



Liqun Luo

Ann and Bill Swindells Professor in the School of Humanities and Sciences and Professor, by courtesy, of Neurobiology
Biology

CONTACT INFORMATION

- **Alternate Contact**

Stephanie Wheaton - Administrative Associate

Email swheaton@stanford.edu

Tel (650)724-3719

Bio

BIO

Dr. Luo grew up in Shanghai, China, and earned his bachelor's degree in molecular biology from the University of Science and Technology of China. After obtaining his PhD in Brandeis University, and postdoctoral training at the University of California, San Francisco, Dr. Luo started his own lab in the Department of Biology, Stanford University in December 1996. Together with his postdoctoral fellows and graduate students, Dr. Luo studies the logic of brain wiring using genetic tools. They have developed mosaic marking systems in flies and mice and used them to study how signals are transduced from cell surface receptors to the cytoskeleton, how neuronal processes are pruned, and how neural circuits are organized and built. Dr. Luo is currently a Professor of Biology and an investigator of the Howard Hughes Medical Institute. He teaches neurobiology to Stanford undergraduate and graduate students. He recently published a single-author textbook entitled "Principles of Neurobiology."

Dr. Luo has served on the editorial boards of several scientific journals, including *Neuron*, *eLife*, and *Annual Review of Neuroscience*. He has also served on the Pew Scholar National Committee and Scientific Advisory Committee of Damon Runyon Cancer Research Foundation. He is recipient of the McKnight Technological Innovation in Neuroscience Award, the Society for Neuroscience Young Investigator Award, the Jacob Javits Award from National Institute of Neurological Disorders and Stroke, HW Mossman Award from American Association of Anatomists, and the Lawrence Katz Prize. Dr. Luo is a Member of the National Academy of Sciences and a Fellow of the American Academy of Arts and Sciences.

ACADEMIC APPOINTMENTS

- Professor, Biology
- Professor (By courtesy), Neurobiology
- Member, Bio-X
- Member, Stanford Cancer Institute
- Member, Stanford Neurosciences Institute

HONORS AND AWARDS

- Technology Innovation Award in Neuroscience, McKnight Foundation (2002)
- Young Investigator Award, Society for Neuroscience (2002)

- Investigator, Howard Hughes Medical Institute (2005)
- Jacob Javits Award, National Institute of Neurological Disorders and Stroke (2005)
- H.W.Mossman Award, American Association of Anatomists (2007)
- Fellow, American Association for the Advancement of Science (2011)
- Fellow, American Academy of Arts and Sciences (2012)
- Member, National Academy of Sciences (2012)
- The Lawrence C. Katz Prize for Innovative Research in Neuroscience, Duke University (2013)

PROFESSIONAL EDUCATION

- B.S., Univ. of Sci. & Tech. of China , Molecular Biology (1986)
- Ph.D., Brandeis University , Biology (1992)

PATENTS

- He Z, Zhai Q, Wang J, Watts R, Hoopfer E, Luo L. "United States Patent 7,012,063 Reducing axon degeneration with proteasome inhibitors", Harvard & Stanford
- Luo L, Zong H. "United States Patent 7,282,621 Somatic recombination", Stanford
- Luo L, Tsai RY, Tasic B, Hippenmeyer S, Zong H. "United States Patent 9,125,385 Site-directed integration of transgenes in mammals", Stanford

LINKS

- LuoLab: <http://web.stanford.edu/group/luolab/>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

1. Organization of the olfactory system

The olfactory systems from flies to mammals use a similar organizational principle. Olfactory receptor neurons (ORNs) expressing the same odorant receptor project their axons to the same glomerulus. Projection neurons (PNs) send dendrites to individual glomeruli, and relay olfactory information via their axons to high olfactory centers. Using MARCM (see below) to label individual fly PNs, we found that PN axon terminals exhibit striking stereotypy at the lateral horn according to the glomeruli they send dendrites to. Axon terminals of PNs representing food odors are spatially segregated from those that represent mating pheromones. By contrast, PN axon terminal arborizations in the mushroom body, the olfactory learning and memory center, exhibit much less stereotypy. We are currently using two-photon calcium imaging, optogenetics, and quantitative behavioral assays to identify principles of information processing at the antennal lobe and in higher olfactory centers suggested by previous anatomical studies. We are also investigating how the glomerular map in the mouse olfactory bulb is represented in olfactory cortex using virus-mediated trans-synaptic tracing.

2. Development of wiring specificity in the fly olfactory system

The assembly of the fly olfactory system requires precise glomerular targeting of axons from each of the 50 ORN classes, as well as dendrites of each of the 50 PN classes. We are using this neural circuit as a model to investigate the general principles by which precise wiring specificity arises during development. Our previous studies have shown that PN dendrite patterning precedes ORN axon targeting. PN dendrite targeting relies on global cues in the form of gradients, as well as local cues distributed in a "salt-and-pepper" fashion on dendrites projecting to different glomeruli. Targeting of ORN axons may use the same molecules as PN dendrite targeting, but via distinct mechanisms including axon-axon interactions and axon-target interactions. We are currently performing systematic genetic studies to identify the cell-surface code ORNs and PNs use to form specific connections at stereotypically organized glomeruli.

