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EDUCATION

- 09/2003 - 06/2008: **Ph.D.** in Biophysics
(08/2006 - 06/2008) Institute of Biophysics, Chinese Academy of Sciences (CAS), Beijing, China.
(09/2003 - 08/2006) Huazhong University of Science and Technology, Wuhan, China.
- 09/1999 - 06/2003: **B.S.** in Biomedical Engineering
Huazhong University of Science and Technology, Wuhan, China.

WORK EXPERIENCE

- 11/2015 - present: **Professor**, Huazhong University of Sci.&Tech., China.
Molecular and circuit mechanisms of behaviors
- 09/2008 - 10/2015: **Postdoctoral Fellow**, University of Toronto, Canada.
*Deciphering the molecular and circuit mechanisms of locomotion in *C. elegans**

PERSONAL STATEMENT

I am interested in identifying the underlying molecular and circuit mechanisms that regulating different behaviors. Using *C. elegans* as a genetic model, combining with molecular biology, electrophysiology, optogenetics and quantitative behavior analyse, my team focuses on uncovering mechanisms that govern the ensemble of the *C. elegans* motor circuit and the dynamics of *C. elegans* motor behaviors, and underlie the physiological basis of relevant neurological disorders.

RESEARCH INTERESTS

- Molecular and circuit mechanisms underlying behaviors
- Synaptic plasticity and synapse development
- Function and structure of ion channels, ion channelopathy

TEACHING

- (2017) Guidance of Life Science, Huazhong University of Sci. and Tech., China.
- (2017) Biophysics, Huazhong University of Science and Technology, China.
- (2016) Frontier of Modern Cellular Biophysics Technologies, Huazhong University of Science and Technology, China.

- (2015) Frontier of Modern Cellular Biophysics Technologies, Huazhong University of Science and Technology, China.
- (2012) Neurobiology in Model Organism, University of Toronto, Canada.

HONORS & AWARDS

- (2016) National 1000-Young-Talent Program of China.
- (2009) Early Scholar Award, Samuel-Lunenfeld Research Institute, Canada.

PUBLICATIONS

Research Articles: (* Equal Contribution)

- **Gao, S.#**, Guan, A., et al., Zhen, M.#, (2017) Excitatory motor neurons are local oscillators for backward locomotion. *eLife*. 29915.(#Corresponding authors)
- Park, S., Bin, N., Yu, B., Wong, R., itarska, E., et al., **Gao, S.**, Rizo, J., and Sugita, S. (2017) UNC-18 and Tomosyn antagonistically control synaptic vesicle priming downstream of UNC-13 in *C. elegans*. *J Neurosci*. 37(36):8797-8815.
- Yu, W., Lin, X., **Gao, S.#**, Li, C.#, (2015) Age-related changes of inactivating BK channels in rat dorsal root ganglion neurons. *J Neurol Sci*. 358:138-45 (#Corresponding authors)
- **Gao, S.#**, Xie, L., Po, M.D., Guan, A., Zhen, M.#, (2015) The NCA sodium leak channel is required for persistent motor circuit activity that sustains locomotion. *Nat. Commun*. 6:6323.(#Corresponding authors)
- Maro, G.S. *, **Gao, S. ***, Olechwier A.M., Hung W.L., Liu M., Özkan E., Zhen M. , Shen K. (2015) MADD-4/Punctin and Neurexin Organize *C. elegans* GABAergic Postsynapses through Neuroligin. *Neuron*, S0896-6273(15)00422-5.
- Norris, A.D., **Gao, S.**, Norris, M.L., Ray, D., Ramani, A.K., Fraser, A.G., Morris, Q., Hughes, T.R., Zhen, M., Calarco, J. (2014) A Pair of RNA-Binding Proteins Controls Networks of Splicing Events Contributing to Specialization of Neural Cell Types. *Molecular Cell*, S1097-2765(14).
- Hung, W., Hwang, C., **Gao, S.**, Liao, E., Chitturi, J., Wang, Y. Li, H., Stigloher, C., Bessereau, J.L. and Zhen, M. (2013) Attenuation of Insulin Signaling Contributes to FSN-1-mediated Regulation of Synapse Development. *EMBO J*, 32, 1745-1760.
- Xie, L.* , **Gao, S.***, Alcaire, S.M., Aoyagi, K., Wang, Y., Stagljar, I., Nagamatsu, S. and Zhen, M. (2013) NLF-1 Delivers a Sodium Leak Channel to Regulate Neuronal Excitability and Modulate Rhythmic Locomotion. *Neuron*, 77(6):1069-1082.
- **Gao, S.** and Zhen, M. (2011) Action potentials drive body wall muscle contractions in *Caenorhabditis elegans*. *Proc. Natl. Acad. Sci. U.S.A.* 108(6) 2557-2562.

