



## John Huguenard

Professor of Neurology and Neurological Sciences (Neurology Research), of Neurosurgery (Adult Neurosurgery) and, by courtesy, of Molecular and Cellular Physiology

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#### ACADEMIC APPOINTMENTS

- Professor, Neurology and Neurological Sciences
- Professor, Neurosurgery
- Professor (By courtesy), Molecular and Cellular Physiology
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Wu Tsai Neurosciences Institute

#### ADMINISTRATIVE APPOINTMENTS

- Chair, Neuroscience Program Admissions Committee, Stanford University, (2002-2005)
- Professional Advisory Board, Epilepsy Foundation, (2003- present)
- Director, Neuroscience Graduate Program, Stanford University, (2006-2013)
- Board of Directors, American Epilepsy Society, (2009-2011)

#### HONORS AND AWARDS

- Javits Merit Award, NINDS/NIH (2004-2011)
- Research Recognition Award, American Epilepsy Society (2007)
- Faculty Award for Outstanding Service to Graduate Students, Stanford University School of Medicine (2010)
- Fellow of the AAAS, American Association for the Advancement of Science (2015)

#### PROFESSIONAL EDUCATION

- Ph.D., Duke University , Pharmacology (Neuroscience) (1983)

#### LINKS

- Huguenard Lab Website: <https://huguenardlab.stanford.edu/>

### Research & Scholarship

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#### CURRENT RESEARCH AND SCHOLARLY INTERESTS

What are the neuronal mechanisms that underlie network oscillatory synchrony in the thalamocortical system? Such oscillations are related to cognitive processes, normal sleep activities and certain forms of epilepsy. Our approach is an analysis of the cells and microcircuits that make up thalamic and cortical circuits. We also use computational approaches to build physiologically constrained network models to test and improve our understanding of the

circuit. Accordingly, we have been able to identify genes whose products, mainly ion channels, play key roles in the regulation of thalamocortical network responses.

Currently, projects focus on: Development of excitatory connections in neocortex, with an emphasis on AMPA receptor alterations in the early postnatal period -- Molecular pharmacology of inhibitory GABA-A receptors in the thalamus -- and the role of receptor phosphorylation in regulating inhibitory function -- Analysis of progression and destabilization of widespread thalamic network activity using large microelectrode arrays -- The roles of neuropeptides, especially NPY, SST, and VIP in regulating thalamic and cortical function -- Reorganization of neocortical connectivity following injury -- Roles of specific GABA-B receptors in regulating pre- and postsynaptic function.

The laboratory uses experimental techniques ranging from biophysical studies of single ion channels to in vivo recording to purely theoretical studies of network synchrony. Our toolbox includes: --Use of mutant mouse models for analysis of gene function in circuit behavior. For example, knockout and knockin mice have been used to identify the specific GABA-A receptor isoforms that are critical for the therapeutic actions of benzodiazepines in thalamus -- patch clamp recording methods for single channels and whole cell currents, with both isolated neurons and those in situ in brain slices -- multi-unit, multi-site extracellular recording techniques -- immunohistochemical techniques for cell identification and protein localization -- molecular & genetic approaches for in situ hybridization of specific transcripts -- targeted antisense oligodeoxynucleotide knockdown of specific gene products -- microscopic techniques for computerized neuronal reconstruction (NeuroLucida) -- laser uncaging of photo-labile glutamate derivatives for circuit analysis -- single cell intracellular perfusion for modification of e.g., phosphorylation state -- paired intracellular recordings for analysis of single-axon synaptic connections -- fluorometric detection of calcium indicator dyes in cells and circuits -- local perfusion within slice micro-regions for pharmacological analysis -- computer-based modeling of single cell and circuit behaviors.

