# Peng Miao

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## EDUCATION

**Sichuan University** *July 2023 - Present*

**Master of Medicine in Basic Medicine** **Score: 87 / 100**

- Core Coursework: The Basic Cellular and Molecular Principles of Pathogenesis, Medical Molecular Biology, Medicinal Biotechnology Frontier, Seperation and Purification Technology of Protein and Enzyme, Nucleic Acid Molecular Cloning Technique, Practical Histological Technique
- Research Focus: Colorectal Cancer Liver Metastasis and Cancer Stem Cell-Targeted Immunotherapy

**Chongqing Medical University** *Sep 2018 - Jun 2023*

**Bachelor of Medicine in Radiology** **Score: 84 / 100**

- Core Coursework: Medical Imaging and Diagnostic Radiology, Ultrasound Diagnostics, Interventional Radiology, Nuclear Medicine, Internal Medicine, Surgery, Obstetrics and Gynecology, Pediatrics, Physiology, Biochemistry and Molecular Biology, Pathology, Immunology, and Cell Biology
- Research Focus: Molecular Mechanisms of Depression

## RESEARCH EXPERIENCE

**Sichuan University, School of Basic Medicine & Forensic Medicine / State Key Laboratory of Biotherapy**

***Jun 2023 - Present***

***Graduate Researcher, advised by Prof. Canhua Huang*** ***Chengdu, China***

- Independent research on colorectal cancer stem cells and liver metastasis mechanisms.
- Constructed engineered exosomes combined with redox disruption and RNA interference to target cancer stem cells for immunotherapy. Analyzed single-cell sequencing data to investigate CRC exosome effects on hepatic lipid accumulation and Kupffer cell signaling.
- First author on a manuscript submitted to *Journal of Nanobiotechnology*; co-author on papers in *Gut* and *Biomaterials*.

**Sichuan University, School of Basic Medicine & Forensic Medicine / State Key Laboratory of Biotherapy**

***Jun 2024 - Present***

***Graduate Researcher, AI & Multi-Omics Integration*** ***Chengdu, China***

- Integrating single-cell, spatial transcriptomics, metabolomics, and microbiome data to build deep learning predictive models (GNN, Transformer).
- Predicting post-translational modifications from protein sequences using pre-trained protein language models (ESM, ProtBert) and CNN/LSTM/Transformer architectures.
- Completed data preprocessing and preliminary model framework; ongoing model training and optimization.

**Molecular Medicine Diagnostic and Testing Center, Institute of Life Science, Chongqing Medical University**

***Jan 2020 - Jun 2023***

***Undergraduate Researcher, advised by Assoc.Prof.Xiu Yun*** ***Chongqing, China***

- Assist in the construction of a mouse depression model (CUMS and CRS) and behavioral assessment experiments (SPT, SWM, OFT), as well as partial qPCR and WB experiments.

- Participate in discussion and interpretation to evaluate the effects of the depression model and related molecular mechanisms.

## PUBLICATIONS

**[1] Extracellular vesicle-induced lipid dysregulation drives liver premetastatic niche formation in colorectal cancer**
***Gut*** *2025*
*Cao J, Qin S, Li B, Zhang Z,* ***Miao P****, et al.*
Investigated CRC exosome-mediated lipid dysregulation in liver pre-metastatic niche formation.

**[2] Self-assembly driven nano-salinomycin for high-efficiency cancer immunotherapy by reticulum stress mediated stemness suppression**
***Biomaterials*** *2025*
*Wang L, Cheng W, Qin S, Tian H, Liu G,* ***Miao P****, et al.*
Developed nano-salinomycin systems for cancer stem cell-targeted therapy using ER stress mechanisms.

**[3] Oxidative Stress in Antigen Processing and Presentation**
***MedComm–Oncology*** *2025*
*Chang Q, Zhang Y, Liu X,* ***Miao P****, et al.*
Explored oxidative stress impact on antigen processing pathways.

