

BIOGRAPHICAL SKETCH

NAME: Yimin Zou

eRA COMMONS USER NAME: YIMINZOU

POSITION TITLE: Professor and Chair

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Dept of Genetics, Fudan University, Shanghai	B.S.	1984-1988	Genetics
University of California, Davis and San Diego	Ph. D.	1989-1995	Biochemistry and Molecular Biology With Kenneth R. Chien
University of California, San Diego	Postdoctoral Fellowship	1995-1996	Developmental Biology with Kenneth R. Chien
University of California, San Francisco	Postdoctoral Fellowship	1996-2000	Developmental Neuroscience with Marc Tessier-Lavigne

A. Personal Statement

I am interested in development, diseases and repair of neural circuits. My lab studies molecular and cellular mechanisms of axon guidance, synapse formation, degeneration and regeneration of neural circuits. My lab pioneered the finding that the Wnt family morphogens are important axon guidance molecules that direct the pathfinding of axons and organize topographic maps. We were also the first to show that the axonal growth cones use highly conserved cell polarity pathways, planar cell polarity and apical-basal polarity pathways, to steer growth cones in response to Wnt gradients. Our work first established that axon guidance molecules, such as Wnts, are reinduced and their signaling pathways are reactivated after spinal cord injury in adulthood and they profoundly regulate axon plasticity and functional recovery. In the past 4 years, my lab has made another novel finding of the signaling pathway that may directly assemble glutamatergic synapses in nervous system development. I have extensive experience in studying the development and function of many neuronal cell types, including cortical and hippocampal neurons, spinal cord projection neurons and sensory neurons, such as dorsal root ganglion and retinal ganglion neurons. We carry out functional studies, including behavior and electrophysiology, as well as organotypic or dissociated cultures to study molecular and cellular mechanisms. We are experienced with all knockout and transgenic approaches, including CRISPR-Cas9 system, viral infection, electroporation and other transfection techniques.

B. Positions and Honors**Positions and Employment**

12/1996-10/2000	Postdoctoral Fellowship, University of California, San Francisco.
11/2000-04/2006	Assistant Professor, Dept of Neurobiology, Pharmacology and Physiology. The University of Chicago.
05/2006-06/2006	Associate Professor (with tenure), Dept of Neurobiology, Pharmacology and Physiology. The University of Chicago.
07/2006-06/2011	Associate Professor, Neurobiology Section, Biological Sciences Division. University of California, San Diego

07/2011-Present	Full Professor, Neurobiology Section, Biological Sciences Division. University of California, San Diego
07/2012-Present	Vice Chair, Neurobiology Section, Biological Sciences Division. University of California, San Diego
07/2014-	Chair, Neurobiology Section, Biological Sciences Division. University of California, San Diego

Other Experience and Professional Memberships

Faculty Search Committee, Dept of Neurobiology, Pharmacology and Physiology, U Chicago
 Graduate Admission Committees for Developmental Biology and Neurobiology, U Chicago
 Organizing Committee, Chicago Signal Transduction Symposium
 Curriculum Committee, Committee on Developmental Biology, the University of Chicago
 International Graduate Student Admission Committee, Molecular Biosciences, U Chicago
 Graduate Student Travel Award Committee, Neurobiology, U Chicago
 Neuroscience Task Force, Biological Science Division, U Chicago
 Divisional Search Committee for Director of Center for Stem Cell Research and Regenerative Medicine, U Chicago
 UCSD Neuroscience Program Recruitment Coordinator (co-chair, 2007-2012)
 UCSD/Salk Biology Program Retreat Planning Committee (chair, 2008-2011)
 UCSD Kamen Prize Committee for Best Chemistry and Biochemistry Ph.D. Thesis (Chair, 2010-2012)
 NIH Training Grant Co-Director: Developmental Biology of Neural Disease (2009-present)
 Ad Hoc Member of NIH and DoD Study Sections, European Research Council
 NIH NDPR Study Section Regular Member (July 2011- June 2017)
 UCSD Academic Senate Faculty Welfare Committee (2011-2013)
 Editorial Board: *Developmental Neurobiology*, *Neural Regeneration Research*, *Neuroscience Bulletin* (Associate Editor) and *Frontiers in Biology* (Section Editor)
 President, Association of Chinese Neuroscientists in America (2012&2013)
 Medical Advisory Board of HeadNorth Help & Hope for Spinal Cord Injury Survivors (2012-2014)
 Selection Committee for the Distinguished Neuroscientist Award by GlaxoSmithKline (GSK) R&D China
 UCSD Neurobiology Faculty Search Committee (2012)
 UCSD Neurobiology Senior Faculty Search Committee (Chair) (2013)
 Member and Secretary of Board of Directors of Ray Wu Memorial Fund (2013-)
 Member of Board of Directors of Chinese Biological Investigators Society (CBIS) (2014-)

