotation of the selenate-reducing bacterium *Selenospirillum indicus*. DOE/JGI, 2008. Co-PI (PI, E. Bini).

Whole genome sequencing, assembly and initial annotation of *Acidobacterium* species from Arctic tundra soils. DOE/JGI, 2009, PI.

Whole-genome sequencing, assembly and initial annotation of four phylogenetically diverse strains of selenate respiring bacteria. DOE/JGI, 2011. Co-PI (PI, E. Bini).

Genomic basis of thermal adaption and carbon metabolism in permafrost isolates. DOE/JGI, 2012. Co-PI (PI, Corien Bakermans).

Comparative metagenomic analysis of anaerobic MTBE-degrading enrichment cultures. DOE/JGI 2014. PI.

STUDENTS AND POST-DOCTORAL ASSOCIATES:

Graduate Students:

Ph.D.

Peter Milligan, Environmental Science, 1994-1998 (M.S. 1995, Ph.D. 1998; Anaerobic biodegradation of dicamba and related chlorosalicylates under different reducing conditions).

Bongkeun Song, Environmental Science, 1996-2000 (Ph.D. 2000; Diversity of bacteria capable of degrading halobenzoates under denitrifying conditions).

Riina Turpeinen, Environmental Science, University of Helsinki, Finland, 1998-2002 (Ph.D. 2002; Interactions between metals, microbes and plants - Bioremediation of arsenic and lead contaminated soils).

Piyapawn Somsamak, Environmental Science, 2000-2005 (Ph.D. 2005; Anaerobic biotransformation of methyl tert-butyl ether (MTBE) and related fuel oxygenates under different anoxic conditions).

Beth Ravit, Environmental Science, 2001-2005, co-advisor (Ph.D. 2005; Macrophytes and microbes: *Spartina alterniflora* and *Phragmites australis* affect brackish sediment microbial community).

Jane Pavlik, Microbiology and Molecular Genetics, 1999-2005 (Ph.D. 2005; Multiple aspects of dehalogenation by denitrifying bacteria).

Priya Narasingarao, Environmental Science, 2001-2006 (Ph.D. 2006; Anaerobic bacterial respiration of selenium oxyanions).

Laura Youngster, Microbiology and Molecular Genetics, 2004-2009 (Ph.D. 2009; Microbial degradation of the fuel oxygenate methyl tert-butyl ether (MTBE)).

Jessica McCormick, Microbiology and Molecular Genetics, 2006-2010 (Ph.D. 2010; Microbial transformations of tetrabromobisphenol A and its metabolites, and their impact on toxicity to the developing zebrafish (*Danio rerio*) embryo).

Hui Liu, Environmental Science, 2005-2010 (Ph.D. 2010; Microbial reductive dechlorination of weathered polychlorinated dibenzo-*p*-dioxins and dibenzofurans in contaminated sediments).

Ines Rauschenbach, Microbiology and Molecular Genetics, 2007-2011 (Ph.D. 2011; Growth, genes, genomes - Insights into microbial respiration of arsenic and selenium).

Tong Liu, Environmental Science, 2010-2015 (Ph.D. 2015; Characterization of anaerobic methyl tert-butyl ether (MTBE)-degrading communities).

Seo Yean Sohn, Environmental Science, 2009-2015 (Ph.D. 2015; Microbial reductive dehalogenation of persistent halogenated aromatic contaminants in sediments of the Hackensack River in New Jersey).

Isabel Horna Gray, Environmental Science, 2006-2015 (Ph.D. 2015; Sponge-associated dehalogenating microorganisms and isotope analysis of their dehalogenation of brominated phenols).

Hang Dam, Microbial Biology, 2011-2016 (Ph.D. 2016; Reductive dechlorination of polychlorinated dibenzo-*p*-dioxins by *Dehalococcoides*-enriched cultures from contaminated soils and sediments).

Sanna Mäntynen (née Kuokka), Environmental Science, University of Helsinki, 2009-2018 (Ph.D. 2018; Anaerobic microbial dechlorination of polychlorinated dibenzo-*p*-dioxins and dibenzofurans in contaminated Kymijoki River sediments).

Preshita Gadkari, Microbial Biology, 2014-2018 (Ph.D. 2018; Ecology and physiological potential of tundra soil bacteria).

