

Jun Wu

Professor of microbial ecology

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Education:

- Ph.D., Nanjing Agricultural University, Environmental Microbiology, 2006
- M.S., Nanjing Agricultural University, Environmental Microbiology, 2003
- B.A., Nanjing Agricultural University; Microbiology, 2000

Research interests and expertise:

- My research has examined the universal antibiotic resistance in bacteria. The resistance is generated by antibiotic resistance genes (ARGs) or bacterial persisters. Currently, I focus on the molecular mechanisms underlying bacterial persisters. Bacterial persisters are dormant phenotypic variants tolerant to lethal antibiotics and responsible for chronic and recurrent infections. Multiple mechanisms have been linked to persister formation. I have discovered that a complex, consisting of an extracellular poly(dC) and its membrane-associated binding protein RmlB, determines how the opportunistic pathogen *Pseudomonas aeruginosa* responds to environmental stimuli. A switch in the complex physiological state rapidly dissipates cellular proton motive force and reduces intracellular ATP levels, resulting in dormancy. This alteration in complex status is linked to a (p)ppGpp-controlled signaling pathway. This finding provides a novel perspective for understanding the mechanisms of persister formation.

Current projects:

- The National Natural Science Foundation of the People's Republic of China (2015 ~ 2018, Projects no. 31470551): Transfer and bioaccumulation of a cyanobacterial neurotoxin β -methyl-amino-L-alanine (BMAA) within farmland soil ecosystems
- The Fundamental Research Funds for the Central Universities (2018, Project no. KYZ201874): Effects of polycyclic aromatic hydrocarbons on the higher/novel resistance mutation of antibiotic resistance genes in soils

Current teaching:

- Microbial Ecology, Convergence of Disciplines, autumn term
- Ecological experiment, Ecological Disciplines, spring term

Selected publications:

- Mengsha Li, Rui Guo, Fei Yu, Xu Chen, Haiyan Zhao, Huixin Li*, Jun Wu*. (2018) Indole-3-Acetic Acid Biosynthesis Pathways in the Plant-Beneficial Bacterium *Arthrobacter pascens* ZZ21. *International Journal of Molecular Sciences*. 19(2). pii: E443.
- Xincheng Ge, Wei Wei, Gen Li, Mingming Sun, Huixin Li, Jun Wu*, Feng Hu*. (2017) Isolated *Pseudomonas aeruginosa* strain VIH2 and antagonistic properties against *Ralstonia solanacearum*. *Microbial Pathogenesis*. 111: 519-526.
- Gen Li, Mingming Sun, Jun Wu*, Mao Ye, Xincheng Ge, Wei Wei, Huixin Li, Feng Hu. (2015) Identification and biochemical characterization of a novel endo-type β -agarase AgaW from *Cohnella* sp. strain LGH. *Applied Microbiology and Biotechnology*. 99(23): 10019-10029.
- Mingming Sun, Mao Ye*, Jun Wu*, Yanfang Feng, Jinzhong Wan, Da Tian, Fangyuan Shen, Kuan Liu, Feng Hu, Huixin Li, Xin Jiang, Linzhang Yang, Fredrick Orori Kengara. (2015) Positive relationship detected between soil bioaccessible organic pollutants and antibiotic resistance genes at dairy farms in Nanjing, Eastern China. *Environmental Pollution*. 206: 421-428.
- Mingming Sun, Mao Ye*, Jun Wu*, Yanfang Feng, Fangyuan Shen, Da Tian, Kuan Liu, Feng Hu, Huixin Li, Xin Jiang, Linzhang Yang, Fredrick Orori Kengara. (2015) Impact of bioaccessible pyrene on the abundance of antibiotic resistance genes during *Sphingobium* sp.- and sophorolipid-enhanced bioremediation in soil. *Journal of Hazardous Materials*. 300: 121-128.