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**DATE OF BIRTH:** August 13, 1971

**PLACE OF BIRTH:** Wenatchee, Washington

**EDUCATION:**

1995-2001 Ph.D. in Physiology, University of California, San Francisco  
1989-1994 B.S. in Cognitive Science, University of California, San Diego  
B.A. in Computer Science, University of California, San Diego

**PROFESSIONAL EXPERIENCE:**

2014- **Associate Professor**, Department of Neuroscience, Center for Perceptual Systems, The University of Texas at Austin.  
2008-2014 **Assistant Professor**, Section of Neurobiology, Center for Perceptual Systems, The University of Texas at Austin.  
2002-2007 **Postdoctoral Fellow**, Department of Neurobiology and Physiology, Northwestern University, Evanston, Illinois, with Dr. David Ferster.  
2001 **Postdoctoral Fellow**, Department of Physiology, University of California, San Francisco, with Dr. Stephen Lisberger.  
1995-2001 **Graduate Student**, Department of Physiology, University of California, San Francisco. Advisor: Dr. Stephen Lisberger; Dissertation: Constraints on the mechanism of short-term adaptation in motion selective neurons of visual area MT.  
1994-1995 **Research Technician**, Computational Neurobiology Lab, The Salk Institute, with Dr. Terrence Sejnowski.  
1993-1994 **Research Programmer**, Visualization Lab, San Diego Supercomputer Center, with Richard Frost.

**AWARDS AND FELLOWSHIPS:**

2011 College of Natural Sciences Teaching Excellence Award  
2009-2014 Pew Scholar in the Biomedical Sciences, The Pew Charitable Trusts  
2002-2005 NIH NRSA postdoctoral fellowship grant  
1996-2000 NIH NRSA predoctoral training grant

## **MAJOR FIELDS OF RESEARCH INTEREST:**

Neurobiology  
Central mechanisms of mammalian visual and auditory processing  
Development  
Neuronal function of mammalian neocortex  
Neuroethology  
Evolution of the neocortex  
Computational neuroscience

## **PROFESSIONAL ACTIVITIES:**

Consulting reviewer for:

Cerebral Cortex  
Current Biology  
European Journal of Neuroscience  
Journal of Neurophysiology  
Journal of Neuroscience  
Journal of Vision  
Nature  
Nature Neuroscience  
Neural Computation  
Neurocomputing  
Neuron  
Trends in Neuroscience  
Visual Neuroscience

Grant reviewer for:

National Science Foundation  
National Institutes of Health  
French National Research Agency (L'agence Nationale de la Recherche)  
Wellcome Trust

## **RESEARCH PUBLICATIONS:**

1. **Priebe, N.J.** (2001) Constraints on the mechanism of short-term adaptation in motion selective neurons of visual area MT. Ph.D. Dissertation, University of California, San Francisco.
2. Bush, P. & **Priebe, N.J.** (1998) GABAergic inhibitory control of the transient and sustained components of orientation selectivity in a model microcolumn in layer 4 of cat visual cortex. *Neural Computation* **10**: 855-867.

