

Curriculum Vitae

James Schummers

Department of Biomedical Engineering
Florida International University
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Education

2003 Ph.D. Systems Neuroscience, Massachusetts Institute of Technology, Cambridge MA
1995 B.A. Neuroscience, Oberlin College, Oberlin OH

Research Positions

2018- Associate Professor, Dept. Biomedical Engineering, FIU
2011-2018 Research Group Leader, Max Planck Florida Institute for Neuroscience
2005-2010 Postdoctoral Associate, Picower Institute for Learning and Memory, MIT
2003-2005 Postdoctoral Fellow, Picower Institute for Learning and Memory, MIT
1997-2003 HHMI Predoctoral Fellow, Dept Brain and Cognitive Sciences, MIT
1995-1997 Research Assistant, Dept of Pharmacology, U Colorado Health Science Center
1994-1995 Undergraduate Honors Thesis, Dept Neuroscience, Oberlin College

Honors and Awards

2004 Dept Brain and Cognitive Sciences Outstanding Thesis Award (for 2002-2004)
1998-2003 Howard Hughes Medical Institute Predoctoral Fellowship
1995 High Honors in Neuroscience, Oberlin College
1995 Nancy Robell Memorial Prize in Undergraduate Research, Oberlin College

Institutional Service

2014-present Optical Workshop Faculty Oversight Committee
2014-present Animal Resource Center Faculty Oversight Committee
2014-present Information Technology Services Faculty Oversight Committee
2013-present Voting Member - Institutional Animal Care and Use Committee (IACUC)
2012-2013 Institutional Official
2011-present RGL Representative to Directors
2011-2012 Co-Organizer FAU-MPFI Seminar Series

External Service

Grant Ad Hoc Reviewer: NINDS BRAIN Initiative Special Emphasis Panel, Research Foundation - Flanders (Fonds Wetenschappelijk Onderzoek - Vlaanderen, FWO)
Journal Ad Hoc Reviewer: *Science*, *Nature Neuroscience* (x3), *Neuron* (x2), *ELife*, *Journal of Neuroscience*, *Nature Communications*, *Cerebral Cortex*, *Journal of Neurophysiology*, *Neuron Glia Biology*, *Frontiers in Neuroscience*, *Neurophotonics*, *Journal of Neuroscience Methods*, *Neuroscience Letters*

Funding

Max Planck Florida Institute for Neuroscience: internal (2011-2017)
National Eye Institute: NEI R01EY02697 (2016-2021)

Publications

In preparation & submitted:

Duarte SP, **Schummers J** (submitted) Retinotopic scatter minimizes receptive field redundancy in ferret visual cortex

López Hidalgo M, Kellner V **Schummers J** (in prep) Astrocyte subdomains respond independently in vivo

Kellner V, López Hidalgo M, **Schummers J** (in prep) Astrocyte temporal integration of neural activity in vivo.

López Hidalgo M, Hoover WB and **Schummers J** (2016) Spatial organization of astrocytes in ferret visual cortex. *J Comp Neurol.* Dec 1;524(17):3561-3576

Estrada G, Beetle C, and **Schummers J**. Simple method to improve spatial resolution for *in vivo* two-photon fluorescence imaging. (2015) *Applied Optics* Vol. 54, Issue 34, pp. 10044-10050

Sharma J, Sugihara H, Katz Y, **Schummers J**, Tenenbaum J and Sur M (2015) Spatial Attention and Temporal Expectation Under Timed Uncertainty Predictably Modulate Neuronal Responses in Monkey V1. *Cereb. Cortex* (2015) 25 (9):2894-2906.

Wilson NR*, **Schummers J***, Runyan CA, Yan SX, Chen RE, Deng Y, Sur M (2013) Two-way communication with neural networks in vivo using focused light. *Nat Protoc.* Jun;8(6):1184-203. *Co-first author

Jarosiewicz B, **Schummers J**, Malik WQ, Brown EN, Sur M. (2012) Functional biases in visual cortex neurons with identified projections to higher cortical targets. *Curr Biol.* 2012 Feb 21;22(4):269-77.

Mao R, **Schummers J**, Knoblich U, Lacey CJ, Van Wart A, Cobos I, Kim C, Huguenard JR, Rubenstein JL, Sur M (2012) Influence of a Subtype of Inhibitory Interneuron on Stimulus-Specific Responses in Visual Cortex. *Cereb Cortex* Mar;22(3):493-508

Malik WQ, **Schummers J**, Sur M and Brown EN. (2011) Denoising two-photon calcium imaging data *PLoS ONE* 2011;6(6):e20490

Runyan CA*, **Schummers J***, Van Wart A*, Kuhlman SJ, Wilson NR, Huang ZJ, Sur M (2010) Response features of parvalbumin-expressing interneurons suggest precise roles for subtypes of inhibition in visual cortex. *Neuron* Sep 9;67(5):847-57. *Co-first author

Related commentary: Hasenstaub AR, Callaway EM. (2010) Paint it black (or red, or green): optical and genetic tools illuminate inhibitory contributions to cortical circuit function. *Neuron* Sep 9;67(5):681-4.

Malik WQ, Schummers J, Sur M, Brown EN (2009) A statistical model for multiphoton calcium imaging of the brain. *Conf Proc IEEE Eng Med Biol Soc.* 2009:7002-5.

Stimberg M, Wimmer K, Martin R, Schwabe L, Marino J, **Schummers J**, Lyon DC, Sur M and Obermayer K. The Operating Regime of Local Computations in Primary Visual Cortex. *Cerebral Cortex* Sep;19(9):2166-80.