- Kawano, T. *, Po, M.D. *, **Gao, S.**, Leung, G., Ryu, W.S. And Zhen, M. (2011) An Imbalancing Act: Gap Junctions Reduce the Backward Motor Circuit Activity to Bias *C. elegans* for Forward Locomotion. **Neuron** 17 (4): 572-587.
- Sancar, F. *, Touroutine, D. *, **Gao, S.***, Oh, H.J., Gendrel, M., Bessereau, J., Kim, H., Zhen, M. and Richmond, J.E. (2011) The dystrophin-associated protein complex maintains muscle excitability by regulating BK channel localization. **J. Biol. Chem.** 286(38):33501-10.
- Bouhours, M., Po, M.D., **Gao, S.**, Hung, W., Li, H., Georgiou, J., Roder, J.C and Zhen, M. (2011) A Co-operative Regulation of Neuronal Excitability by UNC-7 Innexin and NCA/NALCN Leak Channel. **Molecular Brain** 4:16.
- **Gao, S.** *, Fan, Y. *, Chen, L-Y., Lu, J-Z., Xu, T., Xu, P-Y. (2009) Mechanism of Different Spatial Distributions of *C. elegans* and Human STIM1 at Resting State. **Cell Calcium** 45, 77-88.
- Zhang, L.* , Li, J-L.* , **Gao, S.***, Wu, Z-X., Zhang, R-Y., Xu, T. (2009) Sec-10 Knockout Increases The Neuroactive-drug Responses Without Affecting Function of The Postsynaptic Ionotropic Receptors in Neuromuscular Junctions. **Prog. in Biochem. and Biophys.** 36(4): 410-416.
- **Gao, S.** *, Wu, Y. *, Lv, C-X., Guo, Z-H., Li, C-H., Ding, J-P. (2008) Slack and Slick K_{Na} channels are required for the depolarizing after potential of acutely isolated, medium diameter rat dorsal root ganglion neurons. **Acta Pharmacologica Sinica** 29(8):899-905.
- **Gao, S.** *, Wang, C-M. *, Chen, X-S. *, Yu, W-W., Mo, B-W., Li, C-H. (2007) Cerebrosides of *baifuzi*, a novel potential blocker of Calcium-activated Chloride channels in rat pulmonary artery smooth muscle cells. **Cell Biol Int.** 31(9):908-15.
- Li, W.* , **Gao, S.***, Lv, C-X., Wu, Y., Guo, Z-H., Ding, J-P., Xu, T. (2007) Characterization of Voltage- and Ca²⁺-Activated K⁺ Channels in Rat Dorsal Root Ganglion Neurons. **J. Cell Physiol.** 212(2):348-57.

Book chapter:

- **Gao, S. #**, and Hu, Z., (2017). In Vivo Recordings at the *Caenorhabditis elegans* Neuromuscular Junction. **Extracellular Recording Approaches, Neuromethods**, vol. 134, Roy Sillitoe (ed.). (#Corresponding authors)

PRESENTATIONS

- (2017) S. Gao, Excitatory Motor Neurons are local oscillator for backward locomotion. 21th *C. elegans* meeting, Los Angeles, CA. (Invited speaker)
- (2017) S. Gao, Excitatory Motor Neurons are local oscillator for backward locomotion. 4th *worm PI* meeting, Suzhou, China. (Invited speaker)

