CHENGXI ZHANG

(713) 598-9832 | zhangcx318@gmail.com | Emeryville, CA 94608

EDUCATION

Ph.D. Biochemistry & Biophysics Aug. 2020
Texas A&M University College Station, TX
Dissertation: Genetic Approaches to Regulation and Identification of Bacterial Specialized Metabolites
Adviser: Dr. Paul Straight, Associate Professor

B.S. Pharmaceutical Sciences June. 2012
Wuhan University Wuhan, China
Thesis: Determination and Heterologous Expression of the Minimum Biosynthetic Gene Cluster of Agglomerins
Adviser: Dr. Yuhui Sun, Professor

EXPERIENCE

Scientist I Aug. 2021 - present
Zymergen Emeryville, CA

Build chassis strain for metabolic titer improvement
Develop advanced prototyping strategies for drug discovery project
Collaborate internally and externally to facilitate metagenomic discovery platform

Postdoctoral Research Associate Oct. 2020 - Aug. 2021
Texas A&M AgriLife Research College Station, TX

Graduate Research Assistant Aug. 2013 - Aug. 2020
Texas A&M University College Station, TX

Develop an efficient genome-wide secondary metabolite screening tool in *Streptomyces* species using CRISPR interference

- Designed and constructed an efficient shuttle plasmid carrying dCas9 and CRISPR guide elements
- Developed a genome engineering workflow which shortened the time in original CRISPR mutant generation and improved conjugation efficiency to a thousand-fold
- Evaluated and optimized the efficiency of CRISPRi knockdown using integrated phenotypic and metabolic assays in different species of *Streptomyces*
- Identified a novel thiopeptide metabolite that influences *Streptomyces* spp. fitness

Investigate the mechanisms of regulatory elements in bacterial secondary metabolite biosynthetic gene clusters

- Constructed fluorescent reporter in *Bacillus subtilis* to visualized promoter activities *in vivo*
- Performed promoter activities tracking during cell development using fluorescence microscopy
- Collaborated and characterized antitermination protein LoaP in the function of regulating *cis* and *trans* large biosynthetic gene clusters in *Bacillus velezensis* at both transcription and metabolic level

Discover and characterize natural products using multidisciplinary approaches

- Adapted CRISPR/Cas9 based genetic manipulation in non-standard model organism *Streptomyces* spp.
- Developed comparative analyses for the identification of phenotypes and secondary metabolites from microbial cultures
- Identified lavendomycin through comparative metabolomics and characterized its biosynthetic gene cluster and potential biological function
- Proposed biosynthetic pathway for synthesizing lavendomycin, which connects the gap between bioinformatic prediction and metabolite detection

Undergraduate Research Assistant Sept. 2011 - July. 2012
Key Laboratory of Combinatorial Biosynthesis and Drug Discovery Wuhan, China

Determine the minimized biosynthetic gene cluster of agglomerins

- Investigated the boundaries of agglomerins biosynthetic gene cluster using gene knockout
- Implemented heterologous expression for agglomerins minimized biosynthetic gene cluster

Undergraduate Research Project Leader July. 2010 - June. 2011
Wuhan University Wuhan, China

Drive the project to investigate interventional effects of amino acids on schizophrenia

- Designed a biochemical treatment strategy for rescuing schizophrenia-relevant behavioral abnormalities in mice

SKILLS

Bacterial and Chemical Genetics
Molecular cloning; Gene editing (CRISPR/Cas9); Metabolic pathway engineering; Bacterial cell culture extraction (DNA, RNA, metabolites); Fermentation; Protein overexpression and purification; Phage transduction

Analytical Assays
RT-qPCR; Fluorescence microscopy; Natural product extraction, purification, identification and quantification using HPLC, MALDI and LC/MS

Bioinformatic and Data Analysis
Metabolomic analysis and visualization using R, XCMS, GNPS

Management and Collaboration
Manage and maintain laboratory functions; Assist and mentor undergraduate researchers

Laboratory automation

PUBLICATIONS

Zhang, C. and Straight, P. CRISPR approaches to the bacterial specialized metabolite discovery. (in preparation)

Zhang, C. and Straight, P.D., 2019. Antibiotic discovery through microbial interactions. *Current Opinion in Microbiology*, *51*, pp.64-71. doi:10.1016/j.mib.2019.06.006

Goodson, J.R., Klupt, S., **Zhang, C.**, Straight, P. and Winkler, W.C., 2017. LoaP is a broadly conserved antiterminator protein that regulates antibiotic gene clusters in *Bacillus amyloliquefaciens*. *Nature Microbiology*, *2*(5), pp.1-10. doi:10.1038/nmicrobiol.2017.3

PROFESSIONAL ACTIVITIES

Peer review for *Cell Chemical Biology* College Station, TX 2019

R workshop
46th Annual Meeting of the Texas Genetics Society College Station, TX 2019

Poster presentation: CRISPR interference based specialized metabolite identification and biological function study
Gordon Research Conference on Marine Natural Products Ventura, CA 2018
Texas A&M Biochemistry Graduate Student Research Competition College Station, TX 2018

Built a toolkit for performance and understanding of natural product biosynthesis using CRISPRi
Undergraduate laboratory course design for Wellesley College College Station, TX 2017

Undergraduate Students Mentored
Savana Green Texas A&M University 2021
Victoria Yell Texas A&M University 2018
Minkyung Kim Texas A&M University 2018
Kacey Talbot Jacksonville University 2015

AWARDS

Texas A&M Biochemistry Graduate Student Association Travel Award College Station, TX 2017

Undergraduate Outstanding Thesis Award of Hubei Province Wuhan, China 2012

Scholarship for Academic Excellence Wuhan, China 2012

TEACHING

Comprehensive Biochemistry I & II 2016,2020
Texas A&M University Recitation Instructor

Comprehensive Genetics Laboratory 2014 - 2020
Texas A&M University Laboratory Instructor

Biochemistry Laboratory I 2014 - 2015
Texas A&M University Laboratory Instructor

Volunteer Teaching 2011 - 2012
Meiyuan Community, Nanjing English and Mathematics Instructor