Jaewook Myung

Assistant Professor
Department of Civil and Environmental Engineering
Southern Methodist University
+1-214-768-4229
jjaimyung@smu.edu
http://s2.smu.edu/~jjaimyung
https://scholar.google.com/citations?hl=en&user=QovpdgUAAAAJ&sortby=pubdate
http://www.researchgate.net/profile/Jaewook_Myung

Education

(Ph.D.) Stanford University, 2016

Ph.D. in Civil and Environmental Engineering
Dissertation Advisor: Craig S. Criddle (Environmental Biotechnology Lab)
Concentration: Environmental Engineering and Science
Thesis Title: Recovery of resources and energy using methane-utilizing bacteria: synthesis and regeneration of biodegradable, tailorable bioplastics and production of nitrous oxide. [LINK]

(M.S.) Stanford University, 2014

M.S. in Civil and Environmental Engineering
Program Advisor: Craig S. Criddle (Environmental Biotechnology Lab)
Concentration: Environmental Engineering and Science

(B.S.) KAIST, 2011

B.S. in Civil and Environmental Engineering (Salutatorian)
Advisor: Woojin Lee (Environmental Geochemical Research Lab)

Awards and Honors

- Travel Grant Award, CJ-Forum at US-KOREA Conference 2015 (UKC 2015), Atlanta, GA, 2015
- Top Poster Award, 2015 Opportunity Job Fair, Stanford School of Engineering, 2015
- ISME15 Travel Grant Award, International Society for Microbial Ecology (ISME), 2014
- KSEA-KUSCO Scholarships, Korean-American Scientists and Engineers Association (KSEA), 2014
- ASM 2014 Student Travel Grant, American Society for Microbiology, 2014
- Top Poster Award, 2014 Opportunity Job Fair, Stanford School of Engineering, 2014
- Samsung Scholarship, 2013–2016
- STX Scholarship for Graduate Study Abroad, STX Scholarship Foundation, 2011–2013
- Leon B. Reynolds Memorial Scholarship, Stanford School of Engineering, 2011–2012
- Neukermans Family Graduate Fellowship, Stanford School of Engineering, 2011–2012
- Salutatorian, KAIST Commencement, 2011
- KAIST Honor Student, KAIST, 2010
- Kim Younghan Global Leader Scholarship, KAIST, 2006–2007
- National Science Scholarship with Highest Honor, Korea Scholarship Foundation, 2005–2010
- Departmental Scholarship with top honor in CEE Department, KAIST, 2006–2010
- Daedeok Science Complex Scholarship, 2004

Appointments

- Assistant Professor, Civil and Environmental Engineering, Southern Methodist University (SMU), Dallas, TX, 2017–
- Postdoctoral Researcher, Logan Lab, Pennsylvania State University, University Park, PA, 2016–2017
    - Postdoctoral advisor: Bruce E. Logan (Bioenergy Laboratory)
    - Conversion of wastes into bioelectricity using microbial fuel cell (MFC)
    - Combined MFC and biofilter (BF) for effective treatment of wastewater
    - Development of full-scale, fouling-resistant cathodes
    - Full-scale demonstration of MFCs at military sites
- Graduate research assistant, Criddle Lab, Stanford University, Stanford, CA, 2011–2016
    - Removal of waste nitrogen and recovery of nitrogen fuel using methanotrophs
    - Enhanced mass transfer of gas substrates using microfluidic emulsions
    - Reliable strategy for selecting polyhydroxyalkanoate-producing methanotrophic community
    - Synthesis of polyhydroxyalkanoates copolymer from waste-driven biogas methane
    - Stable production of high molecular weight polyhydroxyalkanoates using complex natural gas
    - Biotic-abiotic recycling of polyhydroxyalkanoates biopolymer
- Water treatment engineer, K-water, Daejeon, South Korea, 2011
    - Liquid radioactive wastes treatment
- Software engineer, Software Team, COMIZOA, Daejeon, South Korea, 2007
    - Motion controller software development
- Undergraduate research assistant, New Energy Conversion System Laboratory at KAIST, 2010
    - Solid oxide fuel cell design
- Undergraduate research assistant, KAIST Institute for Eco-Energy, 2010
    - Solid oxide fuel cell design
- Undergraduate research assistant, Hazardous Substances Control and Environment Remediation Laboratory at KAIST, 2006–2007
    - Reductive debromination of polybrominated diphenyl ethers by zerovalent metal
- High School researcher, Environmental Engineering Research Laboratory at KAIST, 2004
    - Environmental monitoring of a local river