## Teaching

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### COURSES

#### 2024-25

- Cellular/Molecular Neuroscience Laboratory: NEPR 288 (Sum)

#### 2023-24

- Cellular/Molecular Neuroscience Laboratory: NEPR 288 (Sum)

#### 2022-23

- Cellular/Molecular Neuroscience Laboratory: NEPR 288 (Sum)

### STANFORD ADVISEES

#### Doctoral Dissertation Reader (AC)

Charlotte Herber

### GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Molecular and Cellular Physiology (Phd Program)
- Neurosciences (Phd Program)

## Publications

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### PUBLICATIONS

- **Beyond seizure control: Identifying deficits in cognitive networks in absence epilepsy.** *Science advances*  
Vantomme, G., Devienne, G., Hull, J. M., Huguenard, J. R.

2026; 12 (20): eaed3642

- **Human neuromodulatory assembloids to study serotonin signaling and disease.** *bioRxiv : the preprint server for biology*  
Kanton, S., Meng, X., Dong, C., Birey, F., Wang, D., Reis, N., Yoon, S. J., Kim, J. I., McQueen, J. P., Sakai, N., Nishino, S., Huguenard, J. R., Paşca, et al  
2026
- **Juvenile-to-adult refinement of thalamic reticular circuits via LRRTM3 enables high-resolution sensory encoding.** *Neuron*  
Lee, D., Han, K. A., Jeong, H., Ha, G. E., Lee, H., Kim, B. S., Park, C., Piao, Y., Lee, H., Kim, J., Yoon, T. H., Kim, S., Kim, et al  
2026
- **Disrupted Development of the mPFC-Thalamic Circuit in Shank3-/- mice, an autism-associated model.** *Molecular psychiatry*  
Devienne, G., Vantomme, G., Huguenard, J. R.  
2025
- **Reticular thalamic hyperexcitability drives autism spectrum disorder behaviors in the Cntnap2 model of autism.** *Science advances*  
Jang, S. S., Takahashi, F., Huguenard, J. R.  
2025; 11 (34): eadw4682
- **Actions of the antiseizure drug carbamazepine in the thalamic reticular nucleus: Potential mechanism of aggravating absence seizures.** *Proceedings of the National Academy of Sciences of the United States of America*  
Jang, S. S., Agranonik, N., Huguenard, J. R.  
2025; 122 (31): e2500644122
- **Rhythmic Quakes Shock the Cortical Focus Theory.** *Epilepsy currents*  
Hull, J. M., Huguenard, J. R.  
2025: 15357597251314673
- **Synaptic cell adhesion molecule Cdh6 identifies a class of sensory neurons with novel functions in colonic motility.** *eLife*  
Gomez-Frittelli, J., Devienne, G. F., Travis, L., Kylah, M. A., Duan, X., Hibberd, T. J., Spencer, N. J., Huguenard, J. R., Kaltschmidt, J. A.  
2025; 13
- **Reticular Thalamic Hyperexcitability Drives Autism Spectrum Disorder Behaviors in the Cntnap2 Model of Autism.** *bioRxiv : the preprint server for biology*  
Jang, S., Takahashi, F., Huguenard, J. R.  
2025
- **The reuniens thalamus recruits recurrent excitation in the medial prefrontal cortex.** *Proceedings of the National Academy of Sciences of the United States of America*  
Vantomme, G., Devienne, G., Hull, J. M., Huguenard, J. R.  
2025; 122 (11): e2500321122
- **Human assembloids reveal the consequences of CACNA1G gene variants in the thalamocortical pathway.** *Neuron*  
Kim, J. I., Miura, Y., Li, M. Y., Revah, O., Selvaraj, S., Birey, F., Meng, X., Thete, M. V., Pavlov, S. D., Andersen, J., Paşca, A. M., Porteus, M. H., Huguenard, et al  
2024
- **Synaptic cell adhesion molecule Cdh6 identifies a class of sensory neurons with novel functions in colonic motility.** *bioRxiv : the preprint server for biology*  
Gomez-Frittelli, J., Devienne, G., Travis, L., Kylah, M. A., Duan, X., Hibberd, T. J., Spencer, N. J., Huguenard, J. R., Kaltschmidt, J. A.  
2024
- **Cross-regional coordination of activity in the human brain during autobiographical self-referential processing.** *Proceedings of the National Academy of Sciences of the United States of America*  
Stieger, J. R., Pinheiro-Chagas, P., Fang, Y., Li, J., Lusk, Z., Perry, C. M., Girn, M., Contreras, D., Chen, Q., Huguenard, J. R., Spreng, R. N., Edlow, B. L., Wagner, et al  
2024; 121 (32): e2316021121
- **Reuniens thalamus recruits recurrent excitation in medial prefrontal cortex.** *bioRxiv : the preprint server for biology*  
Vantomme, G., Devienne, G., Hull, J. M., Huguenard, J. R.  
2024

