BIOGRAPHICAL SKETCH

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NAME Stephen J Smith	POSITION TITLE Professor of Molecular and Cellular Physiology
eRA COMMONS USER NAME SMITH.STEPHEN	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Reed College, Portland Oregon	B.A.	1970	Psychology
University of Washington, Seattle WA	Ph.D.	1977	Physiology/Psychology
University of California, Berkeley, CA	Postdoc	1977-1980	Physiology

A. Positions and Honors.

1981-1984 Assistant Professor of Physiology, Yale Medical School
1984-1987 Assistant Professor of Molecular Neurobiology, Yale Medical School
1986-1987 Assistant Investigator, Howard Hughes Medical Institute
1987-1989 Associate Professor of Molecular Neurobiology, Yale Medical School
1987-1989 Associate Investigator Howard Hughes Medical Institute
1989-1994 Associate Professor of Molecular and Cellular Physiology, Stanford Medical School
1994-Pres Professor of Molecular and Cellular Physiology, Stanford Medical School
1994-2004 External Advisory Panel, National Center for Microscopy and Imaging Research, La Jolla
1994-1995 Course Director, *Imaging Neuronal Sturcture and Function* Course, Cold Spring Harbor
1996-1999 Section Director, *Neurobiology* Course, Woods Hole
1999-2004 Board of Scientific Counselors, National Institute of Child Health and Human Development, NIH
2000-2004 Scientific Advisory Board, Max Planck Institute, Heidelberg, Germany
2000-2006 Faculty, *Neurobiology* Course, Woods Hole

B. Selected peer-reviewed publications. (Selected from 97 total peer-reviewed publications)

1. Smith, S.J., MacDermott, A.B. and Weight, F.F. (1983) Detection of intracellular calcium transients in sympathetic neurones using arsenazo III. *Nature* **304**: 350-352.
2. MacDermott, A.B., Mayer, M.L., Westbrook, G.L., Smith, S.J., and Barker, J.L. (1986) NMDA-receptor activation increases cytoplasmic calcium concentration in cultured spinal cord neurones. *Nature* **321**: 519-522.
3. Forscher, P. and Smith, S.J. (1988) Actions of cytochalasins on the organization of actin filaments and microtubules in a neuronal growth cone. *J. Cell Biol.* **107**: 1505-1516.
4. Smith, S.J. (1988) Neuronal Cytomechanics: The actin-based motility of growth cones. *Science* **242**: 708-715.
5. Brehm, P., Lechleiter, J., Smith, S.J and Dunlap, K. (1989) Intercellular signalling as visualized by endogenous calcium-dependent bioluminescence. *Neuron* **3**: 191-198.
6. Cornell-Bell, A.H., Finkbeiner, S.M., Cooper, M.S. and Smith, S.J (1990) Glutamate induces calcium waves in cultured astrocytes: Long-range glial signalling. *Science* **247**: 470-473.
7. Cooper, M.S., Cornell-Bell, A.H., Chernjavsky, A., J.W. Dani and Smith, S.J (1990). Tubulovesicular processes emerge from trans-Golgi cisternae, extend along microtubules, and interlink adjacent trans-Golgi elements into a reticulum. *Cell*, **61**: 135-145.
8. Dani, J.W., Chernjavsky, A, and Smith, S.J. (1992) Neuronal activity triggers Ca waves in hippocampal astrocyte networks. *Neuron*, **8**: 429-440.
9. O'Rourke, N.A., Dailey, M.E., Smith, S.J. and McConnell, S.K. (1992) Diverse migratory pathways in the developing cerebral cortex. *Science*, **258**, 299-302.
10. Frances, C.L., Ryan, T.A., B.D. Jones, Smith, S.J and Falkow, S. (1993) Ruffles induced by *Salmonella* and other stimuli direct macropinocytocis of bacteria. *Nature*, **364**, 639-642.
11. Ryan, T.A., Reuter, H., Wendland, B., Schweizer, F.E., Tsien, R.W. and Smith, S.J. (1993) The kinetics of synaptic vesicle recycling measured at single presynaptic boutons. *Neuron*, **11**, 713-724.
12. Ryan, T.A., and Smith, S.J. (1995) Vesicle pool mobilization during action potential firing at hippocampal synapses. *Neuron*, **14**: 983-989.

