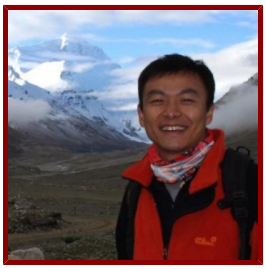
Stanford



Jun Ding

Assistant Professor of Neurosurgery and of Neurology

CONTACT INFORMATION

- **Administrative Contact**

  Nichole Zito - Program Administrator

  Email nicholez@stanford.edu

  Tel 6507362817

Bio

ACADEMIC APPOINTMENTS

- Assistant Professor, Neurosurgery
- Assistant Professor, Neurology & Neurological Sciences
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Department of Neurosurgery, and Department of Neurology and Neurological Sciences, by courtesy, Stanford University School of Medicine, (2012- present)

HONORS AND AWARDS

- K99/R00 Pathway to Independence Award, NIH/NINDS (2011)
- Postdoctoral Fellowship, Parkinson’s Disease Foundation (2011)
- Klingenstein Fellowship Awards in Neuroscience, Klingenstein Foundation (2013)
- Kavli Fellow, Kavli Foundation (2014)

PROFESSIONAL EDUCATION

- Ph.D., Interdepartmental Neuroscience PhD Program , Department of Physiology, Northwestern University , Neuroscience (2007)

LINKS

- Ding lab website: http://med.stanford.edu/dinglab.html

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

The interplay between motor cortex, sensory cortex, thalamus and basal ganglia is essential for neural computations involved in generating voluntary movements. Our goal is to dissect the functional organization of motor circuits, particularly cortico-thalamo-basal ganglia networks, using electrophysiology, 2-photon microscopy,

optogenetics, and genetic tools. The long-term scientific goal of the lab is to construct functional circuit diagrams and establish causal relationships between activity in specific groups of neurons, circuit function, animal motor behavior and motor learning, and thereby to decipher how the basal ganglia process information and guide motor behavior. We will achieve this by investigating the synaptic organization and function that involve the cortex, thalamus and basal ganglia at the molecular, cellular and circuit level. Currently, we are focusing on several questions:

How are excitatory and inhibitory inputs integrated in the striatum?

How do feed-forward and recurrent local inhibitions balance the excitation in the striatum?

How are functional maps modulated in motor behavior and motor learning?

Our goal is to bridge the gap between molecular or cellular events and the circuit mechanisms that underlie motor behavior. In addition, we aim to further help construct the details of psychomotor disorder 'circuit diagrams,' such as the pathophysiological changes in Parkinson's disease.

Teaching

COURSES

2017-18

- Neuroplasticity: From Synapses to Behavior: BIO 204 (Spr)

2016-17

- 2 Photon Imaging of Neural Circuits: NSUR 262 (Spr)
- Neuroplasticity: From Synapses to Behavior: BIO 204 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Chung-ha Davis, Yi Liu, Isabel Low, John Peters, Mark Plitt

Postdoctoral Faculty Sponsor

Daniel Bloodgood, Di Lu, Richard Roth, Mengjun Sheng, Yue Sun, Dongli Xu

Doctoral Dissertation Advisor (AC)

Eddy Albarran, Konstantin Kaganovsky

Doctoral Dissertation Co-Advisor (AC)

Stephen Evans

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Neurosciences (Phd Program)

Publications

PUBLICATIONS

- **The THO Complex Coordinates Transcripts for Synapse Development and Dopamine Neuron Survival.** *Cell*
  Maeder, C. I., Kim, J., Liang, X., Kaganovsky, K., Shen, A., Li, Q., Li, Z., Wang, S., Xu, X. Z., Li, J. B., Xiang, Y. K., Ding, J. B., Shen, et al
  2018

- **Cell-type-specific inhibition of the dendritic plateau potential in striatal spiny projection neurons.** *Proceedings of the National Academy of Sciences of the United States of America*
  Du, K., Wu, Y. W., Lindroos, R., Liu, Y., Rózsa, B., Katona, G., Ding, J. B., Kotaleski, J. H.
  2017; 114 (36): E7612–E7621

- **Aldehyde dehydrogenase 1a1 mediates a GABA synthesis pathway in midbrain dopaminergic neurons.** *Science*

Kim, J., Ganesan, S., Luo, S. X., Wu, Y., Park, E., Huang, E. J., Chen, L., Ding, J. B.
2015; 350 (6256): 102-106

- **Dynamic rewiring of neural circuits in the motor cortex in mouse models of Parkinson's disease.** *Nature neuroscience*
  Guo, L., Xiong, H., Kim, J., Wu, Y., Lalchandani, R. R., Cui, Y., Shu, Y., Xu, T., Ding, J. B.
  2015; 18 (9): 1299-1309

- **Input- and Cell-Type-Specific Endocannabinoid-Dependent LTD in the Striatum.** *Cell reports*
  Wu, Y., Kim, J., Tawfik, V. L., Lalchandani, R. R., Scherrer, G., Ding, J. B.
  2015; 10 (1): 75-87

- **Balanced Activity between Kv3 and Nav Channels Determines Fast-Spiking in Mammalian Central Neurons.** *iScience*
  Gu, Y., Servello, D., Han, Z., Lalchandani, R. R., Ding, J. B., Huang, K., Gu, C.
  2018; 9: 120–37

- **Diametric neural ensemble dynamics in parkinsonian and dyskinetic states.** *Nature*
  Parker, J. G., Marshall, J. D., Ahanonu, B., Wu, Y. W., Kim, T. H., Grewe, B. F., Zhang, Y., Li, J. Z., Ding, J. B., Ehlers, M. D., Schnitzer, M. J.
  2018

