SAMUEL ANDREW HIRES, Ph.D.

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PROFESSIONAL EXPERIENCE

2007-2008 **Postdoctoral Associate**, Janelia Research Campus, Howard Hughes Medical Institute, Ashburn, Virgina
Advisor: Loren Looger

2008-2013 **Postdoctoral Associate**, Janelia Research Campus, Howards Hughes Medical Institute, Ashburn, Virgina
Advisor: Karel Svoboda

2014-present **Assistant Professor**, Department of Biological Sciences, Neurobiology Section, University of Southern California, Los Angeles, California.

2016-present **Member**, The Bridge at USC, University of Southern California, Los Angeles, California.

EDUCATION

2001 **S.B., Brain and Cognitive Science**, Minor: Biology, Massachusetts Institute of Technology, Cambridge, Massachusetts

2007 **Ph.D., Neurosciences**, University of California, San Diego, La Jolla, California
Dissertation Title: Development and use of genetically-encoded indicators of neural activity.
Dissertation Advisor: Prof. Roger Tsien

OTHER TRAINING

1998 **Undergraduate Researcher**, Massachusetts Institute of Technology, Cambridge, Massachusetts.
Research Advisor, Prof. Richard Wurtman

2000-2001 **Undergraduate Researcher**, Picower Center for Learning and Memory, Massachusetts Institute of Technology,
Research Advisor, Prof. Guosong Liu

2001-2002 **Ph.D. Rotations**, Graduate Program in Neurosciences, University of California, San Diego, La Jolla, Californa,
Research Advisors: Prof. Marla Feller, Prof. Charles Zuker

2002 **Visiting Scientist**, RIKEN Brain Science Institute, Wako-shi, Tokyo, Japan.
Research Advisor, Dr. Atsushi Miyawaki

2007 **Summer Program in Ion Channel Physiology**, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York

PUBLICATIONS

Peer-reviewed

20. Gutnisky DA, Yu J, **Hires SA**, To MS, Bale M, Svoboda K, Golomb D. Mechanisms underlying a thalamocortical transformation during active tactile sensation. PLoS Comput Biol. 2017;13(6):e1005576.

19. Yu J, Gutnisky DA, **Hires SA**, Svoboda K. Layer 4 fast-spiking interneurons filter thalamocortical signals during active somatosensation. Nature Neuroscience 2016;

18. **Hires SA^**, Schuyler A, Sy J, Huang V, Wyche I, Wang X, Golomb D. Beyond cones: An improved model of whisker bending based on measured mechanics and tapering. J Neurophysiol. 2016 Jun 1:jn.00511.2015. doi: 10.1152/jn.00511.2015.
^Corresponding Author

17. Sofroniew NJ, Vlasov YA, **Hires SA**, Freeman J, Svoboda K. Neural coding during whisker-guided locomotion. eLIFE. 2015 Dec 23;4. pii: e12559. doi: 10.7554/eLife.12559.

16. **Hires SA***, Gutnisky D*, Yu J, O'Connor DH, Svoboda K; Low-noise encoding of active touch by layer 4 in the somatosensory cortex. eLIFE 2015 Aug 6; 10.7554/eLife.06619

15. Guo Z; **Hires SA**; Li N; O'Connor D; Komiyama T; Ophir E; Huber D; Bonardi C; Morandell K; Gutnisky D; Peron S; Xu N; Cox J; Svoboda K. "Procedures for behavioral experiments in head-fixed mice". PLoS One. 2014 Feb 10;9(2):e88678.

14. **Hires SA**, Pammer L, Svoboda K, Golomb D. Tapered whiskers are required for active tactile sensation eLIFE, 2013 Nov 19;2:e01350. doi: 10.7554/eLife.01350.

13. O'Connor DH*, **Hires SA***, Guo ZV, Li N, Yu J, Sun QQ, Huber D, Svoboda K; Neural coding during active somatosensation revealed using illusory touch. Nature Neuroscience 2013 Jun 2; 16(7):958-65

12. Talantova M*, Sanz-Blasco S*, Zhang X*, Xia P*, Akhtar MW, Okamoto S, Dziewczapolski G, Nakamura T, Cao G, Pratt AE, Kang YJ, Tu S, Molokanova E, McKercher SR, **Hires SA**, Wolosker H, Sason H, Solomon J, Powers ET, Kelly JW, Roberts AJ, Tong G, Zhang D, Nakanishi N, Chen HSV, Michael S, Masliah E, Heinemann SF, Piña-Crespo JC, Lipton SA. Aβ induces astrocytic glutamate release, extrasynaptic NMDA receptor activation, and synaptic loss Proc Natl Acad Sci U S A 2013 Jul 2;110(27):E2518-27

