

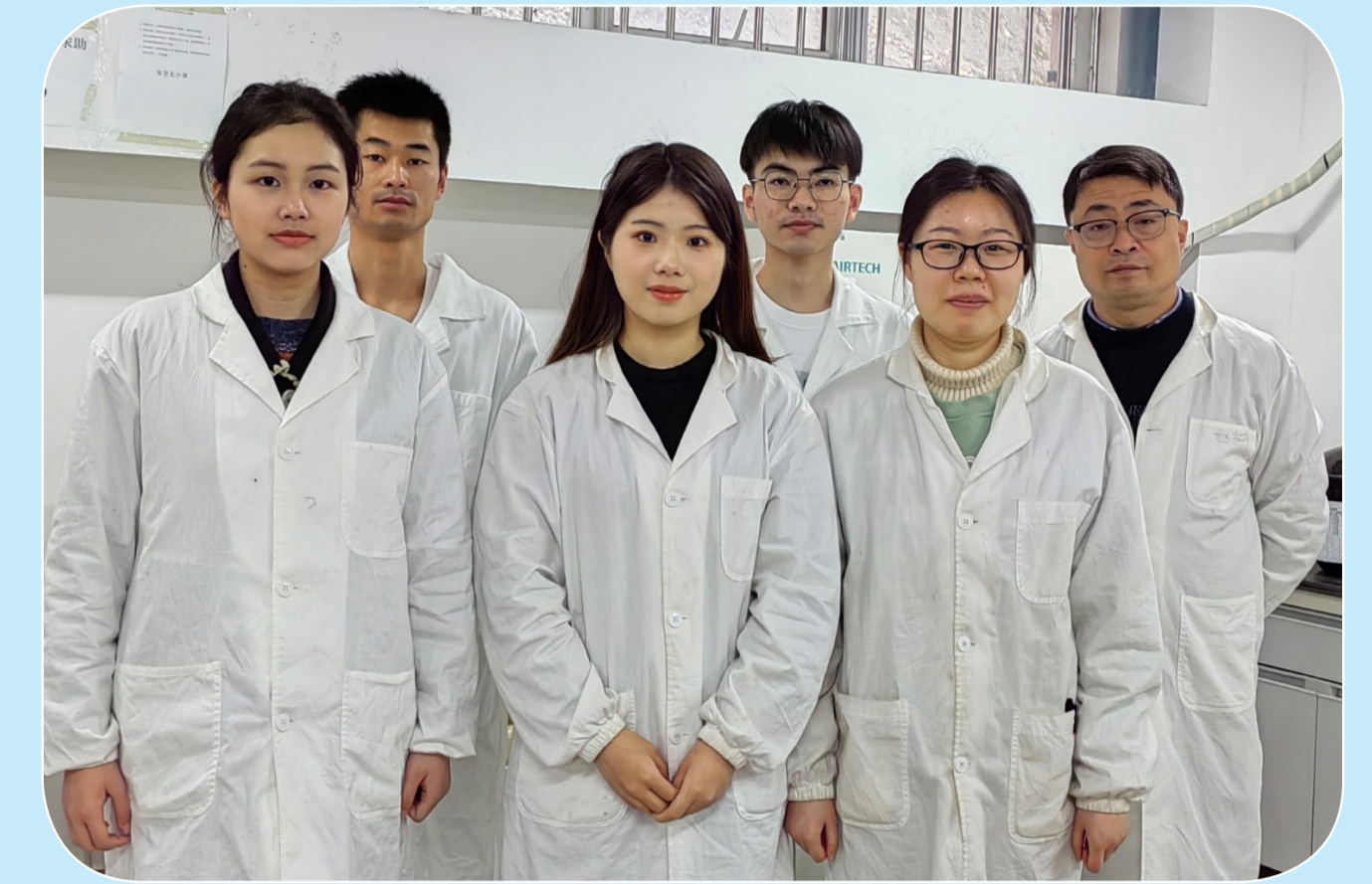


## 微藻生物技术课题组

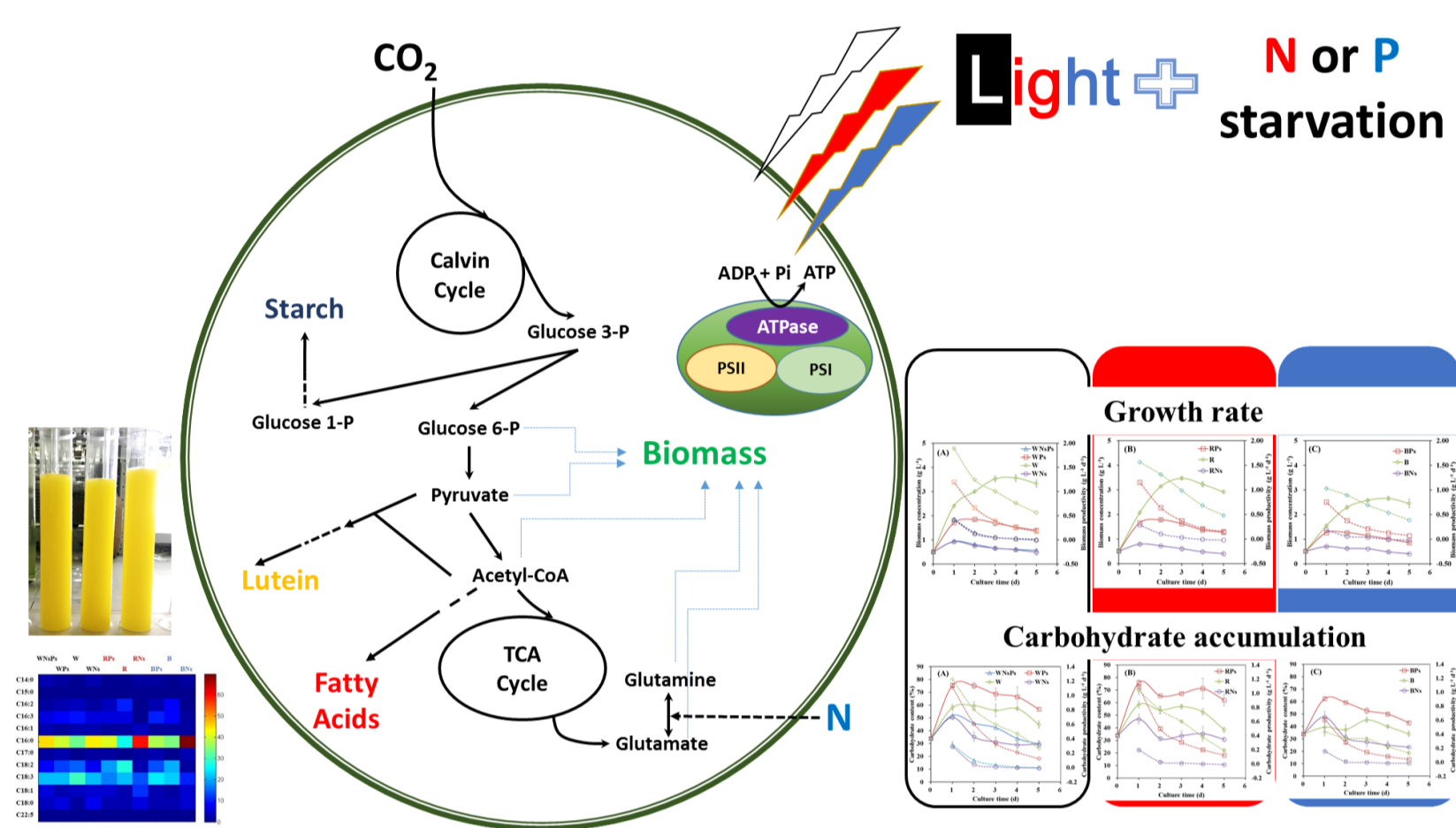
### 课题组负责人：



赵权宇，教授，博士生导师，2012年入选上海市“浦江人才”计划。目前担任 Briefings in Bioinformatics 的 Handling Editor, Algal Research 和 Applied Biochemistry and Biotechnology 副主编。赵权宇教授团队在微藻固碳、废水处理、微藻农业、活性产物提取及精准营养品及药物研发等领域取得了一定成果。迄今已发表中文论文 20 篇，国际期刊论文超过 50 篇，授权中国专利 15 件，美国专利 2 件。