- **A cell-type-specific jolt for motor disorders.** *Nature neuroscience*
  Wu, Y., Ding, J. B.
  2017; 20 (6): 763-765

- **Motor Learning in Animal Models of Parkinson's Disease: Aberrant Synaptic Plasticity in the Motor Cortex** *MOVEMENT DISORDERS*
  Xu, T., Wang, S., Lalchandani, R. R., Ding, J. B.
  2017; 32 (4): 487-497

- **The Locomotion Tug-of-War: Cholinergic and Dopaminergic Interactions Outside the Striatum.** *Neuron*
  Kaganovsky, K., Ding, J. B.
  2017; 96 (6): 1208–10

- **Selective activation of parvalbumin interneurons prevents stress-induced synapse loss and perceptual defects.** *Molecular psychiatry*
  Chen, C. C., Lu, J., Yang, R., Ding, J. B., Zuo, Y.
  2017

- **TGF-beta Signaling in Dopaminergic Neurons Regulates Dendritic Growth, Excitatory-Inhibitory Synaptic Balance, and Reversal Learning** *CELL REPORTS*
  Luo, S. X., Timbang, L., Kim, J., Shang, Y., Sandoval, K., Tang, A. A., Whistler, J. L., Ding, J. B., Huang, E. J.
  2016; 17 (12): 3233-3245

- **Live-Cell Superresolution Imaging by Pulsed STED Two-Photon Excitation Microscopy** *BIOPHYSICAL JOURNAL*
  Takasaki, K. T., Ding, J. B., Sabatini, B. L.
  2013; 104 (4): 770-777

- **Dopaminergic neurons inhibit striatal output through non-canonical release of GABA** *NATURE*
  Tritsch, N. X., Ding, J. B., Sabatini, B. L.
  2012; 490 (7419): 262-?

- **Fasting Activation of AgRP Neurons Requires NMDA Receptors and Involves Spinogenesis and Increased Excitatory Tone** *NEURON*
  Liu, T., Kong, D., Shah, B. P., Ye, C., Koda, S., Saunders, A., Ding, J. B., Yang, Z., Sabatini, B. L., Lowell, B. B.
  2012; 73 (3): 511-522

- **Semaphorin 3E-Plexin-D1 signaling controls pathway-specific synapse formation in the striatum.** *Nature neuroscience*
  Ding, J. B., Oh, W., Sabatini, B. L., Gu, C.
  2012; 15 (2): 215-223

- **Muscarinic modulation of striatal function and circuitry.** *Handbook of experimental pharmacology*
  Goldberg, J. A., Ding, J. B., Surmeier, D. J.
  2012: 223-241

- **Cholinergic modulation of synaptic integration and dendritic excitability in the striatum** *CURRENT OPINION IN NEUROBIOLOGY*
  Oldenburg, I. A., Ding, J. B.
  2011; 21 (3): 425-432
- **Thalamic Gating of Corticostriatal Signaling by Cholinergic Interneurons** *NEURON*
  Ding, J. B., Guzman, J. N., Peterson, J. D., Goldberg, J. A., Surmeier, D. J.
  2010; 67 (2): 294-307
- **Supraresolution Imaging in Brain Slices using Stimulated-Emission Depletion Two-Photon Laser Scanning Microscopy** *NEURON*
  Ding, J. B., Takasaki, K. T., Sabatini, B. L.
  2009; 63 (4): 429-437
- **Corticostriatal and thalamostriatal synapses have distinctive properties** *JOURNAL OF NEUROSCIENCE*
  Ding, J., Peterson, J. D., Surmeier, D. J.
  2008; 28 (25): 6483-6492
- **Re-emergence of striatal cholinergic interneurons in movement disorders** *TRENDS IN NEUROSCIENCES*
  Pisani, A., Bernardi, G., Ding, J., Surmeier, D. J.
  2007; 30 (10): 545-553
- **D1 and D2 dopamine-receptor modulation of striatal glutamatergic signaling in striatal medium spiny neurons** *TRENDS IN NEUROSCIENCES*
  Surmeier, D. J., Ding, J., Day, M., Wang, Z., Shen, W.
  2007; 30 (5): 228-235
- **RGS4-dependent attenuation of M-4 autoreceptor function in striatal cholinergic interneurons following dopamine depletion** *NATURE NEUROSCIENCE*
  Ding, J., Guzman, J. N., Tkatch, T., chen, s., Goldberg, J. A., Ebert, P. J., Levitt, P., Wilson, C. J., Hamm, H. E., Surmeier, D. J.
  2006; 9 (6): 832-842
- **Dopaminergic control of corticostriatal long-term synaptic depression in medium spiny neurons is mediated by cholinergic interneurons** *NEURON*
  Wang, Z., Kai, L., Day, M., Ronesi, J., Yin, H. H., Ding, J., Tkatch, T., Lovinger, D. M., Surmeier, D. J.
  2006; 50 (3): 443-452
- **Selective elimination of glutamatergic synapses on striatopallidal neurons in Parkinson disease models** *NATURE NEUROSCIENCE*
  Day, M., Wang, Z. F., Ding, J., An, X. H., Ingham, C. A., Shering, A. F., Wokosin, D., Ilijic, E., Sun, Z. X., Sampson, A. R., Mugnaini, E., Deutch, A. Y., Sesack, et al
  2006; 9 (2): 251-259