Honors

1989-1993	CUSBEA Fellowship
1993-1995	Institutional Predoctoral NRSA, NIH
1995-1996	Institutional Postdoctoral NRSA, NIH
1996-1998	Individual Postdoctoral NRSA, NIH
1999-2000	Postdoctoral Fellowship from the Spinal Cord Research Foundation
2002-2005	Schweppe Foundation Career Development Award
2002-2004	March of Dimes Basil O'Connor Starting Scholar Research Award
2003-2005	Alfred P. Sloan Research Fellow Award
2003	W. M. Keck Foundation Research Achievement Award (Semi-finalist in Keck Young Scholar Competition)
2005	<u>Chair</u> of "Minisymposium on Wnt Signaling in Neural Circuit Development" at Society for Neuroscience Meeting. Washington, DC.
2006	<u>Gail Beach Memorial Seminar Series</u> at the University of Miami Miller School of Medicine. Miami, Florida
2006	<u>Keynote Speaker</u> at Midwest Student Biomedical Research Forum. Omaha, Nebraska.
2008	<u>Chair</u> of "Symposium on Genetic determinants specifying neuronal connections" at Society for Neuroscience Meeting. Washington, DC.
2009	<u>Killam Research Seminar</u> the Montreal Neurological Institute McGill University. Montreal, Canada.

2011	<u>Chair of Symposium Organizer: Signaling and cell biological mechanisms of growth cone guidance at 8th IBRO World Congress of Neurosciences. Florence Italy</u>
2011	<u>Organizer of Cold Spring Harbor Asia Meeting on Neural Circuits. Suzhou China</u>
2012	<u>S. T. Huang-Chan Memorial Lecture Hong Kong University, Hong Kong, China</u>
2013	<u>Organizer of Cold Spring Harbor Asia Meeting on Neural Circuits. Suzhou China</u>
2013-	Member and Secretary of Board of Directors of Ray Wu Memorial Fund and CBIS
2013-2016	Honorary Professor of the University of Hong Kong

C. Contribution to Science

1. My earlier work pioneered the finding that morphogens, such as Wnts, are essential axon guidance molecules and provide directional instructions for neural circuit wiring. They provide directional information along the major neurases to guide axon pathfinding and topographic organization. We also found that change responsiveness of growth cones to other axon guidance molecules at intermediate targets.

1) Anna I. Lyuksyutova, Chin-Chun Lu, Nancy Milanesio, Leslie A. King, Nini Guo, Yanshu Wang, Jeremy Nathans, Marc Tessier-Lavigne and Yimin Zou*. Anterior-posterior guidance of commissural axons by Wnt-Frizzled signaling. **Science**. 2003. 302, 1984-1988. (PMC Journal-In process). (Evaluated by Faculty of 1000 Biology).

2) Yaobo Liu, Jun Shi, Chin-Chun Lu, Zheng-Bei Wang, Xuejun Song and Yimin Zou*. Anterior-posterior guidance of corticospinal tract axons by conserved repulsive Wnt-Ryk interaction. **Nature Neuroscience**. 2005. 8(9):1151-9. (PMC Journal-In process). (Evaluated by Faculty of 1000 Biology)

3) Adam Schmitt, Jun Shi, Alex Wolf, Chin-Chun Lu, Leslie A. King and Yimin Zou*. Wnt-Ryk signaling mediates medial-lateral retinotectal topographic mapping. **Nature**. 2006. 439(7072):31-7. (PMC Journal-In process). (Evaluated by Faculty of 1000 Biology)