- (2016) S. Gao, Excitatory Motor Neurons Function as Central Pattern Generators in *C. elegans*. Nerve cell biology frontier seminar, Changchun.
- (2015) S. Gao, L. Xie, T Kawano, M.D. Po, S. Guan and M. Zhen, Persistent Neural Activity Sustains *C. elegans* Locomotion Via NCA channel. Modulation of Neural Circuits & Behavior, Gordon Research Conference, Hong Kong.
- (2015) S. Gao, L. Xie, T Kawano, M.D. Po, S. Guan and M. Zhen, Persistent Neural Activity Sustains *C. elegans* Locomotion Via NCA channel. East-lake forum, Huazhong University of Science and Technology, Wuhan.
- (2014) S. Gao, L. Xie, M.D. Po, A. Guan, and M. Zhen, Persistent Neural Activity from Premotor Interneurons Sustains *C. elegans* Locomotion via NCA Channel. SCNW 2014, Suzhou.
- (2014) S. Gao, Persistent Neural Activity Sustains *C. elegans* Locomotion via NCA Channel. Talk in Wuhan University International Forum for Interdisciplinary Sciences and Engineering, Wuhan.
- (2014) S. Gao, L. Xie, M.D. Po, A. Guan, and M. Zhen, Persistent Neural Activity from Premotor Interneurons Sustains *C. elegans* Locomotion via NCA Channel. 'Neural Circuits' meeting, CSHL.
- (2014) S. Gao, L. Xie, M.D. Po, A. Guan, and M. Zhen, NLF-1 and NCA channel Mediate Persistent Neural Activity to Sustain *C. elegans* Locomotion. Talk in Annual Research Day, B.R.A.I.N. platform in Physiology, University of Toronto.
- (2013) S. Gao, L. Xie, and M. Zhen, A sodium leak channel potentiates a defined premotor interneuron circuit to maintain rhythmicity of locomotion. Talk in Toronto Area Worm Meeting.
- (2013) S. Gao, L. Xie, S. M. Alcaire and M. Zhen, A sodium leak channel potentiates a defined premotor interneuron circuit to maintain rhythmicity of locomotion. Genes, Circuits and Behavior (Cell Symposia Meeting).
- (2012) L. Xie, S. Gao, S. Alcaire, Y. Wang, I. Stagljar, M. Zhen, NLF-1 Regulates Neuronal Excitability through a Conserved Sodium Leak Channel. *C. elegans* Neurobiology EMBO Conference Series, Heidelberg, Germany.
- (2012) S. Gao, L. Xie and M. Zhen, NCA channel regulates neural circuit plasticity to sustain locomotion. The Molecular & Cellular Neurobiology Gordon Research Conference, Hong Kong.
- (2012) S. Gao, NLF-1 Delivers a Sodium Leak Channel to Modulate Rhythmic Locomotion. Talk in School of Basic Medical Sciences, Zhejiang University, China.
- (2011) T. Kawano, M. D. Po, S. Gao and M. Zhen, AN IMBANLANCING ACT: Gap junctions reduce the backward motor circuit activity to bias *C. elegans* for forward locomotion. Champalimaud Neuroscience Symposium, Portugal.
- (2011) S. Gao, M. Bouhours, M. D. Po, , L. Xie, W. Hung, H. Li, J. Georgiou, J. C. Roder and M. Zhen, A Co-operative Regulation of Neuronal Excitability by UNC-7 Innexin and NCA/NALCN Leak Channel. 18th *C. elegans* meeting, Los Angeles, CA.
- (2010) F. Sancar, D. Touroutine, S. Gao, H. J. Oh, M. Gendrel, J. Bessereau, H. Kim, M. Zhen and J. E. Richmond, The Dystrophin-associated Protein Complex Maintains Muscle Excitability by Regulating BK Channel Localization. 'C. *elegans* Neuronal Development, Synaptic Function and Behavior' meeting, Madison, WI.
- (2010) S. Gao and M. Zhen, Action potentials drive body wall muscle contractions in *C. elegans*. 'Axon Guidance, Synaptogenesis & Neural Plasticity' meeting, CSHL, NY.
- (2010) S. Gao and Mei Zhen, Action Potentials Drive Body Wall Muscle Contractions. Talk in 'C. *elegans* Neuronal Development, Synaptic Function and Behavior' meeting, Madison, WI.

- (2009) S. Gao and M. Zhen, Action potential drive body wall muscle contractions in *C. elegans*. 17th *C. elegans* meeting, Los Angeles, California.
- (2009) S. Gao and M. Zhen, Typical action potentials drive muscle contraction in *C. elegans*. B.R.A.I.N. platform in Physiology, University of Toronto.