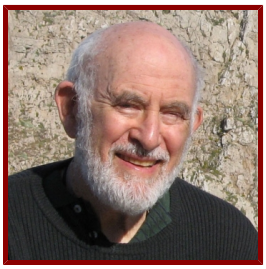
Stanford



David Prince

Edward F. and Irene Thiele Pimley Professor of Neurology and the Neurological Sciences, Emeritus

Adult Neurology

NIH Biosketch available Online

CONTACT INFORMATION

- **Alternate Contact**

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Bio

ACADEMIC APPOINTMENTS

- Emeritus Faculty, Acad Council, Adult Neurology
- Member, Bio-X
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Chairman, Department of Neurology and Neurological Sciences, Stanford Univ. School of Medicine, (1970-1989)

HONORS AND AWARDS

- Principal Investigator, NS39579 Modulation of Neocortical Interneuronal Function°, NINDS (7/00-current)
- Program Director, Dana Fellowship Program in Neuroscience, Dana Foundation (1988-1995)
- Program Director, NIH Training Grant NS07280 "Epilepsy Training Program", National Institute of Neurological Diseases and Stroke (1985-2003)
- Program Director,Principal Investigator Epilepsy Program Project Grant NS 12151, National Institute of Neurological Diseases and Stroke (1975-present)
- Principal Investigator, USPHS Research Grant NS 06477 "Cellular mechanisms in focal epileptogenesis", National Institute of Neurological Diseases and Stroke (1966-current)
- Lennox Award for contributions in the field of epilepsy., American Epilepsy Society (1978)
- Research Recognition Award in Basic Neuroscience, Americal Epilepsy Society (1991)
- Javits Neuroscience Investigator Award, NINDS, National Institute of Neurological Disorders and Stroke (1987-1995; 1995-2001)
- Arthur Bloomfield Award for excellence in clinical teaching., Stanford Univ. School of Medicine (1986)
- First Morris B. Bender Memorial Lectureship., Mount Sinai Medical School, New York, New York. (1984)
- Herbert Jasper Lecture, Montreal Neurological Institute, Montreal, Quebec, Canada. (1984)
- Lennox Lecturer, American Epilepsy Society (1987)
- Sachs Lecturer, Child Neurology Society (1994)
- George Bishop Lecturer, Washington University, St. Louis (1997)

- Peter Kellaway Lecturer, Baylor College of Medicine, Houston, Texas (1998)
- Bronte Lecturer, University of California, Davis (2001)
- Servier Lecturer, University of Montreal (2002)
- The Larry Benardo Research and Education Fund Lecturer ., SUNY Downstate Medical Center, New York (2006)
- Lothman Lecturer, University of Virginia (2007)
- Special Lecturer, Society for Neuroscience (2008)

PROFESSIONAL EDUCATION

- B.S., Univ. of Vermont , Psychology (1953)
- M.D., Univ. of Pennsylvania , Medicine (1956)

LINKS

- Prince Lab Site: https://web.stanford.edu/group/prince_lab/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My work deals with regulation of excitability in neurons of mammalian cerebral cortex and thalamus and mechanisms underlying development of epilepsy. Long-term goals are to understand how injury produces changes in structure and function of neurons and neuronal networks that lead to hyperexcitability and epileptogenesis, and approaches to prevention of epilepsy after cortical injury. Areas of interest include regulation of voltage dependent membrane properties, neuropharmacology of transmitters and modulators including neuropeptides, synaptic mechanisms, and intrinsic properties of single, anatomically identified neurons. Techniques include use of in vivo mammalian preparations as well as in vitro slices and acutely dissociated neurons for recordings of synaptic activities and membrane properties, using patch-clamp techniques to study whole cell currents and membrane channels. Electrophysiological approaches are combined with intracellular labeling and immunocytochemistry to identify types of neurons and responses to injury.

Current studies include:

i) Reorganization of neocortical neuronal synaptic activities,and intrinsic neuronal properties after cortical trauma.

ii) Electrophysiologic and neuroanatomic studies of axonal sprouting following chronic neocortical injury.

iii) Anatomy and pathophysiology of neocortical developmental malformations.

iv) Effects of neuropeptides and GABAergic inhibition on intrinsic, synaptic and network properties of thalamic neurons; and generation of normal and pathophysiologic rhythms.

v) Modulation of neocortical inhibitory interneuronal activities by neurotransmitters and injury.

