

Shuai Zhang

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Educational details:

Ph.D (Pharmacology)

Harbin Medical University, China.

Master and Bachelor (Seven-year Program of Basic Medical Sciences)

Harbin Medical University, China.

Publications:

1. Epigallocatechin-3-Gallate Allosterically Activates Protein Kinase C- α and Improves the Cognition of Estrogen Deficiency Mice. ACS Chemical Neuroscience. 2021, IF=4.418, Q2, First Author.
2. AhR/miR-23a-3p/PKCa axis contributes to memory deficits in ovariectomized and normal aging female mice. Molecular Therapy-Nucleic Acids. 2021, IF=8.886, Q1, First author.
3. MicroRNA-153 impairs hippocampal synaptic vesicle trafficking via downregulation of synapsin I in rats following chronic cerebral hypoperfusion. Experimental Neurology. 2020, IF=5.33, Q2, First Author.
4. Medical Histories of Control Subjects Influence the Biomarker Potential of Plasma A β in Alzheimer's Disease: a Meta-analysis. Journal of Molecular Neuroscience. 2020, IF=3.444, Q3, First Author.
5. Cholinergic Dysfunction Involves in the Impairment of MS-dCA1 Neurocircuit in Rats with Chronic Cerebral Hypoperfusion. Frontiers in Cellular Neuroscience. 2020, IF=5.505, Q1, Co-first Author.
6. MicroRNA-153 impairs presynaptic plasticity by blocking vesicle release following chronic brain hypoperfusion. Cell Communication and Signaling. 2020, IF=5.782, Q2, Co-first Author.
7. Metoprolol prevents neuronal dendrite remodeling in a canine model of chronic obstructive sleep apnea. Acta Pharmacologica Sinica, 2019, Eleventh Author.
8. Glutamate Dysfunction and Alzheimer's Disease, Acta Neuropharmacologica, 2018, First Author.
9. The Action and Molecular Mechanisms of MicroRNA-195 on Cognitive Decline Induced by Chronic Brain Hypoperfusion, Acta Neuropharmacologica, 2016, First Author.
10. Myocardial infarction-induced hippocampal microtubule damage by cardiac originating microRNA-1 in mice. Journal of Molecular and Cellular Cardiology. 2018, IF=5.0, Q2, Eighth Author.

11. MicroRNA-195 prevents dendritic degeneration and neuron death in rats following chronic brain hypoperfusion. Cell Death and Disease. 2017, IF= 8.469, Q1, Seventh Author.

Manuscript under preparation:

1. Gut Prevotellaceae-GABAergic Septohippocampal Pathway Mediates the Spatial Memory Impairment in High-fat diet Fed Ovariectomized Mice. First Author.
2. The different sensitivity of hippocampus and cortical neurons dendrite degeneration to estrogen decline in female aging mice. Second Author.

Awards and Honors:

- 2014 National Scholarships
- 2013 and 2015 National Encouragement Scholarship
- 2015 the 14th "Challenge Cup" College Students' Extracurricular Academic and Technological Works Competition in Hei Longjiang Province, Third Award
- 2015 "Merit Student" of Hei Longjiang Province
- 2020 Youth Research Paper Award in Cardiovascular and Cerebrovascular Pharmacology Conference, First Prize
- 2021 The 7th "Internet+" Innovation and Entrepreneurship Competition in Hei Longjiang Province, Silver Award
- 2021 The Medical Scholarship by Daiichi-Sankyo Corporation (International Health Exchange and Cooperation Centre, Ministry of Health)
- 2021 Harbin Medical University Innovation Fund to Graduate Student

Research experience:

September 2019-May 2022, Ph.D.

Department of Pharmacology, Harbin Medical University, China

Mentor: Dr. Jing Ai

Professor, Department of Pharmacology, Harbin Medical University, China

Thesis title: "Gut Prevotellaceae-GABAergic Septohippocampal Pathway Mediates the Spatial Memory Impairment in High-fat diet Fed Ovariectomized Mice."