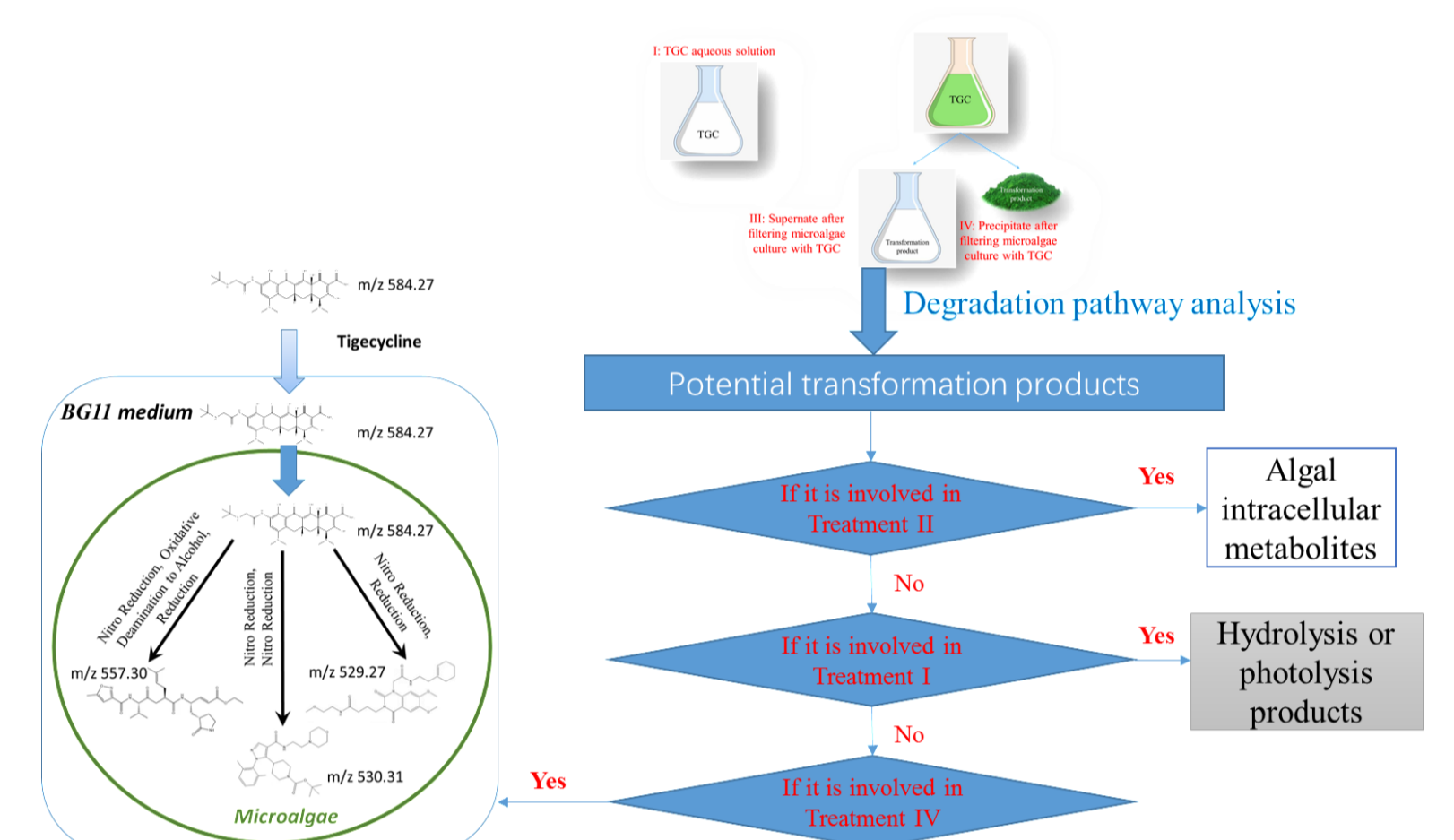
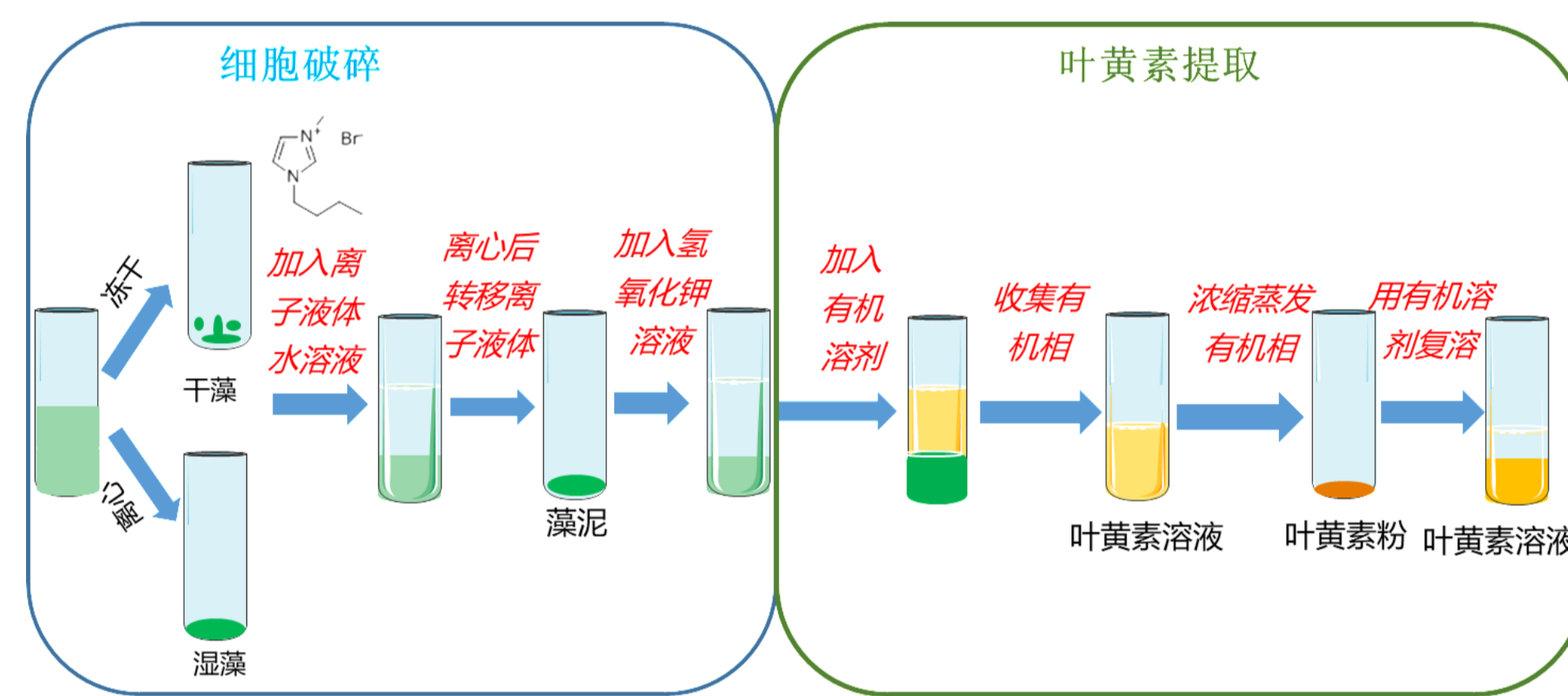


