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Education

1981-1985 *A.B. in Physics*, with High Honors

University of California at Berkeley

1985-1987 *M.A. in Physics*

University of California at Berkeley

1987-1991 *Ph.D. in Physics*

University of California at Berkeley

Thesis: “Non-Boltzmann Dynamics in Networks of Spiking Neurons”

Advisor: William Bialek, Ph.D.

Postgraduate Training

1991-1993 *Postdoctoral Researcher*, supported by an N.S.F./J.S.P.S. Fellowship

Kyoto University and Kyoto Prefectural Medical School, Kyoto, Japan

Advisors: Profs. Shigeru Shinomoto. (Physics) and Keisuke Toyama (Neuroscience)

1993-1997 *Postdoctoral Researcher*, supported by an N.I.H./N.R.S.A. Fellowship

University of California at San Francisco

Advisors: Profs. Robert Malenka (Neuroscience) and Michael Stryker (Neuroscience)

2016-2018 *Emerging Leaders Program,* Yale School of Management

Academic Appointments

1998-2006 *Assistant Professor*, Department of Neuroscience, Baylor College of Medicine (BCM)

1998-2006 *Assistant Professor*, Program in Developmental Biology, Baylor College of Medicine

2005-2006 *Assistant Professor*, Program in Translational Biology and Molecular Medicine, BCM

2006 *Associate Professor*, Department of Neuroscience, Program in Developmental Biology, and Program in Translational Biology and Molecular Medicine, BCM

2006 *Co-Director*, Medical Scientist Training Program (MD/PhD program), BCM

2007-2012 *Associate Professor*, Department of Neurobiology, Department of Ophthalmology & Visual Science, Yale University School of Medicine

2007-present *Director*, Vision Core Program, Yale University

2008-2017 *Director of Graduate Studies*, Neurobiology Graduate Program, Yale University School of Medicine

2009-2012 *William Ziegler III Associate Professor of Vision Research*

2010-present *Fellow* (undergraduate faculty advisor)*,* Berkeley College, Yale University

2012-present *William Ziegler III Professor,* Department of Neuroscience, Department of Ophthalmology & Visual Science, Yale University School of Medicine

2012-present *Member*, Swartz Program in Theoretical Neurobiology at Yale University

2012-present *Member*, Kavli Institute for Neuroscience

2015-2017 *Deputy Chairman,* Department of Neuroscience

2015-2020 *Member*, Steering Committee, Kavli Institute for Neuroscience

2017-2020 *Deputy Dean for Scientific Affairs (Basic Science Depts)*, Yale School of Medicine

2020-present *Vice Provost for Research,* Yale University

Professional Societies

Physics Honors Society

American Association for the Advancement of Science

American Physiological Society

Association for Research in Vision and Ophthalmology

Society for Neuroscience

Honors and Awards

Outstanding Graduate Student Instructor, University of California at Berkeley, 1989

Faculty Associate in the Department of Physics, University of California at Berkeley (for excellence in Physics instruction), 1989

NSF/JSPS Post-Doctoral Fellowship, 1991-1993

National Research Service Award (NIH), 1993-1996

Alfred P. Sloan Foundation Research Fellow, 1998-2000

The Esther A and Joseph Klingenstein Foundation Fellowship Award in the Neurosciences, 1998-2001

John Merck Fund Scholar, 1998-2002

MRRC New Program Development Award, Baylor College of Medicine, 1999-2000

Curtis Hankamer Research Award, 1999-2000

Basil O’Connor Fellow, March of Dimes Foundation, 1999-2001

American Heart Association Grant-in-Aid, 1999-2001

Marc Dresden Excellence in Graduate Education Award, Baylor College of Medicine, 2002

NARSAD-Sidney R. Baer, Jr. Foundation Young Investigator Award, 2004-2006

Rett Syndrome Research Foundation Grant Award, 2006-2008

William Ziegler III Endowed Chair in Vision Research, 2009-present

Review Panels and Advisory Boards

Ad hoc grant reviewer for Medical Research Council (UK), 1999, 2003, 2005

Co-Director of the De Lange Conference on Neuroscience, 1999-2001

Ad hoc grant reviewer for NSF, 2001, 2003, 2005

NIH (NCI) Special Emphasis Study Section ZCA1, Washington DC, June 19-20, 2003

Co-Organizer of the Vision Research Conference, “The Mouse Visual System: From Photoreceptors to Cortex”, April, 2004

External Peer Review of Department of Environmental Medicine and Visual Neuroscience, University of Nagoya, Japan, November 2005

NIH F02B study section, 2005 – 2007

NIH F03A study section, 2006 – 2011

NIH MDCN Special Emphasis Panel August 2007, November 2011

NIH (NEI) Special Emphasis Panel ZEY1, Dec 2007, 2008, 2009, 2010, 2013

Ad hoc grant reviewer for Swiss National Science Foundation, ISF

NIH SMI study section Regular Member, 2008-present, Chair, 2011-2012

E. Matilda Ziegler Foundation for the Blind Scientific Advisory Committee, 2009-pres., Chair, 2011-pres.

NIH ZRG1 MDCN R15 Scientific Review Group, 2010-2012

NIH SPC study section, 2013, 2014

NIH R01 special emphasis panel, 2015, 2017

NIH (NINDS) ZNS1 (R25) special study section, 2011, 2012, 2013, 2015

NIH (NINDS) ZNS1 (T32) special study section, 2013, 2016

NIH (NEI) K99/R13 special study section, 2017

NIH BRAIN Initiative U19 special study section, 2017

External Peer Review of Duke University Neurobiology Graduate Program, 2011

Co-Organizer of the NEI conference, “Reconnecting Neurons in the Visual System”, October 2015

E. Matilda Ziegler Foundation for the Blind Board of Directors, 2011-present

Jane Coffin Childs Board of Scientific Advisors, 2018-2021

External Advisory Board for Sensorimotor Processing in Zebrafish Program, Harvard Univ., 2018-pres.

Dan Lewis Foundation for Brain Regeneration Research Board of Directors, 2020-present

Editorial Activities

Guest Editor for *Vision Research*, 2004; Member: *Faculty of 1000*

Reviewer for: *Journal of Neuroscience, Journal of Neurophysiology, Nature, Science, Nature Methods, Nature Neuroscience, Neuron, Development, Visual Neuroscience, European Journal of Neuroscience, Vision Research, Journal of Physiology, Journal of Comparative Neurology, Cerebral Cortex, Proceedings of the National Academy of Science, PLoS Biology, Elife and others.*

Current Funding

NEI/NIH R01 EY015788 grant titled, *“Mechanisms of Visual Map Development”*

Role on Project: Principal Investigator;

Dates of funding: 7/1/2004 – 12/31/2020

Annual direct costs: $200,000; Total direct costs: $800,000; Total costs: $1,332,000

NIDCD/NIH R01 DC008860 grant titled “*Spontaneous Activity in the Developing Auditory System*”

Role on Project: Co-Principal Investigator

Contact PI and Co-Principal Investigator: Dwight Bergles at Johns Hopkins University

Dates of funding: 4/01/2016 - 3/31/2021

Annual direct costs: $389,162; Total direct costs: $1,991,648; Total costs: $3,248,742

NIMH/NIH R01 MH111424 BRAIN Initiative grant titled “*Understanding evoked and resting-state fMRI through multi scale imaging*”

Role on Project: Principal Investigator

Co-Principal Investigators: R. Todd Constable and D. S. F. Hyder at Yale University

Dates of funding: 9/16/2016 - 7/31/2021

Annual direct costs: $664,523; Total direct costs: $3,175,099; Total costs: $5,161,289

NINDS/NIH T32 NS007224 grant titled, *“Neurobiology of Cortical Systems Training Grant”*

Role on Project: Principal Investigator;

Dates of funding: 7/01/1983– 6/30/2021

Annual direct costs: $177,004; Total direct costs: $885,020; Total costs: $930,720

NEI/NIH P30 EY026878 grant titled, *“Yale Core Grant for Vision Research”*

Role on Project: Principal Investigator and Director of Imaging Core

Dates of funding: 9/01/2016– 8/31/2021

Annual direct costs: $403,025; Total direct costs: $1,999,561; Total costs: $3,305,151

Core grant for Yale Vision Research community

NIMH/NIH R01 MH067528 grant titled “*Energetics of Neuronal Populations by fMRI*”

Role on Project: Co-Investigator

Principal Investigator: D. S. F. Hyder at Yale University

Dates of funding: 4/01/2017 - 1/31/2022

Annual direct costs: $288,419; Total direct costs: $1,442,095; Total costs: $2,374,730

