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Biography: Dr. Shuang-Jiang (SJ) Liu obtained his B.S. in 1984 at Hebei Unviersity (Baoding) and Ph. D in 1991 at Tsinghua University (Beijing). Dr. Liu did his postdoc and worked as visiting scholar in the United States of America, Germany, and Japan during 1995-2000. In 1991, he joined the Institute of Microbiology (Beijing), Chinese Academy of Sciences, and was promoted to a professor in 2001. He served the Institute as deputy Director-General during 2008-2013, and is Director-General since 2013. Dr. Liu's research interests include bacterial degradation of aromatic compounds; bacterial behavior in environments particularly chemotaxis, and microbial diversity at various environments. He is serving as the Editor of "Applied and Environmental Microbiology" (ASM), Editor of "Achieves of Microbiology", and Associate Editor of "Microbes and Environments".

Physiology of aromatic compound assimilation with *Comamonas testosteroni*

Aromatic compounds are a large group of organic molecules originated from biological or chemically synthesized. Chemically synthesized aromatic compounds are often used for production of many commercial products such colorants, pesticides, herbicides, etc., and the biological/natural aromatic compounds are used as building block for biomass or signal molecules by many prokaryotes or eukaryotes. Recycle of chemical elements of aromatic compounds are mainly dependent on microbial activities in natural environments such as soil, water, and sediments.

Comamonas testosteroni CNB-1 was isolated from sludge of a wastewater treatment plant that dealt with wastewater from chemical industry producing nitroaromatic compounds. CNB-1 has robust ability to degrade and grows on a range of aromatic compounds, including chloronitrobenzene, nitrobenzene, benzoate, hydroxylated benzoate, etc. In addition, CNB-1 has the ability to respond chemical gradient of aromatic compounds in environment (chemotaxis). It was demonstrated that CNB-1 was associated with plants and was able to degrade chloronitrobenzene in polluted soil. This lecture will summarize the knowledge of physiology and genetics of aromatic metabolism, as well as recently progresses on understanding of the chemotactic responses to aromatic compounds by CNB-1.

Related publications:

1. Huang Z, Ni B, Jiang CY, Wu YF, He YZ, Parales RE, Liu SJ. 2016. Direct sensing and signal transduction during bacterial chemotaxis toward aromatic compounds in *Comamonas testosteroni*. Mol Microbiol. 2016 Jul;101(2):224-37.
2. Ni B, Huang Z, Fan Z, Jiang CY, Liu SJ. 2013. *Comamonas testosteroni* uses a chemoreceptor for tricarboxylic acid cycle intermediates to trigger chemotactic responses towards aromatic compounds. Mol Microbiol. 90:813-23.
3. Ni B, Zhang Y, Chen DW, Wang BJ, Liu SJ. 2013. Assimilation of aromatic compounds by *Comamonas testosteroni*: characterization and spreadability of protocatechuate 4,5-cleavage pathway in bacteria. Appl Microbiol Biotechnol. 97:6031-41
4. Wu JF, Jiang CY, Wang BJ, Ma YF, Liu ZP, Liu SJ. 2006. Novel partial reductive pathway for 4-chloronitrobenzene and nitrobenzene degradation in *Comamonas* sp. strain CNB-1. Appl Environ Microbiol. 72:1759-65.