- **Antisense oligonucleotide therapeutic approach for Timothy syndrome.** *Nature*  
Chen, X., Birey, F., Li, M. Y., Revah, O., Levy, R., Thete, M. V., Reis, N., Kaganovsky, K., Onesto, M., Sakai, N., Hudacova, Z., Hao, J., Meng, et al  
2024; 628 (8009): 818-825
- **Atlas of the aging mouse brain reveals white matter as vulnerable foci.** *Cell*  
Hahn, O., Foltz, A. G., Atkins, M., Kedir, B., Moran-Losada, P., Guldner, I. H., Munson, C., Kern, F., Pálovics, R., Lu, N., Zhang, H., Kaur, A., Hull, et al  
2023
- **Adult Gene Therapy for Epilepsy in a Model of Angelman Syndrome: Hope or Hype?** *Epilepsy currents*  
Huguenard, J. R.  
2023; 23 (5): 312-314
- **Adult Gene Therapy for Epilepsy in a Model of Angelman Syndrome: Hope or Hype?** *EPILEPSY CURRENTS*  
Huguenard, J. R.  
2023
- **A CMOS-based highly scalable flexible neural electrode interface.** *Science advances*  
Zhao, E. T., Hull, J. M., Mintz Hemed, N., Uluşan, H., Bartram, J., Zhang, A., Wang, P., Pham, A., Ronchi, S., Huguenard, J. R., Hierlemann, A., Melosh, N. A.  
2023; 9 (23): eadf9524
- **Prefrontal PV interneurons facilitate attention and are linked to attentional dysfunction in a mouse model of absence epilepsy.** *eLife*  
Ferguson, B., Glick, C., Huguenard, J. R.  
2023; 12
- **Loss of Rai1 enhances hippocampal excitability and epileptogenesis in mouse models of Smith-Magenis syndrome (vol 119, e2210122119, 2022 )** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Chang, Y., Kowalczyk, M., Fogerson, P., Lee, Y., Haque, M., Wang, D. C., DeNardo, A., Tessier-Lavigne, M., Huguenard, J. R., Adams, E. L., Luo, L., Huang, W.  
2022; 119 (52)
- **Loss of Rai1 enhances hippocampal excitability and epileptogenesis in mouse models of Smith-Magenis syndrome.** *Proceedings of the National Academy of Sciences of the United States of America*  
Chang, Y., Kowalczyk, M., Fogerson, P. M., Lee, Y., Haque, M., Adams, E. L., Wang, D. C., DeNardo, L. A., Tessier-Lavigne, M., Huguenard, J. R., Luo, L., Huang, W.  
2022; 119 (43): e2210122119
- **Maturation and circuit integration of transplanted human cortical organoids.** *Nature*  
Revah, O., Gore, F., Kelley, K. W., Andersen, J., Sakai, N., Chen, X., Li, M. Y., Birey, F., Yang, X., Saw, N. L., Baker, S. W., Amin, N. D., Kulkarni, et al  
2022; 610 (7931): 319-326
- **Maladaptive myelination promotes generalized epilepsy progression.** *Nature neuroscience*  
Knowles, J. K., Xu, H., Soane, C., Batra, A., Saucedo, T., Frost, E., Tam, L. T., Fraga, D., Ni, L., Villar, K., Talmi, S., Huguenard, J. R., Monje, et al  
2022
- **Author Correction: Precise spatiotemporal control of voltage-gated sodium channels by photocaged saxitoxin.** *Nature communications*  
Elleman, A. V., Devienne, G., Makinson, C. D., Haynes, A. L., Huguenard, J. R., Du Bois, J.  
2022; 13 (1): 2277
- **NF1 MUTATION DRIVES NEURONAL ACTIVITY-DEPENDENT OPTIC GLIOMA INITIATION**  
Pan, Y., Hysinger, J., Barron, T., Schindler, N., Cobb, O., Guo, X., Yalcin, B., Anastasaki, C., Mulinyawe, S., Ponnuswami, A., Scheaffer, S., Ma, Y., Chang, et al  
OXFORD UNIV PRESS INC.2021: 212
- **Precise spatiotemporal control of voltage-gated sodium channels by photocaged saxitoxin.** *Nature communications*  
Elleman, A. V., Devienne, G., Makinson, C. D., Haynes, A. L., Huguenard, J. R., Du Bois, J.  
2021; 12 (1): 4171
- **NF1 mutation drives neuronal activity-dependent initiation of optic glioma.** *Nature*