Jie Liu, Microbial Biology, 2014-2018 (Ph.D. 2018; Discovering the organohalide respiring capacity of Deltaproteobacteria in marine and estuarine environments).

Nora Lopez, Microbiology and Molecular Genetics, 2007-2021, co-advisor (Ph.D. 2021; *Desulfohalobium spongiiphila* strain AA1 and other marine sponge associated reductive debrominating bacteria).

Tiffany Louie, Microbial Biology, 2011-2021 (Ph.D. 2021; Anaerobic molybdenum-utilizing bacteria: genomic insights into anaerobic respiration and anaerobic (halo)benzoate degradation).

Michelle Zeliph, Microbial Biology, 2015-pres.

Chloe Costea, Environmental Science, 2018-pres.

Lauren Hall, Microbial Biology, 2019-pres.

Neil Simmons, Microbial Biology, 2019-pres.

Matthew Finegan, Microbial Biology, 2021-pres.

Visiting Students

Ji-li Feng, 2009-2010 (Northwest Agricultural and Forestry University, China), Tiina Mononen, 12/2011-3/2012 (University of Helsinki, Finland), Mohamed Ali EL-Badry Hafez Amen, 6/2014-9/2014 (Al-Azhar

University, Egypt), Antonella Rosato 6/2016-12/2016 (University of Bologna, Italy), Muhammad Bashir Ahmed Siddique, 8/2017-3/2018 (PMAS-Arid Agriculture University, Pakistan), Liyuan Qiang, 10/2018-9/2020 (China Eastern Normal University, Shanghai), Muhamad Usman Ghani, 10/2019-8/2020 (University of Agriculture, Faisalabad, Pakistan), Atilade Adedeji, 10/2019-9/2020 (Northwest University, Mafikeng, South Africa).

Post-Doctoral Associates, Research Associates and Visiting Scholars:

Esteban Monserrate (1994-1996), Cecilia Vargas (1996-1998), Victoria Knight (1996-1999), Lori Daane (1997-1999), Miao Y. Wang (1997-1998), Loren Launen (1999-2001), Matthew Caldwell (2000-2001), Donna Fennell (1999-2001), Sung-Keun Rhee (2000-2002), Peter Kourtev (2001-2002), Young-Beom Ahn (2001-2008), Minna Männistö, Finnish Forest Research Institute, Finland (2001-2004), Sari Stark, Finnish Forest Research Institute, Finland (2001-2004), Katri Mattila, Finnish Forest Research Institute, Finland (2001-2005), Joong-Wook Park (2006-2011), Suman Rawat (2008-2014), Duong Minh Vien (2008-2009), Yuan Ren (2009-2010), Lars Ganzert, Finnish Forest Research Institute, Finland (2012-2014), Mrinalini Nikrad (2014-2015), Weimin Sun (2013-2016), Aamani Rupakula (2015-2017), Chuling Guo (2016-2017), Folasade M. Olajuyigbe (2017-2018), Kyoung-Ho Kim (2017-2018), Pin Gao (2017-2018), Huaqing Liu (2019-2021), Emre Babur (2021-pres.).

TEACHING:

Director, Microbiology Undergraduate Program, 2004-2008.

Developed the proposal to establish Microbiology as an independent major in the School of Environmental and Biological Sciences and served as founding Director.

Director, Microbial Biology Graduate Program, 2009-2011.

Developed the proposal to establish the new Graduate Program in Microbial Biology, which is inaugurated in Fall 2010 with the first class of Ph.D. and M.S. students. Served as founding Director.

Member, Graduate Program in Microbial Biology, Graduate Program in Microbiology and Molecular Genetics, Graduate Program in Environmental Sciences, Graduate Program in Ecology and Evolution

Courses taught:

Applied Microbiology (11:680:494; undergraduate 4 cr, full responsibility for lectures; since 1999).

Redeveloped this course with complete redesign of syllabus and lectures.

Applied and Industrial Microbiology (16:682:524; graduate 3 cr; since 2012)

Microbial Technology (11:126:405; undergraduate 3 cr, 50% responsibility; offered 1997-2010)

Analytical Methods in Microbiology (11:680:486, undergraduate 3 cr lab; offered other year since 2003).

Developed this new lab course and served as Co-PI on New Jersey Commission on Higher Education grant that provided funding for HPLC and GC-MS equipment used for teaching.

Seminar in Microbiology (11:680:495, 1 cr, full responsibility, taught 2005-2010).