11. Pammer L*, O'Connor, DH*, **Hires SA**, Efros AL, Clack N, Huber D, Myers EW, Svoboda K. The mechanical variables underlying object localization along the axis of the whisker. J Neuroscience 2013 Apr 17;33(16):6726-41

10. Marvin JS, Borghuis BG, Tian L, Cichon J, Harnett MT, Akerboom J, Gordus A, Renninger S, Chen TW, Bargmann CI, Orger MB, Schreiter ER, Demb JB, Gan W, Magee JC, **Hires SA**, Looger LL An optimized fluorescent probe for visualizing glutamate neurotransmission. Nature Methods. 2013 Feb;10(2):162-70.

9. Clack NG, O'Connor DH, Huber D, Petreanu L, **Hires SA**, Peron S, Svoboda K, Myers EW. Automated tracking of whiskers in videos of head fixed rodents. PLoS Comput Biol. 2012 Jul; 8(7):e1002591

8. Tian L, **Hires SA**, Looger LL. Imaging neuronal activity with genetically encoded calcium indicators. Cold Spring Harb Protoc. 2012 Jun 1;2012(6):647-56.

7. Li H, Foss SM, Dobryy YL, Park CK, **Hires SA**, Shaner NC, Tsien RY, Osborne LC, Voglmaier SM. Concurrent imaging of synaptic vesicle recycling and calcium dynamics. Front Mol Neurosci. 2011;4:34. Epub 2011 Nov 2.

6. Hooks BM, **Hires SA**, Zhang YX, Huber D, Petreanu L, Svoboda K, Shepherd GM. Laminar analysis of excitatory local circuits in vibrissal motor and sensory cortical areas. PLoS Biol. 2011 Jan 4;9(1):e1000572.

5. Tian L, **Hires SA**, Mao T, Huber D, Chiappe ME, Chalasani SH, Petreanu L, Akerboom J, McKinney SA, Schreiter ER, Bargmann CI, Jayaraman V, Svoboda K, Looger LL. Imaging neural activity in worms, flies and mice with improved GCaMP calcium indicators. Nature Methods. 2009 Dec;6(12):875-81. Epub 2009 Nov 8.

4. Akerboom J, Rivera JD, Guilbe MM, Malavé EC, Hernandez HH, Tian L, **Hires SA**, Marvin JS, Looger LL, Schreiter ER. Crystal structures of the GCaMP calcium sensor reveal the mechanism of fluorescence signal change and aid rational design. J Biol Chem. 2009 Mar 6;284(10):6455-64. Epub 2008 Dec 18.

3. **Hires SA**, Tian L, Loren Looger. Neural Activity Reporting with Genetically Encoded Calcium Indicators. Brain Cell Biology 2008 Aug;36(1-4):69-86

2. **Hires SA**, Zhu Y, and Tsien RY. Optical measurement of synaptic glutamate spillover and reuptake by linker optimized glutamate-sensitive fluorescent reporters. Proc Natl Acad Sci U S A. 2008 Mar 18;105(11):4411-6

1. Palmer AE, Giacomello M, Kortemme T, **Hires SA,** Lev-Ram V, Baker D, and Tsien RY. 2006. Ca2+ Indicators based on computationally redesigned calmodulin-peptide pairs. Chemistry & Biology 13, 521–530

Other Publications

1. Kim J & **Hires SA,** News & Views: Brake and gas pedals in motor cortex *Nature Neuroscience* (in press)

Pending Manuscripts

Vaxenburg, R, Efros A, Svoboda K, **Hires SA**. Whisker dynamics underlying tactile exploration. (*in revision*)

Citation metrics

Times Cited: 2872 (Google Scholar); 1813 (ISI)
h-index: 16

FUNDING HISTORY

ACTIVE

2014-2018 **United States - Israel Binational Science Foundation, 2013033**
($47,250 total costs / year)
Do cortical neuronal circuits operate in a balanced state?
Role: CoPI, 50% effort
The major goal of this project is to test if activity in Layer 4 of primary somatosensory cortex in mouse matches the theoretical model of the balanced state.