Schummers J, Yu H, Sur M. (2008) Tuned responses of astrocytes and their influence on hemodynamic signals in the visual cortex. *Science*. 320:1638-43.

Related commentary: Wolf F, Kirchhoff F. (2008) Neuroscience. Imaging astrocyte activity. *Science*. 320:1597-1599.

Schummers J, Cronin B, Wimmer K, Stimberg M, Martin R, Obermayer K, Koerding K and Sur M (2007) Dynamics of orientation tuning in cat V1 neurons depend on location within layers and orientation maps. *Frontiers in Neuroscience* 2007 Nov;1(1):145-59.

Wang KH, Majewska A, **Schummers J**, Farley B, Hu C, Sur M, Tonegawa S (2006) In vivo two-photon imaging reveals a role of arc in enhancing orientation specificity in visual cortex. *Cell* 126:389-402.

Mariño J, **Schummers J**, Lyon DC, Schwabe L, Beck O, Wiesing P, Obermayer K, Sur M (2005) Invariant computations in local cortical networks with balanced excitation and inhibition. *Nat Neurosci* 8:194-201.

Schummers J, Mariño J, Sur M (2002) Synaptic integration by V1 neurons depends on location within the orientation map. *Neuron* 36:969-978.

Related commentary: Callaway EM (2002) Orientation tuning--a crooked path to the straight and narrow. *Neuron* 36:783-785.

Schummers J, Browning MD (2001) Evidence for a role for GABA(A) and NMDA receptors in ethanol inhibition of long-term potentiation. *Brain Res Mol Brain Res* 94:9-14.

Schummers J, Bentz S, Browning MD (1997) Ethanol's inhibition of LTP may not be mediated solely via direct effects on the NMDA receptor. *Alcohol Clin Exp Res* 21:404-408.

Colvin RA, Walker JP, **Schummers J**, Davis N (1996) Aging does not affect steady-state expression of the Na⁺/Ca²⁺ exchanger in rat brain. *Cell Mol Neurobiol* 16:11-19.

Janapati V, Wu A, Davis N, Derrico CA, Levensgood J, **Schummers J**, Colvin RA (1995) Post-transcriptional regulation of the Na⁺/Ca²⁺ exchanger in aging rat heart. *Mech Ageing Dev* 84:195-208.

Book Chapters, Reviews and Commentaries:

López-Hidalgo M, Kellner V, **Schummers J**. (2017) Astrocyte Calcium Responses to Sensory Input: Influence of Circuit Organization and Experimental Factors. *Front Neural Circuits* Mar 22;11:16

López Hidalgo M, **Schummers J** (2014) Cortical maps: a role for astrocytes? *Curr Op Neur* Feb: 24:176–189

Yu H, **Schummers J**, Sur M "The influence of astrocyte activation on hemodynamic signals for functional brain imaging". in Roe AW, (ed), *Imaging the Brain with Optical Methods*. Springer NY (2009)

Schummers J, Sharma J, Sur M (2005) Bottom-up and top-down dynamics in visual cortex. *Prog Brain Res* 149:65-81.

Schummers J , Mariño J, Sur M (2004) Local networks in visual cortex and their influence on neuronal responses and dynamics. *J Physiol Paris* 98:429-441.

Mariño J, **Schummers J**, Sur M (2003) Combination of new electrophysiological and imaging techniques in the study of primary visual cortex function. *Rev Neurol* 36:944-950. (Spanish)

Sur M, **Schummers J**, Dragoi V (2002) Cortical plasticity: time for a change. *Curr Biol* 12:R168-170.

Browning MD, **Schummers J**, Bentz S. "Alcohol, memory and molecules". In Liu, G and Hunt, T. (Eds.) *The "Drunken" Synapse*. New York: Plenum Publishers, pp. 159-166, 1999.

Patents

Noise reduction of imaging data. WQ Malik, JM Schummers, M Sur, EN Brown US Patent 8,903,192, 2014

Students Supervised

Sally Duarte Ph.D.	Postdoc 2013-
Nathan Crock	PhD Student FSU 2015-
F. Isaac Guillen	Postbac Scholar 2017-
Siddhant Pusdekar	Postbac Scholar 2016-
Vered Kellner Ph.D. Current: Postdoc, Johns Hopkins	Postdoc 2014-2016
Christine Ryan Current: PhD student, University of Miami	FAU Scholar 2013-2016
Spenser Smith Current: Pharm.D. student, UNC	Postbac Scholar 2015-2016
Gerardo Estrada Current: Optical Specialist, Boston University	PhD Student FAU 2011-2014
Mónica López Hidalgo Ph.D. Current: Assistant Professor, Universidad Autónoma de Querétaro	Postdoc 2012-2015
Andrew Li Current: Medical Student FAU	FAU Scholar 2013-2015
Mario Treviño Villegas Ph.D. Current: Assistant Professor, Universidad de Guadalajara	Postdoc 2012-2013

Invited Talks

VIB Center for the Biology of Disease K.U. Leuven Center for Human Genetics	(2018)
IV International Symposium Frontiers in Neuroscience Rio de Janeiro Brazil	(2017)
Cosyne Workshop (co-organizer): Advances in studies of astrocyte-neuron interactions	(2017)
Florida International University, Miami FL	(2017)
Society for Neuroscience Minisymposium	(2016)
TINNS, Scripps Florida, Jupiter FL	(2016)
Institute of Neurobiology UNAM Juriquilla MX	(2015)
Gordon Conference: Glial Biology: Functional Interactions among Glia & Neurons	(2015)
Florida Institute of Technology, Melbourne, FL	(2014)
<i>Photons and Neurons Symposium</i> : SPIE Photonics West, San Francisco	(2012)