4) Liseth Parra and Yimin Zou*. Sonic hedgehog induces response of spinal cord commissural axons to Semaphorin repulsion during midline crossing. **Nature Neuroscience**. **Nature Neuroscience**. 2010 Jan;13(1):29-35. (Evaluated by Faculty of 1000 Biology)

2. My more recent work focuses on how morphogens control the direction of axon growth. Although many axon guidance molecules have been identified, the signaling and cell biological mechanisms are still poorly understood, esp the question of how growth cone signaling asymmetry is achieved and how does this asymmetry trigger the cellular machinery to cause growth cone turning. My lab found that the highly conserved cell polarity signaling pathways mediate asymmetric signaling in the growth cones and is beginning to unveil new insights on how antagonistic interactions of these signaling components may generate asymmetry and amplify signals to detect shallow molecular gradients.

1) Alex M. Wolf, Anna I. Lyuksyutova, Ali G. Fenstermaker, Beth Shafer, Charles G. Lo and Yimin Zou*. PI3K-atypical PKC signaling is required for Wnt attraction and anterior-posterior axon guidance. **Journal of Neuroscience**. 2008. 28(13):3456-3467.

2) Ali G. Fenstermaker, Asheeta Prasad, Ahmad Bechara, Youri Adolfs, Fadal Tissir, Andre Goffinet, Yimin Zou, Y*, R. Jeroen Pasterkamp*. Wnt-Planar Cell Polarity signaling controls the anterior-posterior organization of monoaminergic axons in the brainstem. **Journal of Neuroscience**. 2010. 30(47):16053-16064.

3) Beth Shafer, Charles Lo, Keisuke Onishi and Yimin Zou*. Vangl2 Promotes Wnt/Planar Cell Polarity-like Signaling by Antagonizing Dvl1-Mediated Feedback Inhibition in Growth Cone Guidance. **Developmental Cell**. 2011 Feb 15;20(2):177-91.

4) Keisuke Onishi, Beth Shafer, Charles Lo, Fadel Tissir, Andre M. Goffinet and Yimin Zou*. Antagonistic functions of Dishevelleds regulate Frizzled3 recycling via filopodia tips in Wnt-mediated growth cone guidance. **Journal of Neuroscience**. 2013 Dec 4;33(49):19071-85.

3. Parallel to axon guidance, I also pioneered the findings that axon guidance molecules play important roles in regulating axon plasticity after traumatic injury in the adult central nervous system. We were the first to show that an axon guidance system is reactivated after spinal cord injury and regulate the regenerative ability of corticospinal cord axons in the lesioned adult spinal cord. Subsequent work from lab showed that Wnt-Ryk signaling also inhibits regeneration of sensory axons in conditioning lesion paradigm and overcoming Wnt inhibition further enhances functional recovery.

1) Yaobo Liu, Xiaofei Wang, Chin-Chun Lu, Rachel Kermen, Oswald Steward*, Xiao-Ming Xu* and Yimin Zou*. Repulsive Wnt signaling inhibits axon regeneration following central nervous system injury. **Journal of Neuroscience**. 2008. 28(33):8376-8382. (PMC Journal-In process). (Evaluated by Faculty of 1000 Biology)

2) Edmund Hollis II and Yimin Zou*. Re-induced Wnt-Ryk signaling limits regeneration potential of sensory axons in the spinal cord following conditioning lesion. **Proc Natl Acad Sci U S A**. 2012. Sept 4; 109(36):14663-8. 2012 Aug 17 [Epub ahead of print].

3) Edmund R Hollis II, Nao Ishiko, Kristine Tolentino, Ernest Doherty, Maria J. Rodriguez, Nigel Calcutt and Yimin Zou*. A novel and robust pre-conditioning lesion induced by ethidium bromide. **Experimental Neurology**. Exp Neurol. 2014 Dec 23. pii: S0014-4886(14)00389-6.

4) Edmund R Hollis II, Nao Ishiko, Maysam Pessian, Kristine Tolentino, Corinne A. Lee-Kubli, Nigel A. Calcutt and Yimin Zou*. Remodeling of spared proprioceptive circuit of a small number of neurons supports major functional recovery. **Nature Communications**. 2015 Jan 19;6:6079. doi: 10.1038/ncomms7079.