NEI/NIH R01 EY02892 grant titled, *“CaMKII-mediated Neuroprotection of Retinal Ganglion Cells”*

Role on Project: PI subcontract to Mount Sinai

Dates of funding: 9/30/2019– 7/31/2023

Annual direct costs: $381,837; Total direct costs: $1,527,348; Total costs: $2,393,160

Previous Funding (Last 5 Years)

Simons Foundation (SFARI) 308450 grant titled, “*Disrupted Network Activity in Neonatal Cortex of Mouse Models of Autism”*

Role on Project: Principal Investigator;

Dates of funding: 7/01/2014 – 6/30/2016

Annual direct costs: $105,500; Total direct costs: $211,000; Total costs: $250,000

NEI/NIH R01 EY023105 grant titled, *“In Vivo Properties of Spontaneous Waves in the Retina and Developing Visual System”*

Role on Project: Principal Investigator;

Dates of funding: 2/1/2013 – 1/31/2018

Annual direct costs: $250,000; Total direct costs: $1,250,000; Total costs: $2,081,250

NINDS/OD/NIH U01 NS094358 BRAIN Initiative grant titled “*Multiscale Imaging of Spontaneous Activity in the Cortex: Mechanisms, Development and Function*”

Role on Project: Principal Investigator

Co-Principal Investigator: R. Todd Constable at Yale University

Dates of funding: 9/30/2015 - 6/30/2018

Annual direct costs: $1,031,800; Total direct costs: $3,217,290; Total costs: $4,492,027

NEI/NIH R01 EY021502 grant titled “*HDAC4-mediated Photoreceptor Protection in Retinal Degeneration*”

Role on Project: Co-Investigator

Principal Investigator: Bo Chen at Yale University

Dates of funding: 5/01/2012 - 4/30/2017

Annual direct costs: $245,000; Total direct costs: $1,225,000; Total costs: $2,039,625

NEI/NIH U01 EY027256 grant titled “*Evaluation of Novel Targets for Retinal Ganglion Cell Axon Regeneration*”

Role on Project: Co-Investigator

Principal Investigator: Steven Strittmatter at Yale University

Dates of funding: 9/01/2016 – 08/31/2019

Annual direct costs: $406,943; Total direct costs: $1,220,829; Total costs: $3,662,487

NIMH/NIH P50 MH016934 grant titled “*Functional Genomics of Human Brain Development*”

Role on Project: Co-Investigator

Principal Investigator: Nenad Sestan at Yale University

Dates of funding: 9/19/2014 - 7/31/2019

Annual direct costs: $873,179; Total direct costs: $4,365,895; Total costs: $6,690,075

