

所属学院 生物工程学院

学科领域 生物工程

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个人简介

周勉，博士，副教授。2009年毕业于南京大学生命科学院，获理学学士学位。2014年于美国德克萨斯大学西南医学中心(UT Southwestern Medical Center at Dallas)获博士学位。2014年12月加入华东理工大学，先后入选“上海市浦江人才计划（2015）”、“上海市晨光计划（2015）”、“上海市青年科技启明星计划（2019）”等人才项目，担任国家重点研发计划子课题负责人，获国家自然科学基金青年项目（2016）和华东理工大学青年教师探索研究基金（2017）资助。代表性研究成果发表在Nature主刊，*Molecular Microbiology*, *EMBO Reports*, *Scientific Reports*等期刊上。

研究方向

我们课题组致力于研究基因密码子偏好调控基因转录和蛋白质翻译的分子机制，以及在此理论研究基础上的底盘细胞构建和表达系统改造。具体研究方向包括：

- 1、密码子偏好影响基因转录的机制研究，包括基因组表观遗传形态的改变、RNA稳定性改变以及转录活性改变；
- 2、密码子偏好影响蛋白质翻译的机制研究，包括对翻译速度、翻译效率及蛋白质折叠和结构的影响研究；
- 3、密码子偏好分子机制研究基础上的表达系统改造，通过遗传学、分子生物学、生物信息学等方法设计重组蛋白的密码子优化策略，目的导向性构建底盘细胞，优化重组蛋白表达

研究成果及主要发表文章

1. Mian Zhou, Jinhua Guo, Joonseok Cha, Michael Chae, She Chen, Jose Barral, Matthew Sachs, Yi Liu*. Non-optimal codon usage affects expression, structure and function of clock protein FRQ. *Nature* 2013, 495(7439): 111-115.
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3. Joonseok Cha, Mian Zhou, Yi Liu*. The mechanism of the *Neurospora* circadian clock, a frequency-centric view. *Biochemistry* 2014, 54: 150-156.
4. Joonseok Cha, Mian Zhou, Yi Liu*. Methods to study molecular mechanisms of the *Neurospora* circadian clock. *Methods in Enzymology* 2014, 551: 137-151.
5. Mian Zhou, Tao Wang, Jingjing Fu, Guanghua Xiao, Yi Liu*. Non-optimal codon usage influences protein structure in intrinsically disordered regions. *Molecular Microbiology* 2015, 97(5): 974-987.
6. Wei Shen, Ying Xue, Yiqi Liu, Chuixing Kong, Xiaolong Wang, Mengmeng Huang, Menghao Cai, Xiangshan Zhou, Yuanxing Zhang, Mian Zhou*. A novel methanol-free *Pichia pastoris* system for recombinant protein expression. *Microbial Cell Factories* 2016, 15: 178.
7. Xiaolong Wang, Qi Wang, Jinjia Wang, Peng Bai, Lei Shi, Wei Shen, Mian Zhou, Xiangshan Zhou, Yuanxing Zhang, Menghao Cai*. Mit1 transcription factor mediates methanol signaling and regulates alcohol oxidase 1 promoter in *Pichia pastoris*. *Journal of Biological Chemistry* 2016, 291(12): 6245-6261.
8. Xiaolong Wang, Menghao Cai*, Lei Shi, Qi Wang, Jinxiang Zhu, Jinjia Wang, Mian Zhou, Xiangshan Zhou, Yuanxing Zhang. PpNrg1 is a transcriptional repressor for glucose and glycerol repression of AOX1 promoter in methylotrophic yeast *Pichia pastoris*. *Biotechnology Letters* 2016, 38(2): 291-298.
9. Zhipeng Zhou, Yunkun Dang, Mian Zhou, Liande Li, Chien-Hung Yu, Jingjing Fu, She Chen, Yi Liu*. Codon usage is an important determinant of gene expression levels largely through its effects on transcription. *Proceedings of the National Academy of Sciences of the United States of America* 2016, 113(41): E6117-E6125.
10. Jingjing Fu, Katherine Murphy, Mian Zhou, Ying Li, Vu Lam, Christine Tabuloc, Joanna Chiu*, Yi Liu*. Codon usage affects the structure and function of the *Drosophila* circadian clock protein PERIOD. *Genes and Development* 2016, 30(15): 1761-75.
11. Wei Shen, Chuixing Kong, Ying Xue, Yiqi Liu, Menghao Cai, Yuanxing Zhang, Tianyi Jiang, Xiangshan Zhou* and Mian Zhou*. Kinase screening in *Pichia pastoris* identified promising targets involved in cell growth and Alcohol Oxidase 1 promoter (PAOX1) regulation. *PLoS One* 2016, 11(12): e0167766.
12. Ning Xu, Jinxiang Zhu, Qiaoyun Zhu, Yanzi Xing, Menghao Cai, Tianyi Jiang, Mian Zhou* and Yuanxing Zhang. Identification and characterization of novel promoters for recombinant protein production in yeast *Pichia pastoris*. *Yeast* 2018, 35: 379-385.
13. Zhen Yang, Xiaohui Zhou, Yue Ma, Mian Zhou, Matthew K. Waldor, Yuanxing Zhang and Qiyao Wang*. Serine/threonine kinase PpkA coordinates the interplay between T6SS2 activation and quorum sensing in the marine pathogen *Vibrio alginolyticus*. *Environmental Microbiology* 2018, Epub ahead of print.
14. Yunpeng Guan, Kaiyu Yin, Mian Zhou, Minjun Yang, Yuanxing Zhang, Xiaohong Liu and Qiyao Wang. EsrB negatively regulates expression of the glutamine synthetase GlnA in the fish pathogen *Edwardsiella piscicida*. *FEMS Microbiology Letters* 2018, Epub ahead of print.
15. Zhipeng Zhou, Yunkun Dang, Mian Zhou, Haiyan Yuan and Yi Liu. Codon usage biases co-evolve with transcription termination machinery to suppress premature cleavage and polyadenylation. *Elife* 2018, 7: e33569.
16. Jinxiang Zhu, Ruiqing Gong, Qiaoyun Zhu, Qiulin He, Ning Xu, Yichun Xu, Menghao Cai, Xiangshan Zhou, Yuanxing Zhang and Mian Zhou*. Genome-wide determination of gene essentiality by transposon insertion sequencing in yeast *Pichia pastoris*. *Scientific Reports* 2018, 8(1): 10223.
17. Jinxiang Zhu, Qiaoyun Zhu, Ruiqing Gong, Qin Xu, Menghao Cai, Tianyi Jiang, Xiangshan Zhou, Mian Zhou* and Yuanxing Zhang. PiggyBac transposon-mediated mutagenesis and application in yeast *Komagataella phaffii*. *Biotechnology Letters* 2018, 40(9-10): 1365-1376.
18. Xiaoyue Sun, Wei Shen, Yanyun Gao, Menghao Cai, Mian Zhou* and Yuanxing Zhang. Heterologous expression and purification of a marine alginate lyase in *Escherichia coli*. *Protein Expression and Purification* 2019, 153: 97-104.
19. Yanzi Xing, Ruiqing Gong, Yichun Xu, Kunshan Liu and Mian Zhou*. Codon usage bias affects α -amylase mRNA level by altering RNA stability and cytosine methylation patterns in *Escherichia coli*. *Canadian Journal of Microbiology* 2020, 7:1-8.