3. Troyer, T.W., Krukowski, A.E., **Priebe, N.J.** & Miller, K.D. (1998) Contrast-invariant orientation tuning in cat visual cortex: thalamocortical input tuning and correlation-based intracortical connectivity. *Journal of Neuroscience* **18**: 5908-5927.
4. Kayser, A., **Priebe, N.J.** & Miller, K.D. (2001) Contrast-dependent nonlinearities arise locally in a model of contrast-invariant orientation tuning. *Journal of Neurophysiology* **85**: 2130-2149.
5. **Priebe, N.J.\***, Churchland, M.M.\* & Lisberger, S.G. (2001) Reconstruction of target speed for the guidance of pursuit eye movements. *Journal of Neuroscience* **21**: 3196-3206.
6. **Priebe, N.J.**, Churchland, M.M. & Lisberger, S.G. (2002) Constraints on the source of short-term motion adaptation in macaque area MT. I. the role of input and intrinsic mechanisms. *Journal of Neurophysiology* **88**: 354-369.
7. **Priebe, N.J.** & Lisberger, S.G. (2002) Constraints on the source of short-term motion adaptation in macaque area MT. II. Tuning of neural circuit mechanisms. *Journal of Neurophysiology* **88**: 370-382.
8. Churchland, A.K., Gardner, J.L., Chou, I., **Priebe, N.J.** & Lisberger, S.G. (2003) Directional anisotropies reveal a functional segregation of visual motion processing for perception and action. *Neuron* **37**: 1001-1011.
9. **Priebe, N.J.**, Cassanello, C.R. & Lisberger, S.G. (2003) The neural representation of speed in macaque area MT/V5. *Journal of Neuroscience* **23**: 5650-5661.
10. **Priebe, N.J.** & Lisberger, S.G. (2004) Estimating target speed from the population response in visual area MT. *Journal of Neuroscience* **24**: 1907-1916.
11. Imaizumi, K., **Priebe, N.J.**, Crum, P.A., Bedenbaugh, P.H., Cheung, S.W. & Schreiner, C.E. (2004) Modular functional organization of cat anterior auditory field. *Journal of Neurophysiology* **92**: 444-457.
12. **Priebe, N.J.**, Mechler, F., Carandini, M.C. & Ferster, D. (2004) The contribution of spike threshold to the dichotomy between cortical simple and complex cells. *Nature Neuroscience* **7**: 1113-1122.
13. Churchland, M.M., **Priebe, N.J.** & Lisberger S.G. (2005) Comparison of the spatial limits on direction selectivity in visual areas MT and V1. *Journal of Neurophysiology* **93**: 1235-1245.
14. **Priebe, N.J.** & Ferster D. (2005) Direction-selectivity of excitation and inhibition in simple cells of the cat primary visual cortex. *Neuron* **45**: 133-145.

15. **Priebe, N.J.**, Lisberger S.G. & Movshon J.A. (2006) Tuning for spatiotemporal frequency and speed in directionally selective neurons of macaque striate cortex. *Journal of Neuroscience* **26**: 2941-2950.
16. **Priebe, N.J.** & Ferster D. (2006) The mechanism underlying cross-orientation suppression in cat visual cortex. *Nature Neuroscience* **9**: 552-561.
17. Finn, I.\*, **Priebe, N.J.\***, & Ferster D. (2007) The emergence of contrast-invariant orientation tuning in simple cells of cat visual cortex. *Neuron* **54**: 137-152.
18. **Priebe, N.J.** (2008). The relationship between subthreshold and suprathreshold ocular dominance in cat primary visual cortex. *Journal of Neuroscience* **28**: 8553-8559.
19. Churchland M.M.\*, Yu B.M.\*, Cunningham J.P., Sugrue L.P., Cohen M.R., Corrado G.S., Newsome W.T., Clark A.M., Hosseini P., Scott B.B., Bradley D.C., Smith M.A., Kohn A., Movshon J.A., Armstrong K.M., Moore T., Chang S.W., Snyder L.H., Lisberger S.G., **Priebe N.J.**, Finn I.M., Ferster D., Ryu S.I., Santhanam G., Sahani M., and Shenoy K.V. (2010) Stimulus onset quenches neural variability: a widespread cortical phenomenon. *Nature Neuroscience* **13**: 369-378.
20. Imaizumi, K., **Priebe, N.J.**, Cheung, S.W. & Schreiner, C.E. (2010). Encoding of temporal information by timing rate and place in cat auditory. *PLOS One* **5**: e11531.
21. **Priebe, N.J.\***, Lampl I.\*, & Ferster D. (2010). Mechanisms of direction selectivity in cat primary visual cortex as revealed by visual adaptation. *Journal of Neurophysiology*, **104**: 2615-2623.
22. Imaizumi, K., **Priebe, N.J.**, Cheung, S.W. & Schreiner, C.E. (2011). Spatial organization of repetition rate processing in cat anterior auditory field. *Hearing Research* **280**: 70-81.
23. Tan, A.Y.Y., Brown, B.D., Scholl B., Mohanty, D. & **Priebe, N.J.** (2011). Orientation selectivity of synaptic input to neurons in mouse and cat primary visual cortex. *Journal of Neuroscience* **31**: 12339-12350.
24. Mohanty, D, Scholl B., & **Priebe, N.J.** (2012). The accuracy of membrane potential reconstruction based on spiking receptive fields. *Journal of Neurophysiology* **107**: 2143-2153.
25. Scholl, B., Latimer, K.W., & **Priebe, N.J.** (2012). A retinal origin for spatial invariance in contrast gain control. *Journal of Neuroscience* **32**: 9824-9830.
26. Scholl, B., Burge, J. & **Priebe, N.J.** (2013). Disparity tuning and binocular integration in mouse primary visual cortex. *Journal of Neurophysiology*, **109**: 3013-3024.
27. Scholl, B, Tan, A.Y.Y., Corey J. & **Priebe, N.J.** (2013). The emergence of orientation selectivity in the visual pathway. *Journal of Neuroscience*, **33**: 10616-10624.