D. Research Support

Ongoing Research Support

1. R01 NS047484 12/01/2003 - 2/28/2018
NIH/NINDS
“Characterizing Wnt signaling pathways in axon guidance”
The major goal of this project is to understand the molecular and cellular mechanisms of axon guidance during nervous system development.

2. ALS Association 8/01/2012-7/31/2015
“Axon degeneration in ALS models”
The major goal is to test the role of axon survival pathway in ALS pathogenesis.

3. March of Dimes 7/01/2013 – 6/30/2016
“Synapse formation”
The major goal is to study the role of apical-basal polarity signaling components in synapse development.

4. International Foundation for Research in Paraplegia 05/01/2015-4/30/2017
“Signaling mechanism for myelination in spinal cord development and repair”
The major goal is to identify the signaling mechanisms controlling differentiation of oligodendrocytes in myelination.

Completed Research Support

1. Wings for Life Foundation on Spinal Cord Injury 7/01/2011-6/30/2013
“Wnt signaling in corticospinal tract axon regeneration”
The major goal is to develop therapeutic tools to block axon retraction and promote regeneration.

2. 1R21MH099082 9/18/2012-7/31/2014
“Wnt/planar cell polarity signaling in synapse formation”

The major goal is to understand the molecular and cellular mechanisms of synapse assembly.

3. International Foundation for Research in Paraplegia 4/4/2012-3/31/2014

“Functional recovery of the motor system after spinal cord injury”

The major goal is to achieve motor function recovery after spinal cord injury

4. 1R21NS081738

4/01/2013 - 3/31/2015

“Combinatorial approaches to maximize axon regeneration after spinal cord injury”

The major goal is enhance intrinsic growth state and overcome extrinsic inhibition to repair sensory pathways.

Seminar Invitations

University of Western Ontario; Loyola University (Medical School); University of Wisconsin, Madison; Loyola University (Department of Biology); Johns Hopkins University Medical School (2003&2013); Rush University Medical School; Luther College; University of Nevada; Ernest Gallo Clinic and Research Center UC, San Francisco; Harvard Medical School Children's Hospital; Biogen (2005&2008); University College London; University of Zurich; Northwestern University; Cornell University Weill Medical College; University of Illinois, Urbana-Champaign; University of British Columbia; Yale University (Department of Cell Biology); University of Miami; Zhejiang University Biology, China; UNC Chapel Hill; Riken BRI, Japan; King's College London; University of Sheffield, England (2007 and 2014); University of Louvain, Belgium (2007); UC, Santa Cruz; Penn State; University of Virginia; Mayo Clinic; SUNY Stony Brook; Institute of Biophysics, Chinese Academy of Sciences; Friedrich Miescher Institut, Switzerland; Biogen, Idec; Kyoto University, Japan; Zhejiang University Medical School, China; Indiana University; Montreal Neurological Institute McGill University, Canada; Mount Sinai School of Medicine (2009&2015); University of Leuven, Belgium (2009); Max Planck Institute of Munich, Germany; Institute of Neurosciences, Chinese Academy of Sciences, Shanghai, China (2006, 2009&2013); The University of Pennsylvania; University Medical Center Utrecht, Utrecht, the Netherlands; NIH/NHGRI; Hangzhou Normal University, China; UCLA; University of Leiden, the Netherlands; The Karolinska Institute; Institut of Vision, Paris France; Queensland Brain Institute (QBI), University of Queensland, Australia; Jinan University, China; Suzhou University; Drexel University, Philadelphia; UT Southwestern, Dallas; Duke; University of Bourdeaux, France; Shanghai Jiaotong University Stem Cell Center, China; Fudan University; Cincinnati Children's Hospital, Ohio; Huazhong Medical University, Wuhan, China; Doris Neuroscience Center at the Scripps Research Institute, La Jolla, CA; University of Southern California; S. T. Huang-Chan Memorial Lecture, Hong Kong University, Hong Kong, China; Duke-NUS Graduate Medical School Singapore, Singapore; CUNY Advanced Science Research Center; University of Arizona College of Medicine, Tucson, AZ; University of Ottawa, Canada; Scripps Florida; University of Kansas; Stowers Institute; Institute of Genetics and Development, Chinese Academy of Sciences; Department of Psychiatry, Jiaotong University Medical School; UNC, Chapel Hill; Toronto Western Research Institute, Toronto Canada; Ohio State; Institute of Biophysics, CAS(Director's Seminar Series); McGovern Institute for Neuroscience, Tsinghua Univ, China; Nanjing Univ, China; UC, Irvine; UC Riverside; Hong Kong University; Institute of Health Sciences Chinese Academy of Sciences, Shanghai; Peking University Medical School (Dean's Seminar Series); Peking University Institute of Molecular Medicine; Institute of Science and Technology of Austria, Vienna, Austria; King's College, London; University of Michigan, Ann Arbor; Emory University; St Jude Hospital, Memphis Tennessee; Institute of Cellular and Organismic Biology, Academia Sinica, Taipei, Taiwan; Institute of Molecular Biology, Academia Sinica, Taipei, Taiwan; National Taiwan University; EMBL Hamburg/Hamburg University, Germany; Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland; Burke Medical Research Institute, New York; Boston Children's Hospital/Harvard Med School Joint Seminar; NIH NINDS, Bethesda; University of Arizona College of Medicine-Phoenix.