Microbiology and Culture of Cheese and Wine (undergraduate 3 cr, Rutgers Study Abroad, Cluny France, Course Director; developed and taught every Summer 2010-2019).

Microbial Life (16:682:501; graduate 3 cr, 1/3 responsibility; taught every Fall since 2001)

Microbial Physiology (11:682:503; graduate 3 cr, 50% responsibility; taught 2011 and 2012)

Biodegradation and Bioremediation (16:375:529, graduate 3 cr, 25% responsibility; taught every other Fall since 2010)

Is there Life on Mars (Byrne Freshman seminar, taught every spring since 2018)

Co-Director, NSF REU program The Biogeography of Biotransformations for Halogenated Organic Compounds, a Comparison of the Tropics, Temperate and Sub-Arctic Environments (2012-2014).

Short courses taught outside of Rutgers:

Biodegradation and Bioremediation (University of Jyväskylä, Finland, 1-week 2 cr graduate course, developed new lecture series for the Environmental Sciences graduate curriculum and taught in 1996, 1997, 1999, 2001, 2003 and 2007).

United States - European Union Theoretical and Practical Course on Molecular Approaches for in situ Biodegradation, June 14-26, 1998, organized at Rutgers University

European Union course "Advanced Field Course of Environmental Ecology" held in Hyytiälä, Finland, Sept. 1-11, 1998.

International Summer School "Biomonitoring, bioavailability and microbial transformation of pollutants in sediments and approaches to stimulate their biodegradation", Genoa, Italy, September 12-14, 2005.

AXIOM-Virtual Institute Spring School Microbial Activity at Biogeochemical Gradients, Leipzig, Germany, April 3-6, 2006.

Organized and taught short course on Assessment and Remediation of Contaminated Sediments, University of Helsinki, Finland October. 12-16, 2009.

Lead Instructor for International Workshop on Bioremediation organized at the Birla Institute of Technology and Science - Pilani, Goa Campus, India, January 4-16, 2010. The course was funded by the Indo-US Science & Technology Forum and the American Society for Microbiology through the Indo-US Professorship Award.

Instructor for 1-week lectures series on Biodegradation and Bioremediation, Summer International Lectures on Environmental Sciences, Chinese Academy of Sciences Institute of Urban Environment, Xiamen, China, Aug 21-25, 2010.

Environmental Microbiology, Cantho University, 1 week short-course, January 2012.

Environmental Microbiology, Chinese Academy of Sciences Institute of Urban Environment, Xiamen, 1 week short-course, January 2012.

Environmental Microbiology, Universidad Nacional Santiago Antúnez De Mayolo, Huaraz, Peru, April 2013.

Short Course on Contaminated Watersheds, Chinese Academy of Sciences, Institute of Urban Environment, Xiamen, May 2013.

Short Course in Environmental Microbiology, South China University of Technology, Guangzhou, China, March 2014, March 2016, March 2018.

Environmental Microbiology in a Changing World, Can Tho University, Vietnam, Spring 2017.

PROFESSIONAL ACTIVITIES:

Editorial Board Memberships

Editor in Chief, *FEMS Microbiology Ecology*, 2011-pres.

Editor, *FEMS Microbiology Ecology*, 2003-2011.

Editor for special thematic issues: Microbial Life in Cold Ecosystems (2005), Microorganisms in Cold Environments (2007), Subsurface Microbiology (2012), Polar and Alpine Microbiology (2012, 2014, 2017, 2018, 2020), The Sponge Microbiome (2020).

Associate Editor, Member of Editorial Board, *Microbiology Spectrum*, American Society for Microbiology Press, 2015-2019.

Editorial Board, *Watershed Ecology and the Environment*, 2019-pres.

Editorial Board, *Applied and Environmental Microbiology*, 1995-2006.

Editorial Board, *FEMS Microbiology Ecology*, 1998-2003.

Conference Chairmanships/Convener Activities

Convener and organizer of ASM Symposium on Diversity of Anaerobic Microbial Processes, ASM General Meeting, Atlanta, 1993.

Convener and organizer of Society for Industrial Microbiology Symposium on Novel Microorganisms for Bioremediation, SIM Annual Meeting, Boston, 1994.

Member of International Advisory Board & Invited speaker, International Seminar on Biosorption and Bioremediation, Prague, October 1-4, 1995.

