# Ting Gong

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## EDUCATION BACKGROUND

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| ♦ Post-doc | Chemical Engineering | Penn State University, USA | 09/2017-04/2019 |
| ♦ Ph.D. | Microbiology | Nankai University, China | 09/2012-09/2017 |
| ♦ B.S. | Biotechnology | Nankai University, China | 09/2008-09/2012 |
| | Exchange Student | Korea University, South Korea | 09/2010-01/2011 |

## RESEARCH EXPERIENCE

**The Pennsylvania State University** Postdoctoral Research Assistant, 2017.09-Present

**Biofilm and Souring Control in Energy Fields via Microbial Quorum Sensing Regulation**

♦ Revealed that σ54-dependent regulator DVU2956 reduces *Desulfovibrio vulgaris* biofilm formation.
♦ Explored small molecular chemicals that could activate DVU2956, then reduce SRB biofilm.
♦ Explored sulfate-reducing bacteria biofilm containing extracellular DNA component by DNA staining and microscopy.
♦ Identified dispersal effect of rhamnolipids from *Pseudomonas aeruginosa* on biofilms of sulfate-reducing bacteria.

**Mechanism of *Pseudomonas aeruginosa* PA14 and *E. coli* persister cells**

♦ Explored the mechanism of indole inhibit *P. aeruginosa* PA14 persister cells waking
♦ Explored whether PA14 and BW25113 persister cells could simultaneous wake up by different kinds of nutrition.

**Nankai University, China** Graduate Research Assistant, 2012.09-2017.09

**Leveraging synthetic biology in constructing bioremediation pathways of persistent organic pollutants in microbial cells. (Thesis project)**

♦ Construction of a biosafety *Pseudomonas putida* KT2440 for complete mineralization of methyl parathion (MP) and γ-hexachlorocyclohexane (γ-HCH) by functional assembly of the MP and γ-HCH mineralization pathways.
♦ Construction a 1,2,3-trichloropropane (TCP)-utilizing recombinant strain that can completely degrade TCP through an improved catabolic pathway.
♦ Construction of an engineered *Pseudomonas putida* KT2440 that could degrade pyrethroids and carbamates simultaneously.

**Morphology engineering for enhanced production of medium-chain-length polyhydroxyalkanoates (PHA) in *Pseudomonas.***

♦ Overexpression of MreB to construct longer *Pseudomonas mendocina* NK-01.
♦ Recruiting a new strategy to improve PHA production in *P. putida*.

**Heterologous expression synthetic pathway of value-added compound.**

♦ Using a scarless gene replacement procedure with *upp* as a counter-selectable marker, isobutanol synthetic pathway was assembled in KT2440.
♦ Construction of an energy saving carbon metabolic pathway in *Pseudomonas putida* KT2440.

## TECHNICAL SKILLS

♦ Microbial cell culture; 5-L, 30-L, 200-L bioreactor culture; Microbial co-culture fermentation; Recombinant technique and Genetic-systems operation; Plasmid transformations; Plasmid construction; Small regulatory sRNA design and application; Real-time qPCR; Heterogeneous expression; Recombinant protein expression

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and purification; Enzyme activity assay; Enzymatic display; SDS-PAGE; Southern/Western Blot; DGGE; EMSA; Persister cell assay; Bacterial biofilm assay; Sulfur detection; Anaerobic bacteria culturing and genetic operation; RNA-seq analysis.

♦ Gas Chromatography (GC); Gel Filtration Chromatography (GFC); High Performance Liquid Chromatography (HPLC); Biosensor detection; Electron microscope (SEM&TEM).

## RECENT PUBLICATION

♦ **2017-present Postdoctoral Research**

1. Lei Zhu, **Ting Gong** (co-author), Thammajun L. Wood, Ryota Yamasaki, Thomas K. Wood.* σ54-dependent regulator DVU2956 reduces *Desulfovibrio vulgaris* biofilm formation and hydrogen sulfide production. ***Environ. Microbiol.*** Revising.
2. **Ting Gong**, Lei Zhu, Ryota Yamasaki, Thammajun L. Wood, Thomas K. Wood.* Hypothetical protein DVU0086 SRB biofilm inhibitor. Preparing.
3. Thammajun L. Wood, **Ting Gong**, Lei Zhu, James Miller, Daniel S. Miller, Bei Yin, and Thomas K. Wood.* Rhamnolipids from *Pseudomonas aeruginosa* disperse the biofilms of sulfate-reducing bacteria. ***NPJ Biofilms Microbiomes*** 4: 22 (2018).
4. Sooyeon Song, **Ting Gong**, Ryota Yamasaki, and Thomas K. Wood.* Identification of a potent indigoid persister antimicrobial by screening dormant cells. ***Biotechnol. Bioeng.*** Submitted.
5. Weiwei Zhang, **Ting Gong**, Ryota Yamasaki, and Thomas K. Wood.* Interkingdom signal indole inhibits *Pseudomonas aeruginosa* persister cell waking. Preparing.
6. Mingming Pu, Lili Sheng, Sooyeon Song, **Ting Gong**, Thomas K. Wood.* Serine hydroxymethyltransferase *shrA* (PA2444) controls rugose small-colony variant formation in *Pseudomonas aeruginosa*. ***Front. Microbiol.*** 9, 315.

