

# Kai Cheng

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## EDUCATION

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<b>Texas A&amp;M University</b> , College Station, TX Doctor of Philosophy in Environmental Engineering	Aug 2020 to present
<b>Southern Methodist University</b> , Dallas, TX Master of Science in Environmental Engineering,	Jun 2020
<b>Huazhong University of Science and Technology</b> Master of Engineering in Environmental Engineering	Jun 2016
<b>Yantai University</b> Bachelor of Engineering in Environmental Engineering	Jun 2014

## AWARDS AND HONORS

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<b>Zachry Department Excellence Fellowship</b> Texas A&M University	Aug 2020
<b>Conference Travel Grant Award</b> (\$750) Lyle School of Engineering GSC, Southern Methodist University	Feb 2020
<b>Graduate Student Travel Grant Award</b> (\$750) Southern Methodist University	Feb 2020
<b>Outstanding Poster Award</b> (Presented to one student in each department) Lyle School of Engineering Research Day, Southern Methodist University	Oct 2019
<b>College Solid Waste Focus Scholarship</b> (\$1500) Texas Lone Star Chapter, Solid Waste Association of North America	May 2019
<b>Second Place in "Present around the World" Competition</b> The Institute of Engineering and Technology	Apr 2016
<b>National Motivational Graduate Fellowship</b> Huazhong University of Science and Technology	2014-2016

## RESEARCH EXPERIENCE

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Department of Civil and Environmental Engineering 2020 to present  
Texas A&M University  
*Evaluating the Microheterogenous Distribution of Photochemical Produced Singlet Oxygen Using Furfuryl Amine*

Department of Civil and Environmental Engineering 2018-2020  
Southern Methodist University  
*(Thesis) Microbial Synthesis of Environmental Functional Materials from Anaerobically Treated Food Wastes*

- Synthesized polyhydroxyalkanoates biopolymer from methane using *Methylocystis parvus* OBBP.
- Produced enhanced quality of polyhydroxyalkanoates by the addition of volatile fatty acids (VFAs).
- Tracked metabolic pathways of biopolymer when VFAs were added to the system.
- Elucidated the microbial community biodiversity through phylogenetic trees from different inoculation sources that were used for enrichment culture.

Department of Biological Science Aug-Dec 2019  
Southern Methodist University  
*CRISPR-Cas9 System in Drosophila to Create New Research Tools*

- Designed the sgRNA spacer sequence based on the CG 10466 gene of interests and constructed recombinant plasmid DNA.
- Designed the homology arms and created the recombinant plasmid by the Gibson assembly method.
- Prepared the Midiprep sgRNA constructs and donor constructs for injection into *Drosophila* in making research tools.

Department of Environmental Science and Engineering 2014-2016  
 Huazhong University of Science and Technology

***Aerobic Granular Sludge Inoculated Microbial Fuel Cells (MFCs) for Enhanced Treatment of Wastewater***

- Set up the novel reactor of aerobic granular sludge inoculated MFCs.
- Analyzed the biological and electrochemical performance of the reactors.
- Proposed microbial degradation mechanism to reveal intrinsic relations between biofilm formation, electron transfer, and toxin degradation.

Yantai Institute of Coastal Zone Research July 2013-Aug 2013  
 Chinese Academy of Sciences

***Undergraduate Research Training Program***

- Observed the change of microbial communities in the formation of activated sludge.
- Examined the associations between microorganisms and the sludge in different formation phases.

**WORK EXPERIENCE**

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**Southern Methodist University, Dallas, TX** Jul-Dec 2019

*Teaching Assistant for "Intro to Civil & Environmental Engineering" (CEE 1302)*

- Lectured to a class for 36 students on the usage of AutoCAD.

*Teaching Assistant for "Engineering Microbiology Lab" (CEE 5/7418)* May 2018, 2019

- Led lab sessions with a class of 16 students.
- Instructed students to perform aseptic techniques.
- Delivered lectures on microscope usage, staining, culturing, and dilution/counting technique to identify and enumerate microorganisms.

**City of Plano, TX** Jul-Aug 2019

*Intern to Environmental Quality Specialist*

- Performed site visits to creeks to collect information regarding pollution conditions
- Captured aquatic creatures to evaluate water quality
- Determined if creeks met requirements and if related systems were in compliance

**China City Environment Protection Company, Wuhan, China** Jul 2016-August 2017

*Assistant Engineer of Water Supply and Drainage*

- Designed building's water supply/drainage pipelines, and sprinkler system.
- Achieved familiarity with design codes, hydraulic calculation, and AutoCAD software operation.

**PUBLICATIONS**

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- Sun, W., **Cheng, K.**, Sun, K. Y., & Ma, X. (2021). Microbially Mediated Remediation of Contaminated Sediments by Heavy Metals: a Critical Review. *Current Pollution Reports*, 1-12.
- Chen, Q., Pu, W., Hou, H., Hu, J., Liu, B., Li, J., **Cheng, K.**, Huang, L., Yuan, X., Yang, C. and Yang, J., 2018. Activated microporous-mesoporous carbon derived from the chestnut shell as a sustainable anode material for high-performance microbial fuel cells. *Bioresource technology*, 249, pp.567-573.
- **Cheng, K.**, Hu, J., Hou, H., Liu, B., Chen, Q., Pan, K., Pu, W., Yang, J., Wu, X. and Yang, C., 2017. Aerobic granular sludge inoculated microbial fuel cells for enhanced epoxy reactive diluent wastewater treatment. *Bioresource technology*, 229, pp.126-133.
- Long, B., Yang, C.Z., Pu, W.H., Yang, J.K., Liu, F.B., Zhang, L. and **Cheng, K.**, 2015. Rapid cultivation of aerobic granular sludge in a continuous flow reactor. *Journal of Environmental Chemical Engineering*, 3(4), pp.2966-2973.
- Long, B., Yang, C.Z., Pu, W.H., Yang, J.K., Liu, F.B., Zhang, L., Zhang, J. and **Cheng, K.**, 2015. Tolerance to organic loading rate by aerobic granular sludge in a cyclic aerobic granular reactor. *Bioresource technology*, 182, pp.314-322.

In preparation

- **Kai Cheng** and Garrett McKay (2021). Evaluating the Microheterogeneous Distribution of Photochemically Produced Singlet Oxygen Using Furfuryl Amine. *Environmental Science & Technology*.

## CONFERENCE/POSTER PRESENTATIONS

**The 259<sup>th</sup> ACS National Meeting & Exposition (Canceled due to Covid-19)** Mar 22-26, 2020  
Philadelphia

*Optimizing the Methanotrophic Production of Different Types of Polyhydroxyalkanoates (PHAs) by Utilizing Organic Waste-Derived Methane and Volatile Fatty Acids (Oral Presentation)*

**Lyle School of Engineering Research Day 2019** Oct 24-25, 2019  
Southern Methodist University, Dallas

*Enhanced polyhydroxyalkanoates generation from foodwaste-derived volatile fatty acid addition (Poster)*

**IWA Science Summit for Urban Water** Nov 17-20, 2016  
Beijing

*Aerobic granular sludge inoculated microbial fuel cell for enhanced wastewater treatment (Poster)*