3. Developmental neurobiology

In addition to our focus on the olfactory system, we are investigating several other developmental neurobiological problems. These include mechanisms of axon pruning, the roles of neuronal activity in neuronal maturation and incorporation into functional circuits, and cell autonomous functions of genes that are implicated in human neurological disorders. We are using both fly and mouse systems to study these problems.

4. Creating genetic tools

In the process of dissecting the adult organization and developmental assembly of complex neural circuits, we have created several useful genetic tools. The MARCM method (Mosaic Analysis with a Repressible Cell Marker) enables the visualization and genetic manipulation of small populations of cells or single neurons in a mosaic fly. We have developed a new repressible binary expression system, the Q system, which has many applications and is helping us to study several problems described above.

We have also developed a mosaic method in the mouse called MADM (Mosaic Analysis with Double Markers) that allows sparse labeling and genetic manipulation of individual cells or cells that share the same lineage with distinct colors in mosaic animals. We have used MADM as trace lineages and study cell autonomous gene functions in neural developmental processes. We are currently expanding the MADM technique to other mouse chromosomes, and will use MADM to study several developmental neurobiological problems (see above). We have also developed other useful mice, such as a double fluorescent Cre reporter and synapse labeling tools in vivo.

Teaching

COURSES

2017-18

- Exploring Neural Circuits: BIO 222 (Spr)

2016-17

- Exploring Neural Circuits: BIO 222 (Spr)
- Molecular and Cellular Neurobiology: BIO 154 (Win)
- Molecular and Cellular Neurobiology: BIO 254 (Win)

2015-16

- Exploring Neural Circuits: BIO 222 (Win)

2014-15

- Exploring Neural Circuits: BIO 222 (Win)
- Molecular and Cellular Neurobiology: BIO 154 (Spr)
- Molecular and Cellular Neurobiology: BIO 254 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Eddy Albarran, Conor Jacobs, Michelle Pang, Helen Yang

Postdoctoral Faculty Sponsor

Dominic Berns, Drew Friedmann, Wei-Hsiang Huang, Justus Kecsichull, Hongjie Li, Tongchao Li, Daniel Tyler Pederick, Jing Ren, Mark Wagner, Laura Wilke

Doctoral Dissertation Advisor (AC)

Jiefu Li

Doctoral Dissertation Co-Advisor (AC)

William Allen

Doctoral (Program)

Jiefu Li

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biology (School of Humanities and Sciences) (Phd Program)
- Neurosciences (Phd Program)

Publications

PUBLICATIONS

- **Cerebellar granule cells encode the expectation of reward** *NATURE*
Wagner, M. J., Kim, T. H., Savall, J., Schnitzer, M. J., Luo, L.
2017; 544 (7648): 96-?
- **Molecular and Neural Functions of Rai1, the Causal Gene for Smith-Magenis Syndrome.** *Neuron*
Huang, W., Guenther, C. J., Xu, J., Nguyen, T., Schwarz, L. A., Wilkinson, A. W., Gozani, O., Chang, H. Y., Shamloo, M., Luo, L.
2016; 92 (2): 392-406
- **Viral-genetic tracing of the input-output organization of a central noradrenergic circuit.** *Nature*
Schwarz, L. A., Miyamichi, K., Gao, X. J., Beier, K. T., Weissbourd, B., DeLoach, K. E., Ren, J., Ibanes, S., Malenka, R. C., Kremer, E. J., Luo, L.
2015; 524 (7563): 88-92
- **Principles of Neurobiology**
Luo, L.
Garland Science.2015
- **Dendrite morphogenesis depends on relative levels of NT-3/TrkC signaling** *SCIENCE*
Joo, W., Hippenmeyer, S., Luo, L.
2014; 346 (6209): 626-629
- **Linking cell fate, trajectory choice, and target selection: genetic analysis of sema-2b in olfactory axon targeting.** *Neuron*
Joo, W. J., Sweeney, L. B., Liang, L., Luo, L.
2013; 78 (4): 673-686
- **Teneurins instruct synaptic partner matching in an olfactory map** *NATURE*
Hong, W., Mosca, T. J., Luo, L.
2012; 484 (7393): 201-U82
- **Global Representations of Goal-Directed Behavior in Distinct Cell Types of Mouse Neocortex** *NEURON*
Allen, W. E., Kauvar, I. V., Chen, M. Z., Richman, E. B., Yang, S. J., Chan, K., Gradinaru, V., Deverman, B. E., Luo, L., Deisseroth, K.
2017; 94 (4): 891-?
- **Cell type-specific long-range connections of basal forebrain circuit** *ELIFE*
Do, J. P., Xu, M., Lee, S., Chang, W., Zhang, S., Chung, S., Yung, T. J., Fan, J. L., Miyamichi, K., Luo, L., Dan, Y.
2016; 5
- **Wiring and Molecular Features of Prefrontal Ensembles Representing Distinct Experiences** *CELL*
Ye, L., Allen, W. E., Thompson, K. R., Tian, Q., Hsueh, B., Ramakrishnan, C., Wang, A., Jennings, J. H., Adhikari, A., Halpern, C. H., Witten, I. B., Barth, A. L., Luo, et al
2016; 165 (7): 1776-1788
- **Developmental Sculpting of Intracortical Circuits by MHC Class I H2-Db and H2-Kb.** *Cerebral cortex*
Adelson, J. D., Sapp, R. W., Brott, B. K., Lee, H., Miyamichi, K., Luo, L., Cheng, S., Djurisic, M., Shatz, C. J.
2016; 26 (4): 1453-1463
- **Organization of the Locus Coeruleus-Norepinephrine System** *CURRENT BIOLOGY*
Schwarz, L. A., Luo, L.