- Pan, Y., Hysinger, J. D., Barron, T., Schindler, N. F., Cobb, O., Guo, X., Yalcin, B., Anastasaki, C., Mulinyawe, S. B., Ponnuswami, A., Scheaffer, S., Ma, Y., Chang, et al  
2021
- **Long-term maturation of human cortical organoids matches key early postnatal transitions.** *Nature neuroscience*  
Gordon, A. n., Yoon, S. J., Tran, S. S., Makinson, C. D., Park, J. Y., Andersen, J. n., Valencia, A. M., Horvath, S. n., Xiao, X. n., Huguenard, J. R., Paşca, S. P., Geschwind, D. H.  
2021
  - **Development and validation of a potent and specific inhibitor for the CLC-2 chloride channel.** *Proceedings of the National Academy of Sciences of the United States of America*  
Koster, A. K., Reese, A. L., Kuryshv, Y., Wen, X., McKiernan, K. A., Gray, E. E., Wu, C., Huguenard, J. R., Maduke, M., Du Bois, J.  
2020
  - **PFC PV Interneurons Facilitate Visual Attention and are Disrupted in a Genetic Model of Absence Epilepsy**  
Ferguson, B., Huguenard, J.  
SPRINGER NATURE.2020: 88–89
  - **Perspective: Is Cortical Hyperexcitability the Only Path to Generalized Absence Epilepsy?** *EPILEPSY CURRENTS*  
Huguenard, J. R.  
2020
  - **Nonlinearities between inhibition and T-type calcium channel activity bidirectionally regulate thalamic oscillations.** *eLife*  
Lu, A. C., Lee, C. K., Kleiman-Weiner, M., Truong, B., Wang, M., Huguenard, J., Beenhakker, M. P.  
2020; 9
  - **Neuronal defects in a human cellular model of 22q11.2 deletion syndrome.** *Nature medicine*  
Khan, T. A., Revah, O. n., Gordon, A. n., Yoon, S. J., Krawisz, A. K., Gool, C. n., Sun, Y. n., Kim, C. H., Tian, Y. n., Li, M. Y., Schaepe, J. M., Ikeda, K. n., Amin, et al  
2020
  - **Current Controversy: Spikes, Bursts, and Synchrony in Generalized Absence Epilepsy: Unresolved Questions Regarding Thalamocortical Synchrony in Absence Epilepsy.** *Epilepsy currents*  
Huguenard, J.  
2019; 19 (2): 105–11
  - **Differentiation and maturation of oligodendrocytes in human three-dimensional neural cultures.** *Nature neuroscience*  
Marton, R. M., Miura, Y. n., Sloan, S. A., Li, Q. n., Revah, O. n., Levy, R. J., Huguenard, J. R., Paşca, S. P.  
2019
  - **Reliability of human cortical organoid generation** *NATURE METHODS*  
Yoon, S., Elahi, L. S., Pasca, A. M., Marton, R. M., Gordon, A., Revah, O., Miura, Y., Walczak, E. M., Holdgate, G. M., Fan, H., Huguenard, J. R., Geschwind, D. H., Pasca, et al  
2019; 16 (1): 75–+
  - **Reliability of human cortical organoid generation.** *Nature methods*  
Yoon, S. J., Elahi, L. S., Paşca, A. M., Marton, R. M., Gordon, A. n., Revah, O. n., Miura, Y. n., Walczak, E. M., Holdgate, G. M., Fan, H. C., Huguenard, J. R., Geschwind, D. H., Paşca, et al  
2019; 16 (1): 75–78
  - **Shank and Zinc Mediate an AMPA Receptor Subunit Switch in Developing Neurons.** *Frontiers in molecular neuroscience*  
Ha, H. T., Leal-Ortiz, S., Lalwani, K., Kiyonaka, S., Hamachi, I., Mysore, S. P., Montgomery, J. M., Garner, C. C., Huguenard, J. R., Kim, S. A.  
2018; 11: 405
  - **Shank and Zinc Mediate an AMPA Receptor Subunit Switch in Developing Neurons** *FRONTIERS IN MOLECULAR NEUROSCIENCE*  
Ha, H. T. T., Leal-Ortiz, S., Lalwani, K., Kiyonaka, S., Hamachi, I., Mysore, S. P., Montgomery, J. M., Garner, C. C., Huguenard, J. R., Kim, S. A.  
2018; 11
  - **Anatomically Defined and Functionally Distinct Dorsal Raphe Serotonin Sub-systems.** *Cell*  
Ren, J. n., Friedmann, D. n., Xiong, J. n., Liu, C. D., Ferguson, B. R., Weerakkody, T. n., DeLoach, K. E., Ran, C. n., Pun, A. n., Sun, Y. n., Weissbourd, B. n., Neve, R. L., Huguenard, et al