Publications

Peer Reviewed Articles Published

1. M C Crair and W Bialek, 1990 “Non-Boltzmann Dynamics in Networks of Spiking Neurons”, *Advances in Neural Information Processing Systems 2*, ed., D. Touretzky, Morgan Kaufmann, San Mateo, 109-116.
2. M C Crair and R C Malenka, 1995, “A Critical Period for Long-Term Potentiation at Thalamocortical Synapses”, *Nature*, 375:325-328.
3. T Kurotani, M C Crair, Z Molnar, S Higashi, and K Toyama, 1996, ”The Development of Rat Somatosensory (Barrel) Cortex Visualized by Optical Recording”, *Protein, Nucleic Acid and Enzyme*, 41:758-765.
4. J T R Isaac, M C Crair, R A Nicoll and R C Malenka, 1997, “Silent Synapses during Development of Thalamocortical Inputs”, *Neuron*, 18:269-280.
5. M C Crair, E S Ruthazer, D C Gillespie, M P Stryker, 1997, “Ocular Dominance Peaks at Pinwheel Center Singularities of the Orientation Map in Cat Visual Cortex”, *Journal of Neurophysiology*, 77:3381-3385.
6. M C Crair, E S Ruthazer, D C Gillespie, M P Stryker, 1997, “Relationship between the Ocular Dominance and Orientation Maps in Visual Cortex of Monocularly Deprived Cats”, *Neuron*, 19:307-318.
7. T Aihara, M Tsukada, M C Crair and S Shinomoto, 1997, “The Stimulus-dependent Induction of Long-Term Potentiation in the CA1 Area of the Hippocampus: Experiment and Model”, *Hippocampus*, 7:416-426.
8. M C Crair, D C Gillespie and M P Stryker, 1998, “The Role of Visual Experience in the Development of Columns in Cat Visual Cortex”, *Science*, 19:566-570.
9. A Antonini, D C Gillespie, M C Crair and M P Stryker, 1998, “Morphology of Single Geniculocortical Afferents and Functional Recovery of the Visual Cortex after Reverse Monocular Deprivation in the Kitten”, *Journal of Neuroscience*, 18:9896-909.
10. S Higashi, M C Crair, T Kurotani, H Inokawa and K Toyama, 1999, “Altered Spatial Patterns of Functional Thalamocortical Connections in the Barrel Cortex After Neonatal Infraorbital Nerve Cut Revealed by Optical Recording”, *Neuroscience*, 91:439-452.
11. M C Crair, 1999, “Neuronal Activity in Developing Circuits: Permissive or Instructive?” *Current Opinion in Neurobiology*, 9:88-93.
12. C Zhou, Y Qiu, F A Pereira, M C Crair, S Y Tsai, M Tsai, 1999, “The Nuclear Orphan Receptor COUP-TFI is Required for Differentiation of Subplate Neurons and Guidance of Thalamocortical Axons”, *Neuron*, 24:847-859.
13. D C Gillespie, M C Crair and M P Stryker, 2000, “Neurotrophin-4/5 Alters Responses and Blocks the Effects of Monocular Deprivation in Cat Visual Cortex during the Critical Period”, *Journal of Neuroscience*, 20:9174-9186.
14. M C Crair, J Horton, A Antonini and M P Stryker, 2001, “The Emergence of Ocular Dominance Columns in the Cat by Two Weeks of Age”, *Journal of Comparative Neurology*, 430:235-249.
15. H-C Lu, E Gonzalez and M C Crair, 2001, “Barrel Cortex Critical Period Plasticity is Independent of Changes in NMDA Receptor Subunit Composition,” *Neuron*, 32:619:634.
16. S W Wang, X Mu, W J Bowers, D-S Kim, D J Plas, M C Crair, H Federoff, L Gan and W H Klein, 2002, “Brn3b/Brn3c double knockout mice reveal an unsuspected role for Brn3c in retinal ganglion cell axon outgrowth”, *Development*, 129:467-477.
17. H-C Lu, W-C She, D T Plas, P E Neumann, R Janz and M C Crair, 2003, “Adenylyl Cyclase I Regulates AMPAR Trafficking During Mouse Cortical ‘Barrel’ Map Development”, *Nature Neuroscience*, 6:939-947.
18. S M Wu, W Baehr and M C Crair, “The Mouse Visual System: From Photoreceptors to the Cortex”, *Vision Research*, 2004, 44:3233-34.
19. D T Plas, A Visel, E R Gonzalez, W-C She and M C Crair, 2004, “Adenylate Cyclase 1 Dependent Refinement of Retinotopic Maps in the Mouse”, *Vision Research*, 44:3357-64.
20. D Murali, S Yoshikawa, R R Corrigan, D J Plas, M C Crair, G C Oliver, K M Lyons, Y Mishina and Y Furuta, 2005, “Distinct Developmental Programs Require Different Levels of BMP Signaling During Mouse Retinal Development”, *Development*, 132:913-23.
21. S Q Mehta, P R Hiesinger, S Beronja, R G Zhai, K L Schulze, P Verstreken, Y Cao, Y Zhou, U Tepass, M C Crair and H J Bellen, 2005, “Mutations in Drosophila Sec15 Reveal a Function in Neuronal Targeting for a Subset of Exocyst Components”, *Neuron*, 46:219-32.
22. A R Chandrasekaran, D T Plas, E Gonzalez and M C Crair, 2005, “Evidence for an Instructive Role of Retinal Activity in Retinotopic Map Refinement in the Superior Colliculus of the Mouse”, *Journal of Neuroscience*, 25:6929-38.
23. J P Carson, T Ju, H-C Lu, C Thaller, M Xu, S L Pallas, M C Crair, J Warren, W Chiu and G Eichele, 2005, “A Digital Atlas to Characterize the Mouse Brain Transcriptome”, *PLoS Computational Biology*, 1:289-296.
24. D T Plas, J E Lopez and M C Crair, 2005, “Pre-target Sorting of Retino-collicular Axons in the Mouse”, *Journal of Comparative Neurology*, 491:305-319.
25. H-C Lu, D A Butts, P S Kaeser, W-C She, R Janz and M C Crair, 2006, “Role of Efficient Neurotransmitter Release in Barrel Map Development”, *Journal of Neuroscience*, 26:2692-2703.
26. M Inan, H-C Lu, M J Albright, W-C She and M C Crair, 2006, “Barrel Map Development Requires PKARII-mediated cAMP signaling”, *Journal of Neuroscience*, 26:4338-4349.
27. M Inan, M C Crair, 2007, “Development of cortical maps - Perspectives from the barrel cortex”, *The Neuroscientist*, 13:49-61.
28. A R Chandrasekaran, R D Shah and M C Crair, 2007, “Developmental Homeostasis of Mouse Retinocollicular Synapses”, *Journal of Neuroscience,* 14:1746-1755.
29. M J Albright, M C Weston, M Inan, C Rosenmund and M C Crair, 2007, “Increased Thalamocortical Synaptic Response and Decreased Layer IV Innervation in GAP-43 Knockout Mice”, *Journal of Neurophysiology*, 98:1610-1625.
30. R D Shah and M C Crair, 2008, “Retinocollicular Synapse Maturation and Plasticity are Regulated by Correlated Retinal Waves”, *Journal of Neuroscience,* 28:292-303.
31. T Kurotani, K Yamada, Y Yoshimura, M C Crair and Y Komatsu, 2008, “State-Dependent Bidirectional Modification of Somatic Inhibition in Neocortical Pyramidal Neurons”, *Neuron,* 57:905-916.
32. T. Iwasato\*, M Inan\*, H Kanki, R S Erzurumlu, S Itohara and M C Crair, 2008, “Cortical Adenylyl Cyclase 1 is Required for Thalamocortical Synapse Maturation and Aspects of Layer IV Barrel Development”, *Journal of Neuroscience*, 28:5931-5943.
33. D T Plas, O S Dhande, J E Lopez, D Murali, C Thaller, M Henkemeyer, Y Furuta, P Overbeek and M C Crair, 2008, “Bone Morphogenetic Proteins, Eye Patterning, and Retinocollicular Map Formation in the Mouse”, *Journal of Neuroscience,* 28:7057-7067.
34. R D Shah and M C Crair, 2008, “Mechanisms of Response Homeostasis during Retinocollicular Map Formation” *Journal of Physiology,* 586:4363-4369.
35. M C Crair and R D Shah, 2009, “Long-term Potentiation and Long-term Depression in Experience-Dependent Plasticity”, *Encyclopedia of Neuroscience,* edited by Larry Squire et al. 5:561-570.
36. A R Chandrasekaran, Y Furuta and M C Crair, 2009, “Consequences of Axon Guidance Defects on the Development of Retinotopic Receptive Fields in the Mouse Colliculus”, *Journal of Physiology,* 587:953-963.
37. H P Xu, H Chen, Q Ding, Z H Xie, L Chen, L Diao, P Wang, L Gan, M C Crair and N Tian, 2010, “[The Immune Protein CD3ζ is Required for Normal Development of Neural Circuits in the Retina”,](http://www.ncbi.nlm.nih.gov/pubmed/20188655) *Neuron,* 65:503-515.
38. O S Dhande, E Hua, E Guh, J Yeh, S Bhatt, Y Zhang, E S Ruthazer, M B Feller and M C Crair, 2011, “Development of Single Retinofugal Axons in Normal and β2 Knockout Mice”, *Journal of Neuroscience*, 31:3384-3399.
39. O S Dhande and M C Crair, 2011, “Transfection of Mouse Retinal Ganglion Cells by *in vivo* Electroporation”, *Journal of Visualized Experiments,* 50:2678 pii: 2678. doi: 10.3791/2678.
40. H Li and M C Crair, 2011, “[How Do Barrels Form in Somatosensory Cortex?](http://www.ncbi.nlm.nih.gov/pubmed/21534999)” *Annals of the New York Academy of Science,* 1225:119-129. doi: 10.1111/j.1749-6632.2011.06024.x.
41. O S Dhande, S Bhatt, A Anishchenko, J Elstrott, T Iwasato, E Swindell, HP Xu, M Jamrich, S Itohara, M B Feller and M C Crair, 2011, “Role of Adenylate Cyclase 1 in Retinofugal Map Development”, *Journal of Comparative Neurology*, doi: 10.1002/cne.23000.
42. H P Xu, M Furman, Y S Mineur, H Chen, S L King, D Zenisek, Z J Zhou, D A Butts, N Tian, M R Picciotto and M C Crair, 2011, “An Instructive Role for Patterned Spontaneous Retinal Activity in Mouse Visual Map Development”, *Neuron,* 70:1115-27.
43. J Zhang, J Ackman, O S Dhande and M C Crair, 2011, “Visualization and Manipulation of Neural Activity in the Developing Vertebrate Nervous System”, *Frontiers in Molecular Neuroscience,* 4:43 doi:10.3389/fmol.2011.0043.
44. J Zhang, J Ackman, H P Xu and M C Crair, 2011, “Visual Map Development Depends on the Temporal Pattern of Binocular Activity in Mice”, *Nature Neuroscience,* 15:298-307 doi:10.1038/nn.3007.
45. M Furman and M C Crair, 2012, “Synapse Maturation is Enhanced in the Binocular Region of the Retinocollicular Map Prior to Eye Opening”, *Journal of Neurophysiology,* 107:3200-3216 doi:10.1152/jn.00943.2011.
46. J Ackman, T Burbridge and M C Crair, 2012, “Retinal Waves Coordinate Patterned Activity Throughout the Developing Visual System”, *Nature,* 490:219-225, doi: 10.1038/nature11529.
47. M Furman, H P Xu and M C Crair, 2013, “Competition Driven by Retinal Waves Promotes the Morphological and Functional Synaptic Development of Neurons in the Superior Colliculus”, *Journal of Neurophysiology,* 110:1441-1454, doi: 10.1152/jn.01066.2012.
48. A Ribic, X Liu, M C Crair and T Biederer, 2013, “Structural Organization and Function of Mouse Photoreceptor Ribbon Synapses Involve the Immunoglobulin Adhesion Protein SynCAM 1”, *Journal of Comparative Neurology*, 522:900-920, doi: 10.1002/cne.23452.
49. J Ackman and M C Crair, 2013, “Role of Emergent Neural Activity in Visual Map Development” *Current Opinion in Neurobiology*, 24:166-175, <http://dx.doi.org/10.1016/j.conb.2013.11.011>
50. H Li, S Fertuzinhos, E Mohns, T S Hnasko, M Verhage, R Edwards, N Sestan and M C Crair, 2013, “Laminar and Columnar Development of Barrel Cortex Relies on Thalamocortical Neurotransmission”, *Neuron*, 79:970-986, doi: 10.1016/j.neuron.2013.06.043.
51. S Fertuzinhos, M Li, Y I Kawasawa, V Ivic, D Franjic, D Singh, M C Crair, and N Sestan, 2014, “Laminar and Temporal Expression Dynamics of Coding and Noncoding RNAs in the Mouse Neocortex”, *Cell Reports*, 13:938-50, doi: 10.1016/j.celrep.2014.01.036
52. T J Burbridge, H P Xu, J B Ackman, X Ge, Y Zhang, M-J Ye, Z J Zhou, J Xu, A Contractor and M C Crair, 2014, “Visual Circuit Development Requires Patterned Activity Mediated by Retinal Acetylcholine Receptors”, *Neuron*, 84:1049-1064, doi: 10.1016/j.neuron.2014.10.051.
53. H P Xu, T J Burbridge, G-G Chen, X Ge, Y Zhang, Z J Zhou and M C Crair, 2015, “Spatial pattern of spontaneous retinal waves instructs retinotopic map refinement more than activity frequency”, *Developmental Neurobiology*, 75:621-640, doi: 10.1002/dneu.22288.
54. X Guo X, SB Wang, H Xu, A Ribic, E J Mohns, Y Zhou, X Zhu, T Biederer, M C Crair and B Chen, 2015, “A Short N-terminal Domain of HDAC4 Preserves Photoreceptors and Restores Visual Function in Retinitis Pigmentosa”, *Nature Communications*, 6:8005, doi: 10.1038/ncomms9005.
55. H P Xu, T J Burbridge, M Ye, M Chen, X Ge, Z J Zhou and M C Crair, 2016, “Retinal Wave Patterns are Governed by Mutual Excitation Among Starburst Amacrine Cells”, *Journal of Neuroscience*, 36:3871-3886. doi: 10.1523/JNEUROSCI.3549-15.2016.
56. M C Crair and C A Mason, 2016, “Retinal Ganglion Cell Regeneration”, *Journal of Neuroscience*, 36:10707-10722. doi: 10.1523/JNEUROSCI.1711-16.2016.
57. A Thompson, A Gribizis, C Chen and M C Crair, 2016, “Activity-dependent Development of Visual Receptive Fields”, *Current Opinion in Neurobiology*, 42:136-143. doi: 10.1016/j.conb.2016.12.007.
58. T A Seabrook, T J Burbridge, M C Crair and A D Huberman, 2017, “Architecture, Function and Assembly of the Mouse Visual System”, *Annual Review of Neuroscience*, 40:499-538. doi: 10.1146/annurev-neuro-071714-033842.
59. Y Diao, L Cui, Y Chen, T J Burbridge, W Han, B Wirth, N Sestan, M C Crair and J Zhang, 2017, “Reciprocal Connections Between Cortex and Thalamus Contribute to Retinal Axon Targeting to Dorsal Lateral Geniculate Nucleus”, *Cerebral Cortex*, 10:1-15, doi: 10.1093/cercor/bhx028
60. K Yao, S Qiu, Y V Wang, S J H Park, E J Mohns, B Mehta, X Liu, B Chang, D Zenisek, M C Crair, J B Demb, B Chen, 2018, “[Restoration of Vision after de novo Genesis of Rod Photoreceptors in Mammalian Retinas](https://www.ncbi.nlm.nih.gov/pubmed/30111842)” *Nature*, 560(7719):484-488. doi: 10.1038/s41586-018-0425-3.
61. T A Babola, S Li, A Gribizis, B J Lee, J B Issa, H C Wang, M C Crair, D E Bergles, 2018, “Homeostatic Control of Spontaneous Activity in the Developing Auditory System” *Neuron,* 99(3):511-524.e5. doi: 10.1016/j.neuron.2018.07.004
62. A Ribic, M C Crair, T Biederer, 2019, “[Synapse-Selective Control of Cortical Maturation and Plasticity by Parvalbumin-Autonomous Action of SynCAM 1](https://www.ncbi.nlm.nih.gov/pubmed/30625321)“ *Cell Reports,* 26(2):381-393.e6. doi: 10.1016/j.celrep.2018.12.069
63. A Gribizis, X Ge, T L Daigle, J B Ackman, H Zeng, D Lee, M C Crair, 2019, “[Visual](https://www.ncbi.nlm.nih.gov/pubmed/30625321) Cortex Gains Independence from Peripheral Drive Before Eye Opening“ *Neuron*, 104:1–13. doi: 10.1016/j.neuron.2019.08.015
64. D Barson, A S Hamodi, X Shen, G Lur, R T Constable, J A Cardin, M C Crair\*, M J Higley\*, 2019, “Simultaneous Mesoscopic and Two-Photon Imaging of Neuronal Activity in Cortical Circuits” *Nature Methods*, 17(1):107-113. doi: 10.1038/s41592-019-0625-2
65. A S Hamodi, A Martinez Sabino, N D Fitzgerald, D Moschou, M C Crair, 2020, “[Transverse Sinus Injections Drive Robust Whole-Brain Expression of Transgenes” *Elife*,](https://pubmed.ncbi.nlm.nih.gov/32420870/) May 18;9:e53639. doi: 10.7554/eLife.53639.
66. J A Cardin, M C Crair, M J Higley, 2020, “[Mesoscopic Imaging: Shining a Wide Light on Large-Scale Neural Dynamics”](https://pubmed.ncbi.nlm.nih.gov/33058764/) *Neuron*, Oct 14;108(1):33-43. doi: 10.1016/j.neuron.2020.09.031.
67. E M RLake, X Ge, X Shen, P Herman, F Hyder, J A Cardin, M J Higley, D Scheinost, X Papademetris, M C Crair\*, R T Constable\*, 2020, “[Simultaneous cortex-wide fluorescence Ca2+ imaging and whole-brain fMRI”](https://pubmed.ncbi.nlm.nih.gov/33139894/) *Nature Methods*, 17(12):1262-1271. doi: 10.1038/s41592-020-00984-6.
68. B S Wang, M S Bernardez Sarria, X An, M He, N M Alam, G T Prusky, M C Crair, Z J Huang, 2021, “Retinal and Callosal Activity-Dependent Chandelier Cell Elimination Shapes Binocularity in Primary Visual Cortex” *Neuron* 109(3):502-515.e7. doi: 10.1016/j.neuron.2020.11.004.
69. Y Wang, M Sanghvi, A Gribizis, Y Zhang, L Song, B Morley, D G Barson, J Santos-Sacchi, D Navaratnam, M C Crair, 2021, “[Efferent feedback controls bilateral auditory spontaneous activity](https://pubmed.ncbi.nlm.nih.gov/33907194/)” *Nature Communications*. 12(1):2449. doi: 10.1038/s41467-021-22796-8.
70. B Chen, X Guo; E J Mohns; Y Li, E Chen, Y Y Yoon, C P Kellner, K Tanada, H Wang, J B Demb, M C Crair, J Zhou, C Starr, L R Pasquale, W Liu, 2021 “Preservation of vision after CaMKII-mediated protection of retinal ganglion cells”, *Cell* (in press)
71. X Ge, A Gribizis, A S Hamodi, A M Sabino and M C Crair, 2021, “Retinal Waves Prime Visual Motion Detection by Simulating Future Optic Flow”, *Science* (in press).