2015; 25 (21): R1051-R1056

- **Basal forebrain circuit for sleep-wake control.** *Nature neuroscience*
Xu, M., Chung, S., Zhang, S., Zhong, P., Ma, C., Chang, W., Weissbourd, B., Sakai, N., Luo, L., Nishino, S., Dan, Y.
2015; 18 (11): 1641-1647
- **Connectivity of mouse somatosensory and prefrontal cortex examined with trans-synaptic tracing.** *Nature neuroscience*
DeNardo, L. A., Berns, D. S., DeLoach, K., Luo, L.
2015; 18 (11): 1687-1697
- **Control of REM sleep by ventral medulla GABAergic neurons** *NATURE*
Weber, F., Chung, S., Beier, K. T., Xu, M., Luo, L., Dan, Y.
2015; 526 (7573): 435-?
- **NEUROSCIENCE. It takes the world to understand the brain.** *Science*
Huang, Z. J., Luo, L.
2015; 350 (6256): 42-44
- **Circuit Architecture of VTA Dopamine Neurons Revealed by Systematic Input-Output Mapping** *CELL*
Beier, K. T., Steinberg, E. E., DeLoach, K. E., Xie, S., Miyamichi, K., Schwarz, L., Gao, X. J., Kremer, E. J., Malenka, R. C., Luo, L.
2015; 162 (3): 622-634
- **Intact-Brain Analyses Reveal Distinct Information Carried by SNc Dopamine Subcircuits** *CELL*
Lerner, T. N., Shilyansky, C., Davidson, T. J., Evans, K. E., Beier, K. T., Zalocusky, K. A., Crow, A. K., Malenka, R. C., Luo, L., Tomer, R., Deisseroth, K.
2015; 162 (3): 635-647
- **A transcriptional reporter of intracellular Ca(2+) in Drosophila.** *Nature neuroscience*
Gao, X. J., Riabinina, O., Li, J., Potter, C. J., Clandinin, T. R., Luo, L.
2015; 18 (6): 917-925
- **Extremely Sparse Olfactory Inputs Are Sufficient to Mediate Innate Aversion in Drosophila** *PLOS ONE*
Gao, X. J., Clandinin, T. R., Luo, L.
2015; 10 (4)
- **Toll receptors instruct axon and dendrite targeting and participate in synaptic partner matching in a Drosophila olfactory circuit.** *Neuron*
Ward, A., Hong, W., Favaloro, V., Luo, L.
2015; 85 (5): 1013-1028
- **Improved and expanded Q-system reagents for genetic manipulations** *NATURE METHODS*
Riabinina, O., Luginbuhl, D., Marr, E., Liu, S., Wu, M. N., Luo, L., Potter, C. J.
2015; 12 (3): 219-?
- **Diversity of transgenic mouse models for selective targeting of midbrain dopamine neurons.** *Neuron*
Lammel, S., Steinberg, E. E., Földy, C., Wall, N. R., Beier, K., Luo, L., Malenka, R. C.
2015; 85 (2): 429-438
- **Diversity of transgenic mouse models for selective targeting of midbrain dopamine neurons.** *Neuron*
Lammel, S., Steinberg, E. E., Földy, C., Wall, N. R., Beier, K., Luo, L., Malenka, R. C.
2015; 85 (2): 429-438
- **Prion-like transmission of neuronal huntingtin aggregates to phagocytic glia in the Drosophila brain.** *Nature communications*
Pearce, M. M., Spartz, E. J., Hong, W., Luo, L., Kopito, R. R.
2015; 6: 6768-?
- **Prion-like transmission of neuronal huntingtin aggregates to phagocytic glia in the Drosophila brain.** *Nature communications*
Pearce, M. M., Spartz, E. J., Hong, W., Luo, L., Kopito, R. R.
2015; 6: 6768-?
- **Deterministic Progenitor Behavior and Unitary Production of Neurons in the Neocortex** *CELL*
Gao, P., Postiglione, M. P., Krieger, T. G., Hernandez, L., Wang, C., Han, Z., Streicher, C., Papusheva, E., Insolera, R., Chugh, K., Kodish, O., Huang, K., Simons, et al