Teaching Experiences

- Special lecture on bioplastic regeneration, CEE224A: Sustainable Development Studio, Stanford University, Stanford, CA, 2014
- Teaching assistant, CEE177: Aquatic Chemistry and Biology, Stanford University, Stanford, CA, 2012
- Computer teacher, Khumuun Complex School, Zuunmod, Mongolia, 2008–2010
- Korean language teacher, Khumuun Complex School, Zuunmod, Mongolia, 2008–2010

Publications

- **J. Myung**, P. E. Saikaly, B. E. Logan, Two-step methane powered microbial fuel cell, *in preparation*.
- **J. Myung**, W. Yang, P. E. Saikaly, B. E. Logan, Comparison of the long-term performance of microbial fuel cells made of stainless steel and copper cathodes, *in preparation*.
- **J. Myung**, C. S. Criddle, Microbial enrichment enabling stable production of poly(3-hydroxybutyrate) using pipeline natural gas, *under review*.
- **J. Myung**, J. C. A. Flanagan, R. M. Waymouth, C. S. Criddle, Production of P3HB using ethane by *Methylocystis parvus* OBBP, *under review*.
- **J. Myung***, J. C. A. Flanagan*, R. M. Waymouth, C. S. Criddle, Expanding the range of polyhydroxyalkanoates synthesized by methanotrophic bacteria through the utilization of omega-hydroxyalkanoate co-substrates, *AMB Express*, **7**, 118 (2017). [DOI]

JAEWOOK MYUNG
Phone: 214-768-4229 • E-mail: jjaimyung@smu.edu • Web: https://sites.google.com/view/jjaimyung

- J. C. A. Flanagan*, **J. Myung***, C. S. Criddle, R. M. Waymouth, Poly(hydroxyalkanoate)s from Waste Biomass: A Combined Chemical–Biological Approach, *ChemistrySelect* **1**, 2327–2331 (2016). [DOI]
- **J. Myung**, J. C. A. Flanagan, R. M. Waymouth, C. S. Criddle, Methane or methanol-oxidation dependent synthesis of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) by obligate Type II methanotrophs, *Process Biochem.* **51**, 561–567 (2016). [DOI]
- **J. Myung**, M. Kim, M. Pan, C. S. Criddle, S. K. Y. Tang, Low energy emulsion-based fermentation enabling accelerated methane mass transfer and growth of poly(3-hydroxybutyrate)-accumulating methanotrophs, *Bioresour. Technol.* **207**, 302–307 (2016). [DOI] [AudioSlides]
- **J. Myung**, W. M. Galega, J. D. Van Nostrand, T. Yuan, J. Zhou, C. S. Criddle, Long-term cultivation of a stable *Methylocystis*-dominated methanotrophic enrichment enabling tailored production of poly(3-hydroxybutyrate-co-3-hydroxyvalerate), *Bioresour. Technol.* **198**, 811–818 (2015). [DOI]
- **J. Myung**, Z. Wang, T. Yuan, P. Zhang, J. D. Van Nostrand, J. Zhou, C. S. Criddle, Production of nitrous oxide from nitrite in stable Type II methanotrophic enrichment, *Environ. Sci. Technol.* **49**, 10969–10975 (2015). [DOI]
- **J. Myung**, N. I. Strong, W. M. Galega, E. R. Sundstrom, J. C. A. Flanagan, S. Woo, R. M. Waymouth, C. S. Criddle, Disassembly and reassembly of polyhydroxyalkanoates: recycling through abiotic depolymerization and biotic repolymerization, *Bioresour. Technol.* **170**, 167–174 (2014). [DOI]

* These authors contributed equally to the corresponding work.