Teaching

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Neurosciences (PhD Program)

Publications

PUBLICATIONS

- **Partial TrkB receptor activation suppresses cortical epileptogenesis through actions on parvalbumin interneurons** *NEUROBIOLOGY OF DISEASE*
  Gu, F., Parada, I., Yang, T., Longo, F. M., Prince, D. A.

2018; 113: 45–58

- **Structural alterations in fast-spiking GABAergic interneurons in a model of posttraumatic neocortical epileptogenesis** *NEUROBIOLOGY OF DISEASE*
  Gu, F., Parada, I., Shen, F., Li, J., Bacci, A., Graber, K., Taghavi, R., Scalise, K., Schwartzkroin, P., Wenzel, J., Prince, D. A.
  2017; 108: 100–114

- **TGF beta signaling is associated with changes in inflammatory gene expression and perineuronal net degradation around inhibitory neurons following various neurological insults** *SCIENTIFIC REPORTS*
  Kim, S., Senatorov, V. V., Morrissey, C. S., Lippmann, K., Vazquez, O., Milikovsky, D. Z., Gu, F., Parada, I., Prince, D. A., Becker, A. J., Heinemann, U., Friedman, A., Kaufer, et al
  2017; 7: 7711

- **Epileptiform activity and behavioral arrests in mice overexpressing the calcium channel subunit a2d-1.** *Neurobiology of disease*
  Faria, L. C., Gu, F., Parada, I., Barres, B., David Luo, Z., Prince, D. A.
  2017

- **Aberrant excitatory rewiring of layer V pyramidal neurons early after neocortical trauma** *NEUROBIOLOGY OF DISEASE*
  Takahashi, D. K., Gu, F., Parada, I., Vyas, S., Prince, D. A.
  2016; 91: 166-181

- **Antiepileptogenic repair of excitatory and inhibitory synaptic connectivity after neocortical trauma** *NEUROBIOLOGY OF EPILEPSY: FROM GENES TO NETWORKS*
  Prince, D. A., Gu, F., Parada, I.
  2016; 226: 209-227

- **Excitatory and inhibitory synaptic connectivity to layer V fast-spiking interneurons in the freeze lesion model of cortical microgyria** *JOURNAL OF NEUROPHYSIOLOGY*
  Jin, X., Jiang, K., Prince, D. A.
  2014; 112 (7): 1703-1713

- **How Do We Make Models That Are Useful in Understanding Partial Epilepsies?** *Workshop on Issues in Clinical Epileptology - A View from the Bench held in honor of Phil*
  Prince, D. A.
  SPRINGER.2014: 233–241

- **Remodeling of dendrites and spines in the C1q knockout model of genetic epilepsy** *EPILEPSIA*
  Ma, Y., Ramachandran, A., Ford, N., Parada, I., Prince, D. A.
  2013; 54 (7): 1232-1239

- **Gabapentin decreases epileptiform discharges in a chronic model of neocortical trauma** *NEUROBIOLOGY OF DISEASE*
  Li, H., Graber, K. D., Jin, S., McDonald, W., Barres, B. A., Prince, D. A.
  2012; 48 (3): 429-438

- **Finding a better drug for epilepsy: Antiepileptogenesis targets** *EPILEPSIA*
  Kobow, K., Auvin, S., Jensen, F., Loescher, W., Mody, I., Potschka, H., Prince, D., Sierra, A., Simonato, M., Pitkaenen, A., Nehlig, A., Rho, J. M.
  2012; 53 (11): 1868-1876

- **Functional alterations in GABAergic fast-spiking interneurons in chronically injured epileptogenic neocortex** *NEUROBIOLOGY OF DISEASE*
  Ma, Y., Prince, D. A.
  2012; 47 (1): 102-113

- **Interneuronal calcium channel abnormalities in posttraumatic epileptogenic neocortex** *NEUROBIOLOGY OF DISEASE*
  Faria, L. C., Parada, I., Prince, D. A.
  2012; 45 (2): 821-828

- **Targets for preventing epilepsy following cortical injury** *NEUROSCIENCE LETTERS*
  Li, H., McDonald, W., Parada, I., Faria, L., Graber, K., Takahashi, D. K., Ma, Y., Prince, D.
  2011; 497 (3): 172-176