2014; 159 (4): 775-788

- **Functional transformations of odor inputs in the mouse olfactory bulb** *FRONTIERS IN NEURAL CIRCUITS*
Adam, Y., Livneh, Y., Miyamichi, K., Groysman, M., Luo, L., Mizrahi, A.
2014; 8
- **Synaptic organization of the Drosophila antennal lobe and its regulation by the Teneurins** *ELIFE*
Mosca, T. J., Luo, L.
2014; 3
- **Drosophila Strip serves as a platform for early endosome organization during axon elongation** *NATURE COMMUNICATIONS*
Sakuma, C., Kawachi, T., Haraguchi, S., Shikanai, M., Yamaguchi, Y., Gelfand, V. I., Luo, L., Miura, M., Chihara, T.
2014; 5
- **SELECTIVE ATTENTION Long-range and local circuits for top-down modulation of visual cortex processing** *SCIENCE*
Zhang, S., Xu, M., Kamigaki, T., Johnny Phong Hoang Do, J. P., Chang, W., Jenvay, S., Miyamichi, K., Luo, L., Dan, Y.
2014; 345 (6197): 660-665
- **Presynaptic partners of dorsal raphe serotonergic and GABAergic neurons.** *Neuron*
Weissbourd, B., Ren, J., DeLoach, K. E., Guenther, C. J., Miyamichi, K., Luo, L.
2014; 83 (3): 645-662
- **A molecular basis for classic blond hair color in Europeans.** *Nature genetics*
Guenther, C. A., Tasic, B., Luo, L., Bedell, M. A., Kingsley, D. M.
2014; 46 (7): 748-752
- **Existing cardiomyocytes generate cardiomyocytes at a low rate after birth in mice.** *Proceedings of the National Academy of Sciences of the United States of America*
Ali, S. R., Hippenmeyer, S., Saadat, L. V., Luo, L., Weissman, I. L., Ardehali, R.
2014; 111 (24): 8850-8855
- **Mosaic Analysis with Double Markers (MADM) in Mice.** *Cold Spring Harbor protocols*
Espinosa, J. S., Tea, J. S., Luo, L.
2014; 2014 (2)
- **Genetic Control of Wiring Specificity in the Fly Olfactory System** *GENETICS*
Hong, W., Luo, L.
2014; 196 (1): 17-29
- **Synaptic organization of the Drosophila antennal lobe and its regulation by the Teneurins.** *eLife*
Mosca, T. J., Luo, L.
2014; 3
- **Deterministic progenitor behavior and unitary production of neurons in the neocortex.** *Cell*
Gao, P., Postiglione, M. P., Krieger, T. G., Hernandez, L., Wang, C., Han, Z., Streicher, C., Papusheva, E., Insolera, R., Chugh, K., Kodish, O., Huang, K., Simons, et al
2014; 159 (4): 775-88
- **Dissecting Local Circuits: Parvalbumin Interneurons Underlie Broad Feedback Control of Olfactory Bulb Output** *NEURON*
Miyamichi, K., Shlomag-Fuchs, Y., Shu, M., Weissbourd, B. C., Luo, L., Mizrahi, A.
2013; 80 (5): 1232-1245
- **High-speed laser microsurgery of alert fruit flies for fluorescence imaging of neural activity** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Sinha, S., Liang, L., Ho, E. T., Urbaneck, K. E., Luo, L., Baer, T. M., Schnitzer, M. J.
2013; 110 (46): 18374-18379
- **GABAergic projection neurons route selective olfactory inputs to specific higher-order neurons.** *Neuron*
Liang, L., Li, Y., Potter, C. J., Yizhar, O., Deisseroth, K., Tsien, R. W., Luo, L.
2013; 79 (5): 917-931

- **Specific Kinematics and Motor-Related Neurons for Aversive Chemotaxis in *Drosophila*** *CURRENT BIOLOGY*
Gao, X. J., Potter, C. J., Gohl, D. M., Silies, M., Katsov, A. Y., Clandinin, T. R., Luo, L.
2013; 23 (13): 1163-1172
- **Permanent Genetic Access to Transiently Active Neurons via TRAP: Targeted Recombination in Active Populations.** *Neuron*
Guenther, C. J., Miyamichi, K., Yang, H. H., Heller, H. C., Luo, L.
2013; 78 (5): 773-784
- **Plum, an Immunoglobulin Superfamily Protein, Regulates Axon Pruning by Facilitating TGF- β Signaling.** *Neuron*
Yu, X. M., Gutman, I., Mosca, T. J., Iram, T., Ozkan, E., Garcia, K. C., Luo, L., Schuldiner, O.
2013; 78 (3): 456-468
- **Plum, an Immunoglobulin Superfamily Protein, Regulates Axon Pruning by Facilitating TGF-beta Signaling** *NEURON*
Yu, X. M., Gutman, I., Mosca, T. J., Iram, T., Oezkan, E., Garcia, K. C., Luo, L., Schuldiner, O.
2013; 78 (3): 456-468
- **Mosaic Analysis with Double Markers Reveals Cell-Type-Specific Paternal Growth Dominance** *CELL REPORTS*
Hippenmeyer, S., Johnson, R. L., Luo, L.
2013; 3 (3): 960-967
- **Neuroscience. dSarm-ing axon degeneration.** *Science*
Yu, X. M., Luo, L.
2012; 337 (6093): 418-419
- **The SUMO Protease Verloren Regulates Dendrite and Axon Targeting in Olfactory Projection Neurons** *JOURNAL OF NEUROSCIENCE*
Berdnik, D., Favaloro, V., Luo, L.
2012; 32 (24): 8331-8340
- **Trans-synaptic Teneurin signalling in neuromuscular synapse organization and target choice** *NATURE*
Mosca, T. J., Hong, W., Dani, V. S., Favaloro, V., Luo, L.
2012; 484 (7393): 237-U122
- **Controlling gene expression with the Q repressible binary expression system in *Caenorhabditis elegans*** *NATURE METHODS*
Wei, X., Potter, C. J., Luo, L., Shen, K.
2012; 9 (4): 391-U105
- **Extensions of MADM (Mosaic Analysis with Double Markers) in Mice** *PLOS ONE*
Tasic, B., Miyamichi, K., Hippenmeyer, S., Dani, V. S., Zeng, H., Joo, W., Zong, H., Chen-Tsai, Y., Luo, L.
2012; 7 (3)
- **Secreted Semaphorins from Degenerating Larval ORN Axons Direct Adult Projection Neuron Dendrite Targeting** *NEURON*
Sweeney, L. B., Chou, Y., Wu, Z., Joo, W., Komiyama, T., Potter, C. J., Kolodkin, A. L., Garcia, K. C., Luo, L.
2011; 72 (5): 734-747
- **Anterograde or retrograde transsynaptic labeling of CNS neurons with vesicular stomatitis virus vectors** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Beier, K. T., Saunders, A., Oldenburg, I. A., Miyamichi, K., Akhtar, N., Luo, L., Whelan, S. P., Sabatini, B., Cepko, C. L.
2011; 108 (37): 15414-15419
- **Using the Q system in *Drosophila melanogaster*** *NATURE PROTOCOLS*
Potter, C. J., Luo, L.
2011; 6 (8): 1105-1120
- **Mosaic Analysis with Double Markers Reveals Tumor Cell of Origin in Glioma** *CELL*
Liu, C., Sage, J. C., Miller, M. R., Verhaak, R. G., Hippenmeyer, S., Vogel, H., Foreman, O., Bronson, R. T., Nishiyama, A., Luo, L., Zong, H.
2011; 146 (2): 209-221
- **Site-specific integrase-mediated transgenesis in mice via pronuclear injection** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Tasic, B., Hippenmeyer, S., Wang, C., Gamboa, M., Zong, H., Chen-Tsai, Y., Luo, L.