### ◎ 研究方向



在生物炼制和绿色生物制造的框架下，通过环境调控高效获得包括叶黄素，不饱和脂肪酸和糖等多个微藻产品。

通过离子液体辅助萃取等绿色提取工艺，高效获得叶黄素，再制备成纳米乳液。



除了去除工农业废水和生活污水中的氮磷等污染物，微藻也可以有效去除废水中的抗生素等新型污染物。除了物理吸附、光解和水解，微藻具有降解抗生素的生物途径。

微藻是高效的光合细胞工厂，既可以获得具有药用价值的高附加值产品，也可以处理含抗生素等废水，并改良土壤。微藻生物技术也是碳中和的可能解决途径之一。

### ◎ 主要研究成果

#### 承担的科研项目：

- 1) 江苏省碳达峰碳中和科技创新专项，富 CO<sub>2</sub> 环境下光驱动水生生物生态增容技术及碳汇计算方法研究子课题
- 2) 国家自然科学基金委员会，适应性进化强化小球藻固碳的机制研究
- 3) 国家自然科学基金委员会，小球藻耐受高浓度二氧化碳的适应进化机制研究
- 4) 上海市农委，微藻复合肥制备关键技术研究
- 5) 上海市科委“浦江人才”计划，微藻固碳的适应进化研究