Invited Talks

- Wastewater Harnessed to Make Electricity and Plastics, New York University, New York, NY, Apr 18, 2017
- Renovating the Water and Materials Infrastructure for Smart and Sustainable Development, Southern Methodist University, Dallas, TX, Apr 4, 2017
- Methanotroph Biotechnology for Environmental Sustainability, New Jersey Institute of Technology, Newark, NJ, Mar 28, 2017
- Wastewater to Energy and Resources, University of Houston, Houston, TX, Mar 21, 2017
- Methanotrophic Bacteria: Use in Bioremediation, Wayne State University, Detroit, MI, Mar 10, 2017
- Wastewater Harnessed to Make Electricity and Plastics, New York University Abu Dhabi, Abu Dhabi, United Arab Emirates, Mar 5, 2017
- Integrated Waste Management through Biogas Infrastructure, Concordia University, Montréal, QC, Canada, Feb 27, 2017
- Energy and Resource Recovery for Sustainable Wastewater Treatment, Kansas State University, Manhattan, KS, Feb 21, 2017
- Biodegradable Polymers from Methane, Seoul National University, Seoul, South Korea, Feb 1, 2017
- Turning Waste into Value: Integrated Resource Management through Methanogenic and Methanotrophic Biotechnology, Nanyang Technological University (NTU), Singapore, Jan 23, 2017
- The Immense Value of Biogas Methane, Newcastle University, Newcastle upon Tyne, UK, Dec 9, 2016
- Reinventing the Water Infrastructure: Integrated Recovery of Energy, Materials, Food, and Water, Carleton University, Ottawa, ON, Canada, Oct 18, 2016
- Understanding Cellular Metabolism in Type II Methanotrophs, Lewis-Sigler Institute for Integrative Genomics, Princeton University, Princeton, NJ, Apr 7, 2016
- Methanotrophic Production of Coproducts, National Renewable Energy Laboratory (NREL), Golden, CO, Mar 30, 2016
- Biotechnological Application of Methanotrophs, Lawrence Berkeley National Laboratory (LBNL), Emeryville, CA, Mar 10, 2016
- PHA Copolymers from Methane, International Conference and Exhibition on Biopolymers and Bioplastics, San Francisco, CA, Aug 10, 2015 [DOI]
- Polymer from Bacteria, Stanford Polymer Collective, Stanford University, Stanford, CA, Feb 13, 2015
- Microbial Recycling of PHA Bioplastics, "Bug Club Microbiology" Seminar Series, Stanford University, Stanford, CA, Nov 10, 2014

JAEWOOK MYUNG
Phone: 214-768-4229 • E-mail: jjaimyung@smu.edu • Web: https://sites.google.com/view/jjaimyung

Presentations

- Two-Step Methane-Powered Microbial Fuel Cells, US-KOREA Conference 2017 (UKC 2017), Washington, DC, Aug 10, 2017
- Recovery of Resources and Energy Using Methane-Utilizing Bacteria, Kappe Seminar, State College, PA, Aug 31, 2016
- Energy and Resource Recovery for Sustainable Wastewater Treatment, US-KOREA Conference 2016 (UKC 2016), Dallas, TX, Aug 12, 2016
- Methane as a Resource, Chevron Fellowship Meeting at Chevron Park, San Ramon, CA, Oct 12, 2015
- Polyhydroxyalkanoate-Accumulating Methanotrophs as High-Value Animal Food Supplement and Prebiotic, CJ-Forum at US-KOREA Conference 2015 (UKC 2015), Atlanta, GA, Jul 30, 2015
- Nitrogen Energy Recovery from Ammonium and Methane-Rich Centrate, US-KOREA Conference 2015 (UKC 2015), Atlanta, GA, Jul 30, 2015
- Poly(3-hydroxybutyrate-co-3-hydroxyvalerate) Copolymer from Methane, 2015 Stanford Polymer Collective (SPC) Symposium, Stanford, CA, Apr 17, 2015
- What Can We Do with Methane?, Stanford Environmental Engineering Program Student Seminar Series, Stanford, CA, Feb 19, 2015
- Production of High-Value Copolymers Using Methane as a Low-Cost Primary Substrate, Stanford School of Engineering Opportunity Job Fair 2015, Stanford, CA, Jan 23, 2015
- Bacterial Community that Utilizes Polyphosphate and Accumulates Bioplastics, ISME15, International Society for Microbial Ecology (ISME), Seoul, South Korea, Aug 25, 2014
- Biocompatible Polymer Production as a Means of Carbon Sequestration, US-KOREA Conference 2014 (UKC 2014), San Francisco, CA, Aug 7, 2014
- Utilization of Organic Phosphorus by PHB Accumulating Heterotrophs in a Bioreactor Fed with 3-Hydroxybutyrate, World Environmental & Water Resources Congress 2014, Portland, OR, Jun 2, 2014
- Stepwise Enrichment of a 3-hydroxybutyrate-Fed Microbial Community Capable of Stable Production of Poly(3-hydroxybutyrate) (PHB) and its Hydroxyvalerate Copolymer, American Society for Microbiology (ASM) 2014 General Meeting, Boston, MA, May 20, 2014
- Bacterial Enrichment Enabling Biopolymer Recycling, Stanford School of Engineering Opportunity Job Fair 2014, Stanford, CA, Jan 20, 2014
- Utilization of Organic Phosphorus during PHB Accumulation by Heterotrophs, Stanford Environmental & Water Studies Program 50th Anniversary, Stanford, CA, Sep 7, 2013
- PHB-to-PHB Direct Recycle using Eco-Biotechnology, US-KOREA Conference 2013 (UKC 2013), East Rutherford, NJ, Aug 9, 2013
- Integrated Energy-Material Recovery from Wastewater, Integrated Energy-Material Recovery from Wastewater, Korean-American Scientists and Engineers Association (KSEA) North West Regional Conference (NWRC) Presentation, Sacramento, CA, Nov 3, 2012
- Reductive Debromination of Polybrominated Diphenyl Ethers by Zerovalent Metal, Korean Society of Environmental Engineers (KSEE) Fall Meeting 2007, Chuncheon, South Korea, Nov 2, 2007