2011; 108 (19): 7902-7907

- **A Combinatorial Semaphorin Code Instructs the Initial Steps of Sensory Circuit Assembly in the Drosophila CNS** *NEURON*
Wu, Z., Sweeney, L. B., Ayoob, J. C., Chak, K., Andreone, B. J., Ohyama, T., Kerr, R., Luo, L., Zlatić, M., Kolodkin, A. L.
2011; 70 (2): 281-298
- **Cortical representations of olfactory input by trans-synaptic tracing** *NATURE*
Miyamichi, K., Amat, F., Moussavi, F., Wang, C., Wickersham, I., Wall, N. R., Taniguchi, H., Tasic, B., Huang, Z. J., He, Z., Callaway, E. M., Horowitz, M. A., Luo, et al
2011; 472 (7342): 191-196
- **The chromatin remodeling factor Bap55 functions through the TIP60 complex to regulate olfactory projection neuron dendrite targeting** *NEURAL DEVELOPMENT*
Tea, J. S., Luo, L.
2011; 6
- **Genetic Mosaic Dissection of Lis1 and Ndel1 in Neuronal Migration** *NEURON*
Hippenmeyer, S., Youn, Y. H., Moon, H. M., Miyamichi, K., Zong, H., Wynshaw-Boris, A., Luo, L.
2010; 68 (4): 695-709
- **Ten years of Nature Reviews Neuroscience: insights from the highly cited** *NATURE REVIEWS NEUROSCIENCE*
Luo, L., Rodriguez, E., Jerbi, K., Lachaux, J., Martinerie, J., Corbetta, M., Shulman, G. L., Piomelli, D., Turrigiano, G. G., Nelson, S. B., Joels, M., de Kloet, E. R., Holsboer, et al
2010; 11 (10): 718-?
- **Patterning Axon Targeting of Olfactory Receptor Neurons by Coupled Hedgehog Signaling at Two Distinct Steps** *CELL*
Chou, Y., Zheng, X., Beachy, P. A., Luo, L.
2010; 142 (6): 954-966
- **'Fore Brain: A Hint of the Ancestral Cortex** *CELL*
Sweeney, L. B., Luo, L.
2010; 142 (5): 679-681
- **Histone Deacetylase Rpd3 Regulates Olfactory Projection Neuron Dendrite Targeting via the Transcription Factor Prospero** *JOURNAL OF NEUROSCIENCE*
Tea, J. S., Chihara, T., Luo, L.
2010; 30 (29): 9939-9946
- **Visualizing the Distribution of Synapses from Individual Neurons in the Mouse Brain** *PLOS ONE*
Li, L., Tasic, B., Micheva, K. D., Ivanov, V. M., Spletter, M. L., Smith, S. J., Luo, L.
2010; 5 (7)
- **The Q System: A Repressible Binary System for Transgene Expression, Lineage Tracing, and Mosaic Analysis** *CELL*
Potter, C. J., Tasic, B., Russler, E. V., Liang, L., Luo, L.
2010; 141 (3): 536-548
- **The olfactory circuit of the fruit fly Drosophila melanogaster.** *Science China. Life sciences*
Liang, L., Luo, L.
2010; 53 (4): 472-484
- **The olfactory circuit of the fruit fly Drosophila melanogaster** *SCIENCE CHINA-LIFE SCIENCES*
Liang, L., Luo Liquan, L. Q.
2010; 53 (4): 472-484
- **Diversity and wiring variability of olfactory local interneurons in the Drosophila antennal lobe** *NATURE NEUROSCIENCE*
Chou, Y., Spletter, M. L., Yaksi, E., Leong, J. C., Wilson, R. I., Luo, L.
2010; 13 (4): 439-U60
- **Dendritic tiling through TOR signalling** *EMBO JOURNAL*
Hong, W., Luo, L.
2009; 28 (24): 3783-3784