Invited Seminars/Symposia

International

Kyoto Prefectural Medical School, Department of Physiology, “A Model Learning Rule for Hippocampal Plasticity”, Kyoto, Japan, November, 1992

University of Kyoto, Department of Physics, “Optical Imaging of Barrel Development in the Rat”, Kyoto, Japan, April, 1993

Tadeshina Conference on Neuroscience, “Optical Imaging of Barrel Development in the Rat”, Tadeshina, Japan , May, 1993

University of Nagoya, Department of Physiology, “Role of Sensory Experience and Neural Activity in Cortical Map Development, Nagoya, Japan, March, 2000

University of Osaka, Department of Physiology, “Role of Sensory Experience and Visual Cortical Development”, Osaka, Japan, March, 2000

National Institute for Basic Biology Center of Excellence International Symposium, “Role of Sensory Experience in Visual Cortical Development”, Okazaki, Japan, March, 2000

National Academy of Science Frontiers in Science Symposium, “Activity Dependent Neural Circuit Development”, Beijing, China, Sept 2001

European Winter Conference on Brain Research, “Mechanisms of Sensory Map Development”, Les Arcs, Switzerland, March, 2003

Gulbenkian Institute for Science Seminar, “Nature vs. Nurture in Sensory Map Development”, Lisbon, Portugal, February, 2005

RIKEN Brain Sciences Institute, “Mechanisms of Sensory Map Development”, Wako, Japan, November 2005

International Symposium on Molecular and Cellular Mechanisms of Environmental Adaptation, “Development of Thalamocortical Connections”, Nagoya University, Nagoya, Japan, November 2005

Nagoya University, Department of Visual Sciences, “Spontaneous Retinal Waves During Development are Instructive in Retinotopic Map Refinement”, Nagoya University, Nagoya, Japan, December 2005

Osaka University, Graduate School of Frontier Biosciences, “Nature vs. Nurture in Sensory Map Development”, Osaka University, Osaka, Japan, December 2005

University of Tokyo, Department of Molecular and Systems Biology “Mechanisms of Sensory Map Development”, University of Tokyo, Tokyo, Japan, September 2012

Japanese Neuroscience Society Symposium, “Retinal Waves Drive the Activity-Dependent Development of Visual Circuits In Vivo”, Nagoya, Japan, September 2012

Osaka University, Graduate School of Frontier Biosciences, “Retinal Waves Drive the Activity-Dependent Development of Visual Circuits In Vivo”, Osaka University, Osaka, Japan, September 2012

Basel NeuroSeminars at Friedrich Miescher Institute for Biomedical Research, “Characteristics and Role of Spontaneous Activity in Neonatal Sensory Map Development”, FMI, Basel, Switzerland, May 2013

University of Geneva, Department of Basic Neurosciences Seminar, “Spontaneous Activity in Neonatal Sensory Map Development”, University of Geneva, Geneva, Switzerland, May 2013

