

Fuxing Kang

Associate Professor of Environmental Sciences

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Education:

- PhD, Nanjing University, Environmental Science, 2013
- M. S., Guizhou Normal University, Environmental Science, 2009
- B. S., Jiamusi University, Geographical Science, 2006

Research interests and expertise:

His research has examined environmental processes of typical pollutants, including physiochemical process of organic chemicals/heavy metals at microorganism-environment interface, biological responses to transformation of toxic chemicals, and effect on public health. Currently, He focuses on the interplay among biofilms, transformation of toxic chemicals, and rhizosphere absorption of crops from the soil, particularly association of the driving mechanisms for chemical transformation with toxic effect, elucidated by using quantitative models. He has discovered that saccharides-driven reduction of high-oxidation-state chemicals (e.g., organics and metals) within microbially extracellular matrix, also made efforts to explore the effect of noncovalent bonding mechanisms on attenuation of chemical toxicity/ARG activity (e.g., organics, antibiotics, and antibiotics resistance genes (ARGs)) at different bio-environment interfaces at a molecular/functional level. Understanding these environmental processes of pollutant transformations at multiple environmental interfaces are critical for sustaining quality of agricultural products under increasingly serious environmental pollution.

Foundation items:

- Microbially functional saccharides coupled with electron shuttles in rhizosphere restrain uptake of perchlorate by vegetables. National Science Foundation of China, ¥ 650,000, 2017-2021.
- Immobilization and Chemical conversion of typical organic chemicals in water-microbe systems. The Fundamental research funds of the central university, ¥ 160,000, 2018-2019.
- PAH-induced physical damages to the antibiotic resistance plasmids. National Science Foundation of China, ¥ 250,000, 2013-2016.
- Typical PAHs physically damage plasmids and effect on expression of antibiotic

resistance genes. Natural Science Foundation of Jiangsu Province of China, ¥200,000, 2013-2016.

Prizes, awards, honors:

- Jiangsu Science and Technology Progress Award (Second Prize, Rank fourth), 2016
- Soil Science Society of China Award (Second Prize, Rank second), 2015
- Zhongshan Academic Rookie Talent, 2015

Current teaching:

- Environmental Toxicology, Fall Semester
- An Introduction to Environmental Science and Technology, Spring Semester
- Environmental Monitoring, Fall Semester

Selected publications:

- Weijun Shou, **Fuxing Kang***, Jiahao Lu. Nature and value of freely dissolved EPS ecosystem services: Insight into molecular coupling mechanisms for regulating metal toxicity. *Environ. Sci. Technol.* 2018; 52(2): 457–466.
- **Fuxing Kang**, Xiaolei Qu, Pedro J. J. Alvarez, and Dongqiang Zhu*. Extracellular saccharide-mediated reduction of Au³⁺ to gold nanoparticles: new insights for heavy metals biomineralization on microbial surfaces. *Environ. Sci. Technol.* 2017, 51(5): 2776–2785.
- **Fuxing Kang**, Xuewei Mao, Xiyu Wang, Jian Wang, Bing Yang, Yanzheng Gao*. Sources and health risks of polycyclic aromatic hydrocarbons during haze days in eastern China: A 1-year case study in Nanjing City. *Ecotox. Environ. Safe.* 2017, 140: 76–83.
- **Fuxing Kang**, Qian Wang, Weijun Shou, Chris D. Collins, Yanzheng Gao*. Alkali-earth metal bridges formed in biofilm matrices regulate the uptake of fluoroquinolone antibiotics and protect against bacterial apoptosis. *Environ. Pollut.* 2017, 220: 112–123.
- **Fuxing Kang**, Yangyang Ge, Xiaojie Hu, Caspar Goikavi, Michael Gatheru Waigi, Yanzheng Gao*, Wanting Ling. Understanding the sorption mechanisms of aflatoxin B1 to kaolinite, illite, and smectite clays via a comparative computational study. *J Hazard. Mater.* 2016, 320: 80–87.
- **Fuxing Kang**, Xiaojie Hu, Juan Liu, and Yanzheng Gao*. Noncovalent binding of polycyclic aromatic hydrocarbons with genetic bases reducing the in vitro lateral transfer of antibiotic resistant genes. *Environ. Sci. Technol.* 2015; 49(17):10340–10348.
- **Fuxing Kang**, Pedro J. Alvarez, and Dongqiang Zhu*. Microbial extracellular polymeric substances reduce Ag⁺ to silver nanoparticles and antagonize bactericidal activity. *Environ. Sci. Technol.* 2014, 48: 316–322.
- **Fuxing Kang** and Dongqiang Zhu*. Abiotic reduction of 1, 3-dinitrobenzene by aqueous dissolved extracellular polymeric substances produced by microorganisms. *J Environ.*

Qual. 2014, 42: 1441–1448.

- **Fuxing Kang**, Yanzheng Gao*, and Qian Wang. Inhibition of free DNA degradation by the deformation of DNA exposed to trace polycyclic aromatic hydrocarbon contaminants. *Environ. Sci. Technol.* 2010, 44: 8891–8896.
- **Fuxing Kang**, Dongsheng Chen, Yanzheng Gao*, Yi Zhang. Distribution of polycyclic aromatic hydrocarbons in subcellular root tissues of ryegrass (*Lolium multiflorum Lam.*). *BMC Plant Biol.* 2010, 10: 210–215.