Zhou Zhaosheng

Vice professor of plant resistance response

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Education:

Ph. D., Nanjing agricultural University; Biochemistry and Molecular Biology; 2008

BSc, Tianjin University of Commerce; Food Science and Technology; 1994

Research interests and expertise:

My research has examined environmental stress tolerance in plants. This includes the oxidation resistance and the regulatory functions of non-coding RNAs in *Medicago trucatula* and Jerusalem artichoke under heavy metal, salt and heat stresses. Currently, I focus on small RNAs which plan important roles in plant resistance to abiotic stress. We isolated more than one hundred sRNAs (miRNA and siRNA) and identified their targets. Our experiments have demonstrated some of sRNA and their targets were differentially regulated in expression under several stresses, but their functions are unclear. We will functionally characterize their biological roles by the methods of molecular biology and bioinformatics. The studies will provide the evidences in investigation of regulatory mechanism for plant tolerance to stresses.

Current projects:

The China Postdoctoral Science Foundation (grant: 20090451223, special grant: 201003593)

The National Natural Science Foundation of China (31200204)

The key research and development program of Jiangsu (BE2017310-2)

Current teaching:

The advance in regulated non-coding RNAs, autumn term

The intertidal plant biology, autumn term

Selected publications:

1. Xuan Y**, Zhou ZS***, Li HB, Yang ZM*. Identification of a group of XTHs genes responding to heavy metal mercury, salinity and drought stresses in *Medicago truncatula*. Ecotoxicol Environmental Safety, 2016, 132: 153-163. (*corresponding authors)
2. **Zhou ZS,** Yang SN, Zhu CC, Liu ZP, Yang ZM. Molecular dissection of mercury-responsive transcriptome and sense/antisense genes in *Medicago truncatula* by high-throughput sequencing. ***Journal of Hazardous Materials.*** 2013, 252-253: 123-131.
3. **Zhou ZS**, Song JB, Yang ZM. Genome-wide identification of *Brassica napus* microRNAs and their targets in response to cadmium. ***Journal of Experiment Botany***. 2012, 63(12): 4597–4613.
4. **Zhou ZS**, Zeng HQ, Liu ZP, Yang ZM. Genome-wide identification of *Medicago truncatula* microRNAs and their targets reveals their differential regulation by heavy metal. ***Plant, Cell and Environment***. 2012, 35: 86–99.
5. **Zhou ZS**, Huang SQ, Guo K, Mehta SK, Zhang, PC, Yang ZM. Metabolic adaptations to mercury-induced oxidative stress in roots of *Medicago sativa* L. ***Journal of Inorganic Biochemstry***. 2007, 101: 1–9.

(限 3000 Characters): Functional analysis have demonstrated that miRNA plays an important role in plant resistance to abiotic as well as biotic stresses. Recently, we identified a species-specific miR2687 and its target xyloglucan endotransglucosylase/hydrolase (XTH), a cell wall metabolism enzyme, from M. truncatula. Our previous experiments have demonstrated that miR2687 was down-regulated while its target XTH was differentially up-regulated in expression under Hg stress in M. truncatula, suggesting that miR2687 likely negatively regulates XTH. In this study, we will construct overexpression vectors of the miR2687 and XTH with specific site mutation and transform them into M. truncatula, respectively. By the methods of northern blot and in situ hybridization etc., the expressions of miR2687 and XTH, the characteristics of phenotype and mechanisms of physiology and biochemistry will be studied in the control and transgenic plants under heavy metal Hg stress. The results will facilitate our better understanding the regulatory function of miR2687 and the role of XTH in cell wall metabolism under the control and Hg stress. The study also may provide the evidences in investigation of regulatory mechanisms for plant tolerance to stresses.