Institute for Advanced Study Workshop on Statistical Physics and Computational Neuroscience, “Activity Dependent Mechanisms of Sensory Map Development”, Hong Kong University of Science and Technology, Hong Kong, July 2013

IAS Program on Statistical Physics and Computational Neuroscience, “What Does Activity Have To Do With It? Development of Visual Circuits Before Vision”, Hong Kong Baptist University, Hong Kong, July 2013

From Maps to Circuits: Models and Mechanisms for Generating Neural Connections, “Activity-Dependent Map Development Prior to Sensory Experience”, Edinburgh, UK, July 2014

Killam Lecture, Montreal Neurological Institute, McGill University, “Activity Dependent Neural Circuit Development Prior to Sensory Experience”, Montreal, Canada, October 2014

MRC Centre for Developmental Neurobiology/King’s College London, “Self-Organization in the Developing Nervous System”, London, UK, March 2015

Cortex Club, Oxford University, “Self-Organization in the Developing Nervous System”, Oxford, UK, March 2015

From Maps to Circuits: Models and Mechanisms for Generating Neural Connections (Co-Organizer), Strasbourg, France, Dec 2015

International Symposium, Circuit Construction in the Mammalian Brain, “The Development of Spontaneous Activity in Neonatal Mice”, Osaka, Japan, Aug 2016

Gordon Research Conference, Visual System Development, “Spontaneous Activity in Visual Circuit Development”, Lucca, Italy, May 2018

Institute of Brain Science, Fudan University, Frontiers in Neuroscience Seminar, “Multi-Scale Imaging of Spontaneous Activity During Development”, Shanghai, China, Sept 2018

Shanghai Jiao Tong University Seminar, “Self-Organization in the Developing Nervous System”, Shanghai, China, Sept 2018

Spontaneous Activity in Brain Development Conference, “Spontaneous Activity Across Developent and Spatial Scales”, Leiden, Amsterdam Oct 2018

Circuits and Behavior in Tuscany Keynote Seminar, “Multiscale Imaging of Spontaneous Activity in Mice”, Montecastelli, Italy, June 2019

National

University of California, San Francisco, Department of Psychiatry, “A Model Learning Rule for Hippocampal Plasticity”, San Francisco, CA, November, 1992

University of California, Irvine, Department of Neuroscience, “Optical Imaging of Barrel Development in the Rat”, Irvine, CA, October, 1994

University of Rochester, Cognitive Science Department Seminar Series, “Cortical Development and Plasticity”, Rochester, NY, February, 1997

Case Western Reserve University, Neuroscience Department Seminar Series, “Cortical Development and Plasticity”, Cleveland, OH, March, 1997

University of Pittsburgh, Neuroscience Department Seminar Series, “Cortical Development and Plasticity”, Pittsburgh, PA, March, 1997

Case Western Reserve University, Bioengineering Department, “Cortical Development and Plasticity”, Cleveland, OH, March, 1997

Baylor College of Medicine, Division of Neuroscience, “Cortical Development and Plasticity”, Houston, TX, May, 1997

University of California at Los Angeles, Neuroscience Department Seminar Series, “Cortical Development and Plasticity”, Los Angeles, CA, May, 1997

University of Pennsylvania, Neuroscience Department, “Cortical Development and Plasticity”, Philadelphia, PA, June, 1997

Baylor College of Medicine, Developmental Biology Retreat, Feb., 1999

University of Florida, Neuroscience Department, “Cortical Development and Plasticity”, Gainesville, FL, November, 1999

Baylor College of Medicine, Department of Cell and Molecular Biology, “Cortical Development and Plasticity”, Houston, TX, February, 2000

Gordon Conference on Neural Development, “Role of Sensory Experience and Neural Activity in Cortical Map Development”, Newport, RI, June, 2000

LTP, LTD and Synaptic Plasticity in the Brain, Satellite Symposium, “Synaptic Plasticity, Adenylyl Cyclase and Barrel Development”, Society for Neuroscience, New Orleans, LA, November, 2000

University of Texas at Houston Health Science Center, Neurobiology and Anatomy Department Seminar, 'Mechanisms of Cortical Development and Plasticity', Houston, TX, November, 2000

Baylor College of Medicine MD/PhD Symposium, “Nature vs. Nurture: Exploring the roles of genetics and the environment in brain development”, Galveston, TX, September, 2001

Louisiana State University, Neuroscience Department Seminar, “Mechanisms of Sensory Map Development and Plasticity”, New Orleans, LA, October, 2001

University of California Alumni Club Annual Meeting, “Nature vs. Nurture in Brain Development”, Feb., 2002

Brain Expo, “Brain Development”, San Antonio Texas, July 2002

Cold Spring Harbor Lab Meeting, “Altered Thalamocortical Synapse Development in Barrelless Mice”, September, 2002

MIT Department of Brain and Cognitive Sciences Seminar, “Mechanisms of Sensory Map Development”, Boston, MA, October, 2002

UT Southwestern Neuroscience Department Seminar, “Mechanisms of Sensory Map Development”, Dallas, TX, January, 2003

Baylor College of Medicine, Developmental Biology Retreat, “Mechanisms of Neuronal Map Development”, Houston, TX Feb, 2003

University of California, San Diego and The Salk Institute for Neuroscience Seminar, “Mechanisms of Sensory Map Development”, San Diego, CA, April, 2003

Society for Neuroscience Satellite Symposium on Cortical Development, “Mechanisms of Thalamocortical Synapse Development”, New Orleans, LA, November, 2003

University of Texas, Houston Neuroscience Department Seminar, “Mechanisms of Visual Map Development”, Houston, TX, Jan., 2004

Rice University, Psychology Department, “Nature vs. Nurture in Sensory Map Development”, Houston, TX, February, 2004

Society for Neuroscience Mini Symposium on “Cellular and Molecular Mechanisms Patterning Cortical Connectivity”, San Diego, CA, Oct., 2004

University of Virginia Neuroscience Department Symposium on “Mechanisms of Thalamocortical Synapse Development and Plasticity”, Charlottesville, VA, Dec., 2004

Harvard Medical School Neuroscience Department Symposium on “Mechanisms of Visual Map Development”, Boston, MA, Dec., 2004

Texas A&M University Symposium on Neurodevelopment, “Nature vs. Nurture in Sensory Map Development”, Bryan, TX, April, 2005

Baylor College of Medicine, Menninger Department of Psychiatry and Behavioral Sciences Grand Rounds, “Nature vs. Nurture in Sensory Map Development”, Houston, TX, May, 2005

Cullen Eye Institute Vision Research Seminar Series on “Neurophysiologic and Clinical Aspects of Amblyopia and Vision Development”, Houston, TX, June, 2005

Houston Society for Engineering in Medicine and Biology, “Nature vs. Nurture in Sensory Map Development”, Houston, TX, Feb 2006

Yale School of Medicine, Department of Neurobiology, “Mechanisms of Sensory Map Development”, New Haven, CT, Mar 2006

NINDS/NIH Neurobiology Seminar, “Mechanisms of Sensory Map Development”, Bethesda, MD, June 2006

Albert Einstein College of Medicine Neurobiology Department Seminar, “Nature vs. Nurture in Sensory Map Development”, New York, NY, Mar 2007

Duke University, Department of Neuroscience, “Mechanisms of Retinotopic Map Development”, Durham, NC, April 2007

Brown University, Department of Neuroscience, “Mechanisms of Sensory Map Development”, Providence, RI, Oct 2007

Winter Conference on Brain Research, “Retinocollicular Response Homeostasis”, Snowbird, UT Feb 2008

ARVO Symposium on Retinal Ganglion Cells in Model Organisms, “Response Homeostasis of Retinocollicular Receptive Fields”, Ft. Lauderdale, FL April 2008

SFN Mini-Symposium on Homeostatic Plasticity in Intact Neural Circuits, “Response Homeostasis of Retionocollicular Receptive Fields”, Washington, DC Nov 2008

University of Connecticut, Behavioral Neuroscience Seminar Series, “How ‘Nature’ and ‘Nurture’ Guide the Development of Visual Maps”, Storrs, CT Oct 2008

University of Wyoming, Center for Neuroscience Seminar, “Mechanisms of Senaory Map Development”, Laramie, WY, Oct 2008

Columbia University, VisioNYC, “Ankle Busters and Mavericks: Wave Size Matters in Visual Map Development”, NY, Dec 2008

University of Chicago, Department of Neuroscience Seminar, “Nature vs. Nurture in Visual Map Development”, Chicago, IL, Dec 2008

