ZEHUA ZENG

PERSONAL INFORMATION

Date of Birth, 02/02/2000

email starlitnightly@gmail.com

phone +86 13120235355

GOAL

Building a Python-based multi-omics ecosystem and working on resolving regulatory mechanisms in diseases, developmental processes.

EDUCATION

2018-2022 School of Chemistry and Biological Engineering, University of Science and Technology Beijing

Bachelor of Biotechnology

I completed my undergraduate double degree at the University of Science and Technology Beijing. In Biotechnology, I received training related to molecular biology and microbiology, and my research during my undergraduate studies focused on the design of transcriptomics algorithms, and the application of proteomics in mesenchymal stem cells.

2018-2022 School of Computer and Communication Engineering, University of Science and Technology Beijing

Bachelor of Internet of Things Engineering

In Internet of Things Engineering, I received TRAINING related to Artificial Intelligence and microcontroller applications, and I have carried out a series of biologically relevant analyses mainly around generative adversarial networks.

2022- Daxing Research, University of Science and Technology Beijing

Ph.D. Candidate of Chemistry

During my PhD Candidate, I mainly developed the transcriptomics framework algorithm OmicVerse, the trajectory inference algorithm OmicFate, and I also completed the analysis of single-cell multi-omics data for maternal-fetal interface, breast cancer, and retinoblastoma.
Advisors: Prof. Hongwu Du & Dr. Cencan Xing

EXPERIENCE

2022-2023 School of Life Sciences, Tsinghua University

Learning ATAC-seq library building, analysis, visualisation process, and for ATAC-seq in Python algorithmic vacancy developed a series of scATAC-seq visualisation algorithmic tools Epiverse, algorithms are still in the process of finishing, will be constructed a new completely Python implementation of scATAC-seq framework
Advisors: Prof. Wei Xie & Dr. Xiaotong Wu

2022- School of Life Sciences, Sun-Yat-Sen University

"Single-cell multimodal integrated screening of synthetic lethal tumour targets", completed the construction of a pan-cancer atlas and proposed a more accurate cell subtype annotation algorithm and target prediction algorithm.
"Identification of cellular communication domains for spatial transcriptomics", completed the acquisition of spatial location on single-cell data and proposed an algorithm for identification of cellular communication regions.
Advisors: Associated Prof. Yuanyan Xiong

2024- Institute of process engineering, Chinese Academy of Sciences

Performing the construction of a multi-organ atlas of senescent rhesus monkeys at the Institute of process engineering, I designed a new model that taps into the coordinated changes of multiple organs on single-cell data.
Advisors: Prof. Wei Wei

PUBLICATIONS

Publications

[1] **Zehua Zeng**[*†], Yuqing Ma[*], Lei Hu[*], Peng Liu, Bowen Tan, Yixuan Wang, Cencan Xing[†], Yuanyan Xiong[†], and Hongwu Du[†]. Omicverse: A framework for bridging and deepening insights across bulk and single-cell sequencing. ***Nature Communications (Accepted)***, 2024.

[2] **Zehua Zeng**[*], Yuzhe Xiong, Wenhuan Guo, and Hongwu Du[†]. Ergene: Python library for screening endogenous reference genes. ***Scientific Reports***, 10(1):18557, 2020.

[3] Liping Zhou[*], **Zehua Zeng**[*], Jingchong Liu, Fengshi Zhang, Xiaochun Bian, Zhiwei Luo, Hongwu Du[†], Peixun Zhang[†], and Yongqiang Wen[†]. Double bionic deformable dna hydrogel microneedles loaded with extracellular vesicles to guide tissue regeneration of diabetes ulcer wound. ***Advanced Functional Materials***, 34(14):2312499, 2024.

[4] Liping Zhou[*], **Zehua Zeng**[*], Songyang Liu[*], Tiantian Min, Wenmin Zhang, Xiaochun Bian, Hongwu Du[†], Peixun Zhang[†], and Yongqiang Wen[†]. Multifunctional dna hydrogel enhances stemness of adipose-derived stem cells to activate immune pathways for guidance burn wound regeneration. ***Advanced Functional Materials***, 32(46):2207466, 2022.

[5] Liping Qian and **Zehua Zeng**[†]. Network-based pharmacology and uhplc-q-exactive-orbitrap-ms reveal jinhua qinggan granule's mechanism in reducing cellular inflammation in covid-19. ***Frontiers in Immunology***, 15:1382524, 2024.

[6] Cencan Xing[*], **Zehua Zeng**[*], Yaqi Li, Bo Gong, Weimin Shen, Roshan Shah, Lu Yan, Hongwu Du[†], and Anming Meng[†]. Regulatory factor identification for nodal genes in zebrafish by causal inference. ***Frontiers in Cell and Developmental Biology***, 10:1047363, 2022.

[7] Wenhuan Guo[*], **Zehua Zeng**[*], Cencan Xing[*], Jinghui Zhang, Wangyu Bi, Jingjie Yang, Roshan Shah, Donghui Wang, Yingxian Li, Xiaoshuang Zhang, Yongzhong Bian[†], and Hongwu Du[†]. Stem cells from human exfoliated deciduous teeth affect mitochondria and reverse cognitive decline in a senescence-accelerated mouse prone 8 model. ***Cytotherapy***, 24(1):59–71, 2022.

[8] Cencan Xing[*], Zhongci Hang[*], Wenhuan Guo, Yingxian Li, Roshan Shah, Yihan Zhao, **Zehua Zeng**[†], and Hongwu Du[†]. Stem cells from human exfoliated deciduous teeth rejuvenate the liver in naturally aged mice by improving ribosomal and mitochondrial proteins. ***Cytotherapy***, 25(12):1285–1292, 2023.

[9] **Zehua Zeng** and Hongwu Du[†]. Revolutionizing single cell analysis: The power of large language models for cell type annotation. ***arXiv***, 2023.

[10] Cencan Xing, **Zehua Zeng**[*†], Lei Hu, Shah Roshan, Yuanyan Xiong[†], Hongwu Du[†], and Tongbiao Zhao[†]. scltnn: an innovative tool for automatically visualizing single-cell trajectories. ***bioRxiv***, pages 2022–09, 2022.

COMPUTER SKILLS

Basic Word, LaTeX

Intermediate python, Qt, R, SQL, Linux

Advanced C#, C++

OTHER INFORMATION

Achievements and Awards

2021 · Third Prize in the Main Competition and Third Prize in the Black Technology Special Competition at the 17th "Challenge Cup" National College Students Extracurricular Academic and Technological Works Competition;
Project Name: "Development, Optimization, and Application Demonstration of Integrated Omics Analysis Techniques for Disease Association." **Project Leader**

· First Prize at the 11th "Challenge Cup" Capital College Students Extracurricular Academic and Technological Works Competition;
Project Name: "Development and Application Demonstration of a Network Topology Algorithm Framework Platform Integrating Multi-Omics Data." **Project Leader**

2022 · First Prize in the Beijing Division (Capital Division 64/890) and Third Prize Nationally at the 8th "Internet+" College Students Innovation and Entrepreneurship Competition;
Project Name: Cross-Omics Bio-Genomic Multi-Omics Pathology Mining Platform Designed for Precision Medicine; **Project Leader**.

2023 · Second Place Nationally in the Task Challenge at the First Bio-OS Open Source Competition;
Project Name: OmicVerse - An Integrated Framework for Transcriptome Analysis. **Project Leader**.

Languages

Chinese · Mothertongue

Cantonese Mothertongue

English · Intermediate (conversationally fluent)

Interests

BasketBall · History and Geography · Travelling · Photography ·

July 11, 2024