Meeting talks

Midwest Developmental Biology Meeting. Columbia, Missouri. 2001.

Society for Neuroscience (the Chicago Chapter) Symposium on Neurodevelopment and Disease. Chicago. 2002.

Midwest Neurobiology Meeting in Ames, IA. 2003.

Society for Developmental Biology 62nd Annual Meeting in Boston, Symposium 1, *From Neuron to Brain*. 2003.

EMBO Workshop on : The Assembly of Neural Circuits, Varenna, Italy. 2003.

Friedrich Miescher Institut Conference on: Formation and Function of Neuronal Circuits, Ascona, Switzerland. 2003.

The Robert Packard Center for ALS Research 3rd Annual Symposium, Baltimore, Maryland. 2004.

The 3rd Symposium on Neuroscience of Young Scholars Worldwide. Guangzhou, China. 2004

Symposium on Development and Plasticity of Neural Circuits. Fudan University, Shanghai, China. 2004.

Keystone Symposium on Axonal Connections: Molecular Cues for Development and Regeneration. Breckenridge, CO. 2005.

11th annual Kentucky Spinal Cord and Head Injury Research Trust Symposium. Louisville, Kentucky. 2005.

Axon Guidance and Regeneration Workshop by Fondation des Treilles. Les Treilles, France. 2005.

Banbury Center Meeting on Stem Cells and Axonal Regeneration: Strategies for the Treatment of ALS. Cold Spring Harbor. 2005.