**[4] Dysfunction of GluN3A subunit is involved in depression-like behaviors through synaptic deficits**
***J Affect Disord*** *2023*
*Zhang M, Kong X, Chen J, Liu W, Liu C, Dou X, Jiang L, Luo Y, Song M,* ***Miao P****, Tang Y, Xiu Y.*
GluN3A knockout via CRISPR/Cas9 and viral rescue showed that hippocampal GluN3A deficiency induces depression-like behavior through synaptic protein loss, while restoration reverses these effects.

## INTERNSHIP EXPERIENCE

### The Beibei Affiliated Hospital of Chongqing Medical University
**Medical Intern** ***Chongqing, China*** ***Jan 2022 - Jun 2022***

- Rotated through multiple departments, including Radiology, Internal Medicine, and Surgery, gaining hands-on experience in clinical diagnostics and patient care.
- Assisted in medical imaging interpretation and interventional procedures under physician supervision.
- Conducted case studies and participated in discussions on disease mechanisms and treatment strategies.

### The Second Affiliated Hospital of Chongqing Medical University
**Medical Intern** ***Chongqing, China*** ***Jun 2022 - Jan 2023***

- Engaged in clinical training across Neurology, Cardiology, and Emergency Medicine, handling patient assessments and preliminary diagnostics.
- Assisted in surgical procedures, monitored post-operative patients, and gained experience in ICU patient management.
- Participated in multidisciplinary case discussions and contributed to research on disease imaging and treatment outcomes.

### The University-Town Affiliated Hospital of Chongqing Medical University
**Medical Intern** ***Chongqing, China*** ***Jan 2023 - Jun 2023***

- Trained in Oncology, Pediatrics, and Gastroenterology, performing clinical evaluations and assisting in treatment planning.
- Gained experience in radiotherapy planning, chemotherapy administration, and diagnostic endoscopic procedures.

- Assisted in patient counseling and provided support for clinical research on imaging biomarkers for disease prognosis.

## PERSONAL PROJECTS

### Personal Resume & Blog Website

- **Introduction:** This project combines a personal blog and resume into one website, developed with React and Bootstrap. It features an easy-to-use configuration system, allowing users to personalize their site by editing a JSON file. Ideal for anyone seeking a quick and simple way to create a personalized online presence.
- **Stacks:** React, Bootstrap, FastAPI *etc.*

### Machine Learning & Deep Learning Tutorial

- **Introduction:** This tutorial provides a comprehensive guide to Machine Learning (ML) and Deep Learning (DL) concepts, algorithms, and techniques. It covers topics like supervised/unsupervised learning, neural networks, and advanced architectures such as CNNs and RNNs. Learners will gain the skills to implement ML/DL models and apply them to real-world problems.
- **Stacks:** Python, Numpy, Pandas, Scikit-learn, PyTorch *etc.*

## SKILLS

- **Molecular Biology & Animal Models:** Cell culture, primary cells, protein purification, WB, ELISA, qPCR, RNAi, CRISPR, FACS, mouse tumor and disease models, tissue sectioning, IHC, experimental design, data analysis.
- **Programming & Data Analysis:** C, Java, Python, R, MATLAB; data processing, statistical analysis, ML/DL modeling; full-stack web development (frontend & backend).
- **Mathematics & Physics:** Self-studied group theory, abstract algebra, differential geometry, game theory, theoretical mechanics, quantum mechanics, particle physics, field theory; numerical simulation and modeling.
- **General Research Skills:** Literature review, SCI manuscript writing, project management, interdisciplinary collaboration.
- **Languages:** CET-6, proficient in reading and writing scientific papers in English.

## AWARDS & HONORS

### Third-Class Scholarship for Advanced Individual in Technological Innovation

**Chongqing Medical University** **September 2022**

- Recognized for leadership in *The 2020 University Innovation Experiment Project* on NMDA receptor NR3A knockout mice and contributions to the *Sky Project in The Institute of Life Science,*, investigating NR3A's role in depression.
- Awarded the Excellence Award in *The 8th Concept Cup at Chongqing Medical University* for an outstanding research proposal on m6A methylation in autism.