2015-2017 **Rose-Hills Foundation, 003565**
($75,000 total costs / year)
Optogenetic approaches to understanding and restoring touch sensation
Role: PI
The major goal of this project is to develop methods for artificial touch perception via optogenetic stimulation of primary somatosensory cortex in mice.

2015-2018 **Whitehall Foundation, 2015-05-66**
Reverse-engineering the sense of touch in cortical circuits
($75,000 total costs / year)
Role: PI
The major goal of this project is to gain a comprehensive understanding of the neural dynamics of primary somatosensory cortex in healthy mice during object localization.

2016-2018 **NIH BRAIN Initiative / NEI, R21EY027620** *Impact score **25***
Structure guided design of photoselectable channelrhodopsins
(total costs: $247,500 / year)
Role: Lead PI (MPI, 30% effort)
The major goal of this project is to develop a new type of channelrhodopsin to control flexible sets of neurons in distributed circuits *in vivo.*

2017-2019 **NIH / NIMH R21MH109844-01A1** *Percentile score **10.0%,** Impact score **25***
(total costs $226,875 / year)
Exploring Anatomical and Circuit Plasticity Deficits in Fmr1 Mice During Tactile Learning
Role: MPI 50% effort
The major goal of this project is to identify changes in neural dynamics in primary somatosensory cortex in a mouse model of fragile X syndrome.

PENDING

2017-2022 **NIH New Innovator Award, DP2OD024308** *Impact score **16***
New approaches to understanding sensorimotor learning and perception
(total costs $495,000 / year)
The major goal of this project is to understand how sensory representations of touch change in cortex across learning.

2017-2020 **NIH BRAIN Initiative, U01NS103558** *Impact score **19***
Novel fluorescent sensors based on GPCRs for imaging neuromodulation
(total costs $752,842 / year)
Role: Lead PI (MPI 30% effort)
The major goal of this project is to develop and validate GPCR-based fluorescent sensors for imaging neuromodulation

2018-2023 **NIH / NINDS, R01NS102808** *Percentile score **10.0%,** Impact score **26***
Cortical circuit mechanisms of sensorimotor object localization
(total costs $412,500 / year)
The major goal of this project is to understand how sensory and motor signals are integrated within primary somatosensory cortex to construct a neural code for object location.

NOT FUNDED

2014

- HFSP: *Flexible and precise optical control of sensory perception with reengineered channelrhodopsins*
- NSF EAGER: *Rapidly re-assignable optical control of selected neural ensembles during behavior*
- Sloan Foundation: *Reverse-engineering the sense of touch with new optogenetic tools*

2015

- Klingenstein-Simons Foundation: *Synthesizing touch perception*
- Mallinckrodt Foundation: *Mechanisms of texture perception in cortical circuits*
- NIH DP2 New Investigator: *A new approach to understanding and restoring the sense of touch* **Finalist, top 20%, Final Round Impact Score 40**
- NSF Biophotonics: *Transfer-Printed Photonic-Crystal Probes for Optogenetic Light-Sheet Illumination*
- Pew Biomedical Scholars (internal): *Synthesizing touch perception*
- Rita Allen Foundation (internal): *New optogenetic approaches to understanding and restoring the sense of touch*
- Simons Collaboration on the Global Brain Fellowships: *The function of cortical ensemble reorganization in perceptual learning*

2016

- Agilent Young Investigator: *New technologies for observing, controlling, and correcting dynamics of neural circuits*
- Brain Research Fund: *Circuit mechanisms of texture perception in somatosensory cortex*
- Klingenstein-Simons Foundation: *The source and influence of neural variability on sensory representation and perception*
- NIH BRAIN Initiative R21: *Transfer-printed glowstick probes for optogenetic light-sheet illumination*
- NSF Biophotonics: *Transfer-Printed Photonic-Crystal Probes for Layer-Specific Optogenetic Illumination*
- Packard (internal): *Understanding signal and noise in the brain*
- Rita Allen Foundation (internal): *Identifying and correcting disrupted cortical circuit dynamics in neurological disorders*

SERVICE HISTORY

Departmental Service (Neurobiology/Biological Sciences)

2014-present Webmaster, Biological Sciences, Neurobiology Section
2014-2015 Member, Neurobiology faculty search committee: Bruce Herring
2016 Member, Biological Sciences, Neurobiology Section, Faculty Merit Evaluation Committee