13. Wong, R. O. L., Chernjavsky, A., Smith, S.J and Shatz, C.J. (1995) Early functional neural networks in the developing retina. *Nature*, **374**: 716-718.
14. Dailey, M.E. and Smith, S.J (1996) The dynamics of dendritic structure in developing hippocampal slices. *J. Neurosci*., 16: 2983-2994.
15. Ryan, T.A., Smith, S.J and Reuter, H. (1996) The timing of synaptic vesicle endocytosis. *Proc. Natl. Acad. Sci., USA*, **93**: 5567-5571.
16. Shalon, D., Smith, S. J and Brown, P.O. (1996) A DNA micro-array system for analyzing complex DNA samples using two-color fluorescent probe hybridization. *Genome Research* **6**:639-645.
17. Ryan, T.A., Ziv, N.E. and Smith, S.J (1996) Potentiation of evoked vesicle turnover at individually resolved synaptic boutons. *Neuron* **17**: 125-134.
18. Ziv. N.E. and Smith, S.J (1996) Evidence for a role of dendritic filopodia in synaptogenesis and spine formation. *Neuron* **17**: 91-102.
19. Ryan, T.A., Li, L., Chin, L.-S., Greengard, P. and Smith, S.J (1996) Synaptic vesicle recycling in synapsin I knock-out mice. *J. Cell Biol*. 134: 1219-1227.
20. Ryan, T.A., Reuter, H. and S.J Smith (1997) Optical detection of quantal presynaptic membrane turnover. *Nature* **388**: 478-482.
21. Adams, C.L., Chen, Y.T., Smith, S.J and Nelson, W.J. (1998) Mechanisms of epithelial cell-cell adhesion and cell compaction revealed by high-resolution tracking of E-Cadherin-green fluorescent protein. *J. Cell Biol*. 142: 1105-1119.
22. Smith, S.J (1999) Dissecting dendrite dynamics. *Science* 19: 1860-1861.
23. Jontes, J.D., Buchanan, J. and Smith, S.J (2000) Growth cone and dendrite dynamics in zebrafish embryos: in vivo imaging of early events in synaptogenesis. *Nature Neuroscience* 3: 231-237.
24. Ahmari, S.E., Buchanan, J. and Smith, S.J (2000) Assembly of presynaptic active zones from cytoplasmic transport packets. *Nature Neuroscience* 3: 445-451.
25. Jontes, J.D. and Smith, S.J (2000) Filopodia, spines and the generation of synaptic diversity. *Neuron* 27, 11-14.
26. Micheva, K.D., Holz, R.W. and Smith, S.J (2001) Regulation of presynaptic phosphatidylinositol 4,5-biphosphate by neuronal activity. *J. Cell Biol.* 154, 355-68.
27. Harata, N., Ryan, T.A., Smith, S.J., Buchanan, J. and Tsien, R.W. (2001) Visualizing recycling synaptic vesicles in hippocampal neurons by FM 1-43 photoconversion. *Proc Natl Acad Sci U S A.* 98(22):12748-53.
28. Hopf, F.W., Waters, J., Mehta, S. and Smith, S.J (2002) Stability and plasticity of developing synapses in hippocampal neuronal cultures. *J. Neurosci.* 22(3):775-781
29. Ahmari, S.E. and Smith, S.J (2002) Minireview: Knowing a nascent synapse when you see it. *Neuron*, 34, 333-336.
30. Meyer, M.P., Niell, C.M., and Smith, S.J. (2003) Brain imaging: how stable are synaptic connections? *Curr. Biol.* 13, R180-182.
31. Micheva, K.D., Buchanan, J., Holz, R.W. and Smith. S.J (2003) Evidence for retrograde regulation of synaptic vesicle endocytosis and recycling. *Nature Neurosci.* 6, 925-932.
32. Waters, J. and Smith, S.J (2003) Mitochondria and release at hippocampal synapses. *Pflügers Archiv* 447(3):363-70.
33. Niell, C.M., Meyer, M.P and Smith, S.J (2004) *In vivo* imaging of synapse formation on a growing dendritic arbor. *Nature Neurosci*. 7: 254-260.
34. Niell, C.M. and Smith, S.J (2004) Live optical imaging of nervous system development. *Ann. Rev. Physiol*. 66: 771-798.
35. Hua, Y and Smith, S.J (2004) Neural activity and the dynamics of central nervous system development. *Nature Neurosci.* 7:327-332.
36. Jontes, J.D., Emond, M.R., Smith, S.J (2004) In vivo trafficking and targeting of N-cadherin to nascent presynaptic terminals. *J. Neurosci.* 24(41):9027-34.
37. Meyer, M.P., Trimmer, J.S., Gilthorpe, J.D., and Smith, S.J (2005) Characterization of Zebrafish PSD-95 Gene Family Members. *J. Neurobiol*. 63(2):91-105.
38. Niell, C.M. and Smith, S.J (2005) Functional imaging reveals rapid development of visual response properties in the zebrafish tectum. *Neuron.* 45: 941-951.
39. Hua, Y., Smear, M.C., Baier, H. and Smith, S.J (2005) Activity-Based Competition Regulates Axon Growth in Vivo. *Nature* 434: 1022-1026.
40. Thrush E., Levi O., Cook L.J., Deich J., Kurtz A., Smith S.J., Moerner W.E. and Harris J.S., Jr. (2005) Monolithically integrated fluorescence sensor for microfluidic applications. *Sensors and Actuators B: Chemical* 105: 393-399.
41. Okumoto, S., Looger, L.L., Micheva, K.D., Reimer, R.J., Smith, S.J, and Frommer, W.B. (2005) Detection of glutamate release from neurons by genetically encoded surface-displayed FRET nanosensors. *Proc. Natl. Acad. Sci., USA*, 102:8740-8745.
42. Micheva, K.D. and Smith, S.J (2005) Strong effects of sub-physiological temperature on the function and plasticity of mammalian presynaptic terminals. *J. Neurosci*. 25: 7481-7488.
43. Meyer, M.P. & Smith, S.J (2006) Evidence from in vivo imaging that synaptogenesis guides the growth and branching of axonal arbors by two distinct mechanisms. *J. Neurosci.* 26:3604-14.

