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First Name: **Jun** Last Name: **Yan**

Title: **Professor**

Institution: **Institute of Applied Ecology, Chinese Academy of Sciences**

Mailing Address: **Room 502, 72 Wenhua Road**

City: **Shenyang** State: Liaoning Zip Code: 110016

Country: China

Country Code: 86 Phone: (182) 024-0594

Email: junyan@iae.ac.cn Website:

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**Education:**

PhD: 2009, Louisiana State University, U.S.A. MS: 2003, Nanjing University, China BS: 2000, Nanjing University, China

**General Areas of Expertise:**

Anaerobic Processes; Microbial Ecology; Environmental Biotechnology; Organohalide Respiration

**Short Bio:**

I am interested in innovative biotechnological approaches for solving pressing environmental problems that affect ecosystem and human health. I have been investigating microbial reductive dechlorination of chlorinated contaminants during my Ph.D. training at Louisiana State University (Baton Rouge, LA). As a postdoc at Georgia Tech and later at the University of Tennessee, I acquired new skill sets and integrated molecular tools, including qPCR and high-throughput sequencing, with cultivation-based approaches to explore organohalide-respiring Chloroflexi and to establish microbial community-function relationships. I started using (meta)genomics, (meta)transcriptomics and (meta)proteomics approaches to characterize the essential corrinoid co-factors of reductive dehalogenases, the key enzymes catalyzing reductive dechlorination reactions in organohalide-respiring bacteria. On October 2013, I was promoted as a Research Assistant Professor in the Department of Microbiology at the University of Tennessee. Since March 2015, I have been appointed as a full Professor at the Institute of Applied Ecology of the Chinese Academy of Sciences.

**Five Representative Publications:**

1. J. Yan*, M. Bi, A.K. Bourdon, A.T. Farmer, Y. Yang, Y. Yin, B. Şimşir, S.R. Campagna and F.E. Löffler*. 2017. Purinyl-cobamide is a native prosthetic group of reductive dehalogenases. Nature Chemical Biology. doi:10.1038/nchembio.2512.

2. B. Şimşir, J. Yan, D. Graves and F.E. Löffler*. 2017. Natural attenuation in streambed sediment receiving chlorinated solvents from underlying fracture networks. Environmental Sciences & Technology. 51(9): 4821-4830.

3. J. Yan, B. Şimşir, A.T. Farmer, M. Bi, Y. Yang, S.R. Campagna and F.E. Löffler*. 2016. The corrinoid cofactor of reductive dehalogenases affects dechlorination rates and extents in organohalide-respiring Dehalococcoides mccartyi. The ISME Journal. 10: 1092-1101.

4. J. Yan, J. Im, Y. Yang, and F.E. Löffler*. 2013. Guided cobalamin biosynthesis supports Dehalococcoides mccartyi reductive dechlorination activity. Philosophical Transactions of The Royal Society B. 368(1616): 20120320.

5. J. Yan, K.M. Ritalahti, D.D. Wagner, and F.E. Löffler*. 2012. Unexpected specificity of interspecies cobamide transfer from Geobacter spp. to organohalide-respiring Dehalococcoides mccartyi strains. Applied and Environmental Microbiology. 78(18): 6630-6636.

**FEWSTERN Symposium 2017 Presentation Title and Abstract:**

Presentation title: Corrinoid controlled reductive dehalogenation activity in organohalide-respiring Dehalococcoide maccartyi.

Abstract: Chlorinated compounds, such as tetrachloroethene (PCE) and trichloroethene (TCE), are widespread groundwater pollutants due to broad industrial applications and improper disposal. At many contaminated sites, the strict organohalide-respiring Dehalococcoides mccartyi strains are recognized as the core members in the dechlorination community to accomplish complete detoxification of PCE and TCE to ethene. D. mccartyi genomes harbor multiple genes encoding reductive dehalogenases (RDases) that catalyze the reductive dehalogenation reactions of a range of halogenated compounds, however, genome sequence analysis demonstrated that D. mccartyi strains are corrinoid auxotrophs and lack the ability for de novo biosynthesis of corrinoid, a required essential co-factor to activate RDases. Therefore, exogenous corrinoid (i.e. vitamin B12) must be supplemented in order to grow D. mccartyi in completely synthetic, defined medium. We investigated D. mccartyi strains' corrinoid requirement and dechlorination coupled growth in pure cultures and during the co-cultivations with several corrinoid-producing Archaea and Bacteria. Co-cultures established in vitamin B12-free medium demonstrated interspecies corrinoid transfer and identified the specific types of corrinoid that Dehalococcoides can utilize. Cobalamin (i.e. vitamin B12) is a preferred corrinoid co-factor for D. mccartyi strains BAV1, GT and FL2. Several other benzimidazole types of vitamin B12 derivatives, such as 5'-methylbenzimidazolyl-cobamide, 5'-methoxybenzimidazolyl-cobamide and benzimidazolyl-cobamide, also supported the complete dechlorination of cis-1,2,-dichloroethene (cDCE) to ethene by D. mccartyi strain BAV1, but exhibited prolonged growth lag time, lower growth yields. Understanding the bottlenecks limiting the activity of organohalide-respiring D. mccartyi may lead to innovative engineering approaches that enhance reductive dechlorination rates and extents and enable more efficient bioremediation applications.