Discussion Leader, Gordon Research Conference-Applied and Environmental Microbiology, August 17-22, 1997.

Member of International Advisory Board & Invited speaker, 2nd International Seminar on Biosorption and Bioremediation, Prague, 1998.

Session Chair and Invited speaker. Symposium on Bioremediation of Contaminated Soil and Groundwater: Traditional Methods and Possibilities for Gene-Technology. Helsinki, Finland, August 27-29, 1998.

Discussion Leader, Gordon Research Conference-Environmental Science: Water, July 25-30, 2000.

Convener and organizer of ASM Symposium on Microbial Dehalogenation, ASM General Meeting, Orlando, 2001.

Chair, 34th Mid-Atlantic Industrial & Hazardous Waste Conference, Sept. 20-21, 2002, New Brunswick.

Chair, International Conference on Arctic Microbiology, March 21-25, 2004, Rovaniemi, Finland.

Member of International Advisory Board, International Conference on Alpine and Polar Microbiology Innsbruck, Austria, March 27-30, 2006.

Discussion leader, 2006 Gordon Research Conference on Environmental Sciences: Water, chairing a session on Microbial Degradation of Organic Contaminants.

Member of International Advisory Board, 3rd International Conference on Alpine and Polar Microbiology Banff, Canada, May 1-15, 2008.

Organizer, Symposium on Toxins, Toxic Chemicals and their Microbial Transformations in Honor of Prof. Mirja Salkinoja-Salonen, University of Helsinki, Finland, May 22, 2008.

Program Chair, Rutgers Symposium on The New Biology of Environment and Health, May 27-28, 2009.

Convener and organizer of ASM Symposium on Unusual Appetites: From Enzymes to Environmental Applications, ASM General Meeting, 2009.

Co-Organizer and Co-Chair, Annual Mini-Symposium on Microbiology at Rutgers University, 2007 to present.

Member, Scientific Committee, 14th International Biotechnology Symposium and Exhibition, 14-18 September 2010, Rimini, Italy.

Elected Vice Chair and Chair, Gordon Research Conference on Applied and Environmental Microbiology 2009, 2011.

Member, Program Committee, International Water Association Conference on Microbes in Wastewater & Waste Treatment, Bioremediation and Energy Production. The Birla Institute of Technology and Science (BITS) – Pilani, Goa campus, India, Jan 24-27, 2011.

Steering Committee Member, MicroPerm Workshop, An international workshop to initiate the circumpolar integration of permafrost microbiological studies, November 8-10, 2010, Potsdam, Germany.

Member of Advisory Board and Visiting Scientist, EU PEOPLE Work Programme 2010 Project CSI Environment: Isotope forensics meets biogeochemistry - linking sources and sinks of organic contaminants by compound specific isotope investigation. (2010-2014).

Member of International Organizing Committee and International Scientific Board, Fourth International Conference on Polar and Alpine Microbiology Ljubljana, Slovenia, September 2011.

Member of International Organizing Committee and International Scientific Board, Fifth International Conference on Polar and Alpine Microbiology, Montana, September 2013.

Member, Board of Academic Committee, International Workshop on Urbanization in Watersheds: Ecological and Environmental Responses, Xiamen, China, October 2014.

Member of International Organizing Committee and International Scientific Board, Sixth International Conference on Polar and Alpine Microbiology, Ceske Budejovice, September 2015.

Member, Board of Academic Committee, The 3rd International Workshop on Urbanization in Watersheds: Adaptation to environmental change from a water drop to a river, Xiamen, China, October 31-November 2, 2018.

Member of International Conference Committee, Eighth International Conference on Polar and Alpine Microbiology, Hamilton New Zealand, February 2019.

Chair, Celebration of the 75th Anniversary of the Discovery of Streptomycin, Rutgers University, December 4, 2019.

Organizer and convener of FEMS Microbiology Ecology Webinar series, 2020-2021.

Society Service

Chair Elect, Chair, and Advisor, Division Q (Applied and Environmental Microbiology), American Society for Microbiology, 7/2006-6/2007, 7/2007-6/2008, 7/2008-6/2009.

Theobald Smith Society, Local Councilor, 2006-2009; President Elect 2011-2012, President 2012-2013.

Member: American Society for Microbiology, American Chemical Society, American Association for the Advancement of Science, International Society for Microbial Ecology, Theobald Smith Society (ASM New Jersey Chapter).