- **Leucine-rich repeat transmembrane proteins instruct discrete dendrite targeting in an olfactory map** *NATURE NEUROSCIENCE*
Hong, W., Zhu, H., Potter, C. J., Barsh, G., Kurusu, M., Zinn, K., Luo, L.
2009; 12 (12): 1542-U89
- **Neuroscience. Brain wiring by presorting axons.** *Science*
Miyamichi, K., Luo, L.
2009; 325 (5940): 544-545
- **Uncoupling Dendrite Growth and Patterning: Single-Cell Knockout Analysis of NMDA Receptor 2B** *NEURON*
Espinosa, J. S., Wheeler, D. G., Tsien, R. W., Luo, L.
2009; 62 (2): 205-217
- **A New Family of Odorant Receptors in Drosophila** *CELL*
Spletter, M. L., Luo, L.
2009; 136 (1): 23-25
- **MicroRNA Processing Pathway Regulates Olfactory Neuron Morphogenesis** *CURRENT BIOLOGY*
Berdnik, D., Fan, A. P., Potter, C. J., Luo, L.
2008; 18 (22): 1754-1759
- **Octopamine fuels fighting flies** *NATURE NEUROSCIENCE*
Potter, C. J., Luo, L.
2008; 11 (9): 989-990
- **Genomic analysis of Drosophila neuronal remodeling: A role for the RNA-binding protein boule as a negative regulator of axon pruning** *JOURNAL OF NEUROSCIENCE*
Hoopfer, E. D., Penton, A., Watts, R. J., Luo, L.
2008; 28 (24): 6092-6103
- **Genetic dissection of neural circuits** *NEURON*
Luo, L., Callaway, E. M., Svoboda, K.
2008; 57 (5): 634-660
- **Timing neurogenesis and differentiation: Insights from quantitative clonal analyses of cerebellar granule cells** *JOURNAL OF NEUROSCIENCE*
Espinosa, J. S., Luo, L.
2008; 28 (10): 2301-2312
- **piggyBac-based mosaic screen identifies a postmitotic function for cohesin in regulating developmental axon pruning** *DEVELOPMENTAL CELL*
Schuldiner, O., Berdnik, D., Levy, J. M., Wu, J. S., Luginbuhl, D., Camille Gontang, A., Luo, L.
2008; 14 (2): 227-238
- **Development of continuous and discrete neural maps** *NEURON*
Luo, L., Flanagan, J. G.
2007; 56 (2): 284-300
- **Fly MARCM and mouse MADM: Genetic methods of labeling and manipulating single neurons** *Meeting of the Cajal-Club 2006*
Luo, L.
ELSEVIER SCIENCE BV.2007: 220-27
- **A global double-fluorescent cre reporter mouse** *GENESIS*
Muzumdar, M. D., Tasic, B., Miyamichi, K., Li, L., Luo, L.
2007; 45 (9): 593-605
- **Lola regulates Drosophila olfactory projection neuron identity and targeting specificity** *NEURAL DEVELOPMENT*
Spletter, M. L., Liu, J., Liu, J., Su, H., Giniger, E., Komiyama, T., Quake, S., Luo, L.
2007; 2
- **Cytoplasmic and mitochondrial protein translation in axonal and dendritic terminal arborization** *NATURE NEUROSCIENCE*
Chihara, T., Luginbuhl, D., Luo, L.
2007; 10 (7): 828-837

- **Comprehensive maps of *Drosophila* higher olfactory centers: Spatially segregated fruit and pheromone representation** *CELL*
Jefferis, G. S., Potter, C. J., Chan, A. I., Marin, E. C., Rohlfsing, T., Maurer, C. R., Luo, L.
2007; 128 (6): 1187-1203
- **Modeling sporadic loss of heterozygosity in mice by using mosaic analysis with double markers (MADM)** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Muzumdar, M. D., Luo, L., Zong, H.
2007; 104 (11): 4495-4500
- **Intrinsic control of precise dendritic targeting by an ensemble of transcription factors** *CURRENT BIOLOGY*
Komiyama, T., Luo, L.
2007; 17 (3): 278-285
- **Graded expression of Semaphorin-1a cell-autonomously directs dendritic targeting of olfactory projection neurons** *CELL*
Komiyama, T., Sweeney, L. B., Schuldiner, O., Garcia, K. C., Luo, L.
2007; 128 (2): 399-410
- **Temporal target restriction of olfactory receptor neurons by Semaphorin-1a/PlexinA-mediated axon-axon interactions** *NEURON*
Sweeney, L. B., Couto, A., Chou, Y., Berdnik, D., Dickson, B. J., Luo, L., Komiyama, T.
2007; 53 (2): 185-200
- **Wld(S) protection distinguishes axon degeneration following injury from naturally occurring developmental pruning** *NEURON*
Hoopfer, E. D., McLaughlin, T., Watts, R. J., Schuldiner, O., O'Leary, D. D., Luo, L.
2006; 50 (6): 883-895
- **Wiring stability of the adult *Drosophila* olfactory circuit after lesion** *JOURNAL OF NEUROSCIENCE*
Berdnik, D., Chihara, T., Couto, A., Luo, L. Q.
2006; 26 (13): 3367-3376
- **Dendritic patterning by Dscam and synaptic partner matching in the *Drosophila* antennal lobe** *NATURE NEUROSCIENCE*
Zhu, H. T., Hummel, T., Clemens, J. C., Berdnik, D., Zipursky, S. L., Luo, L. Q.
2006; 9 (3): 349-355
- **Development of wiring specificity in the olfactory system** *CURRENT OPINION IN NEUROBIOLOGY*
Komiyama, T., Luo, L. Q.
2006; 16 (1): 67-73
- **A protocol for dissecting *Drosophila melanogaster* brains for live imaging or immunostaining** *NATURE PROTOCOLS*
Wu, J. S., Luo, L.
2006; 1 (4): 2110-2115
- **A protocol for mosaic analysis with a repressible cell marker (MARCM) in *Drosophila*** *NATURE PROTOCOLS*
Wu, J. S., Luo, L.
2006; 1 (6): 2583-2589
- **Glomerular maps without cellular redundancy at successive levels of the *Drosophila* larval olfactory circuit** *CURRENT BIOLOGY*
Ramaekers, A., Magnenat, E., Marin, E. C., Gendre, N., Jefferis, G. S., Luo, L. Q., Stocker, R. F.
2005; 15 (11): 982-992
- **Mosaic analysis with double markers in mice** *CELL*
Zong, H., Espinosa, S., Su, H. H., Muzumdar, M. D., Luo, L. Q.
2005; 121 (3): 479-492
- **Function and regulation of Tumbleweed (RacGAP50C) in neuroblast proliferation and neuronal morphogenesis** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Goldstein, A. Y., Jan, Y. N., Luo, L. Q.
2005; 102 (10): 3834-3839
- **Developmentally programmed remodeling of the *Drosophila* olfactory circuit** *DEVELOPMENT*
Marin, E. C., Watts, R. J., Tanaka, N. K., Ito, K., Luo, L. Q.