The Robert Packard Center for ALS Research 4th Annual Symposium, Baltimore, Maryland. 2005.
Society for Neuroscience "Minisymposium on Wnt Signaling in Neural Circuit Development (Chair)".
 Washington, DC. 2005.
Midwest Student Biomedical Research Forum (Keynote Speaker). Omaha, Nebraska. February 2006.
The Robert Packard Center for ALS Research 5th Annual Symposium, Baltimore, Maryland. April 2006.
Symposium on Axon Guidance and Regeneration at Institute of Life Sciences. Beijing, China, June 2006.
Symposium on Axon Guidance and Regeneration at Chinese Academy of Sciences. Shanghai, China, June 2006.
16th Biennial Meeting of the International Society for Developmental Neuroscience (ISDN). "Axon pathfinding mechanisms" Session. Banff Centre, Alberta, Canada, August 2006.
Winter Conferences on Brain Research, Snowmass. January 2007.
Symposium at the Association for Research in Otolaryngology. Denver. February 2007.
The Robert Packard Center for ALS Research 6th Annual Symposium, Baltimore, Maryland. April 2007.
Wnt Signaling Meeting. San Diego. June 2007.
Chinese Biological Investigators (Ray Wu) Society Symposium. Beijing China. July 2007.
The Robert Packard Center for ALS Research 7th Annual Symposium, Baltimore, Maryland. April 2008.
Wings for Life Functional Recovery Following Spinal Cord Injury. at Salzburg, Austria. April 28-May 4, 2008.
6th FENS Forum of European Neuroscience: Genetic Control of Neural Circuit Development. Geneva Switzerland, July 2008.
Gordon Research Conference on Neural Development. Newport, Rhode Island. August 2008.
Society for Neuroscience "Symposium on Genetic determinants specifying neuronal connections (Chair)".
 Washington, DC. November 2008.
Keystone Symposium on Axonal Connections: Molecular Cues for Development and Regeneration. Keystone, Colorado. February 2009.
Roman Reed Research Meeting. Irvine, CA. March 2009.
Robert Packard Center for ALS Research 8th Annual Symposium. Baltimore, Maryland. April 2009.
Symposium on Neural Development and Plasticity at Peking University (Chair). Beijing, China, November 2009.
Symposium on Neural Development and Plasticity at Chinese Society for Neuroscience Biannual Meeting (Chair). Guangzhou, China. November 2009.
Symposium on Neural Development and Plasticity at Hong Kong University of Science and Technology. Hong Kong, China. November 2009.
Wnt/PCP Meeting. Alba, Italy. May 2010.
Gordon Conference on Neural Development. Newport, Rhode Island. August 2010.
The Robert Packard Center for ALS Research 10th Annual Symposium, Baltimore, Maryland. March, 2011.
Wnt Meeting. Los Angeles, CA. June-July 2011.
8th IBRO World Congress of Neurosciences (Symposium organizer: Signaling and cell biological mechanisms of growth cone guidance). Florence Italy July 2011.
Chinese Society of Neuroscience (Symposium organizer and speaker). Zhengzhou, China. July 2011.
Neural Circuit Development Symposium. Hangzhou Normal University. Hangzhou, China. August 2011.
Japanese Society for Neuroscience (Symposium organizer and speaker). Yokohama, Japan. September 2011.
Symposium on Neural Circuits at Peking University. Peking, China. October 2011.
Cold Spring Harbor Asia Meeting on Neural Circuits (organizer and speaker). Suzhou China. October 2011.
Symposium on Neural Circuits at Zhejiang University. Hangzhou, China. October 2011.
Society for Neuroscience Annual Meeting Symposium on Planar Cell Polarity (PCP): the many roles of PCP genes in shaping the nervous system. Washington, DC. November 2011.
The Robert Packard Center for ALS Research 11th Annual Symposium, Baltimore, Maryland. March 2012.
Wings for Life Foundation Research Symposium. Salzburg, Austria. May 2012.
8th FENS Forum of Neuroscience Symposium on "Planar cell polarity (PCP) shapes the nervous system".
 Barcelona, Spain. July 2012.
NSFC Meeting on Neural Circuits (symposium organizer and speaker). Shenzhen, China. November 2012.
Ray Wu Symposium. Hangzhou, China. November 2012.
Winter Conferences on Brain Research, Breckenridge. January 2013.
Janelia Conference on Planar Cell Polarity. Janelia Farm, VA. April 14-17, 2013.
Wings for Life Foundation Research Symposium. Salzburg, Austria. May 2013.

Chinese Society for Neuroscience Meeting Symposium Organizer and Speaker. Beijing China. September 2013.

Cold Spring Harbor Asia Meeting on Neural Circuits (Organizer and Speaker). Suzhou China. October 2013.

Winter Conferences on Brain Research, Steamboat. January 2014.

Chinese Neuroscientists Worldwide Conference. Suzhou, June 2014.

Synaptic Transmission and Plasticity Meeting. Wuhan, June 2014.

Gordon Conference on Molecular and Cellular Neurobiology. Hong Kong. June 2014.

Gordon Conference on Neural Development. Newport, Rhode Island. Aug 2014.

The Joint Symposium of the 4th International Neural Regeneration Symposium, the 9th Asia Pacific Symposium on Neural Regeneration and the 6th International Spinal Cord Injury Treatment and Trials Symposium. Nanjing, China. September 2014.

24th Congress of Chinese Association for Physiological Sciences(CAPS). Shanghai, October 2014.

AbCam Meeting on Frontiers of Signaling in Development and Disease (Organizer and Speaker). Shanghai, China. June 2015.

Axon Guidance, Circuit Development and Regeneration. Klosterneuburg, Austria. September 2015.

Cold Spring Harbor Asia Meeting on Neural Circuits (Organizer and Speaker). Suzhou China. October 2016.

Keystone Symposium on Neural Circuit Development, Function and Disease (Organizer and Speaker). Meeting approved. Location to be determined. 2017