2018

- **Absence seizure susceptibility correlates with pre-ictal  $\beta$  oscillations.** *Journal of physiology, Paris*  
Sorokin, J. M., Paz, J. T., Huguenard, J. R.  
2017
- **Assembly of functionally integrated human forebrain spheroids** *NATURE*  
Birey, F., Andersen, J., Makinson, C. D., Islam, S., Wei, W., Huber, N., Fan, H. C., Metzler, K. R., Panagiotakos, G., Thom, N., O'Rourke, N. A., Steinmetz, L. M., Bernstein, et al  
2017; 545 (7652): 54-?
- **Breathing control center neurons that promote arousal in mice** *SCIENCE*  
Yackle, K., Schwarz, L. A., Kam, K., Sorokin, J. M., Huguenard, J. R., Feldman, J. L., Luo, L., Krasnow, M. A.  
2017; 355 (6332): 1411-1415
- **Regulation of Thalamic and Cortical Network Synchrony by Scn8a.** *Neuron*  
Makinson, C. D., Tanaka, B. S., Sorokin, J. M., Wong, J. C., Christian, C. A., Goldin, A. L., Escayg, A., Huguenard, J. R.  
2017
- **Bidirectional Control of Generalized Epilepsy Networks via Rapid Real-Time Switching of Firing Mode.** *Neuron*  
Sorokin, J. M., Davidson, T. J., Frechette, E., Abramian, A. M., Deisseroth, K., Huguenard, J. R., Paz, J. T.  
2017; 93 (1): 194-210
- **Tapping the Brakes: Cellular and Synaptic Mechanisms that Regulate Thalamic Oscillations** *NEURON*  
Fogerson, P. M., Huguenard, J. R.  
2016; 92 (4): 687-704
- **Catching a wave.** *eLife*  
Fogerson, P. M., Huguenard, J. R.  
2016; 5
- **Two classes of excitatory synaptic responses in rat thalamic reticular neurons.** *Journal of neurophysiology*  
Deleuze, C., Huguenard, J. R.  
2016; 116 (3): 995-1011
- **LSPS/Optogenetics to Improve Synaptic Connectivity Mapping: Unmasking the Role of Basket Cell-Mediated Feedforward Inhibition.** *eNeuro*  
Brill, J., Mattis, J., Deisseroth, K., Huguenard, J. R.  
2016; 3 (4)
- **Early postnatal switch in GABAA receptor  $\alpha$ -subunits in the reticular thalamic nucleus.** *Journal of neurophysiology*  
Pangratz-Fuehrer, S., Sieghart, W., Rudolph, U., Parada, I., Huguenard, J. R.  
2016; 115 (3): 1183-1195
- **Enhanced phasic GABA inhibition during the repair phase of stroke: a novel therapeutic target** *BRAIN*  
Hiu, T., Farzampour, Z., Paz, J. T., Wang, E. H., Badgely, C., Olson, A., Micheva, K. D., Wang, G., Lemmens, R., Tran, K. V., Nishiyama, Y., Liang, X., Hamilton, et al  
2016; 139: 468-480
- **Satb2 Regulates the Differentiation of Both Callosal and Subcerebral Projection Neurons in the Developing Cerebral Cortex.** *Cerebral cortex*  
Leone, D. P., Heavner, W. E., Ferenczi, E. A., Dobрева, G., Huguenard, J. R., Grosschedl, R., McConnell, S. K.  
2015; 25 (10): 3406-3419
- **Optogenetics: 10 years after ChR2 in neurons-views from the community** *NATURE NEUROSCIENCE*  
Adamantidis, A., Arber, S., Bains, J. S., Bamberg, E., Bonci, A., Buzsaki, G., Cardin, J. A., Costa, R. M., Dan, Y., Goda, Y., Graybiel, A. M., Haeusser, M., Hegemann, et al  
2015; 18 (9): 1202-12
- **Functional cortical neurons and astrocytes from human pluripotent stem cells in 3D culture.** *Nature methods*

