

CURRICULUM VITAE (CHO, Hyeyoun)

Current Status: Research professor, in Marine Microbial Ecology and Biogeochemistry Lab. Dept. of Marine Sciences and Convergence Engineering, Hanyang University

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Education

- Ph.D. 2015 Hanyang University, Marine microbial ecology
- Thesis Title: Microbial community structures associated with anaerobic carbon oxidation in the Ulleung Basin sediments, East Sea
- M.S. 2004 Inha University, Marine biology
- B.S. 2002 Inha University, Oceanography

Work

- Research Professor Marine Microbial Ecology & Biogeochemistry Lab., Hanyang University (2019.05-present)
- Post-Doctoral Fellow Marine Microbial Ecology & Biogeochemistry Lab., Hanyang University (2015.10-2019.04)
- Research Assistant Korea Ocean Research and Development Institute (KORDI) (2004-2006)

Technique skills

- ✧ **Microbial parameter analysis technique:**
 - Measurement of extracted adenosine triphosphate (ATP) from environmental sample
 - Measurement of microbial enzyme activity
 - Measurement of secondary prokaryotic production using ³H-leucine incorporation technique
 - Total prokaryotic cell counting using DAPI staining

- ✧ **Cultivation technique:**
 - Enumeration of microbial abundance using MPN technique
 - Cultivation of anaerobic bacteria (nitrate reducing bacteria, sulfate reducing bacteria and iron reducing bacteria etc.)

- ✧ **Molecular technique:**
 - Genescan (T-RFLP analysis) and Sequencing (Sanger method)
 - Construction gene library
 - Construction cDNA library
 - Quantification of specific gene using real time-PCR
 - RNA-stable isotope probing
 - Fluorescence in situ hybridization (FISH)
 - Statistical analyses: microbial diversity using MOTHUR, MEGA, Phytidit, FastUniFrac, R studio

- ✧ **Chemical analysis technique:**

- Collection of pore-water and sediment samples under anoxic condition
- Measurement of dissolved inorganic carbon and ammonia concentration using FIA
- Measurement of organic acid concentration in pore-water using HPLC

Fellowships and Awards

2020.4 Jeon JaeKyu Award, Korea Polar Research Institute
 2007-8008 Seoul Science Scholarship Seoul Metropolitan Government

Experience:

2019.05-present Research Professor, Marine Sciences and Convergent Technology, Hanyang University
 2015.10-2019.04 Post-Doctoral Fellow, Marine Microbial Ecology and Biogeochemistry Lab., Hanyang University
 2013.01-2013.03 Visiting Student, Southern Denmark University, Denmark (Prof. Bo Thamdrup)
 Technical training for RNA-stable isotope probing method
 2008.06-2008.08 Visiting Student, Florida State University, USA (Prof. Joel E. Kostka) Study on quantification of functional genes of marine prokaryotes using real-time PCR
 2005.04 Visiting Scientist, Arctic Dasan Station: Enumeration of sulfate or iron reducing bacteria in Arctic sediment.
 2004.09-2006.02 Research Assistant, Korea Ocean Research and Development Institute (KORDI)

Onboard Research Activity

- Environmental research for Mn nodule exploitation, Northeast Equatorial Pacific. (2009.8-2009.9): R/V Onnuri, KIOST, Korea
- Microbial biogeochemistry in the Ulleung Basin, East Sea (2007 - 2013): R/V Eardo or R/V Onnuri, KIOST, Korea

Publication list:

- 16) An S-U, **Cho H**, Jung U-J, Kim B, Lee H, Hyun J-H (2020) Invasive *Spartina anglica* greatly alters the rates and pathways of organic carbon oxidation and associated microbial communities in an intertidal wetland of the Han River Estuary, Yellow Sea. *Frontiers in Marine Science* doi: 10.3389/fmars.2020.00059
- 15) **Cho H**, Hwang CY, Kim J-G, Kang S, Knittel K, Choi A, Kim S-H, Rhee S-K, Yang EJ, Lee SH and Hyun J-H (2020) A unique benthic microbial community underlying the *Phaeocystis antarctica*-dominated Amundsen Sea polynya, Antarctica: a proxy for assessing the impact of global changes. *Frontiers in Marine Science* 6: 797
- 14) **Cho H**, Kim B, Mok S-J, Choi A, Thamdrup B, Hyun J-H (2020) Acetate-utilizing microbial communities revealed by stable-isotope probing in sediment underlying the upwelling system of the Ulleung Basin, East Sea. *Marine Ecology Progress Series* 634:45-61
- 13) Mok S-J, Kim S-H, Kim J, **Cho H**, An S-U, Choi A, Kim B, Yoon C-H, Thamdrup B, Hyun J-H (2019) Impacts of typhoon-induced heavy rainfalls and resultant freshwater runoff on the partitioning of organic carbon oxidation and nutrient dynamics in the intertidal sediments of

the Han River estuary, Yellow Sea. *Science of the Total Environment*. 691: 858-867.