28. Tan, A.Y.Y., Andoni, S., **Priebe, N.J.** (2013). A spontaneous state of weakly correlated synaptic excitation and inhibition in visual cortex. *Neuroscience*, **247**: 364-375.
29. Scholl, B., Tan, A.Y.Y. & **Priebe, N.J.** (2013) The disruption of ocular integration in primary visual cortex by eye misalignment. *Journal of Neuroscience*, **33**: 17108-17122.
30. Tan, A.Y.Y. , Chen, Y., Scholl, B., Seidemann, E., & **Priebe, N.J.** (2014) Sensory stimulation shifts visual cortex from synchronous to asynchronous states. *Nature*, **509**: 226-229.
31. Scholl, B., Pattadkal, J.,J. Dilly, G.A., **Priebe, N.J.** \*, & Zemelman, B.V.\* Local integration accounts for weak selectivity of mouse neocortical parvalbumin interneurons. *Neuron*, *in press*.

#### ARTICLES IN SUBMISSION:

32. Andoni, S., Zemelman B. & **Priebe, N.J.** Thalamocortical Phase Coupling During Spontaneous and Stimulus-evoked Activity in the Visual System. *Submitted*.
33. Scholl, B., Andoni, S. & **Priebe, N.J.** Functional characterization of spikelet activity in the cerebral neocortex. *Submitted*.

#### ARTICLES IN PREPARATION:

34. Hanover, J.L & **Priebe, N.J.** The degree of ocular dominance plasticity in visual cortex: a comparative study. *In preparation*.

#### REVIEWS, CHAPTERS AND OPINIONS:

1. **Priebe, N.J.** & Ferster, D. (2002) A New Mechanism for Neuronal Gain Control (or How the Gain in Brains Has Mainly Been Explained). *Neuron* **35**: 602.
2. **Priebe, N.J.** & Ferster, D. (2008) Inhibition, spike threshold and stimulus selectivity in primary visual cortex. *Neuron* **57**: 482-497.
3. **Priebe, N.J.** & Ferster D. (2009) Mechanisms of orientation, direction and depth. *New Encyclopedia of Neuroscience*.
4. **Priebe, N.J.** & Ferster D. (2010) Each synapse to its own. *Nature* **464**: 1290-1291.

5. Andoni, S., Tan, A.Y. & **Priebe, N.J.** (2012) Assembly of receptive fields in primary visual cortex. *The New Visual Neurosciences*
6. **Priebe, N.J.** & Ferster D. (2012) Mechanisms of neuronal computation in mammalian visual cortex. *Neuron*, **75**: 194-208.
7. Scholl, B. & **Priebe, N.J.** (2014). Modeling the emergence of orientation selectivity in the cerebral cortex. *Springer Encyclopedia of Computational Neuroscience*.
8. **Priebe, N.J.** & McGee, A.W. (2014) Mouse vision as a gateway for understanding how experience shapes neural circuits. *Frontiers in Neural Circuits*, **8**: 123.