Patents

- S. K. Y. Tang, C. S. Criddle, **J. Myung**, M. Kim, Emulsion-based fermentation for accelerated gas substrate mass transfer, U.S. Provisional Patent Appl. 62/289,024, January 29, 2016
- C. S. Criddle, W. M. Galega, **J. Myung**, Production of tailored PHA copolymers from natural gas, U.S. Non-Provisional Patent Appl. 14/836,510, August 26, 2015
- C. S. Criddle, **J. Myung**, Production of tailored PHA copolymers with methane and added co-substrates, U.S. Non-Provisional Patent Appl. 14/825,473, August 13, 2015

JAEWOOK MYUNG
Phone: 214-768-4229 • E-mail: jjaimyung@smu.edu • Web: https://sites.google.com/view/jjaimyung

Professional Services

- Journal reviewer, Chemical Engineering Journal, 2017–
- Journal reviewer, Sustainable Cities and Society, 2017–
- Journal reviewer, Mini-Reviews in Organic Chemistry, 2016–
- Journal reviewer, Journal of Environmental Sciences, 2016–
- Journal reviewer, Scientific Reports, 2015–
- Organizing committee member, Stanford Environmental Engineering Science Program Seminar, 2014-2015

Membership and Certifications

- AEESP member, Association of Environmental Engineering and Science Professors (AEESP), 2017–
- ACS member, American Chemical Society (ACS), 2014–
- ISME member, International Society for Microbial Ecology (ISME), 2014–
- ASM member, American Society for Microbiology (ASM), 2014–
- KSEA member, Korean-American Scientists and Engineers Association (KSEA), 2013–
- Microsoft Office Specialist Master, Microsoft, 2007
- Industrial Engineer Information Processing, Human Resources Development Service of Korea, 2007
- Special committee member, Korea Federation for Environmental Movement, Daejeon, South Korea, 2006–2007

References

Prof. Bruce E. Logan (Postdoctoral Advisor)
Department of Civil and Environmental Engineering
Pennsylvania State University
blogan@psu.edu
http://www.engr.psu.edu/ce/enve/logan

Prof. Craig S. Criddle (Ph.D. Dissertation Advisor)
Department of Civil and Environmental Engineering
Stanford University
ccriddle@stanford.edu
http://www.stanford.edu/group/evpilot

Prof. Perry L. McCarty (Ph.D. Dissertation Reading Committee)
Department of Civil and Environmental Engineering
Stanford University
pmccarty@stanford.edu
http://www-ce.stanford.edu/faculty/mccarty

Prof. Robert M. Waymouth (Ph.D. Dissertation Reading Committee)
Department of Chemistry
Stanford University
waymouth@stanford.edu
http://web.stanford.edu/group/waymouth

Prof. Jizhong Zhou (Research Collaborator)
Department of Microbiology and Plant Biology
University of Oklahoma
jzhou@ou.edu

http://ieg.ou.edu/people/jizhongzhou.html

Prof. Sindy K.Y. Tang (Research Collaborator)
Department of Mechanical Engineering
Stanford University
sindy@stanford.edu
http://stanford.edu/group/tanglab

Prof. Hang-Sik Shin (Undergraduate Advisor)
Department of Civil and Environmental Engineering
KAIST
hangshin@kaist.ac.kr
http://eerl.kaist.ac.kr

Prof. Woojin Lee (Undergraduate Advisor)
Department of Civil and Environmental Engineering
KAIST
woojin_lee@kaist.ac.kr
http://egrl.kaist.ac.kr

Prof. Seung-Rae Lee (Undergraduate Advisor)
Department of Civil and Environmental Engineering
KAIST
srlee@kaist.ac.kr
http://geotech.kaist.ac.kr

JAEWOOK MYUNG
Phone: 214-768-4229 • E-mail: jjaimyung@smu.edu • Web: https://sites.google.com/view/jjaimyung