Summary of Doctoral work:

Clarifying the risk factors and mechanisms which promote the onset of cognitive impairment after estrogen depletion is essential for improving the life quality of

aging females. Therefore, in my Ph.D thesis, using behavioral tests, 16s rDNA sequencing, *in vivo* or *in vitro* electrophysiology, combined with optogenetics and chemogenetics, i revealed that high-fat diet accelerated the impairment of spatial memory through a multi-order gut *Prevotellaceae*-septo(PV+)-hippocampal pathway in ovariectomized mice. Resistant starch supplementation rectified the gut *Prevotellaceae* and rescued the above impairment. These findings provide a better understanding of the precise gut-brain neural control of cognition and a putative way for preventing the cognitive impairment in obese menopausal females.

Overall Research Interest:

- Discovery of neural mechanisms underlying specific behaviors.
- Studying novel targets for the prevention and therapy of neurological diseases.

Techniques known and applied:

- **Patch Clamp:** Extracellular recording of field potential, Whole cell recording in brain slices and cultured neuron.
- ***In vivo* techniques:** Opto/chemo-genetic manipulation of neural circuits. Recording of local field potential. Behavioral Test (Morris Water maze, Barnes Maze, Novel object recognition task, Passive/Active avoidance task).
- **Microscopy:** Immunohistochemistry, microscopy, confocal microscopy.
- **Animal handling:** Expertise in handling of Rat and Mice. Brain stereotactic injection, Ovariectomized mice model, Bilateral common carotid artery occlusion, Subdiaphragmatic vagotomy, Administration of agents via different routes (Oral route, intra-peritoneal, and subcutaneous) in *in vivo*, Autopsy, Isolation of tissue and organs.
- **Molecular Biology:** Isolation of DNA, RNA and Proteins from blood, Cell lines and animal tissues, Reverse Transcriptase-PCR, Quantitative Real Time-PCR, ELISA, SDS-PAGE.
- **Computer and other skills:** Windows, Microsoft Office, Various bioinformatics tool like Pubmed tools, Endnote, Origin, GraphPad Prism software, JASPAR, TargetScan, Autodock. Image processing tools, like ImageJ, Adobe Photoshop, Adobe Illustrator.

Oral talk/Poster presentations:

1. **MicroRNA-195 Alleviates Cognitive Impairment in rat following Chronic Brain Hypoperfusion.** Experimental biology, 2019-United States of America. (Poster presentations)
2. **MicroRNA-153 Impairs Presynaptic Plasticity by Blocking Synaptic Vesicle Trafficking and Release following Chronic Cerebral**

- Hypoperfusion.** Cardiovascular and cerebrovascular pharmacology conference. 2020-China. (Oral presentations)
3. **MicroRNA-153 Impairs Presynaptic Plasticity by Blocking Synaptic Vesicle Trafficking and Release following Chronic Cerebral Hypoperfusion.** International Cross Forum on Cardiovascular Drug Research and Development. 2020-China. (Oral presentations)
 4. **AhR/miR-23a-3p/PKC α Axis Contributes to Memory Deficits in Ovariectomized and Normal Aging Female Mice.** The XXI Pacific Scientific Conference of Students and Young Scholars with International Participation "Actual Problems of Experimental, Preventive and Clinical Medicine", 2021-Russia (Online). (Oral presentations)

Personal details:

Nationality: China

Date of Birth: 07-20-1993

Sex: Male

Marital Status: Single

Languages: Chinese, English

Interests: Chinese traditional culture, listening to music, and photography

Permanent Address: Tonghua, Jinlin Province, China.

References:

1. Jing Ai (Doctoral supervisor)

Professor, Department of Pharmacology, Harbin Medical University, China.

Email: azhrbmu@126.com

2. xxxx (Project advisor)

Professor and Associate Vice Chair for Research, xxxx Research Laboratories, Department of xxxx, University xxxx, United States of America.

Email: xxxx@gmail.com

3. xxxx (PhD supervisor)

Senior Scientist, xxxx Research Institute, India.

Email: xxxx@gmail.com

Declaration

I, hereby declare that the particulars furnished by me are true to the best of my knowledge and belief.