

## 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*, *Neuron*, *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

López Hidalgo M, Kellner V **Schummers J** (2019) Astrocyte subdomains respond independently in vivo BiorXiv **doi:** <https://doi.org/10.1101/675769>

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<sup>+</sup>/Ca<sup>2+</sup> 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<sup>+</sup>/Ca<sup>2+</sup> 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

Pritom Kumar	PhD Student FIU 2020-
Carlos Otero	CURE Fellow FIU 2020-
Gerson Moreno	CURE Fellow FIU 2019-
Sally Duarte Ph.D.	Postdoc 2013-
Tomas Suarez Current: PhD Student Carnegie Mellon	CURE Fellow FIU 2018-2020
Sean Miller	MS Student FIU 2019-2019
Gabriel Santana Current: PhD Student UC Davis	McNair Scholar 2018-2019
Nathan Crock	PhD Student FSU 2015-2019
F. Isaac Guillen Current Graduate student, German Primate Center	Postbac Scholar 2017-2018
Siddhant Pusdekar Current: Graduate student, UMN	Postbac Scholar 2016-2018
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)