Yingjie (Ingrid) Kang

Curriculum Vitae

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EDUCATION

Shihezi University **Xinjiang, China**
Master of Medicine in Physiology and Pathophysiology *Jun 2024*
Research focus: Neurophysiology
Supervisor: Professor Ketao Ma, Dean of Shihezi University School of Medicine
• GPA: 3.75/4.0 (Top 2% in the department)
• Relevant Coursework: Bioinformatics, Neurophysiology, Vascular Physiology and Pathophysiology.

Chengdu Medical College **Chengdu, China**
Bachelor of Medicine in Clinical Medicine (Anesthesiology track) *Jun 2020*
• GPA: 3.45/4.0
• Relevant Coursework: Computer Applications in Medicine, Medical Bioinformatics, Advanced Mathematics for Medicine, Medical Physics, Statistics, Medical Imaging, Internal Medicine, Surgery.

RESEARCH INTERESTS

• Neural Engineering, Human neuroscience, Neurorehabilitation, Computational neuroscience, Multimodal physiological and behavioral sensing; Neurotechnology.

SELECTED RESEARCH EXPERIENCE

Multimodal Prediction of Attentional Lapses **Feb 2026 – Present**
Chongqing University, Chongqing General Hospital
Student Researcher, mentored by faculty members in the Department of Neurology
• Designed and evaluated a multimodal predictive framework to detect impending attention lapses using EEG, ECG, eye-tracking and behavioral data.
• Compared different ways of representing and combining multimodal information for prediction.
Outcome: Ongoing.

Human Cognitive State Estimation and Cross-Subject Generalization **Sep 2024 – Present**
Chongqing University, Chongqing General Hospital
Student Researcher, mentored by faculty members in the Department of Neurology
• Analyzed multimodal data (EEG, ECG, EDA, gaze) to investigate cognitive-load estimation.
• Built multimodal preprocessing and modeling workflows.
• Evaluated modality representations and multimodal fusion strategies for cross-participant prediction.
Outcome: In the ordinary window level classical benchmark, an MLP using all four modalities achieved the highest balanced accuracy, while LOSO revealed substantially weaker generalization and no consistent multimodal advantage across classical or neural models.

Investigation of Neuritin Effects in Traumatic Brain Injury **Sep 2021 – Jun 2024**
Shihezi University, NHC Key Laboratory of Prevention and Treatment of Central Asia High Incidence Diseases
Lab Manager and Research Assistant, supervised by Professor Ketao Ma
• Conducted behavioral experiments (foot-fault test, grip strength, balance beam and Morris water maze (MWM)) to evaluate motor and cognitive recovery in rodent TBI models.
• Performed stereotaxic intracranial microinjections and established primary neuronal cultures and primary microglial cell cultures for downstream assays (WB, qPCR, ELISA, IF).
• Integrated bulk RNA-seq data analysis, miRNA target prediction networks, and molecular docking to identify key target candidates regulated by Neuritin.

Outcome: Provided evidence that Neuritin exerts neuroprotective effects and identified a candidate molecular target.

Coal Dust Exposure and Cognitive Impairment in Miners **Sep 2021 – Feb 2024**
Zhejiang University, Sir Run Run Shaw Hospital
Research Collaborator, supervised by Prof. Jing Zhang
- Investigated how coal dust exposure exacerbates cognitive impairment in miners.
- Performed transcriptome analysis.
- Assisted with collecting and organizing clinical, exposure, questionnaire, and cognitive-assessment data, including data entry and quality control.

Outcome: Showed that higher coal dust exposure was associated with cognitive performance in miners, and that activation of the IL-6/ERK1/2/SP1 pathway exacerbated cognitive impairment.

Modulatory Effects of 4-EG on Cognitive and Affective Dysfunction **Dec 2022 – Apr 2024**
Shihezi University, NHC Key Laboratory of Prevention and Treatment of Central Asia High Incidence Diseases
Lab Manager and Research Assistant, supervised by Professor Ketao Ma
- Evaluated the effects of 4-EG in LPS-induced cognitive and affective impairment across behavioral paradigms (MWM, Y-maze, Open Field Test).
- Executed transcriptomic (bulk & single-cell RNA-seq) analysis to decipher cellular heterogeneity and downstream signaling pathways.
- Conducted histological, biochemical, and cell-based experiments to characterize neural injury and treatment-related changes.

Outcome: Elucidated how neuroinflammatory signaling contributes to cognitive dysfunction and affective dysfunction. Identified a gene involved in the regulation of cognitive function, with additional work in preparation.

Effect and Mechanism of Safranal on ISO-Induced Myocardial Injury **Dec 2021 – Apr 2022**
Shihezi University, NHC Key Laboratory of Prevention and Treatment of Central Asia High Incidence Diseases
Lab Manager and Research Assistant, supervised by Professor Ketao Ma
- Investigated the effects of safranal in ISO-induced myocardial injury.
- Bioinformatics analysis.
- Cultured primary cardiomyocytes, H9C2, THP-1, RAW264.7.

