

## Xinqing Zhao

**Affiliation:** School of Life Science and Biotechnology, Shanghai Jiao Tong University (SJTU), China

**Research title for the award:** Towards efficient bio-based production: new aspect of zinc for improved stress tolerance and low cost cell harvest by controlled cell flocculation



Dr. Zhao has been working in Dalian University of Technology, China from Mar. 1998 to Sept. 2014. After obtaining her doctor's degree from Myongji University, South Korea in Feb. 2006, she performed postdoctoral research at University of Tuebingen in Germany by the support of Alexander von Humboldt Foundation. Dr. Zhao was promoted to a full professor in Dec. 2011, and started her work in Shanghai Jiaotong University in Oct. 2014.

Her current research is mainly focused on the metabolic engineering of budding yeast *Saccharomyces cerevisiae* for efficient biofuels production, as well as the molecular mechanisms of microbial cell flocculation for easy cell harvest and improved stress tolerance.

### **Achievements:**

Dr. Zhao's research mainly contributes on two areas: 1) Isolation of a novel floccullin gene and development of the ethanol-induced flocculation for improved cell growth. A unique long *FLO1* gene was isolated from the flocculating yeast SPSC01, and a controlled flocculation was achieved by employing the trehalose-6-phosphate synthase 1 (*TPS1*) promoter, which responds dynamically to various concentration of ethanol. Using this novel inducible promoter, cell growth of the recombinant yeast was greatly improved compared to that of the constitutive cell flocculation. 2) Zinc is an important micronutrient, but its function in cell stress response has been previously unclear. Dr. Zhao has led the research in the discovery of zinc as a novel contributor to cell stress tolerance, and the global regulatory effect of zinc against acetic acid stress was revealed using metabolic profiling analysis. In addition, novel functional genes were identified using multi-omic analysis, and ethanol fermentation efficiency in the presence of inhibitory compounds was improved by metabolic engineering of yeast stress response. Dr. Zhao has publications of about 60 papers in international peer-reviewed journals. She is currently serving as one of the editorial board members of *Biotechnology Advances*, and has been active in international collaborations.

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