University Service

2014-present Neuroscience Graduate Program Admissions Interviews
2014-present Chair, Neuroscience Graduate Program, Distinguished Lecture Series
2015-2016 Advisor, Department of Biomedical Engineering Faculty Search
2015-2016 Advisor, Department of Electrical Engineering, Neuroengineering Faculty Search
2015-present Member, Neuroscience Graduate Program Executive Committee
2016-present Member, Quantitative Biology Undergraduate Major Executive Committee
2017 MD/PhD Program, Keck School of Medicine Admissions Interviews

Professional Service

Funding Agency Reviewer

2014

- NIH RFA-NS-14-007, BRAIN Initiative: New Technologies and Novel Approaches for Large-Scale Recording and Modulation in the Nervous System (U01). Member, Special Emphasis Panel
- NIH RFA-NS-14-008, BRAIN Initiative: Optimization of Transformative Technologies for Large Scale Recording and Modulation in the Nervous System (U01). Member, Special Emphasis Panel
- Israel-US Binational Science Foundation, Proposal reviewer

2015

- NIH RFA-NS-15-003, BRAIN Initiative: New Technologies and Novel Approaches for Large-Scale Recording and Modulation in the Nervous System (U01). Member, Special Emphasis Panel
- NIH RFA-NS-15-004, BRAIN Initiative: Optimization of Transformative Technologies for Large Scale Recording and Modulation in the Nervous System (U01). Member, Special Emphasis Panel
- Israel Science Foundation. Proposal reviewer

2016

- NIH RFA-NS-16-007, BRAIN Initiative: New Technologies and Novel Approaches for Large-Scale Recording and Modulation in the Nervous System (U01). Member, Special Emphasis Panel
- NIH RFA-NS-16-008, BRAIN Initiative: Optimization of Transformative Technologies for Large Scale Recording and Modulation in the Nervous System (U01). Member, Special Emphasis Panel
- Israel Science Foundation. Proposal reviewer
- Netherlands Organization for Scientific Research, Proposal reviewer

2017

- NIH RFA-NS-17-007, BRAIN Initiative: Targeted Brain Circuits (R01, R21). Member, Special Emphasis Panel

Advisory Boards
2015-present Brain Preservation Foundation

Conference Organization
2015-present Barrels, Society for Neuroscience, Satellite Conference Organizing Committee
2016 Site Leader, Barrels 29, Society for Neuroscience, Satellite Conference, University of Southern California, Los Angeles, California
2016 CoSyne, abstract reviewer

Journal Peer Reviews
2014-present

- *ACS Chemical Neuroscience*
- *eLIFE (3x)*
- *Frontiers in Cellular Neurobiology*
- *Frontiers in Neural Circuits*
- *IEEE Transactions on Haptics*
- *Journal of Neurophysiology (3x)*
- *Journal of Neuroscience*
- *Nature (2x)*
- *Nature Neuroscience (2x)*
- *Nature Biotechnology (2x)*
- *Nature Methods*
- *Zoology*

TEACHING EXPERIENCE

Graduate and Undergraduate Instruction at USC (contribution per course)
2014-present NEUR490, HP490 (advised undergraduate research every semester)
2015 BISC220 Cell Biology and General Physiology, (50%)
Rating: Instructor 3.78, Course 3.56. Mean GPA 2.67
2015 BISC462 Optogenetics : Reading and writing the neural code (100%)
Rating: Instructor 4.59, Course 4.24. Mean GPA 3.76
2016 BISC220 Cell Biology and General Physiology, (50%)
Rating: Instructor 3.63, Course 3.41. Mean GPA 2.69
2017 BISC220 Cell Biology and General Physiology, (50%)
Rating: Instructor 3.80, Course 3.60. Mean GPA 2.70
2017 BISC221 Honors Cell Biology and General Physiology, (50%)
Rating: Instructor 3.70, Course 3.60. Mean GPA 3.50

External Instruction
2002 BIBC100 TA - Structural Biochemistry, University of California, San Diego

Graduate Program Faculty, University of Southern California
2014-present Neuroscience Graduate Program (NGP)

TRAINEES

Postdoctoral Research Associates *(directly supervised)*
2015-present Jinho Kim, Ph.D.

