



Chungheon Shin

Research Engineer

Civil and Environmental Engineering

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BIO

Chungheon Shin is the Research Director at the Codiga Resource Recovery Center at Stanford University. He is passionate about prospects for sustainability through resource recovery from waste streams and believes that engineering can make it possible. He has been developing and optimizing innovative processes that can recover resources while mitigating greenhouse gas emissions. His studies incorporate various processes (biological and physicochemical systems), scales of analyses (kinetics to systems-level), and computational skills (conventional and data-driven models). He received his Ph.D. in Environmental Engineering at Inha University (South Korea) while developing the Staged Anaerobic Fluidized-bed Membrane Bioreactor (SAF-MBR), enabling recovery of clean water and energy from municipal wastewater, with Professor Jaehoe Bae and Professor Perry L. McCarty. He was a postdoctoral scholar in the Civil and Environmental Engineering department at Stanford University under the supervision of Professor Craig S. Criddle and Adjunct Professor Sebastien Tilman.

ACADEMIC APPOINTMENTS

- Research Engineer, Civil and Environmental Engineering

Teaching

COURSES

2023-24

- Environmental Biotechnology: CEE 271B (Win)

Publications

PUBLICATIONS

- **Obituary Perry L. McCarty 1931-2023** *NATURE SUSTAINABILITY*
Criddle, C. S., Luthy, R. G., Rittmann, B. E., Shin, C.
2023
- **Dissolved Methane Recovery and Trace Contaminant Fate Following Mainstream Anaerobic Treatment of Municipal Wastewater.** *ACS ES&T engineering*
Galdi, S. M., Szczuka, A., Shin, C., Mitch, W. A., Luthy, R. G.
2023; 3 (1): 121-130
- **Recovery of Clean Water and Ammonia from Domestic Wastewater: Impacts on Embodied Energy and Greenhouse Gas Emissions.** *Environmental science & technology*
Shin, C., Szczuka, A., Liu, M. J., Mendoza, L., Jiang, R., Tilman, S. H., Tarpeh, W. A., Mitch, W. A., Criddle, C. S.
2022
- **Anaerobic membrane bioreactor model for design and prediction of domestic wastewater treatment process performance** *CHEMICAL ENGINEERING JOURNAL*

- Shin, C., Tilmans, S. H., Chen, F., Criddle, C. S.
2021; 426
- **Temperate climate energy-positive anaerobic secondary treatment of domestic wastewater at pilot-scale.** *Water research*
Shin, C., Tilmans, S. H., Chen, F., McCarty, P. L., Criddle, C. S.
2021; 204: 117598
 - **Optimization of reverse osmosis operational conditions to maximize ammonia removal from the effluent of an anaerobic membrane bioreactor** *ENVIRONMENTAL SCIENCE-WATER RESEARCH & TECHNOLOGY*
Shin, C., Szczuka, A., Jiang, R., Mitch, W. A., Criddle, C. S.
2021; 7 (4): 739–47
 - **A comparative pilot-scale evaluation of gas-sparged and granular activated carbon-fluidized anaerobic membrane bioreactors for domestic wastewater treatment.** *Bioresource technology*
Evans, P. J., Parameswaran, P. n., Lim, K. n., Bae, J. n., Shin, C. n., Ho, J. n., McCarty, P. L.
2019; 120949
 - **Current status of the pilot-scale anaerobic membrane bioreactor treatments of domestic wastewaters: A critical review** *BIORESOURCE TECHNOLOGY*
Shin, C., Bae, J.
2018; 247: 1038–46
 - **Low energy single-staged anaerobic fluidized bed ceramic membrane bioreactor (AFCMBR) for wastewater treatment.** *Bioresource technology*
Aslam, M., McCarty, P. L., Shin, C., Bae, J., Kim, J.
2017
 - **Integrity of hollow-fiber membranes in a pilot-scale anaerobic fluidized membrane bioreactor (AFMBR) after two-years of operation** *SEPARATION AND PURIFICATION TECHNOLOGY*
Shin, C., Kim, K., McCarty, P. L., Kim, J., Bae, J.
2016; 162: 101–105
 - **Development and application of a procedure for evaluating the long-term integrity of membranes for the anaerobic fluidized membrane bioreactor (AFMBR).** *Water science and technology*
Shin, C., Kim, K., McCarty, P. L., Kim, J., Bae, J.
2016; 74 (2): 457–465
 - **Importance of Dissolved Methane Management When Anaerobically Treating Low-Strength Wastewaters** *CURRENT ORGANIC CHEMISTRY*
Shin, C., McCarty, P. L., Bae, J.
2016; 20 (26): 2810–2816
 - **Anaerobic treatment of low-strength wastewater: A comparison between single and staged anaerobic fluidized bed membrane bioreactors** *BIORESOURCE TECHNOLOGY*
Bae, J., Shin, C., Lee, E., Kim, J., McCarty, P. L.
2014; 165: 75–80
 - **Anaerobic treatment of low-strength wastewater: A comparison between single and staged anaerobic fluidized bed membrane bioreactors.** *Bioresource technology*
Bae, J., Shin, C., Lee, E., Kim, J., McCarty, P. L.
2014; 165: 75–80
 - **Pilot-scale temperate-climate treatment of domestic wastewater with a staged anaerobic fluidized membrane bioreactor (SAF-MBR)** *BIORESOURCE TECHNOLOGY*
Shin, C., McCarty, P. L., Kim, J., Bae, J.
2014; 159: 95–103
 - **Lower operational limits to volatile fatty acid degradation with dilute wastewaters in an anaerobic fluidized bed reactor** *BIORESOURCE TECHNOLOGY*
Shin, C., Bae, J., McCarty, P. L.
2012; 109: 13–20
 - **Effects of influent DO/COD ratio on the performance of an anaerobic fluidized bed reactor fed low-strength synthetic wastewater** *BIORESOURCE TECHNOLOGY*
Shin, C., Lee, E., McCarty, P. L., Bae, J.

2011; 102 (21): 9860-9865

- **Anaerobic Fluidized Bed Membrane Bioreactor for Wastewater Treatment** *ENVIRONMENTAL SCIENCE & TECHNOLOGY*

Kim, J., Kim, K., Ye, H., Lee, E., Shin, C., McCarty, P. L., Bae, J.

2011; 45 (2): 576-581