Personal Information

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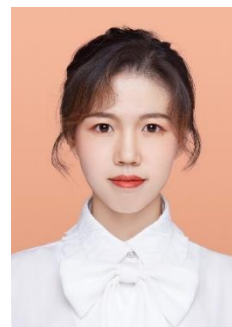
Education Background

09/2018-07/2021	Master of Bioengineering	GPA: 3.77/4.00
	Institute of Microbiology, Chinese Academy of Sciences, Beijing, China	
09/2014-07/2018	Bachelor of Bioinformatics	GPA: 3.23/4.00
	Dalian University of Technology, Liaoning, China	

Research Experience and Projects

Construction and Application of Pan-genome Pipeline 09/2018-06/2021

Key Words: Pan-genome, Bioinformatics Analysis Pipeline, TCSTS, *Xanthomonas*

Instructor: Prof. Wei Qian

Full day at Institute of Microbiology, CAS, Beijing, China

- Wrote review of pan-genome: strategies summary and development direction (unpublished)
- Made research plan and work scheme
- Built a new pipeline by integrating existing bioinformatics methods
    1) Methods: Prokka, PGAP, Roary, ITOL, MEGA, PMAL, PfamScan, blast+, SQLite, etc. on Linux
    2) Python, R, Perl, SQL, etc.
- Used pipeline to analyze genome data of 52 strains of *Xanthomonas*
    1) Constructed pan-genome and drawn phylogenetic tree
    2) Made COGS distribution matrix compared tree
    3) Calculated whole COGS evolutionary rate (*Ka/Ks*)
    4) functional classification and distribution of genes of *Xanthomonas*
    5) Built database for degenerated two-component signal transduction system (TCSTS) genes of *X.campestris*
- Verified analysis results via biochemical experiments
    1) Built mutant pool for degenerated TCSTS genes of *X.campestris*
    2) Identified and filtrated mutant phenotypes
    3) Prokaryotic expression and purification of exogenous protein
- Wrote graduation thesis based on this work

Analyzed How Chronic Hepatitis B Deteriorated into Liver Cancer   01/2018-06/2018

Key Words: Gp96; DAVID Database; Bioinformatics Analysis; Cancer Immunity

Instructor: Prof. Songdong Meng

Full day at Institute of Microbiology, CAS, Beijing, China

- Genetic identification and pathological experiments in mice
- Extracted Gp96 from human placenta
- Assisted in concentrating complex peptides combined with Gp96
- Classification statistics of protein functions and annotation of biochemical pathways involved
    1) DAVID database, GO annotation, KEGG pathway analysis, DAG database

Intern of Force Clouds Software Co., Ltd   Summer 2017

Key Words: ARIMA, Software Development, R Programming Language

Instructor: Dr. Bo Jin, Chief Scientist of Artificial Intelligence

8 hours/day at Force Clouds Software Co., Ltd., Dalian, China

- Collaborated in group to develop software used R to predict drug sales based on ARIMA
- Integrated data read from web pages used Python

Analyzed Antimicrobial Peptides of *Horseshoe Crab*   10/2016-10/2017

No.2016101411164, National Innovation Project for Undergraduate

Key Words: Tachyplesin I, Lipopolysaccharide, Homology Modeling, Molecular Docking

Instructor: Prof. Zhengyao Zhang

Partner: B.S. Zhimin Liu

6 hours/week at Dalian University of Technology, Dalian, China

- Discussed with partner to make research plan and work scheme
- Used homology modeling to simulate Tachyplesin I's (TPI) tertiary structure
- Calculated TPI structure with or without lipopolysaccharide (LPS) using XPLO-NIH
- Constructed composite structure of TPI & LPS
    1) AutoDock Ver. 4.2, Discovery Studio, Lamarchian genetic algorithm
- Proved that TPI caused the death of Escherichia coli by binding LPS

Field Study of Wetland Ecosystem   Autumn 2016

Key Words: Wetland Ecosystem, *Seepweed*, Reed Marshes, *Larus Saundersi*

Instructor: Prof. Pinsan Xu, etc.

