

Stanford



Zhijuan Cao

Instructor, Neurosurgery

Bio

BIO

I am an instructor in Dr. Gary Steinberg's lab in the Department of Neurosurgery. My main interest is to understand the underlying cellular and molecular mechanisms after stroke and to find the therapeutic targets for brain repair and stroke recovery. My PhD. thesis work demonstrated the acute and sustained neuroprotection by the pharmacological hypothermia in ischemic stroke animal model, providing a novel hypothermia treatment for stroke application. Before that, I detected the role of innate immune signaling pathways from toll-like-receptor family in myocardial infarction. My current work focuses on using optogenetic strategies to stimulate the targeted neurons for brain repair after stroke and detecting the neural circuit and molecular mechanisms underlying the stroke recovery.

ACADEMIC APPOINTMENTS

- Instructor, Neurosurgery

HONORS AND AWARDS

- Trainee Professional Development Award, Society for Neuroscience (2019)
- Postdoctoral Fellowship, American Heart Association (AHA) (2017-2019)
- Best Poster award in Third Annual cardiovascular Research Institute Symposium, Baylor College of Medicine, Houston, TX (2015)
- Dean's Awards for Excellence, Baylor College of Medicine, Houston, TX (2015)
- First Place Award for Best Posters at the 27th BCM Annual Graduate Student Symposium,, Baylor College of Medicine, Houston, TX (2015)
- Third place poster award, Medical World Americas Conference, Houston, TX (2015)
- Pre-doctoral Fellowship, American Heart Association (AHA) (2013-2015)
- Outstanding graduation thesis, Nanjing Medical University, Nanjing, Jiangsu, China (2010)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, American Heart Association (2011 - present)
- Member, American Physiological Society (2012 - present)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My current research focuses on:

- 1) using optogenetic strategies to stimulate targeted neurons for brain repair after stroke.
- 2) detecting the neural circuit and molecular mechanisms underlying stroke recovery.

Publications

PUBLICATIONS

- **Unique Subtype of Microglia in Degenerative Thalamus After Cortical Stroke.** *Stroke*
Cao, Z. n., Harvey, S. S., Chiang, T. n., Foltz, A. G., Lee, A. G., Cheng, M. Y., Steinberg, G. K.
2021: STROKEAHA120032402
- **Brain-wide neural dynamics of poststroke recovery induced by optogenetic stimulation.** *Science advances*
Vahdat, S., Pendharkar, A. V., Chiang, T., Harvey, S., Uchino, H., Cao, Z., Kim, A., Choy, M., Chen, H., Lee, H. J., Cheng, M. Y., Lee, J. H., Steinberg, et al
2021; 7 (33)
- **Time-Course Characterization of Blood-Brain Barrier Disruption in Secondary Thalamic Injury After Stroke**
Cao, Z., Harvey, S., Pendharkar, A., Chiang, T., Cheng, M., Steinberg, G.
LIPPINCOTT WILLIAMS & WILKINS.2020
- **Inflammatory Responses in the Secondary Thalamic Injury After Cortical Ischemic Stroke.** *Frontiers in neurology*
Cao, Z., Harvey, S. S., Bliss, T. M., Cheng, M. Y., Steinberg, G. K.
2020; 11: 236
- **Cellular and Molecular Characterization of Microglia in Secondary Thalamic Injury After Ischemic Stroke**
Cao Zhijuan, Harvey, S., Chiang, T., Foltz, A., Cheng, M., Steinberg, G.
LIPPINCOTT WILLIAMS & WILKINS.2019
- **RNA-Sequencing Analysis Revealed a Distinct Motor Cortex Transcriptome in Spontaneously Recovered Mice After Stroke** *STROKE*
Ito, M., Aswendt, M., Lee, A. G., Ishizaka, S., Cao, Z., Wang, E. H., Levy, S. L., Smerin, D. L., McNab, J. A., Zeineh, M., Leuze, C., Goubran, M., Cheng, et al
2018; 49 (9): 2191–99
- **RNA-Sequencing Analysis Revealed a Distinct Motor Cortex Transcriptome in Spontaneously Recovered Mice After Stroke.** *Stroke*
Ito, M. n., Aswendt, M. n., Lee, A. G., Ishizaka, S. n., Cao, Z. n., Wang, E. H., Levy, S. L., Smerin, D. L., McNab, J. A., Zeineh, M. n., Leuze, C. n., Goubran, M. n., Cheng, et al
2018; 49 (9): 2191–99
- **TRPV1-mediated Pharmacological Hypothermia Promotes Improved Functional Recovery Following Ischemic Stroke.** *Scientific reports*
Cao, Z. n., Balasubramanian, A. n., Pedersen, S. E., Romero, J. n., Pautler, R. G., Marrelli, S. P.
2017; 7 (1): 17685
- **Transient Receptor Potential Melastatin 8 Channel Inhibition Potentiates the Hypothermic Response to Transient Receptor Potential Vanilloid 1 Activation in the Conscious Mouse** *CRITICAL CARE MEDICINE*
Feketa, V. V., Zhang, Y., Cao, Z., Balasubramanian, A., Flores, C. M., Player, M. R., Marrelli, S. P.
2014; 42 (5): E355-E363
- **Pharmacologically induced hypothermia via TRPV1 channel agonism provides neuroprotection following ischemic stroke when initiated 90 min after reperfusion** *AMERICAN JOURNAL OF PHYSIOLOGY-REGULATORY INTEGRATIVE AND COMPARATIVE PHYSIOLOGY*
Cao, Z., Balasubramanian, A., Marrelli, S. P.
2014; 306 (2): R149-R156
- **CpG-ODN, the TLR9 agonist, attenuates myocardial ischemia/reperfusion injury: Involving activation of PI3K/Akt signaling** *BIOCHIMICA ET BIOPHYSICA ACTA-MOLECULAR BASIS OF DISEASE*
Cao, Z., Ren, D., Ha, T., Liu, L., Wang, X., Kalbfleisch, J., Gao, X., Kao, R., Williams, D., Li, C.
2013; 1832 (1): 96-104
- **The TIR/BB-loop mimetic AS-1 protects the myocardium from ischaemia/reperfusion injury** *CARDIOVASCULAR RESEARCH*
Cao, Z., Hu, Y., Wu, W., Ha, T., Kelley, J., Deng, C., Chen, Q., Li, C., Li, J., Li, Y.
2009; 84 (3): 442-451
- **Carbamylated erythropoietin protects the myocardium from acute ischemia/reperfusion injury through a PI3K/Akt-dependent mechanism** *SURGERY*
Xu, X., Cao, Z., Cao, B., Li, J., Guo, L., Que, L., Ha, T., Chen, Q., Li, C., Li, Y.
2009; 146 (3): 506-514

- **Dephosphorylation of cardiomyocyte Cx43 is associated with myocardial ischemia and reperfusion injury** *Journal of Nanjing Medical University*
Cao, Z., Xu, X., Que, L., Chen, Q., Li, Y.
2009; 23 (3): 163-167
- **Nonhematopoietic erythropoietin derivative protects cardiomyocytes from hypoxia/reoxygenation-induced apoptosis** *Journal of Nanjing Medical University*
Xu, X., Shan, X., Cao, Z., Wu, M., Chen, Q., Li, Y.
2008; 22 (2): 71-74