Cold Spring Harbor Lab, Meeting on Synapses: From Molecular to Circuits & Behaviors, “Retinal Wave Size Matters for Eye-Specific Segregation and Retinotopic Map Refinement”, Cold Spring Harbor, NY, Apr 2009

West Virginia University, Center for Neuroscience, “Ankle Busters and Mavericks: Wave Size Matters in Visual Map Development”, WV Nov 2009

Thirteenth Annual Vision Research Conference, “An Instructive Role for Retinal Ganglion Cell Activity in Visual Map Development”, Ft. Lauderdale, FL April 2010

Northwestern University, Department of Neurobiology and Physiology, “Ankle Busters and Mavericks: Retinal Wave Size Matters in Visual Map Development”, Evanston, IL May 2010

New Studies of Neurobehavioral Evolution, “How Do ‘Barrels’ in Somatosensory Cortex Form?”, Bethesda, MD June 2010

Princeton University, Bialek 50th Anniversary Symposium, “Mechanisms of Sensory Map Development”, Princeton, NJ Nov 2010

University of California at Santa Cruz, “Mechanisms of Sensory Map Development”, Santa Cruz, CA Jan 2011

University of Southern California, Neuroscience Seminar, “What Role Does Neural Activity Play in Sensory Map Development?”, Los Angeles, CA Dec 2011

Wesleyan University, “Innate or Experience Dependent? How the Eye Gets Wired to the Brain”, Middletown, CT Feb 2012

Yale Eye Center Clinical Conference Series, “Innate or Experience Dependent? How the Eye Gets Wired to the Brain”, New Haven, CT Feb 2012

Barrels XXV, “Does Activity Play a Similar Roe in Somatosensory and Visual Map Development?”, Tulane University, New Orleans, LA Oct 2012

Wesleyan University, Biology Department Seminar, “Brain development before sensory experience: What does activity have to do with it?”, Middletown, CT Oct 2012

Molecular and Biophysical Mechanisms of Perception, Sense to Synapse, “Activity-Dependent Mechanisms of Sensory Map Development”, Columbia University, NY Apr 2013

Max Planck Florida Institute for Neuroscience, “Activity-Dependent Development of Sensory Maps Prior to Sensory Experience”, Jupiter, FL Oct 2013

Yale University Vision Seminar, “Visual Development: What’s Activity Got To Do With It?”, New Haven CT Feb 2014

City College of New York, Biology Department Colloquium, “Activity Dependent Development Prior to Sensory Experience”, New York, NY Feb 2014

Kavli Workshop on Multicellular Monitoring and Manipulation, “Mesoscopic Imaging of Spontaneous Activity in the Neonatal Cortex of Mice”, New Haven CT Mar 2014

Johns Hopkins University, Department of Neuroscience Seminar, “Activity Dependent Development Prior to Sensory Experience”, Baltimore MD Apr 2014

University of California at San Francisco, Department of Ophthalmology Grand Rounds, “Visual Map Development Prior to Visual Experience”, San Francisco, CA May 2014

FASEB Conference on Retinal Neurobiology and Visual Processing, “Role of Down Syndrome Cell Adhesion Molecule (DSCAM) in Mouse Visual Circuit Development”, Saxtons River, VT June 2014

University of California at San Diego, Department of Neurobiology, “Activity Dependent Neural Circuit Development Prior to Sensory Experience”, San Diego, CA Oct 2014

University of Connecticut Health Science Center, Neuroscience Seminar Series, “Self-organization in the Developing Nervous System”, Farmington, CT Mar 2015

Swartz Foundation Workshop –Neuronal Response Variability and Correlation, “Do Activity Correlations Drive Circuit Development?”, Banbury Center of Cold Spring Harbor Lab, NY Apr 2015

University of California at Los Angeles, Joint Seminars in Neuroscience, “Activity Dependent Development Prior to Sensory Experience”, Los Angeles, CA Oct 2015

National Eye Institute Audacious Goals Initiative Workshop (Co-Organizer), “Reconnecting Neurons in the Visual System”, Chicago, IL Oct 2015

BRAIN Initiative Investigators Meeting, “Multiscale Imaging of Spontaneous Activity in Cortex”, Washington, DC Dec 2015

Yale Eye Center Clinical Conference Series, “Activity-Dependent Visual System Development Prior to Vision”, New Haven, CT Jan 2016

National Advisory Eye Council, “Results of AGI Workshop on Reconnecting Neurons”, Washington, DC Jan 2016

Magnetic Resonance Research Center Seminar Series, “The Development of Spontaneous ‘Resting State’ Activity in Neonatal Mice”, Yale University, New Haven, CT, March 2016

Vision Research Funding Partnership III: Bigger Strides, Better Outcomes, “Reconnecting Neurons in the Visual System”, Washington, DC, April 2016

Vision Science Society Symposium, “Retinal Activity Guides Visual Circuit Development Prior to Sensory Experience”, St. Pete, FL, May 2016

Case Western Reserve University, Department of Neurosciences Seminar, “The Development of Spontaneous Activity in Neonatal Mice”, Cleveland, OH June 2016

Vision Research Seminar Series, “Retinal Activity Guides Visual System Development Prior to Sensory Experience”, New Haven, CT, Sept 2016

University of Washington, Department of Biological Structure Seminar, “The Development of Spontaneous Activity in Neonatal Mice”, Seattle, WA, Sept 2016

SFARI Science Meeting, “Development of Spontaneous Activity in Neonatal Mouse Models of Autism”, New York, NY, Sept 2016

Clinical Neuroscience Grand Rounds, Yale University, “Activity Dependent Brain Development”, New Haven, CT, Oct 2016

Neuroscience Seminar Series, National Institutes of Health (NIH), “The Development of Spontaneous Activity in Neonatal Mice”, Bethesda, MD, Nov 2016

Optical Society of America, Optics in the Life Sciences, “Multiscale Imaging of Activity in Cortex”, San Diego, CA Apr 2017

Vision Research Funding Partnership IV: Shaping Eye Health in America, “Update on Progress in Reconnecting Neurons in the Visual System”, Washington, DC, April 2017

Symposium in Honor of Michael Stryker, UCSF, “Multiscale Imaging of Spontaneous Activity in the Developing Visual System”, San Francisco, CA, Aug 2017

NIH BRAIN Initiative Symposium, SfN, “Multiscale, Multimodal Imaging of Spontaneous Activity in Mice”, San Diego, CA, Nov 2017

Bioimaging Sciences Retreat Keynote Seminar, “Multiscale Imaging of Spontaneous Activity”, Southbury, CT, March 2018

Department of Neuroscience Retreat, Yale University, “Multiscale Imaging of Spontaneous Activity in Developing Cortex”, Jiminy Peak, CT April 2018

Stanford Neuroscience Institute Seminar, Stanford University, “Multiscale Imaging of Spontaneous Activity in the Developing Nervous System”, Palo Alto, CA May 2018

Boys Town National Research Hospital Seminar, “Self-Organization in the Developing Nervous System”, Omaha, NE Nov 2018

Teaching Related Activities (since 1998)

Courses taught and/or coordinated at Baylor College of Medicine (BCM)

1998-2001 Systems Neuroscience (Neuroscience Department core course); 6 hrs/yr; 4 lectures/yr; Co-Director of course.

1999-2006 The Nervous System (Medical School course); 3-4 hrs/yr; 3-4 lectures/yr.

1999-2001 Molecular Neuroscience (Neuroscience Department core course); 4.5 hrs/yr; 3 lectures/yr.

1998-2006 Neural Development (Developmental Biology core course, Neuroscience Department elective course). 5-6 hrs/yr; 5-6 lectures/yr; Co-Director of Course.

2001-2006 Integrative Neuroscience II (Neuroscience Department core course); 11-13 hrs/yr; 11-13 lectures/yr; Director of Course.

2001-2006 Learning and Memory (Neuroscience Department elective course); 3 hrs/yr; 3 lectures/yr.

Courses taught and/or coordinated at Other Institutions while at BCM

2005 Neurodevelopment Course, Gulbenkian Institute for Science PhD Program in Biomedicine, Lisbon, Portugal; 8 hrs/yr; 5 lectures/yr.