- Pasca, A. M., Sloan, S. A., Clarke, L. E., Tian, Y., Makinson, C. D., Huber, N., Kim, C. H., Park, J., O'Rourke, N. A., Nguyen, K. D., Smith, S. J., Huguenard, J. R., Geschwind, et al  
2015; 12 (7): 671-678
- **Functional cortical neurons and astrocytes from human pluripotent stem cells in 3D culture.** *Nature methods*  
Pasca, A. M., Sloan, S. A., Clarke, L. E., Tian, Y., Makinson, C. D., Huber, N., Kim, C. H., Park, J., O'Rourke, N. A., Nguyen, K. D., Smith, S. J., Huguenard, J. R., Geschwind, et al  
2015; 12 (7): 671-678
  - **Albumin induces excitatory synaptogenesis through astrocytic TGF-beta/ALK5 signaling in a model of acquired epilepsy following blood-brain barrier dysfunction** *NEUROBIOLOGY OF DISEASE*  
Weissberg, I., Wood, L., Kamintsky, L., Vazquez, O., Milikovsky, D. Z., Alexander, A., Oppenheim, H., Ardizzone, C., Becker, A., Frigerio, F., Vezzani, A., Buckwalter, M. S., Huguenard, et al  
2015; 78: 115-125
  - **Electrical synapses connect a network of gonadotropin releasing hormone neurons in a cichlid fish** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Ma, Y., Juntti, S. A., Hu, C. K., Huguenard, J. R., Fernald, R. D.  
2015; 112 (12): 3805-3810
  - **Microcircuits and their interactions in epilepsy: is the focus out of focus?** *NATURE NEUROSCIENCE*  
Paz, J. T., Huguenard, J. R.  
2015; 18 (3): 351-359
  - **Seizing upon mechanisms for impaired consciousness.** *Neuron*  
Farzampour, Z., Huguenard, J.  
2015; 85 (3): 453-455
  - **Cholinergic control of gamma power in the midbrain spatial attention network.** *journal of neuroscience*  
Bryant, A. S., Goddard, C. A., Huguenard, J. R., Knudsen, E. I.  
2015; 35 (2): 761-775
  - **Optogenetics and Epilepsy: Past, Present and Future** *EPILEPSY CURRENTS*  
Paz, J. T., Huguenard, J. R.  
2015; 15 (1): 34-38
  - **Functional cortical neurons and astrocytes from human pluripotent stem cells in 3D cultures.** *Nature Methods*  
Pasca, A. M., Sloan, S., Clarke, L. E., Tian, Y., Makinson, C., Huber, N., Kim, C., Park, J., O'Rourke, N., Nguyen, K., Smith, S. J., Huguenard, J., Geschwind, et al  
2015: 671-78
  - **Endozepines.** *Advances in pharmacology (San Diego, Calif.)*  
Farzampour, Z., Reimer, R. J., Huguenard, J.  
2015; 72: 147-164
  - **Attentional flexibility in the thalamus: now we're getting SOMwhere.** *Nature neuroscience*  
Makinson, C. D., Huguenard, J. R.  
2014; 18 (1): 2-4
  - **Frequency-dependent, cell type-divergent signaling in the hippocamposeptal projection.** *journal of neuroscience*  
Mattis, J., Brill, J., Evans, S., Lerner, T. N., Davidson, T. J., Hyun, M., Ramakrishnan, C., Deisseroth, K., Huguenard, J. R.  