- **Reorganization of Inhibitory Synaptic Circuits in Rodent Chronically Injured Epileptogenic Neocortex** *CEREBRAL CORTEX*
  Jin, X., Huguenard, J. R., Prince, D. A.
  2011; 21 (5): 1094-1104
- **Neocortical Posttraumatic Epileptogenesis.** *Epilepsia*
  Prince, D. A., Parada, I., Li, H., McDonald, W., Graber, K.
  2010; 51 Suppl 5: 30
- **Neocortical posttraumatic epileptogenesis** *EPILEPSIA*
  Prince, D. A., Parada, I., Li, H., McDonald, W., Graber, K.
  2010; 51: 30-30
- **Neocortical posttraumatic epileptogenesis.** *Epilepsia*
  Prince, D. A., Parada, I., Li, H., McDonald, W., Graber, K.
  2010; 51 Suppl s5: 30
- **Differential effects of Na plus -K plus ATPase blockade on cortical layer V neurons** *JOURNAL OF PHYSIOLOGY-LONDON*
  Anderson, T. R., Huguenard, J. R., Prince, D. A.
  2010; 588 (22): 4401-4414
- **Excitatory Input Onto Hilar Somatostatin Interneurons Is Increased in a Chronic Model of Epilepsy** *JOURNAL OF NEUROPHYSIOLOGY*
  Halabisky, B., Parada, I., Buckmaster, P. S., Prince, D. A.
  2010; 104 (4): 2214-2223
- **Desynchronization of Neocortical Networks by Asynchronous Release of GABA at Autaptic and Synaptic Contacts from Fast-Spiking Interneurons** *PLOS BIOLOGY*
  Manseau, F., Marinelli, S., Mendez, P., Schwaller, B., Prince, D. A., Huguenard, J. R., Bacci, A.
  2010; 8 (9)
- **Presynaptic Inhibitory Terminals Are Functionally Abnormal in a Rat Model of Posttraumatic Epilepsy** *JOURNAL OF NEUROPHYSIOLOGY*
  Faria, L. C., Prince, D. A.
  2010; 104 (1): 280-290
- **Enhanced synaptic connectivity and epilepsy in C1q knockout mice** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Chu, Y., Jin, X., Parada, I., Pesic, A., Stevens, B., Barres, B., Prince, D. A.
  2010; 107 (17): 7975-7980
- **Focal Cortical Infarcts Alter Intrinsic Excitability and Synaptic Excitation in the Reticular Thalamic Nucleus** *JOURNAL OF NEUROSCIENCE*
  Paz, J. T., Christian, C. A., Parada, I., Prince, D. A., Huguenard, J. R.
  2010; 30 (15): 5465-5479
- **Surviving Hilar Somatostatin Interneurons Enlarge, Sprout Axons, and Form New Synapses with Granule Cells in a Mouse Model of Temporal Lobe Epilepsy** *JOURNAL OF NEUROSCIENCE*
  Zhang, W., Yamawaki, R., Wen, X., Uhl, J., Diaz, J., Prince, D. A., Buckmaster, P. S.
  2009; 29 (45): 14247-14256
- **DOES GABAPENTIN PREVENT POSTTRAUMATIC EPILEPTOGENESIS?** *63rd Annual Meeting of the American-Epilepsy-Society*
  Li, H., Graber, K. D., Prince, D. A.
  WILEY-BLACKWELL PUBLISHING, INC.2009: 350–351
- **TEMPORAL AND TOPOGRAPHIC ALTERATIONS IN EXPRESSION OF THE alpha 3 ISOFORM OF Na+,K+-ATPase IN THE RAT FREEZE LESION MODEL OF MICROGYRIA AND EPILEPTOGENESIS** *NEUROSCIENCE*
  Chu, Y., Parada, I., Prince, D. A.
  2009; 162 (2): 339-348
- **Epilepsy following cortical injury: Cellular and molecular mechanisms as targets for potential prophylaxis** *EPILEPSIA*
  Prince, D. A., Parada, I., Scalise, K., Graber, K., Jin, X., Shen, F.
  2009; 50: 30-40