2005; 132 (4): 725-737

- **Development of wiring specificity of the *Drosophila* olfactory system** *Joint Meeting of the 14th International Symposium on Olfaction and Taste/38th Annual Meeting of the Japanese-Association-for-the-Study-of-Taste-and-Smell*
Jefferis, G. S., Marin, E. C., Komiyama, T., Zhu, H. T., Chihara, T., Berdnik, D., Luo, L. Q.
OXFORD UNIV PRESS.2005: 194-194
- **Axon retraction and degeneration in development and disease** *ANNUAL REVIEW OF NEUROSCIENCE*
Luo, L. Q., O'Leary, D. D.
2005; 28: 127-156
- **Rho GTPases regulate axon growth through convergent and divergent signaling pathways** *NEURON*
Ng, J. L., Luo, L. Q.
2004; 44 (5): 779-793
- **Like poles repel: Molecular mechanisms of dendritic tiling** *CELL*
Chihara, T., Luo, L. Q.
2004; 119 (2): 148-149
- **Olfactory receptor neuron axon targeting: intrinsic transcriptional control and hierarchical interactions** *NATURE NEUROSCIENCE*
Komiyama, T., Carlson, J. R., Luo, L. Q.
2004; 7 (8): 819-825
- **Glia engulf degenerating axons during developmental axon pruning** *CURRENT BIOLOGY*
Watts, R. J., Schuldiner, O., Perrino, J., Larsen, C., Luo, L. Q.
2004; 14 (8): 678-684
- **Diverse functions of N-cadherin in dendritic and axonal terminal arborization of olfactory projection neurons** *NEURON*
Zhu, H. T., Luo, L. Q.
2004; 42 (1): 63-75
- **Neuroscience. Calcium and CREST for healthy dendrites.** *Science*
Jefferis, G. S., Komiyama, T., Luo, L.
2004; 303 (5655): 179-181
- **Developmental origin of wiring specificity in the olfactory system of *Drosophila*** *DEVELOPMENT*
Jefferis, G. S., Vyas, R. M., Berdnik, D., Ramaekers, A., Stocker, R. F., Tanaka, N. K., Ito, K., Luo, L. Q.
2004; 131 (1): 117-130
- **Cellular origins of wiring specificity in the olfactory system of *Drosophila*.** *Western Regional Meeting of the American-Federation-for-Medical-Research*
Vyas, R. M., Jefferis, G., Berdnik, D., Ito, K., Luo, L.
LIPPINCOTT WILLIAMS & WILKINS.2004: S154-S154
- **Dendritic development of *Drosophila* high order visual system neurons is independent of sensory experience** *BMC NEUROSCIENCE*
Scott, E. K., Reuter, J. E., Luo, L. Q.
2003; 4
- **Axon pruning during *Drosophila* metamorphosis: Evidence for local degeneration and requirement of the ubiquitin-proteasome system** *NEURON*
Watts, R. J., Hoopfer, E. D., Luo, L. Q.
2003; 38 (6): 871-885
- **Small GTPase Cdc42 is required for multiple aspects of dendritic morphogenesis** *JOURNAL OF NEUROSCIENCE*
Scott, E. K., Reuter, J. E., Luo, L. Q.
2003; 23 (8): 3118-3123
- **A mosaic genetic screen for genes necessary for *Drosophila* mushroom body neuronal morphogenesis** *DEVELOPMENT*
Reuter, J. E., Nardine, T. M., Penton, A., Billuart, P., Scott, E. K., Usui, T., Uemura, T., Luo, L. Q.
2003; 130 (6): 1203-1213
- **From lineage to wiring specificity: POU domain transcription factors control precise connections of *Drosophila* olfactory projection neurons** *CELL*
Komiyama, T., JOHNSON, W. A., Luo, L. Q., Jefferis, G. S.