2014; 34 (35): 11769-11780
  - **Parallel Midbrain Microcircuits Perform Independent Temporal Transformations** *JOURNAL OF NEUROSCIENCE*  
Goddard, C. A., Huguenard, J., Knudsen, E.  
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  - **Parallel midbrain microcircuits perform independent temporal transformations.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*  
Goddard, C. A., Huguenard, J., Knudsen, E.  
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- **Modulation of Short-Term Plasticity in the Corticothalamic Circuit by Group III Metabotropic Glutamate Receptors** *JOURNAL OF NEUROSCIENCE*  
Kyuyoung, C. L., Huguenard, J. R.  
2014; 34 (2): 675-687
- **Spatially reciprocal inhibition of inhibition within a stimulus selection network in the avian midbrain.** *PloS one*  
Goddard, C. A., Mysore, S. P., Bryant, A. S., Huguenard, J. R., Knudsen, E. I.  
2014; 9 (1)
- **Astrocytes potentiate GABAergic transmission in the thalamic reticular nucleus via endozepine signaling** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Christian, C. A., Huguenard, J. R.  
2013; 110 (50): 20278-20283
- **Sniffer patch laser uncaging response (SPLURgE): an assay of regional differences in allosteric receptor modulation and neurotransmitter clearance** *JOURNAL OF NEUROPHYSIOLOGY*  
Christian, C. A., Huguenard, J. R.  
2013; 110 (7): 1722-1731
- **Endogenous Positive Allosteric Modulation of GABA(A) Receptors by Diazepam binding inhibitor** *NEURON*  
Christian, C. A., Herbert, A. G., Holt, R. L., Peng, K., Sherwood, K. D., Pangratz-Fuehrer, S., Rudolph, U., Huguenard, J. R.  
2013; 78 (6): 1063-1074
- **Reemerging role of cable properties in action potential initiation** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Ma, Y., Huguenard, J. R.  
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- **Closed-loop optogenetic control of thalamus as a tool for interrupting seizures after cortical injury** *NATURE NEUROSCIENCE*  
Paz, J. T., Davidson, T. J., Frechette, E. S., Delord, B., Parada, I., Peng, K., Deisseroth, K., Huguenard, J. R.  
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- **Sleep and Epilepsy: A Summary of the 2011 Merritt-Putnam Symposium** *EPILEPSY CURRENTS*  
DeWolfe, J. L., Malow, B., Huguenard, J., Stickgold, R., Bourgeois, B., Holmes, G. L.  
2013; 13 (1): 42-49
- **Glutamate biosensor imaging reveals dysregulation of glutamatergic pathways in a model of developmental cortical malformation** *NEUROBIOLOGY OF DISEASE*  
Dulla, C. G., Tani, H., Brill, J., Reimer, R. J., Huguenard, J. R.  
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