

Ran Liu, MD
Institute for Healthy Aging
Pharmacology & Neuroscience
School of Biomedical Sciences
Email: Ran.Liu@unthsc.edu



Area of Expertise

The principal goals of my research are focused on translational stroke research. Although rtPA is the sole FDA approved treatment for ischemic stroke, very few patients have been benefited from rtPA treatment because of its limited therapeutic window and the increased risk of hemorrhage transformation due to blood-brain barrier breakdown. We are among the first to explore the combined therapy to extend rtPA's therapeutic window in ischemic stroke models. We have demonstrated that estrogens could extend the therapeutic window of rtPA for the treatment of ischemic stroke. In addition, our research has provided insight to target ischemic penumbra and beyond for the treatment of ischemic stroke. Currently we repurpose a century-old drug, methylene blue, for the treatment of ischemic stroke. Our study demonstrates that large MCA territory infarct may induce long-lasting elevated GABAergic tonic inhibition in the hippocampus and, thus, contributes to cognitive impairment after ischemic stroke. All these results have led us to explore the role of GABAA receptor mediated neurotransmission in the cognitive impairment after large MCA territory infarct and to determine the effect of methylene blue on cognitive impairment after ischemic stroke.

Qualifications

MD, Beijing Medical University

Recent Publications

Recurrent Transient Ischemic Attack Induces Neural Cytoskeleton Modification and Gliosis in an Experimental Model

Wang, L., Chaudhari, K., Winters, A., Sun, Y., Berry, R., Tang, C., Yang, S. H. & Liu, R., Oct 2023, In: Translational Stroke Research. 14, 5, p. 740-751 12 p.

Metabolic Heterogeneity of Cerebral Cortical and Cerebellar Astrocytes

Sun, Y., Winters, A., Wang, L., Chaudhari, K., Berry, R., Tang, C., Liu, R. & Yang, S., Jan 2023, In: Life. 13, 1, 184.

Mitochondria transplantation/transfer between single cells

Hu, Q., Lu, J., Zhang, X., Liu, R. & Yang, S. H., Sep 2022, In: Journal of Cerebral Blood Flow and Metabolism. 42, 9, p. 1748-1750 3 p.

Characterizing region-specific glucose metabolic profile of the rodent brain using Seahorse XFe96 analyzer

Wang, L., Chaudhari, K., Winters, A., Sun, Y., Liu, R. & Yang, S. H., Jul 2022, In: Journal of Cerebral Blood Flow and Metabolism. 42, 7, p. 1259-1271 13 p.

Four Decades of Ischemic Penumbra and Its Implication for Ischemic Stroke

Yang, S. H. & Liu, R., Dec 2021, In: Translational Stroke Research. 12, 6, p. 937-945 9 p.

Modulation of astrocyte phenotype in response to T-cell interaction

Hersh, J., Prah, J., Winters, A., Liu, R. & Yang, S. H., 15 Feb 2021, In: Journal of Neuroimmunology. 351, 577455.

Early loss of cerebellar Purkinje cells in human and a transgenic mouse model of Alzheimer's disease

Chaudhari, K., Wang, L., Kruse, J., Winters, A., Sumien, N., Shetty, R., Prah, J., Liu, R., Shi, J., Forster, M. & Yang, S. H., 2021, In: Neurological Research. 43, 7, p. 570-581 12 p.

Determination of metformin bio-distribution by LC-MS/MS in mice treated with a clinically relevant paradigm

Chaudhari, K., Wang, J., Xu, Y., Winters, A., Wang, L., Dong, X., Cheng, E. Y., Liu, R. & Yang, S. H., Jun 2020, In: PLoS ONE. 15, 6, e0234571.

Cholesterol sulfate alters astrocyte metabolism and provides protection against oxidative stress

Prah, J., Winters, A., Chaudhari, K., Hersh, J., Liu, R. & Yang, S. H., 15 Nov 2019, In: Brain Research. 1723, 146378.

Experimental ischemic stroke induces long-term T cell activation in the brain

Xie, L., Li, W., Hersh, J., Liu, R. & Yang, S. H., 1 Nov 2019, In: Journal of Cerebral Blood Flow and Metabolism. 39, 11, p. 2268-2276 9 p.

Sponsored Projects

Assessment of the Effects of Novel Nestle Diets on balance (Phase I) and cognitive function (Phase II) in Female 5XFAD Transgenic Mice (Project VII)

Yang, S. & Liu, R.

Nestle Purina

18/10/16 → 18/10/18

Establishment of Inducible Astrocyte Specific p38 MAPK Knockout Mouse Line

Yang, S. & Liu, R.

NINDS: Neurological Disorders & Stroke

15/09/14 → 28/02/18

Metformin and Cognition

Liu, R., Huang, R., Yang, S. & Sumien, N.

Intramural Research(UNTHSC)

1/05/16 → 31/08/17

Methylene Blue for Ischemic Stroke Therapy

Liu, R., Huang, R. & Yang, S.

American Heart Association

12/06/13 → 30/06/17

Neuroglobin: Cell Membrane and Neuroprotection

Yang, S., Liu, R. & Jin, K.

NINDS: Neurological Disorders & Stroke

1/07/14 → 31/05/19

Novel Mechanistic Targets of Steroid Hormones in the Brain - Core B

Forster, M., Shetty, R., Yang, S., Liu, R. & Sumien, N.

NIA: National Institute on Aging

1/12/12 → 30/11/18

Post Stroke Cognitive Impairment: Mechanism and Therapy

Yang, S., Liu, R., Sumien, N. & Jin, K.

NINDS: Neurological Disorders & Stroke

1/02/19 → 31/01/24

Post Stroke Cognitive Impairment: Mechanism and Therapy

Yang, S., Liu, R., Sumien, N. & Jin, K.

NINDS: Neurological Disorders & Stroke

1/02/19 → 31/01/24

To Determine the Mechanisms Underlying the Protection of Nestle Diet in AD Mice

Yang, S. & Liu, R.

Nestle Purina

5/05/12 → 30/09/13