Graduate students *(directly supervised)*
2014-present Jonathan Cheung, Neuroscience Graduate Program
2015-present Samson King, Neuroscience Graduate Program

2015-present Philip Maire, Neuroscience Graduate Program
2017-present Jing 'Lily' Zou, Neuroscience Graduate Program

NIH T32 Training Grant Faculty Advisor
2016 Philip Maire, Neuroscience Graduate Program

Graduate Guidance and Thesis Committee
Current (9 students)
Rachael Yuan (Chair), Neuroscience Graduate program
Andre Andreev
Beril Kiragasi, Biological Sciences Graduate Program
Chen Tian, Neuroscience Graduate Program
Lei Jin, Neuroscience Graduate Program
Muye Zhu, Neuroscience Graduate Program
Seohee Ahn, Neuroscience Graduate Program
Ulas Ciftcioglu, Neuroscience Graduate Program
Xiling Lee, Neuroscience Graduate Program

Previous (2 students)
Vandana Suresh, Ph.D., Neurobiology Graduate Program
Ramsay Brown, M.S. Neuroscience Graduate Program

Undergraduate Research *(11 students directly supervised)*
Jason Strawbridge (USC post-bac), Mariah Kim (Rose-Hills fellow, Provost award, WiSE award, Mills post-bac), Jonathan Sy (Rose-Hills fellow, 1 publication), Vincent Huang (SURF Fellowship, 1 publication), Erika Chang-Sing (SOAR), Maariyah Patel (SURF), Charles Dorman (Rose Hills Fellowship, SURF), Sally Chen (HP490), Yervand Azatian (SURF), Isis Wyche (Provost, WiSE, NEUR490, 1 publication), Yiyao Liu (SOAR)

PROFESSIONAL ASSOCIATIONS

2000-present Society for Neuroscience
2015-2016 Biophysical Society

FELLOWSHIPS AND AWARDS

2001-2002 Merck-UCSD Pre-doctoral Fellowship
2002 Seeing the Brain in Action : RIKEN BSI summer program
2004 Best student abstract, Fine Science Tools, Meeting of the Society for Neuroscience
2007 Ion channel physiology : Cold Spring Harbor summer program
2010 Best research blog, expert-level, ResearchBlogging
2015 Rose Hills Foundation Research Fellowship

INVITED SEMINARS

2017
"Reverse-engineering the sense of touch", Ben-Gurion University, Be'er Sheva, Israel. 1/25/17
"Reverse-engineering the sense of touch", Weizmann Institute, Rehovat, Israel. 1/26/17
"Reverse-engineering the sense of touch", University of California, Riverside. Riverside, California. 1/15/2017

2016

"Structure guided design of photoselectable channelrhodopsins" BRAIN Investigator Meeting NIH, Bethesda, MD. 12/10/16-12/14/16

"Reverse-engineering the sense of touch" 15th Southern California Learning & Memory Symposium, UCLA, Los Angeles 5/9/16

"Closed-loop optogenetic control of tactile sensation", Optogenetics: From molecules to applications, Lorenz Center, Leiden, The Netherlands, 3/16/16

"Reverse-engineering the sense of touch" Netherlands Institute for Neuroscience, Amsterdam, The Netherlands, 3/15/16

"Low noise encoding of touch in cortex", SoCal SysBio, Irvine CA, 1/30/16

"Low noise encoding of touch in cortex", Winter Conference in Brain Research, 1/27/16

2015

"Low noise encoding of touch in the somatosensory cortex", UCLA, 11/6/15

"Beyond cones: An improved model of whisker bending" Barrels XXVIII, Chicago, 10/16/15

"Reverse-engineering the sense of touch" Seoul National University, Pyeongchang, Korea, 10/9/15

"Reverse-engineering the sense of touch" KAIST, Daejeon, Korea, 10/8/15

"Low noise encoding of Active Touch by Layer 4 in the Somatosensory Cortex" USC NGP retreat 9/26/15

"Low noise encoding of Active Touch by Layer 4 in the Somatosensory Cortex" Joint Symposium on Neural Computation, USC 5/16/15

"Reverse-engineering the sense of touch" BISC Intersection seminar, USC, 1/29/15

2013 and prior

"Deterministic spiking in somatosensory cortex." Mammalian circuits underlying touch sensation : Janelia Farm Research Campus. September 22-26, 2013.

"Cortical coding of touch during active and virtual tactile sensation." Dynamics of cortical and cortical-subcortical circuits : Janelia Research Campus. June 10-14, 2013

"Encoding and decoding of touch sensation and perception in cortical circuits" University of Southern California, March 21th, 2013

"Encoding and decoding of touch sensation and perception in cortical circuits" Caltech, March 12th, 2013

"Encoding and decoding of touch perception in cortical circuits" Naval Research Lab, February 26th, 2013.