2003; 112 (2): 157-167

- **Structure of the vertical and horizontal system neurons of the lobula plate in *Drosophila*** *JOURNAL OF COMPARATIVE NEUROLOGY*
Scott, E. K., Raabe, T., Luo, L. Q.
2002; 454 (4): 470-481
- **Representation of the glomerular olfactory map in the *Drosophila* brain** *CELL*
Marin, E. C., Jefferis, G. S., Komiyama, T., Zhu, H. T., Luo, L. Q.
2002; 109 (2): 243-255
- **Rac GTPases control axon growth, guidance and branching** *NATURE*
Ng, J., Nardine, T., Harms, M., Tzu, J., Goldstein, A., Sun, Y., Dietzl, G., Dickson, B. J., Luo, L. Q.
2002; 416 (6879): 442-447
- **Rac function and regulation during *Drosophila* development** *NATURE*
Hakeda-Suzuki, S., Ng, J., Tzu, J., Dietzl, G., Sun, Y., Harms, M., Nardine, T., Luo, L. Q., Dickson, B. J.
2002; 416 (6879): 438-442
- **Development of neuronal connectivity in *Drosophila* antennal lobes and mushroom bodies** *CURRENT OPINION IN NEUROBIOLOGY*
Jefferis, G. S., Marin, E. C., Watts, R. J., Luo, L. Q.
2002; 12 (1): 80-86
- **Actin cytoskeleton regulation in neuronal morphogenesis and structural plasticity** *ANNUAL REVIEW OF CELL AND DEVELOPMENTAL BIOLOGY*
Luo, L. Q.
2002; 18: 601-635
- **Target neuron prespecification in the olfactory map of *Drosophila*** *NATURE*
Jefferis, G. S., Marin, E. C., Stocker, R. F., Luo, L. Q.
2001; 414 (6860): 204-208
- **Single neuron labeling and genetic manipulation** *NATURE NEUROSCIENCE*
Luo, L. Q., Zong, H.
2001; 4: 1158-1159
- **Regulating axon branch stability: The role of p190 RhoGAP in repressing a retraction signaling pathway** *CELL*
Billuart, P., Winter, C. G., Maresh, A., Zhao, X. S., Luo, L. Q.
2001; 107 (2): 195-207
- ***Drosophila* Rho-associated kinase (Drok) links frizzled-mediated planar cell polarity signaling to the actin cytoskeleton** *CELL*
Winter, C. G., Wang, B., Ballew, A., Royou, A., Karess, R., Axelrod, J. D., Luo, L. Q.
2001; 105 (1): 81-91
- **How do dendrites take their shape?** *NATURE NEUROSCIENCE*
Scott, E. K., Luo, L. Q.
2001; 4 (4): 359-365
- **enok encodes a *Drosophila* putative histone acetyltransferase required for mushroom body neuroblast proliferation** *CURRENT BIOLOGY*
Scott, E. K., Lee, T., Luo, L. Q.
2001; 11 (2): 99-104
- **Rho GTPases in neuronal morphogenesis** *NATURE REVIEWS NEUROSCIENCE*
Luo, L. Q.
2000; 1 (3): 173-180
- **Cell-autonomous requirement of the USP/EcR-B ecdysone receptor for mushroom body neuronal remodeling in *Drosophila*** *NEURON*
Lee, T., Marticke, S., Sung, C., Robinow, S., Luo, L. Q.
2000; 28 (3): 807-818
- ***Drosophila* Lis1 is required for neuroblast proliferation, dendritic elaboration and axonal transport** *NATURE CELL BIOLOGY*
Liu, Z., Steward, R., Lu, L. Q.

2000; 2 (11): 776-783

- **Small GTPases Rac and Rho in the maintenance of dendritic spines and branches in hippocampal pyramidal neurons** *JOURNAL OF NEUROSCIENCE*
Nakayama, A. Y., Harms, M. B., Luo, L. Q.
2000; 20 (14): 5329-5338
- **Trio quartet in D. (melanogaster)** *NEURON*
Luo, L. Q.
2000; 26 (1): 1-2
- **Essential roles of Drosophila RhoA in the regulation of neuroblast proliferation and dendritic but not axonal morphogenesis** *NEURON*
Lee, T. M., Winter, C., Marticke, S. S., Lee, A., Luo, L. Q.
2000; 25 (2): 307-316
- **Intracellular signaling pathways that regulate dendritic spine morphogenesis** *HIPPOCAMPUS*
Nakayama, A. Y., Luo, L. Q.
2000; 10 (5): 582-586
- **Development of the Drosophila mushroom bodies: sequential generation of three distinct types of neurons from a neuroblast** *DEVELOPMENT*
Lee, T., Lee, A., Luo, L. Q.
1999; 126 (18): 4065-4076
- **Mosaic analysis with a repressible cell marker for studies of gene function in neuronal morphogenesis** *NEURON*
Lee, T., Luo, L. Q.
1999; 22 (3): 451-461
- **Genghis Khan (Gek) as a putative effector for Drosophila Cdc42 and regulator of actin polymerization** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Luo, L. Q., Lee, T., Tsai, L., Tang, G., Jan, L. Y., Jan, Y. N.
1997; 94 (24): 12963-12968