



FEATURED MEMBERS



## Dr. Wei-Qin Zhuang (庄渭沁)

Position: Senior Lecturer

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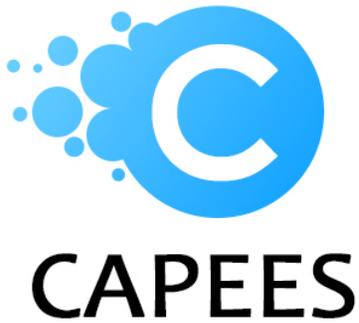
### 1. Career Path

I have a multidisciplinary educational background. My Bachelor's degree is in Biochemical Engineering obtained from Tianjin University (TJU). During my final-year research project at TJU, I learned how to optimize the fermentation process to allow a genetically modified *E. coli* strain to maximize the expression of a cloned human interleukin-6 gene. Fascinated by the capabilities of microbes and their diverse applications in engineering processes, I decided to dive into the invisible world of microbes. I received my Masters and Ph.D. degrees in Environmental Engineering from Nanyang Technological University in Singapore under the supervision of the late A/Professor Stephen Tiong-Lee Tay and the late Professor Joo-Hwa Tay. My dissertation research was in biological wastewater treatment and water reuse, which is still a crucial focus for achieving water sustainability in many regions of the world. Shortly after receiving my Ph.D. degree, I joined Professor Lisa Alvarez-Cohen's research group at the University of California, Berkeley, as a postdoctoral researcher. Here, I worked on a range of projects including; reductive dechlorination, rare earth elements bioleaching, and anaerobically biological nutrient removal. In 2015, I landed a faculty position (Senior Lecturer, academic rank of British derivation) in the Department of Civil and Environmental Engineering at the University of Auckland, New Zealand. Although I have jumped three cities since Singapore, it seems that I have not been able to escape the shadow of the "Ring of Fire." Taking the hints from life, I settled my research to focus on developing energy-efficient and low carbon emission biological wastewater treatment processes using extremophiles, i.e., microbes that can survive and thrive in extreme conditions, such as hot springs or volcanic sites, which are bountiful in New Zealand.

### 2. Research

My research falls within the realm of applied and environmental microbiology. My long-term research path is to understand diverse extremophiles to properly utilize them in environmental engineering processes. At the University of Auckland, I have steered my research to be more focused on urban and coastal water quality management. Currently, there are six enthusiastic Ph.D. Students and two Masters Students in my research group. We have been working on low-carbon emission biological wastewater treatment processes as a response to New Zealand's goal of achieving zero-carbon emission by 2050. For instance, we are developing a nutrient removal process to harness the power of autotrophic ammonia oxidizing and denitrifying microbes to treat aquaculture wastewater; mitigating odor compounds generated by anaerobic digestion of seafood processing wastewater; up-cycling organic waste in dairy wastewater to produce value-added products; also developing decentralized wastewater treatment processes for rural applications.





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### *3. Teaching*

In the Fall Semester (usually starting in late February in the Southern hemisphere), I teach “Water and Wastewater Engineering” to a cohort of 4<sup>th</sup>-year and Master’s students. I also co-teach “Environmental Engineering II” to 3<sup>rd</sup>-year CEE students and “Energy Technology” to Master of Energy students with my colleagues across the Faculty of Engineering. In the Spring Semester, I put on a course director hat and co-teach “Environmental Engineering I” to our 2<sup>nd</sup>-year cohort of approximately 270 students. I believe my role as an educator is to foster a diverse and fertile learning environment that provides each student the opportunity to pursue a high-quality education.

### *4. Professional Activities*

I am a member of the American Chemical Society (ACS), American Society for Microbiology (ASM), and Engineering New Zealand (ENZ). In the past couple of years, I regularly attended ACS National Meetings and co-organized symposia with some close colleagues in the Spring Sessions. I am currently also serving as an Associate Editor for BMC Microbiology.

### *5. University, Area and Community*

New Zealand is a picturesque country, and Auckland is known as the City of Sails. Maori are the indigenous people of New Zealand. Before coming here, I was not aware of the role and the knowledge of Maori in the management of water and land in New Zealand. After these past years of interacting with Maori culture, I gained an appreciation of the ways in which holistic thinking about water and land could be brought into a modern regulatory framework and sustainable development.

### *6. Key factors that lead to your career today?*

Looking back, I attribute the development of my career path to three key factors: curiosity on the fascinating microbial world, unconditional support from many mentors, and constant inspiration from my family, colleagues, and students.



Wei-Qin’s Research Group (December, 2019).

From left to right, Michael, Yang, Hukerenui, Ohinerau, Arastou, Yashika, and Bo.