"Encoding whisker-related variables in the mouse barrel cortex during object localization" BARRELS XXV, October 11-12, 2012

"The science of free will" Unitarian Universalist congregation of Columbus, Indiana, March 22nd 2008.

"Fluorescent protein indicators for glutamate and long-range protein-protein interaction" Fluorescent Proteins and Biological Sensors: Janelia Farm Research Campus. October 28-31, 2007. (shared talk)

"Measuring glutamate spillover and uptake with GluSnFRs." Imaging Neurons and Neural Activity: New Methods, New Results. Cold Spring Harbor Labs, March 2007.

"Direct visualization of synaptic release plasticity with novel, genetically-encoded, glutamate-sensitive fluorescent reporters." UCSD Neuroscience Graduate Program Spring Retreat, April 2005.

SELECTED CONFERENCE ABSTRACTS

Cheung JA, Schuyler A, Hires SA. Representation of mechanosensory forces in somatosensory cortex during object localization, 60th Biophysical Society Annual Meeting, 2016

King S, Song M, Kim M, Wyche I, Schuyler A, Hires SA. 60th Biophysical Society Annual Meeting, 2016

Wang X, Huang V, Sy J, Schuyler A, Golomb D, Hires SA, Beyond cones: computing tactile input forces from improved models of whisker bending, 60th Biophysical Society Annual Meeting, 2016

Hires, S. A., O'Connor, D., Gutnisky, D., Svoboda K. Encoding whisking-related variables in the mouse barrel cortex during object localization Soc. Neurosci. Abstr., Vol. 42 (2012)

O'Connor, D.,* Hires,* S. A., Guo Z., Sun Q.Q., Svoboda K. Neural coding for object location revealed using synthetic touch Soc. Neurosci. Abstr., Vol. 42 (2012)

Golomb D, Hires SA, Svoboda K, Whisker shape changes induced by touch Soc. Neurosci. Abstr., Vol. 42 (2012)

Hires, S. A., O'Connor, D., Gutnisky, D., Svoboda K.. Encoding of vibrissal sensory input and task-related variables in the mouse barrel cortex during whisker-based object localization Soc. Neurosci. Abstr., Vol. 41 (2011)

Tian, L., Hires, S. A., Mao, T., et al. Imaging neural activity with genetically encoded calcium indicators Soc. Neurosci. Abstr., Vol. 40 (2010)

Hires, S. A., O'Connor, D., Clack, N., et al. Encoding of vibrissal sensory input in the mouse barrel cortex during whisker-based object localization Soc. Neurosci. Abstr.,Vol. 40 (2010)

Hooks, B. M., Hires, S. A., Svoboda, K., et al. Local excitatory circuits in mouse vM1, vS1, and S2 cortex Soc. Neurosci. Abstr., Vol. 39 (2009)

Viswanathan, S., Tian, L., Hires, A., et al. Improved genetically encoded calcium indicators (GECIs) by rational protein engineering Soc. Neurosci. Abstr., Vol. 38 (2008)

L. Tian, T. Mao, S.A. Hires, D. Huber, K. Svoboda, L.L. Looger An improved genetically-encoded calcium indicator for recording neural activity. Soc. Neurosci. Abstr., Vol. 34 693.7, 2008

J. Akerboom, L. Tian, S. Viswanathan, S. A. Hires, J. S. Marvin, E. R. Schreiter, L. L. Looger Crystal structure of the genetically encoded calcium indicator gcamp2. Soc. Neurosci. Abstr., Vol. 34 597.17, 2008

"Optical measurements of presynaptic strength with novel, genetically-encoded glutamate sensitive fluorescent reporters." Washington, DC: Society for Neuroscience, 2005.

"Direct visualization of synaptic release plasticity with novel, genetically-encoded, glutamate-sensitive fluorescent reporters." Imaging Neurons and Neural Activity: New Methods, New Results. Cold Spring Harbor Labs, March 2005.

S.A. Hires, Y. Zhu, C.F. Stevens, R.Y.Tsien. Dynamic optical mapping of synaptic glutamate release with genetically encoded, glutamate-sensitive fluorescent reporters. Soc. Neurosci. Abstr., Vol. 30 952.13, 2004

S.A. Hires, C. Zuker. DNA shuffling of mammalian taste receptors RIKEN Summer Program 2002

X. Zhao, A. Hires, G. Liu. Activation of pre- and post-synaptic metabotropic glutamate receptors is crucial for the formation of glutamatergic synapses. Soc. Neurosci. Abstr., Vol. 27, (2001).