#### 部分代表性论文：

- 1) Xueqing Zhong, Xiangxiang Zhang, Tianyi Zhou, Guangping Lv, Quanyu Zhao\*. Exploring kinetics, removal mechanism and possible transformation products of tigecycline by *Chlorella Pyrenoidosa*. *Science of The Total Environment*, 817, 152988, 2022.
- 2) Quanyu Zhao\*, He Huang\*. Adaptive evolution improves algal strains for environmental remediation. *Trends in Biotechnology*, 39(2), 112–115, 2021.
- 3) Lujing Ren, Xiaoman Sun, Lihui Zhang, He Huang, Quanyu Zhao\*. Exergy analysis for docosahexaenoic acid production by fermentation and strain improvement by adaptive laboratory evolution for *Schizochytrium* sp. *Bioresource Technology*, 298, 122562, 2020.
- 4) Dengjin Li, Yizhong Yuan, Dujia Cheng, Quanyu Zhao\*. Effect of light quality on growth rate, carbohydrate accumulation, fatty acid profile and lutein biosynthesis of *Chlorella* sp. AE10. *Bioresource Technology*, 291, 121783, 2019.
- 5) Han Li, Quanyu Zhao\*, He Huang. Current states and challenges of salt-affected soil remediation by cyanobacteria. *Science of The Total Environment*, 669, 258–272, 2019.
- 6) Dujia Cheng, Xuyang Li, Yizhong Yuan, Chengyu Yang, Tao Tang, Quanyu Zhao\*, Yuhan Sun. Adaptive evolution and carbon dioxide fixation of *Chlorella* sp. in simulated flue gas. *Science of The Total Environment*, 650, 2931–2938, 2019.
- 7) Xuyang Li, Yizhong Yuan, Dujia Cheng, Juan Gao, Lingzhao Kong, Quanyu Zhao\*, Wei Wei, Yuhan Sun. Exploring stress tolerance mechanism of evolved freshwater strain *Chlorella* sp. S30 under 30 g/L salt. *Bioresource Technology*, 250,495–504, 2017
- 8) Dujia Cheng, Dengjin Li, Yizhong Yuan, Lin Zhou, Xuyang Li, Tong Wu, Liang Wang, Quanyu Zhao\*, Wei Wei, Yuhan Sun. Improving carbohydrate and starch accumulation product of *Chlorella* sp. AE10 by a novel two stage process with cell dilution. *Biotechnology for Biofuels*, 10, 75, 2017
- 9) Lin Zhou, Dujia Cheng, Liang Wang, Juan Gao, Quanyu Zhao\*, Wei Wei, Yuhan Sun. Comparative transcriptomic analysis reveals phenol tolerance mechanism of evolved *Chlorella* strain. *Bioresource Technology*, 227,266–272, 2017
- 10) Libo Wang, Chuizhao Xue, Liang Wang, Quanyu Zhao\*, Wei Wei, Yuhan Sun. Strain improvement of *Chlorella* sp. for phenol biodegradation by adaptive laboratory evolution. *Bioresource Technology*, 205,264–268, 2016
- 11) Dengjin Li, Liang Wang, Quanyu Zhao\*, Wei Wei, Yuhan Sun. Improving high carbon dioxide tolerance and carbon dioxide fixation capability of *Chlorella* sp. by adaptive laboratory evolution. *Bioresource Technology*, 185,269–275, 2015
- 12) Shuiyan Yu, Quanyu Zhao\*, Xiaoling Miao, Jiping Shi. Enhancement of lipid production in low-starch mutants *Chlamydomonas reinhardtii* by adaptive laboratory evolution. *Bioresource Technology*, 147, 499 – 507, 2013