Outcome: Demonstrated that Safranal suppressed TNF, PTGS2, MMP9, and pRELA expression via TNF signaling pathway, thereby protecting against myocardial injury induced by sympathetic overactivation

Mechanisms and Treatment of Postoperative Cognitive Dysfunction in Aged Mice **Sep 2016 – Mar 2018**
Chengdu Medical College, The First Affiliated Hospital
Student Research Assistant, supervised by Prof. Pingliang Yang, MD, PhD
- Investigated mechanisms contributing to postoperative cognitive dysfunction (POCD) after surgery.
- Conducted behavioral experiments on aged mice using MWM. Administered anesthesia and performed splenectomy in aged mice to establish the POCD model. Assisted with patch-clamp experiments.

Outcome: Demonstrated associations between surgery-induced neuroinflammation, neuronal injury, and postoperative cognitive dysfunction in aged mice.

TECHNICAL SKILLS

Computational & machine learning:
Python, R, PyTorch, Git, basic Linux; classical machine learning, and basic deep-learning models (MLP, CNN, RNN, Transformer).

Bioinformatics:
Bulk and scRNA-seq analysis (DE, GSEA, KEGG/GO), ChIP-seq, miRNA target prediction and regulatory network analysis, molecular docking (AutoDock, PyMOL, ChemDraw/Chem3D)

Behavioral assays:
MWM, Y-maze, OFT, foot-fault test, grip strength, beam walk, neurological scoring.

Laboratory techniques:
WB, qPCR, Flow cytometry, Immunofluorescence, Cell culture (primary neurons, primary microglia, HT22, BV2, THP-1, RAW264.7, primary cardiomyocytes).

Imaging & Visualization:

Confocal imaging, Quantitative image analysis (Fiji, Imaris); Figure & data visualization (GraphPad Prism).

PUBLICATIONS

• Cai F, Xue S, Zhou Z, Zhang X, **Kang Y**, Zhang J, Zhang M. Exposure to coal dust exacerbates cognitive impairment by activating the IL6/ERK1/2/SP1 signaling pathway. *Sci Total Environ*. 2024 Oct 10;946:174202.
• Yan M, Zhao J, **Kang Y***, Shan L, Li X, Ma K. Effect and mechanism of Safranal on ISO-induced myocardial injury based on network pharmacology. *J Ethnopharmacol*. 2023;305:116103.
• Xiong S, Su X, **Kang Y**, Si J, Li X, Ma K. Effect and mechanism of Chlorogenic acid on cognitive dysfunction in mice by LPS-induced neuroinflammation. *Front Immunol*. 2023;14:1178188.
• Shan L, **Kang Y***, Zhang Y, Chen J, Ma K. The perspective of miRNA regulation of Neuritin in traumatic brain injury, *Neurochemical Research* (under review)
• **Kang Y**, Zhang Y, Si J, Shan L, Ma K. 4-EG attenuates LPS-induced cognitive impairment and microglia-associated synaptic vulnerability, *Brain Research Bulletin* (under review)
• Zhang Y, Zhao Z, **Kang Y***, Shan L, Ma K. Columbianadin mitigates cognitive dysfunction in sepsis-associated encephalopathy by oxidative stress, *CJNM* (submitted)

* Co-first author

CLINICAL TRAINING

• *Postgraduate Clinical Training* — Chongqing General Hospital, Chongqing University
Neurology, Neurosurgery, Cardiology, Rehabilitation Medicine, Psychiatry, Orthopedics — Sep 2024 – Present
• *Clinical Internship* — Xinqiao Hospital, Army Medical University
Neurology, Neurosurgery, Cardiology, Psychiatry, Orthopedics — Jun 2019 – Jun 2021
• *Clinical Clerkship* — West China Yibin Hospital, Sichuan University
Neurosurgery, Neurology, Geriatric Medicine, Cardiology, Psychiatry — Sep 2018 – Jun 2019

HONORS & AWARDS

• Outstanding Graduate, Shihezi University — May 2024
• Outstanding Master's Thesis Award, Shihezi University — May 2024
• **National Scholarship**, Ministry of Education of China — Oct 2023
• Merit Student, Shihezi University — Oct 2023
• Merit Scholarship, Shihezi University — 2022 – 2023
• Outstanding Student Leader, Shihezi University — Dec 2022
• Academic Scholarship, Chengdu Medical College — 2016 – 2019
• Outstanding Undergraduate Paper Award, Chengdu Medical College — Dec 2017
• Excellent Award, China Innovation & Entrepreneurship Competition – POCD digital health follow-up platform (RMB 100,000 funding) — Jun 2017

TEACHING, MENTORING & LEADERSHIP

• Lab Manager and Research Assistant, managed laboratory operations, including budgeting, purchasing, research scheduling, and student coordination; trained and mentored junior researchers. Coordinated cerebrovascular and cardiovascular research projects and contributed to manuscript preparation and grant proposal development, Shihezi University — 2021 – 2024
• Teaching Assistant and Undergraduate Research Mentor, taught neurophysiology and cardiovascular physiology; mentored undergraduate students in experimental procedures, data collection, and basic data analysis, Shihezi University — 2022 – 2023
• Publicity & Communications Officer, School of Medicine, Shihezi University — 2021 – 2022
• Research Assistant, coordinated day-to-day laboratory operations, experimental scheduling, and communication among student researchers, Chengdu Medical College — 2016 – 2018
• Deputy Head, Publicity Department, Student Union, Chengdu Medical College — 2016 – 2017
• Founder & Chief Editor, Clinical Medicine official accounts, Chengdu Medical College — 2016 – 2018
• Vice President, Small Animal Protection Association, Chengdu Medical College — 2016 – 2017