- **The Endocannabinoid 2-Arachidonoylglycerol Is Responsible for the Slow Self-Inhibition in Neocortical Interneurons** *JOURNAL OF NEUROSCIENCE*
  Marinelli, S., Pacioni, S., Bisogno, T., Di Marzo, V., Prince, D. A., Huguenard, J. R., Bacci, A.
  2008; 28 (50): 13532-13541
- **SPONTANEOUS EPILEPTIFORM ACTIVITY AND ENHANCED EXCITATORY SYNAPTIC CONNECTIVITY IN C1Q KNOCK- OUT MICE** *62nd Annual Meeting of the American-Epilepsy-Society/2nd Biennial North American Regional Epilepsy Congress*
  Chu, Y., Jin, X., Parada, I., Stevens, B., Prince, D. A.
  WILEY-BLACKWELL.2008: 476–476
- **Alterations in excitatory synaptic activation of neocortical fast-spiking interneurons in a model of posttraumatic epileptogenesis** *61st Annual Meeting of the American-Epilepsy-Society*
  Jin, X., Huguenard, J., Prince, D.
  WILEY-BLACKWELL.2007: 120–120
- **Sick axons and epileptogenesis** *61st Annual Meeting of the American-Epilepsy-Society*
  Prince, D. A., McCormick, D. A., Gutierrez, R.
  WILEY-BLACKWELL.2007: 409–409
- **Modulation of epileptiform activity by glutamine and system A transport in a model of post-traumatic epilepsy** *NEUROBIOLOGY OF DISEASE*
  Tani, H., Bandrowski, A. E., Parada, I., Wynn, M., Huguenard, J. R., Prince, D. A., Reimer, R. J.
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- **Electrophysiological classification of somatostatin-positive interneurons in mouse sensorimotor cortex** *JOURNAL OF NEUROPHYSIOLOGY*
  Halabisky, B., Shen, F., Huguenard, J. R., Prince, D. A.
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- **Enhanced excitatory synaptic connectivity in layer V pyramidal neurons of chronically injured epileptogenic neocortex in rats** *JOURNAL OF NEUROSCIENCE*
  Jin, X. M., Prince, D. A., Huguenard, J. R.
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- **Barrel cortex microcircuits: Thalamocortical feedforward inhibition in spiny stellate cells is mediated by a small number of fast-spiking interneurons** *JOURNAL OF NEUROSCIENCE*
  Sun, Q. Q., Huguenard, J. R., Prince, D. A.
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- **REORGANIZATION OF BARREL CIRCUITS LEADS TO THALAMICALLY-EVOKED CORTICAL EPILEPTIFORM ACTIVITY.** *Thalamus & related systems*
  Sun, Q., Huguenard, J. R., Prince, D. A.
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- **Modulation of neocortical interneurons: extrinsic influences and exercises in self-control** *TRENDS IN NEUROSCIENCES*
  Bacci, A., Huguenard, J. R., Prince, D. A.
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- **Impaired Cl- extrusion in layer V pyramidal neurons of chronically injured epileptogenic neocortex** *JOURNAL OF NEUROPHYSIOLOGY*
  Jin, X. M., Huguenard, J. R., Prince, D. A.
  2005; 93 (4): 2117-2126
- **Excitatory and inhibitory postsynaptic currents in a rat model of epileptogenic microgyria** *JOURNAL OF NEUROPHYSIOLOGY*
  Jacobs, K. M., Prince, D. A.
  2005; 93 (2): 687-696
- **Cortical injury affects short-term plasticity of evoked excitatory synaptic currents** *JOURNAL OF NEUROPHYSIOLOGY*
  Li, H. F., Bandrowski, A. E., Prince, D. A.
  2005; 93 (1): 146-156