- 12) Choi A, **Cho H**, Kim B, Kim H-C, Jung R-H, Lee W-C, Hyun J-H (2018) Effect of finfish aquaculture on biogeochemistry and bacterial communities associated with sulfur cycles in highly sulfidic sediments. *Aquaculture Environment Interactions*. 10: 413-427.
- 11) **Cho H**, Kim K-H, Son SK, Hyun J-H (2018) Fine-scale microbial communities associated with manganese nodules in deep-sea sediment of the Korea Deep Ocean study area in the northeast equatorial Pacific. *Ocean Science Journal*. 53: 337-353.
- 10) Hyun J-H, Kim S-H, Mok J-S, **Cho H**, Lee T, Vandieken V, Thamdrup B (2017) Manganese and iron reduction dominate organic carbon oxidation in surface sediments of the deep Ulleung Basin, East Sea. *Biogeosciences* 14:941-958.
- 9) **Cho H**, Hyun J-H, You O-R, Kim M, Kim S-H, Choi D-L, Green SJ, Kostka JE (2017) Microbial community structure associated with biogeochemical processes in the sulfate-methane transition zone (SMTZ) of gas hydrate-bearing sediment of the Ulleung Basin, East Sea. *Geomicrobiology Journal* 34:207-219. DOI: 10.1080/01490457.2016.1169767.
- 8) Choi A, **Cho H**, Kim S-H, Thamdrup B, Lee SH, Hyun J-H (2016) Rates of N₂ production and diversity and abundance of functional genes associated with denitrification and anaerobic ammonium oxidation in the sediment of the Amundsen Sea Polynya, Antarctica. *Deep-Sea Research II* 123:102-112.
- 7) **Cho H**, Kim S-H, Shin K-H, Bahk J-J, Hyun J-H (2015) Microbial Community composition associated with anaerobic oxidation of methane in gas hydrate-bearing sediments in the Ulleung Basin, East Sea. *The sea*. 20(1): 53-62 (In Korean).
- 6) Lee D-H, Kim J-H, Bahk J-J, **Cho H**, Hyun J-H, Shin K-H (2013) Geochemical signature related to lipid biomarkers of ANMEs in gas hydrate-bearing sediments in the Ulleung Basin, East Sea (Korea). *Marine and Petroleum Geology* 47:12-135.
- 5) Kim B-B, **Cho H**, Hyun J-H (2010) Community Structure, Diversity, and vertical distribution of archaea revealed by 16S rRNA gene analysis in the deep sea sediment of the Ulleung Basin, East Sea. *Ocean and Polar Research* 32:309-319 (In Korean).
- 4) Hyun J-H, Mok J-S, **Cho H**, Kim S-H, Lee KS, Kostka JE (2009) Rapid organic matter mineralization coupled to iron cycling in intertidal mud flats of the Han River estuary, Yellow Sea. *Biogeochemistry*. 92: 231-245.
- 3) Mok J-S, **Cho H**, Hyun J-H (2005) Rates of anaerobic carbon mineralization and sulfate reduction in association with bioturbation in the intertidal mudflat of Ganghwa, Korea. *The sea*. 40:38-46 (In Korean).
- 2) Hyun J-H, Mok J-S, **Cho H**, Cho BC, Choi JK (2004) Anaerobic mineralization of organic matter and sulfate reduction in summer at Ganghwa Intertidal flat, Korea. *Journal of Korean Wetlands Society* 6(1) 117-132 (In Korean).
- 1) **Cho H**, Lee J-H, Hyun J-H (2004) Bacterial community structure and diversity using 16S rDNA analysis in the intertidal sediment of Ganghwa Island. *Korean Journal of Microbiology* 40: 189-198 (In Korean).

Main Research Interests

- Microbial community associated with anaerobic organic carbon oxidation processes
- *Thaumarchaeota* community related to carbon and nitrogen cycle
- Functional gene study associated with carbon mineralization
- RNA-stable isotope probing with stable isotope labeled-substrate
- Microbial communities related to organic carbon cycle in polar region
- Microbial communities controlling biogeochemical cycling in the hypoxia environments