Days at Shuangtaihekou National Nature Reserve, Panjin, China

- Observed appearance and living habits of birds
- Made typical wetland plant specimens

Field Study of Forest Ecosystem   Summer 2016

Key Words: Botany, Zoology, Ecosystem Research, Chinese Herbology Exploration

Instructor: Prof. Pinsan Xu, etc.

A week in Xianrendong National Nature Reserve, Zhuanghe, China

- Made specimens of insects, animals and plants
- Collected Chinese medicinal materials

Coursework

Biological Sciences

Advanced Macrobiotics at University of Chinese Academy of Sciences (UCAS)   Autumn 2018

- Instructor: Wei Qian, Yang Bai, Lili Zhang
- Description: Course teaches basic content, significance, research methods and applications of microbiome, and provides graduate students with new vision and new insights on this filed.
- Grade: A

Principle and Technique of Biochemistry Experiment at UCAS   Autumn 2018

- Instructor: Fang Zhang, etc.
- Textbook: Purifying Proteins for Proteomics：A Laboratory Manual. By Andrew J. Link, Joshua Labaer
- Description: Course enables students engaged in the field of biochemistry to master the basic principles, methods and skills of biochemistry experimental technology.
- Grade: A

Biological Statistics at Dalian University of Technology (DLUT)   Spring 2017

- Description: Course introduces how to use the principles and methods of statistics to study the objective phenomena and problems of biology.
- Grade: A

Genetics and Genomics at DLUT   Spring 2017

- Description: Course covers history of genetics and genomics; basic processes of gene transmission; mutation, expression, regulation and main experimental methods for genetic and molecular biology research.
- Grade: A

Proteomics at DLUT   Autumn 2016

- Description: Course introduces proteomics of studying the protein composition of cells, tissues or organisms and its changing law with proteome as the research object.
- Grade: A

Bioinformatics

Statistical Analysis and SAS Implementation at UCAS   Spring 2019

- Instructor: Sanguo Zhang
- Description: Follow-up course of Biostatistics and Experimental Design teaching students to use SAS software not only to analyze simple experimental data, but also to analyze more complex problems and data through complex program design.
- Grade: A

Genomic Information System and Practice at UCAS   Spring 2019

- Instructor: Qianfei Wang, etc.
- Description: Course focuses on the basic theories and analytical methods of genomics, as well as the latest research progress and frontier trends, including genomic analysis systems of higher eukaryotes (animals and plants), microorganisms and application practices.
- Grade: A+

Bioinformatics at DLUT   Spring 2017

- Description: Course helps students integrate biology, computer science and information technology to uncover the biological secrets of large and complex biological data.
- Grade: A+

Structure and Function of Biological Macromolecules at DLUT   Spring 2017

- Description: Course is based on molecular dynamics simulation techniques of classical physics theories, practicing practical applications to three-dimensional structure, dynamic conformational changes, and biological functions of proteins.
- Grade: A+

The principle of Data Mining and Its Application in Bioinformatics at DLUT   Spring 2017

- Description: Course systematically introduces the basic algorithms of data mining and combines them with the practice of bioinformatics.
- Grade: A

Computational Biology at DLUT   Autumn 2016

- Description: Course is designed to develop and apply data analysis and theoretical methods, using computer language and mathematical logic to construct, describe and simulate the biological world.
- Grade: A

Honors

- Merit Student. University of Chinese Academy of Sciences, 2020.
- Postgraduate Scholarships. Institute of Microbiology, Chinese Academy of Sciences, 2020.
- Excellence Award for Academic Poster. State Key Laboratory of Plant Genomics, 2019.

Professional Skills

- Python, R, Perl, C++, SQL, HTML, et al. under Linux/Windows.
- Skilled in wet experiment like mutant construction, general phenotypic screening, protein heterologous expression and purification, detection of phosphorylation and phosphate transfer, et al.

Miscellaneous

Chinese classical dance, a member of Han dynasty portrait dance reproduction project; **Yoga**; **reading** and **writing**, favorite writers like Dylan Thomas, Hemingway, et al.