C. Research Support.

ONGOING

1R01 NS043461 Smith, Stephen J (PI) 7/1/03 – 4/30/08
National Institutes of Health
"Dendrite Growth and Synaptogenesis in Zebrafish CNS"
Major Goal: Explore relationships between dendrite growth and developmental synaptogenesis in zebrafish optic tectum using in vivo optical imaging and electron microscopy methods.
Role: PI

Technological Innovation in Neuroscience Award Smith, Stephen (PI) 9/1/04 – 8/30/06
McKnight Endowment Fund for Neuroscience
"Methods for the Delineation of Brain Circuitry by Serial-Sectioning Scanning Electron Microscopy"
Major Goal: Develop staining and image processing methods for the analysis of neural circuitry by volume scanning electron microscopy
Role: PI

BES 0423076 Smith, Stephen (PI) 9/1/04 – 8/31/07
National Science Foundation
"Design of Novel Implantable Brain Imaging Devices"
Major Goal: Develop and test designs for an implantable microphotonic sensor of intrinsic optical signals associated with activity of the cerebral cortex.
Role: PI

1 R01 NS054252 Choe, Yoonsuck, Texas A&M Univ. (PI) 9/1/05 – 5/31/08
National Institutes of Health
"Multiscale Imaging, Modeling and Integration of Brain Networks"
Major Goal: Development new imaging and computational tools for mapping central nervous system circuitry at high resolution.
Role: Co-PI (Stanford Subcontract to Texas A&M)

RECENTLY COMPLETED

MDA972-00-1-0032 McAdams, Harley (PI) 9/14/00-12/31/03
DARPA
"Analysis/Modeling of Temporal/Spatial Patterns of Biological Control Circuits"
Major goals: 1) Develop new techniques for high speed, high through-put and high sensitivity two-photon microscopy; 2) development of integrated microfluorimeter technology.
Role: Co-PI

3R01 NS28578 Smith, Stephen J (PI) 5/1/99 – 3/31/03
National Institutes of Health
"Cellular Physiology of Cortical Development"
Major Goal: Explore mechanisms of cell motility, cell-cell adhesion and active zone assembly underlying synaptogenesis in dissociated hippocampal neurons in cell culture using time-lapse optical imaging methods.
Role: PI

Project 1084762 Smith, Stephen J (PI) 2/2/04 – 9/19/04
Pfizer Pharmaceuticals
"Presynaptic Mechanisms of Pregabalin Action"
Major Goal: Explore effects of Pregabalin on presynaptic vesicle function elicited by electrical and osmotic stimulation.