- **Antiepileptogenic treatment of undercut neocortex reduces expression of neuritin** *59th Annual Meeting of the American-Epilepsy-Society/ American-Clinical-Neurophysiology-Society*
  Graber, K. D., Fontoura, P. P., Ho, P. P., Steinman, L., Prince, D. A.
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- **Increased layer vexcitatory connectivity in the neocortical undercut model of post-traumatic epilepsy** *59th Annual Meeting of the American-Epilepsy-Society/American-Clinical-Neurophysiology-Society*
  Jin, X. M., Huguenard, J. R., Prince, D. A.
  WILEY-BLACKWELL.2005: 109–109
- **Long-lasting self-inhibition of neocortical interneurons mediated by endocannabinoids** *NATURE*
  Bacci, A., Huguenard, J. R., Prince, D. A.
  2004; 431 (7006): 312-316
- **A critical period for prevention of posttraumatic neocortical hyperexcitability in rats** *ANNALS OF NEUROLOGY*
  Graber, K. D., Prince, D. A.
  2004; 55 (6): 860-870
- **Effects of preventive treatment on NARP expression in posttraumatic epileptogenesis** *58th Annual Meeting of the American-Epilepsy-Society*
  Graber, K. D., Fontoura, P. P., Ho, P. P., Steinman, L., Prince, D. A.
  WILEY-BLACKWELL.2004: 18–18
- **Target-specific neuropeptide Y-ergic synaptic inhibition and its network consequences within the mammalian thalamus** *JOURNAL OF NEUROSCIENCE*
  Sun, Q. Q., Baraban, S. C., Prince, D. A., Huguenard, J. R.
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- **Major differences in inhibitory synaptic transmission onto two neocortical interneuron subclasses** *JOURNAL OF NEUROSCIENCE*
  Bacci, A., Rudolph, U., Huguenard, J. R., Prince, D. A.
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- **Vasoactive intestinal polypeptide and pituitary adenylate cyclase-activating polypeptide activate hyperpolarization activated cationic current and depolarize thalamocortical neurons in vitro** *JOURNAL OF NEUROSCIENCE*
  Sun, Q. Q., Prince, D. A., Huguenard, J. R.
  2003; 23 (7): 2751-2758
- **Baseline glutamate levels affect group I and II mGluRs in layer V pyramidal neurons of rat sensorimotor cortex** *JOURNAL OF NEUROPHYSIOLOGY*
  Bandrowski, A. E., Huguenard, J. R., Prince, D. A.
  2003; 89 (3): 1308-1316
- **Heterogeneous actions of serotonin on interneurons in rat visual cortex** *JOURNAL OF NEUROPHYSIOLOGY*
  Xiang, Z. X., Prince, D. A.
  2003; 89 (3): 1278-1287
- **Functional autaptic neurotransmission in fast-spiking interneurons: A novel form of feedback inhibition in the neocortex** *JOURNAL OF NEUROSCIENCE*
  Bacci, A., Huguenard, J. R., Prince, D. A.
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- **Light microscopic study of glur1 and calbindin expression in interneurons of neocortical microgyral malformations** *NEUROSCIENCE*
  Kharazia, V. N., Jacobs, K. M., Prince, D. A.
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- **Differential modulation of synaptic transmission by neuropeptide Y in rat neocortical neurons** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Bacci, A., Huguenard, J. R., Prince, D. A.
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Xiang, Z. X., Huguenard, J. R., Prince, D. A.
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- **Somatostatin inhibits thalamic network oscillations in vitro: Actions on the GABAergic neurons of the reticular nucleus** *JOURNAL OF NEUROSCIENCE*
  Sun, Q. Q., Huguenard, J. R., Prince, D. A.
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- **Synaptic activity in chronically injured, epileptogenic sensory-motor neocortex** *JOURNAL OF NEUROPHYSIOLOGY*
  Li, H. F., Prince, D. A.
  2002; 88 (1): 2-12
- **Kinetic and pharmacological properties of GABA(A) receptors in single thalamic neurons and GABA(A) subunit expression** *JOURNAL OF NEUROPHYSIOLOGY*
  Browne, S. H., Kang, J., Akk, G., Chiang, L. W., Schulman, H., Huguenard, J. R., Prince, D. A.
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  Sun, Q. Q., Akk, G., Huguenard, J. R., Prince, D. A.
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- **Neuropeptide Y receptors differentially modulate G-protein-activated inwardly rectifying K+ channels and high-voltage-activated Ca2+ channels in rat thalamic neurons** *JOURNAL OF PHYSIOLOGY-LONDON*
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- **Changes of alpha-amino-3-hydroxy-5-methyl-4-isoxazole-propionate receptors in layer V of epileptogenic, chronically isolated rat neocortex** *NEUROSCIENCE*
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- **Benign focal epilepsies of childhood: Genetically determined pathophysiology - Epilepsy that comes and goes** *Workshop on Benign Focal Epilepsies of Childhood: Genetically Determined Pathophysiology*
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  Kang, J., Huguenard, J. R., Prince, D. A.
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  Jacobs, K. M., Mogensen, M., Warren, E., Prince, D. A.
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- **Mechanisms underlying epileptogenesis in cortical malformations** *International Workshop on the Use of Animal Models for Elucidating the Molecular Basis of Epilepsy*
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  Graber, K. D., Kharazia, V. N., Parada, I., Prince, D. A.
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- **Inhibitory function in chronic focal epileptogenesis** *14th International Congress of EEG and Clinical Neurophysiology*
  Prince, D. A.
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  Prince, D. A.
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- **Effects of neonatal freeze lesions on expression of parvalbumin in rat neocortex** *CEREBRAL CORTEX*
  Rosen, G. D., Jacobs, K. M., Prince, D. A.
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