

Monica Peng

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Research interest: Retina diseases, Dry AMD, Bioinformatics.

ACADEMIC EDUCATIONAL BACKGROUND

University of Chinese Academy of Sciences (UCAS)

Beijing, China

M.S. in Biology and Medicine

Sep 2021-July 2024

GPA: 3.84/4.00, Full-Funded Academic Scholarship

Thesis: Analysing molecular changes in the retina of chick myopia model using spatial and single cell transcriptomics.

Modules: Bioinformatics, Microbial Genetics and Molecular Biology, Epigenetics, etc.

Beijing Genomic Institute (BGI)

Shenzhen, China

Joint Master Student

Sep 2022– 2024

Research Project Funding

Training: Genomics, Neuroscience, Epigenetics, etc.

Zhongkai University of Agriculture and Engineering

Guangzhou, China

B.S. in Animal Science

Sep 2017- July 2021

GPA: 3.53/4.00, Second Class Scholarship

Thesis: Effects of Resveratrol on *SIRT1* Signalling Pathway and Antioxidant Capacity of Ducks on Exposure to Acute Heat Stress

Modules: Animal Physiology, Animal Genetics, Veterinary Biology, etc.

SKILLS

- **Computer Programming language:** Linux, R, Python, Perl, Html.
- **Laboratory Skills:** DNA extraction, PCR, ELISA, Western Blot, Single-cell RNA sequencing (scRNA-seq), Spatial Transcriptomics, Cell culture.
- **IT Skills:** Proficient in MS Office, including Word, Excel, PPT, etc.
- **Language Skills:** English (Proficient), Mandarin (Native), Cantonese (Native)

RESEARCH EXPERIENCES

Zhongkai University of Agriculture and Engineering, Guangzhou, China

Research Project:

< Establishment of RPA-LFD visual detection method for animal influenza A virus > 2018-2019

- The study aimed to establish a recombinant polymerase amplification-lateral flow dipstick (RPA-LFD) detection method for animal influenza A virus (IAV).
- My contributions: Performed the experiments & participate in the competition as a representative

< Effects of resveratrol on *SIRT1* signalling pathway and antioxidant capacity of duck liver under acute heat stress > 2020-2021

- This study aimed to investigate the effects of resveratrol supplementation on the antioxidant capacity of Shanma ducks under acute heat stress.
- My contributions: Performed the experiments & analyzed the data

Research Project:

< Analysing molecular changes in the retina of chick myopia model using spatial and single cell transcriptomics > 2022-2024

- This study used spatial and single-cell transcriptomics to construct the first spatial single-cell atlas of the chick retina, revealing key molecular changes and pathways in myopia, including the WNT pathway in Müller glial cells and ON/OFF signaling in bipolar cells. It also identified dynamic cell subtype positioning and highlighted the central retina as the most affected region. Mapping human myopia-related genes validated the chick model, providing a basis for early intervention and precision treatment of myopia.
- My contribution: Conception and design of experiments, execution of experiments, data analysis, provision of reagents/materials/analysis tools, and manuscript writing and revision.

< Single-cell spatial transcriptomics in human brains of Alzheimer's disease reveals neuronal subtypes that promote A β deposition > 2022-2024

- This study performed high-resolution (0.5 μ m) single-cell spatial transcriptome analysis on postmortem AD and control brains, mapping 6.52 million cells across five cerebral regions. Identified a novel neuronal subtype (A β C neurons) overexpressing *APP*, *BACE1*, and neurodegeneration-associated genes, spatially preceding A β plaque deposition. Findings provide insights into cellular mechanisms of AD and potential cell-targeted therapies.
- My contribution: Sample collection, sample preprocessing, conducting experiments, developing the A-beta plaque identification program, and writing the methods section of the manuscript.

PUBLICATIONS AND PATENTS

Journal Papers:

- Effects of Resveratrol on Anti-oxidation and Anti-apoptosis of Hepatocytes of Ducks on Exposure to Acute Heat Stress[J]. Wanting Zhou, Chen Yang, Cuitian Peng. *Acta Veterinaria et Zootechnica Sinica*, 2023, 54(1): 239-251.doi: 10.11843/j.issn.0366-6964.2023.01.022
- Hui Wei, Yuanwei Zhang, Jianbo Xiu, Yi Yang, Bingnan Li, Cuitian Peng, et al. Single-cell spatial transcriptomics in human brains of Alzheimer's disease reveals neuronal subtypes that promote A β deposition. Under review at *Cell*.
- Cuitian Peng, Tian Han, Yi Yang, et al. Analyzing molecular changes in the retina of chick myopia model using spatial and single-cell transcriptomics. Submitted to *Cell Research*.

Patent:

- A Method for Freezing and Embedding Brain Tissue. CN202311363954.4. Chinese Patent (CN), 2023.10. Ningyuan Zhu, Cuitian Peng, Yuanwei Zhang, Rouxi Chen, Junpu Mei, Xiaodong Fang

AWARDS AND ACHIEVEMENTS

- 1st Prize, BGI Graduation Exhibition Poster Selection Event, 2024.
- Participant of OptoRevolution: Exploring the Frontiers of Physiology with Light, 2023
- Member of the Organizing Committee of the International Conference on Genomics (ICG), 2022
- 1st Prize, The First Guangdong Province Undergraduate Animal Production College Student Innovation and Design Competition, 2021
- Excellent Student Cadre of Zhongkai University of Agriculture and Engineering, 2020
- Outstanding Work Award, The 2nd Guangdong-Hong Kong-Macao Greater Bay Area University Student Art Festival - University Student Art Achievements Exhibition
- National 2nd Place, National College Student Financial Elite Challenge Cup
- Obtained Level 13 Chinese Dance from Beijing Dance Academy