CURRICULUM VITAE

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Research Interest

Research Areas

Discovery and utilization of new insecticidal protein gene resources.

Phage therapy in agriculture production.

Research Projects

1.Novel insecticidal toxins and virulence factors in Bacillus thuringiensis

2.One of the important research directions in our lab is based upon the bacterium B. thuringiensis and its toxins. We are interesting in discovering, function and mechanism research of novel insecticide crystal proteins (Cry) and other virulence factors (such as Bel1, Bmp1, ColB, et al) during the infection process of B. thuringiensis in insects and nematode models.

3.Host-pathogen interactions between B. thuringiensis and its nematode target.

We are also interested in the both the mechanism of action of the B. thuringiensis cell and its toxins or virulence factors in the response of the insect or nematode host to intoxication. We also use this bacterium and its nematode host as a model system for studying a variety of ecological,

physiological, biochemical and genetic processes, especially in the innate immune signaling pathways in nematode host in the response to B. thuringiensis cell or its toxins.

4.Phage therapy for soil-borne bacterial diseases in agriculture production.

The increasing antibiotic resistances of bacteria makes phage therapy become an alternative strategy to replace antibiotics for bacterial disease treatment. Phage therapy has been used in the field of medicine and food industries have been a success, and there are a number of phage drugs undergoing clinical trials. We are interesting in development phage pesticides to prevent the most serious soil-borne bacterial diseases in agricultural production, such as soft rot or leaf wilt disease in vegetables.

Professional Memberships

Other Roles

Education & Working Experience

Education

2006/09—2009/06，Ph.D. of Microbiology College of Life Science and Technology, Huazhong Agricultural University, Wuhan, China (Advisor: Professor Ming Sun)

2004/09—2006/06，Master of Biochemistry and Molecular Biology, College of Life Science and Technology, Huazhong Agricultural University, Wuhan, China (Advisor: Professor Ming Sun)

2000/09—2004/06, BA in Biotechnology, College of Life Science and Technology, Huazhong Agricultural University, Wuhan, China

Experience

2018/11—to date, Professor in College of Life Science and Technology, Huazhong Agricultural University, Wuhan, China

2017/06—2017/12, Visiting fellow in Department of Microbiology, University of Cornel, Ithaca, NY, USA (Working in Bs Lab with John D. Helmann, PhD)

2013/01—2018/10, Assistant professor in College of Life Science and Technology, Huazhong Agricultural University, Wuhan, China

2009/12—2010/02, Visiting fellow in School of Life Sciences, University of Sussex, Brighton, UK (Working in Bt Lab with Neil Crickmore, PhD)

2009/07—2012/12, Lecturer in College of Life Science and Technology, Huazhong Agricultural University, Wuhan, China

Publications

1. Ju S, Chen H, Wang S, Lin J, Ma Y, Aroian RV, Peng D*, Sun M*. C. elegans monitor energy status via the AMPK pathway to trigger innate immune responses against bacterial pathogens. Commun Biol. 2022, 5(1):643. (Co-corresponding author)
2. Zheng Z, Zhang Y, Liu Z, Dong Z, Xie C, Bravo A, Soberón M, Mahillon J, Sun M*, Peng D*. The CRISPR-Cas systems were selectively inactivated during evolution of Bacillus cereus group for adaptation to diverse environments. ISME J, 2020, 14(6):1479-14933.
3. Shi JW, Peng D*, Zhang FJ, Ruan LF, Sun M*. The Caenorhabditis elegans CUB-like-domain containing protein RBT-1 functions as a receptor for Bacillus thuringiensis Cry6Aa toxin. PLoS Pathog, 2020, 16(5): e1008501. (Co-corresponding author)
4. Wan L, Lin J, Du H, Zhang Y, Bravo A, Soberón M, Sun M, Peng D*. Bacillus thuringiensis targets the host intestinal epithelial junctions for successful infection of Caenorhabditis elegans. Environ Microbiol, 2019, 21(3):1086-1098. (Cover story)
5. Peng D, Luo X, Zhang N, Guo S, Zheng J, Chen L, Sun M*. Small RNA-mediated Cry toxin

silencing allows Bacillus thuringiensis to evade Caenorhabditis elegans avoidance behavioral defenses. Nucleic Acids Res, 2018, 46(1):159-173.

6. Dong Z, Xing S, Liu J, Tang X, Ruan L, Sun M, Tong Y, Peng D*. Isolation and characterization of a novel phage Xoo-sp2 that infects Xanthomonas oryzae pv. oryzae. J Gen Virol. 2018, 99(10):1453-1462.
7. Peng D, Wan D, Cheng C, Ye X, Sun M*. Nematode-specific cadherin CDH-8 acts as a receptor for Cry5B toxin in Caenorhabditis elegans. Appl Microbiol Biotechnol. 2018, 102(8):3663-3673.
8. Peng D, Lin J, Huang Q, Zheng W, Liu G, Zheng J, Zhu L, Sun M*. A novel metalloproteinase virulence factor is involved in B. thuringiensis pathogenesis in nematodes and insects. Environ Microbiol, 2016, 8(3):846-862.
9. Peng D, Wang F, Li N, Zhang Z, Song R. Zhu Z, Ruan L, Sun M*. Single cysteine substitution in Bacillus thuringiensis Cry7Ba1 improves the crystal solubility and produces toxicity to Plutella xylostella larvae. Environ Microbiol, 2011, 13:2820-2831.
10. Peng D, Chai L, Wang F, Zhang F, Ruan L, Sun M*. Synergistic activity between Bacillus thuringiensis Cry6Aa and Cry55Aa toxins against Meloidogyne incognita. Microb Biotechnol, 2011, 4(6):794-798.