# Lingmin Lin

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## Education

**Tianjin Medical University**

Department of Neurology, Tianjin Neurological Institute, Tianjin Medical University General Hospital

*Master's /Bachelor's Degree (joined program)* *Aug. 2013-Jun. 2020*

*Major*: Clinical Medicine (Neurology) GPA: 3.5/4.0 (86/100)

Thesis title: The genetic causality study of serum 25OHD and FGF23 levels on ischemic stroke

## Working Experiences

- Department of Rehabilitation Medicine, First Affiliated Hospital, College of Medicine, School of Brain Science and Brain Medicine, Zhejiang University, Zhejiang, China.
  **Research Assistant** *Aug. 2020-Apr. 2022*
- Department of Rehabilitation Medicine, Hongji Hospital, Zhejiang, China
  **Physician** *May. 2022-Jun. 2023*

## Publications and Patents

1. Fang A[#], Wang Y[#], Guan N[#], Zuo Y[#], **Lin L**, Guo B, Cai W, et al. Porous microneedle patch with sustained delivery of extracellular vesicles mitigates severe spinal cord injury. ***Nat Commun*** 2023 Jul 7.
2. Zuo Y[#], Ye J[#], Cai W, Guo B, Chen X, **Lin L**, et al. Controlled delivery of a neurotransmitter–agonist conjugate for functional recovery after severe spinal cord injury. ***Nat Nanotechnol***. 2023 Jun 12.
3. Cao J[#], Wu J[#], Mu J, **Lin L**, Zhang X, Huang T, et al. ROS filter coating scaffold protects 3D mesenchymal stem cell spheroids for dual-phase treatment of spinal cord injury. ***Chem Eng J***. 2023;462:142192.
4. **Lin L**[#], He Z[#], Zhang T[#], Zuo Y, Chen X, Abdelrahman Z, et al. A biocompatible two-photon absorbing fluorescent mitochondrial probe for deep in vivo bioimaging. ***J Mater Chem B***. 2022;10(6):887-98.
5. Zheng K[#], **Lin L**[#], Jiang W, Chen L, Zhang X, Zhang Q, et al. Single-cell RNA-seq reveals the transcriptional landscape in ischemic stroke. ***J Cereb Blood Flow Metab***. 2022;42(1):56-73.
6. Zheng K[#], **Lin L**[#], Cui P, Liu T, Chen L, Yang C, et al. Association of Fibroblast Growth Factor 23 With Ischemic Stroke and Its Subtypes: A Mendelian Randomization Study. ***Front Genet***. 2020;11:608517.
7. **Lin L**[#], Liu K[#], Feng H[#], Li J, Chen H, Zhang T, et al. Glucose trajectory prediction by deep learning for personal home care of type 2 diabetes mellitus: modeling and applying. ***Math Biosci Eng***. 2022;19(10):10096-107.
8. Wang X, He S, Chen Z, Fang A, **Lin L**, He Z, et al. The fabrication and application of a photoinitiator. Zhejiang University. **Patent** CN114644561A
9. Wang X, He S, Chen Z, **Lin L**, Si K, Gong W, et al. The synthesis and application of a carboxylate two-photon dye with a bone of fluorene ring. Zhejiang University. **Patent** CN114644836A
10. Wang X, Zuo Y, Ye J, Cai W, Chen X, **Lin L**, et al. The fabrication of the polymer-hydrophobic compound micelle drug for spinal cord injury. Zhejiang University. **Patent** CN114452256A

## Professional skills

- **Dry lab skills**: Biostatistics, MATLAB/R/python programming; Electrophysiology (EEG/EMG signal analysis), quantitative analysis of animal behaviors (like kinetics), Mendelian randomization/single cell analysis, deep learning in blood glucose prediction (LSTM/RNN, health management)
- **Wet lab skills**: Animal care and surgery (certificated, including stereotaxic surgery), histological and confocal techniques (imaging techniques), cell culture, cell separation (e.g., flow cytometry), biochemistry (like ELISA, WB, & PCR), etc.
- English: IELTS 6.5 (all ≥ 6.0), GRE (167+150, 3.0)

## *Main Research Projects*

### In vivo electrophysiology and quantitative behavior recording & analysis (EMG-EEG)

(Supervised by Prof. *Xuhua Wang*) *Oct. 2020-Apr. 2022*

- Participated in three projects requiring in vivo electrophysiological data with three articles published with two patents (***Chem Eng J*** 2023, ***Nat Nanotechnol*** 2023, ***Nat Commun*** 2023)
- Established in vivo EMG implantation and EEG monitoring methods
- Developed skills: Electrophysiology, behavioral analysis, further in animal care and surgery; advanced use of **MATLAB** and Python in signal processing and visualization and R in biostatistics

### Two-photon mitochondrial probe (FO2) study *Sep. 2020-Dec.2021*

(Supervised by Prof. *Xuhua Wang*, Dr. *Zuobin Chen*)

- Designed and accomplished the project with a published article (***J Mater Chem B***. 2023) and a patent
- Investigated the characteristics of a mitochondria probe FO2 ex vivo and in vivo
- Developed skills: mice stereotaxic injection, cell culture, microscope imaging technologies like two-photon imaging; one-dimensional signal and two-dimensional image analyses (MATLAB)

### Single-cell analysis of MCAO stroke model (Single-cell) *Sep. 2018-Dec. 2019*

(Supervised by Dr. *Junwei Hao*)

- Participated in the project with a published article (***J Cereb Blood Flow Metab***. 2022)
- Co-investigated the further landmarks of microglia with distinct genetic landmarks for ischemic stroke
- Developed skills: Immunohistology, ELISA, Flow cytometry, PCR, WB, single-cell analysis, etc.;

### Causal inference of FGF23 and ischemic stroke (FGF23) *Dec. 2019-Apr. 2020*

(Supervised by Dr. *Junwei Hao*, Prof. *Guiyou Liu*)

- Designed and accomplished the project as the master's thesis with a published article (***Front Genet***. 2020)
- Discovered another explanation for the association between vitamin D and ischemic stroke, by introducing the causality of FGF23 and large atherosclerotic stroke through Mendelian randomization framework
- Developed skills: Mendelian randomization; Developed R in bioinformatics

### Diabetes glucose prediction and health management based on deep learning (DLDM)

(Supervised by Prof. Jiarui Si, Dr. Jin Li) *May. 2017-May. 2018*

- Designed and accomplished the project with the help of other students, finally published an article (***Math Biosci Eng***. 2022)
- Used the LSTM framework to predict the following glucose trajectory for type 2 diabetic patients to facilitate self-management.
- Developed skills: Clinical trial steps; deep learning frameworks (e.g., LSTM-RNN) in Python

## *Honors and Awards*

- Dec. 2015, Tianjin Medical University, Scientific research projects for college students in the School of Basic Medical Sciences, The third prize.
- Jun. 2015, The IV **physics competition** of college students in Tianjin, Municipal first prize.
- Jul. 2014, The **mathematics competition** of college students in Tianjin, Municipal first prize of Humanities and Medicine class.
- Jun. 2017, Tianjin Medical University, School scholarship of the 2015-16 school year, The third prize.
- Nov. 2016, The Games of the III Tianjin Climbing, Memorial Award.
- Sep. 2015, Tianjin Medical University, Excellent member of the Department student union.
- Jun. 2014, China Foundation for Poverty Alleviation, the Excellent service provider.