2006 John Merck Fund Summer Institute on the Biology of Developmental Disabilities, Princeton, NJ

Education and Curriculum Development Work at BCM

1998 New course Co-Director, reorganized the curriculum for the Developmental Biology Core course, “Neural Development”

1998-2006 Member of the Examination Committee for the Program in Developmental Biology

1998-2006 Member of the Examination Committee for the Department of Neuroscience

1998-2006 Member of the Faculty Operating Committee of the Medical Scientist Training Program

1998-2006 Member of the Thesis Committees of 21 Graduate Students in Other Laboratories

1998-2006 Co-Director of the Developmental Biology Core course “Neural Development”

1999-2006 Faculty Coordinator of the Department of Neuroscience Seminar Series

1999-2006 Member of three Faculty Recruitment Committees in the Department of Neuroscience

2000-2006 Member of the Steering Committee of the Program in Developmental Biology

2001 Member of the Committee to Reorganize the Neuroscience Graduate Program curriculum

2001-2006 Director of the Neuroscience Core course, “Integrative Neuroscience II”.

2001 Established elective course for the Neuroscience Graduate Program in “Neural Development”

2005-2006 Member, Graduate Program in Translational Biology and Molecular Medicine

2005-2006 Member of Committee to Reorganize the Core Curriculum for the Neuroscience Graduate Program

2005-2006 Member of the Graduate School of Biomedical Sciences Executive Council

2006 Member of the Graduate School of Biomedical Sciences Promotions Committee

2006 Director, Neuroscience Core course, “Anatomy and Development of the Nervous System”

Courses taught and/or coordinated at Yale University School of Medicine

2007 Neurodevelopment (Neuroscience elective course). Co-Director of Course.

2007, 09,14,16 Principles of Neuroscience (Interdepartmental Neuroscience Program core course) lecture and discussion on the topic of Neuronal Development

2007-pres Structural and Functional Organization of the Human Nervous System (Medical School and Graduate School core course on Neuroanatomy) lectures on Eye Movements, Thalamus, Sleep and Arousal

2007-pres Structural and Functional Organization of the Human Nervous System (Medical School and Graduate School core course on Neuroanatomy) laboratory instructor

2009-2015 Perspectives on Science and Engineering (Yale College Freshman Seminar)

2010, 2013 Sensory Physiology (Yale Graduate School elective course) lecture on visual system

2012-2016 Neurobiology of Cortical Systems (Yale Graduate School elective course) Course Director

2013, 2014 Brain Development and Plasticity (Yale College Advanced Seminar) 4 lectures/4 discussions

2015 Development, Function and Dysfunction of the Visual System (Yale Graduate School elective course) 2 lectures/2 discussions

Courses taught and/or coordinated at Other Institutions while at Yale

2011 Neurodevelopment Course, Columbia University (lecture on topographic maps)

2012 Neurodevelopment Course, Wesleyan University. (lecture on activity dependent development)

2013, ‘15, ‘17 Neurodevelopment Course, Columbia University (lecture on sensory map development)

2013 Institute for Advanced Study Workshop on Statistical Physics and Computational Neuroscience Hong Kong University of Science and Technology, Hong Kong, (lectures on topographic maps and activity dependent development)

2015, ‘18 Neurodevelopment Course, Rockefeller University (lecture on map development)

Education and Curriculum Development Work at Yale University School of Medicine

2007-2012 Member, Medical School Admissions Committee

2007-2017 Member, Interdepartmental Neuroscience Program Admissions Committee

2008-pres Director, “Neurobiology of Cortical Systems” (T32) Training Program

2008-2017 Member, Interdepartmental Neuroscience Program Executive Committee

2008-2017 Director of Graduate Studies, Neurobiology Graduate Program

2008-2017 Member of Biological and Biomedical Science (BBS) Executive Committee

2011 Developed new course on the “Neurobiology of Cortical Systems”

2012-2017 Member of MD/PhD Program Faculty/Admissions Committee

2016-2017 Chair, Curriculum Reorganization Committee, Interdepartmental Neuroscience Program

2017-2018 Developed and directed new core course, “Foundations of Systems Neuroscience” for the Interdepartmental Neuroscience Graduate Program

Postdoctoral Trainees/ Research Associates

**Dong-Seob Kim**, M.D., Ph.D., 1999-2001, Associate Professor, Department of Ophthalmology, Hanyang University School of Medicine, Seoul, South Korea.

**Hui-Chen Lu**, Ph.D., 1999-2005, Professor, Department of Psychological and Brain Sciences, Indiana University.

**Joanna Zhang,** Ph.D., 2009-2011, Associate Professor at Institute of Brain Science, Fudan University, Shanghai, China

**Hong-Ping Xu,** Ph.D., 2007-2014, Resident in Optometry, New England School of Optometry

**Hong Li,** Ph.D., 2008-2012, Assistant Professor, Anhui Medical School, China

**James Ackman,** Ph.D., 2008-2014, Assistant Professor in Molecular, Cell and Developmental Biology, University of California at Santa Cruz

**Moran Furman,** Ph.D., 2008-2011, Scientific Editor, Neuron.

**Ethan Mohns,** Ph.D., 2010-present

**Sophia Fertuzinhos,** Ph.D., 2011-2012, Postdoctoral Fellow, Yale University

**Ali Hamodi,** Ph.D., 2016-present

**Evelyn Lake,** Ph.D., 2016-2019, Assistant Professor, Yale University

**Naoyuki Matsumoto,** Ph.D., 2020-present

Graduate Students

As Thesis Advisor

**Daniel T. Plas**, Ph.D. in Neuroscience, 2005; Current Position: Assistant Professor, University of Texas, Pan American

**Sunil Mehta,** Ph.D. in Developmental Biology, 2005; Current Position: Fellow in Child and Adolescent Psychiatry at UCLA

**Michael Albright**, Ph.D. in Neuroscience, 2007; Current Position: Postdoctoral fellow in Neuroscience at UT Houston

**Anand Chandrasekaran,** Ph.D. Candidate in Neuroscience, 2002-2006; Current Position: Founder, Chief Technology Officer, Mad Street Den

**Ruchir Shah,** Ph.D. Ph.D. in Neuroscience, 2008; Current Position: Supervisor of Scientific Communications at Weber Shandwick

**Melis Inan,** Ph.D. Candidate in Developmental Biology, 2009; Current Position: Postdoctoral fellow at Weill/Cornell Medical School

**Onkar Dhande,** Ph.D. Candidate in Developmental Biology, 2005-2011; Current Position: Postdoctoral fellow in Huberman Lab at UC San Diego

**Timothy Burbridge**, Ph.D. Candidate in Neurobiology, 2009-2015; Current Position: Postdoctoral fellow in Fishell lab at NYU/Harvard

**Yidong Li,** Ph.D. Candidate in Neuroscience, 2012-2018; Current Position: Postdoctoral fellow in Li lab at UQ Queensland Brain Institute

**Alexander Gribizis,** Ph.D. Candidate in Neuroscience, 2013-2019; Current Position: Postdoctoral fellow in Fitzpatrick Lab at Max Plank Florida Institute

**Xinxin Ge**, Ph.D. 2014-2020, Current Position: Postdoctoral fellow in Scanziani lab at UCSF

**Jacob Lister**, M.D./Ph.D. Candidate in Neuroscience, 2015-2020, Current Position: Medical Student, Yale University

**Sol Bernardez**, Ph.D. Candidate in Neuroscience, 2015-present

**Daniel Barson**, M.D./Ph.D. Candidate in Neuroscience, 2016-present

**Yixiang Wang,** Ph.D. Candidate in Neuroscience, 2017-present

**Kathy Zhang**, Ph.D. Candidate in Neuroscience, 2018-present

As Thesis Committee Member (BCM)

**Cynthia Galvan**, Ph.D. in Neuroscience, 2001

**Beth Boudreaux**, Ph.D. in Neuroscience, 2002, Postdoctoral Researcher at Northwestern

**Sam McClure**, Ph.D. in Neuroscience, 2003, Postdoctoral Researcher at Princeton

**Tian-ming Yang**, Ph.D. in Neuroscience, 2003, Postdoctoral Researcher at the University of Washington

**Patrik Verstreken**, Ph.D. in Developmental Biology, 2002, Postdoctoral Researcher at BCM

**Kartik Pappu**, Ph.D. in Developmental Biology, 2004, Postdoctoral Researcher at UCLA

**Tycho Hoogland**, Ph.D. in Neuroscience, 2004, Postdoctoral Researcher at BCM

**Hita Adwanakar**, Ph.D. in Neuroscience, 2005, Postdoctoral Researcher at UT Galveston

**Jacqueline Lee Alldrit**, Ph.D. in Physiology, 2005, High school teacher, CA

**Michael Greenbaum**, Ph.D. Candidate in Genetics, 2001-2003

**Yarimar Carrasaquillo**, Ph.D. in Neuroscience, 2005, Postdoctoral Researcher at Washington University

**Adam Mayer,** Ph.D. Candidate in Neuroscience, 2001-2007

**Xu Liu**, Ph.D. Candidate in Molecular and Cell Biology, 2002-2008

**Tong Wey Koh,** Ph.D. Candidate in Developmental Biology, 2002-2006

**Marci Antion,** Ph.D. Candidate in Neuroscience, 2002-2006

**Bryan McGill** Ph.D. Candidate in Neuroscience, 2002-2007

**William Krause,** Ph.D. Candidate in Molecular and Cell Biology, 2003-2008

**Wilson Chwang,** Ph.D. Candidate in Neuroscience, 2004-2007

**Cindy Ly,** Ph.D. Candidate in Neuroscience, 2004-2007

**Joonyeol Lee**, Ph.D. Candidate in Neuroscience, 2004-2007

**Kahlil Martin,** Ph.D. Candidate in Neuroscience, 2004-6, returned to medical school at BCM

**Olivia Fitch**, Ph.D. Candidate in Neuroscience, 2004-2007

**Matt Weston**, Ph.D. Candidate in Neuroscience, 2005-2007

**Carlos Ballester**, Ph.D. Candidate in Developmental Biology, 2005-2006

As Thesis Committee Member (Yale)