♦ **2012-2017 Graduate Research**

1. **Ting Gong** (co-author), Xiaoqing Xu, Xingdong Wang, Fengjie Zhao, Cunjiang Song,* Chao Yang.* An engineered *Pseudomonas putida* can simultaneously degrade organophosphates, pyrethroids and carbamates. ***Sci. Total Environ***. 628, 1258-1265.
2. **Ting Gong**, Xiaoqing Xu, You Che, Ruihua Liu, Weixia Gao, Fengjie Zhao, Huilei Yu, Jingnan Liang, Ping Xu, Cunjiang Song,* Chao Yang.* Combinatorial metabolic engineering of *Pseudomonas putida* KT2440 for efficient mineralization of 1,2,3-trichloropropane. ***Sci. Rep***. 2017, 7(1):7064.
3. **Ting Gong** (co-author), Ruihua Liu, You Che, Xiaoqing Xu, Fengjie Zhao, Huilei Yu, Cunjiang Song,* Yanping Liu,* Chao Yang.* Engineering *Pseudomonas putida* KT2440 for simultaneous degradation of carbofuran and chlorpyrifos. ***Microbial. Biotechnol***. 2016, 9(6):792-800.
4. **Ting Gong**, Ruihua Liu, Zhenqiang Zuo, You Che, Huilei Yu, Cunjiang Song,* Chao Yang.* Metabolic engineering of *Pseudomonas putida* KT2440 for complete mineralization of methyl parathion and γ-hexachlorocyclohexane. ***ACS Synth Biol***. 2016, 5:434-442.
5. Zhenqiang Zuo, **Ting Gong** (co-author), You Che, Ruihua Liu,* Ping Xu, Hong Jiang, Chuanling Qiao, Cunjiang Song,* Chao Yang.* Engineering *Pseudomonas putida* KT2440 for simultaneous degradation of organophosphates and pyrethroids and its application in bioremediation of soil. ***Biodegradation*** 2015, 26(3):223-233.
6. Fengjie Zhao, **Ting Gong**, Xiangsheng Liu, Xu Fan, Rui Huang, Ting Ma, Shufang Wang, Weixia Gao, Chao Yang.* Morphology engineering for enhanced production of medium-chain-length polyhydroxyalkanoates in *Pseudomonas mendocina* NK-01. ***Appl Microbiol Biotechnol.*** 2019 Jan 4
7. You Che, Peixin Liang, **Ting Gong**, Xiangyu Cao, Ying Zhao, Chao Yang,* Cunjiang Song.* Elucidation of major contributors involved in nitrogen removal and of transcription level of nitrogen-cycling genes in activated sludge from WWTPs. ***Sci. Rep***. 2017, 7, 44728.
8. Yuanyuan Wang, Chi Zhang, **Ting Gong** (second author), Zhenqiang Zuo, Fengjie Zhao, Xu Fan, Chao Yang, Cunjiang Song.* An *upp*-based markerless gene replacement method for genome reduction and metabolic pathway engineering in *Pseudomonas mendocina* NK-01 and *Pseudomonas putida* KT2440. ***J. Microbiol. Methods*** 2015, 113, 27-33.
9. Jingjing Duan, Wenbin Guo, Chi Zhang, Yuanyuan Wang, **Ting Gong**, Cunjiang Song.* Optimization of

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fermentation conditions for medium-chain-length polyhydroxylalkanoate synthesis by *Pseudomonas mendocina* NK-01. ***Journal of Microbiology***. 2015, 35(4):40-45.

10. Chi Zhang, **Ting Gong** (second author), Chao Yang, Yang Sun, Zhenqiang Zuo, Cunjiang Song.* Progress in biosynthesis of polymers and complex compounds in *Pseudomonas* species—a review. ***Microbiology China***. 2014, 42(3):559-567.
11. Xu Fan, **Ting Gong**, Fengjie Zhao, Shufang Wang,* Chao Yang.* Overexpressing MreB results in cell shape change and enhanced synthesis of alginate oligosaccharides in *Pseudomonas mendocina* NK-01. ***3Biotech***. Submitted.