**Amanda Foust**, Ph.D. Candidate in Neurobiology, 2008-2012

**Nao Gamo**, Ph.D. Candidate in Neurobiology, 2008-2012

**Wenqi Han** Ph.D. Candidate in Neurobiology, 2008-2015

**Lu Jin,** Ph.D. Candidate in Neurobiology, 2009-pres

**Matthew Krause,** Ph.D. Candidate in Neurobiology, 2008-2012

**Ying Zhu,** Ph.D. Candidate in Neurobiology, 2009-2014

**Martin Dominguez,** Ph.D. Candidate in Neurobiology, 2008-2013

**Jah Chaisangmongkon**, Ph.D. Candidate in Neuroscience, 2009-2015

**Christopher Donahue**, Ph.D. Candidate in Neurobiology, 2009-2014

**Matthew Kleinman,** Ph.D. Candidate in Neurobiology, 2010-2015

**Christopher Bartley,** Ph.D. Candidate in Neurobiology, 2010-2014

**Feras Akbik**, Ph.D. Candidate in Neuroscience, 2010-2013

**Yixiao Xou,** Ph.D. Candidate in Neuroscience, 2009-2015

**Jonas Belina**, Ph.D. Candidate in Neuroscience, 2011-2015

**Jamie Benoit**, Ph.D. Candidate in Psychology, 2011-2015

**Paul Yuan**, Ph.D Candidate in Neurobiology, 2012-2015

**Mitra Miri**, Ph.D. Candidate in Neuroscience, 2012-2016

**Jeremy Chang**, Ph.D. Candidate in Neurobiology, 2012-2016

**Zhen Li**, Ph.D. Candidate in Neuroscience, 2012-2017

**Bart Massi**, Ph.D. Candidate in Neuroscience, 2013-2018

**Omer Mano**, Ph.D. Candidate in Molecular, Cellular and Developmental Biology, 2013-2019

**Elizabeth Salm**, Ph.D. Candidate in Neuroscience, 2015-pres

Didactic Lectures (since 1998)

International and National

Brain Expo, San Antonio, TX, “Nature versus Nurture in Brain Development: How Genes and the Environment Combine to Guide Brain Development”, July 2002

Gulbenkian Institute for Science PhD Program in Biomedicine, Lisbon, Portugal; “Neuromuscular Junction Activity-Dependent Development”, Feb. 15, 2005

Gulbenkian Institute for Science PhD Program in Biomedicine, Lisbon, Portugal; “Spontaneous Neuronal Activity in Map Development”, Feb. 15, 2005

Gulbenkian Institute for Science PhD Program in Biomedicine, Lisbon, Portugal; “Sensory Experience in Map Development”, Feb. 16, 2005

Gulbenkian Institute for Science PhD Program in Biomedicine, Lisbon, Portugal; “Nature vs. Nurture in Sensory Map Development”, Feb. 16, 2005

Local (BCM and Yale University)

More than 500 lectures in a variety of different Baylor College of Medicine and Yale University undergraduate, graduate and medical school courses on subjects in Neuroscience ranging from Neural Development, Systems Neuroscience, Biology of Schizophrenia, Sleep, Working Memory, Mouse Transgenic Models, Visual System, Eye Movement, Gene Regulation, Sensory Channels, etc.

Service Activities at Baylor College of Medicine (1998-2006)

Neuroscience Department Assignments

Faculty Search Committee-Assistant Professor, Neuroscience, 1998-99

Examination Committee for the Program in Developmental Biology, 1998-2006

Examination Committee for the Department of Neuroscience, 1998-2006

Chair, Neuroscience Seminar Committee, 1998-2006

Co-Chair, De Lange Conference on Neuroscience, 1999-2001

Neuroscience Graduate Curriculum Reorganization Committee, 2001

Neuroscience Graduate Program Steering Committee, 2004-2006

Chair, Neuroscience Graduate Student Recruitment Committee, 2004-2006

Faculty Search Committee-Tenure Track Professor in Systems Neuroscience, 2005

Neuroscience Graduate Curriculum Reorganization Committee, 2005-2006

Faculty Search Committee-Tenure Track Professor in Molecular/Cellular Neuroscience, 2006

College Administrative Assignments

Faculty Oversight Committee, Medical Scientist Training Program, 1998-2006

Program in Developmental Biology Steering Committee, 2000-2006

Baylor College of Medicine Graduate School Recruitment Committee, 2005-2006

Baylor College of Medicine Graduate School Executive Council, 2005-2006

Director, Machine Shop Module, NEI Vision Core Grant, 2005-2006

Baylor College of Medicine Graduate School Promotions Committee, 2006

Co-Director, Baylor College of Medicine Medical Scientist Training Program (MD/PhD), 2006

Service Activities at Yale University (2007-present)

Department Assignments

Member, Department of Neurobiology Tenure-Track Faculty Search Committee, 2007, 2008, 2009

Coordinator, ‘Club Neurobiology’ Colloquium Series, 2007-2010

Member, Department of Ophthalmology Research Director Faculty Search Committee, 2007

Member, Department of Ophthalmology Tenure-Track Faculty Search Committee, 2008, 2009, 2011, 2015

Director of Graduate Studies, Neurobiology Graduate Program, 2008-2017

Coordinator, Department of Neurobiology Seminar Series, 2009-2016

Chair, Department of Neurobiology Tenure-Track Faculty Search Committee, 2011, 2012, 2015

Department of Neurobiology Liaison to Department Chair Search Committee, 2012-2015

Member, Department of Neuroscience Executive Committee, 2015-2017

Deputy Chairman, Department of Neuroscience, 2015-2017

Member, Department of Neuroscience Tenure-Track Faculty Search Committee, 2015, 2016, 2017, 2018

University Administrative Assignments

Member, Yale University School of Medicine (MD) Admissions Committee, 2007-2012

Director, Yale University Vision Research Core Program, 2007-present

Member, Yale University School of Medicine Machine Shop Oversight Committee, 2007-present

Director, Vision Research Imaging Core Module, 2007-present

Member, Neuroscience Track Admissions Committee, 2007-2017

Member, Biological and Biomedical Sciences (BBS) Executive Committee, 2008-2017

Member, Interdepartmental Neuroscience Program (INP) Executive Committee, 2008-2017

Fellow, Berkeley College, Yale University (undergraduate faculty advisor)*,* 2010-present

Member, Funds and Fellowships Committee, Yale University School of Medicine, 2010-2014

Member, Biological and Physical Sciences Degree Committee, Yale University, 2012-2014

Member, MD/PhD Program Faculty Committee, Yale University School of Medicine, 2012-2016

Member, Department of Ophthalmology Chair Search Committee, 2014-2016

Member, Term Appointments and Promotions Committee, 2014-2017

Member, Strategic Planning Committee for Basic Science, 2014-2017

Member, Degree Committee for the Graduate School of Arts and Sciences 2014-2016

Member, Scholar Awards Committee, 2014-2017

Member, LCME Academic Environment Subcommittee, 2014-2015

Member, Kavli Institute for Neuroscience at Yale Steering Committee, 2015-2020

Deputy Dean for Scientific Affairs (Basic Science Departments), Yale School of Medicine, 2017-2020

Member, Yale Center for Research Computing Advisory Committee, 2017-present

Member, Yale Cancer Center Advisory Board, 2017-present

Vice Provost for Research, Yale University, 2020-present