

# The Journal of Neuroscience

August 7, 2013 • Volume 33 Number 32 • www.jneurosci.org



**Cover legend:** This video demonstrates the process for reconstructing objects from a set of images. It begins by traveling through a series of images obtained with serial block-face scanning electron microscopy from the developing mouse auditory brainstem. The view then zooms into a portion of the image plane and elements of a single cell in the medial nucleus of the trapezoid body are highlighted: The nucleus of the cell is colored red, the cell body gold and a large calyx-forming input (calyx of Held) is colored blue. The cell body is  $\sim 20 \mu\text{m}$  across. The image zooms further into the segmented cell to reveal subcellular organelles including endoplasmic reticulum and mitochondria then passes across the membrane of the cell into the calyx of Held that contacts the cell, revealing synaptic vesicles and thickened membrane areas indicative of synaptic contacts. The view moves out of the nerve terminal into a complex neuropil, showing the large volume of open space in the developing brain. A single axon is highlighted in blue, and the process of segmentation across image planes is illustrated by extracting the rendered object as successive image planes are removed. The resulting rendering of the calyx of Held is displayed, illustrating its many fine processes. After rotating the rendered calyx, the postsynaptic neuron is displayed and the entire synaptic complex is then rotated. The image on the issue cover depicts the calyx of Held partially extracted from the image volume. For more information, see the article by Holcomb et al. (pages 12954–12969).



## i This Week in The Journal

### Editorial

- 12909 **Cover Videos**  
John Maunsell

### Journal Club

- 12910 **The Role of  $\beta$ -Amyloid in Alzheimer's Disease-Related Neurodegeneration**  
Mitchell R. Goldsworthy and Ann-Maree Valence
- 12912 **Interactions between Resting-State and Task-Evoked Brain Activity Suggest a Different Approach to fMRI Analysis**  
Dana Mastrovito

### Brief Communications

- 12982 **Dopamine Modulates Risk-Taking as a Function of Baseline Sensation-Seeking Trait**  
Agnes Norbury, Sanjay Manohar, Robert D. Rogers, and Masud Husain
- 13081 **Nocturnal Light Exposure Impairs Affective Responses in a Wavelength-Dependent Manner**  
Tracy A. Bedrosian, Celynn A. Vaughn, Anabel Galan, Ghassan Daye, Zachary M. Weil, and Randy J. Nelson
- 13088 **KIBRA Polymorphism Is Associated with Individual Differences in Hippocampal Subregions: Evidence from Anatomical Segmentation using High-Resolution MRI**  
Daniela J. Palombo, Robert S.C. Amaral, Rosanna K. Olsen, Daniel J. Müller, Rebecca M. Todd, Adam K. Anderson, and Brian Levine
- 13094 **Matching Dynamics of Presynaptic and Postsynaptic Scaffolds**  
Arava Fisher-Lavie and Noam E. Ziv
- 13233 **Disruption of Dorsolateral But Not Ventrolateral Prefrontal Cortex Improves Unconscious Perceptual Memories**  
Taraz G. Lee, Robert S. Blumenfeld, and Mark D'Esposito

### Articles

#### CELLULAR/MOLECULAR

- 12915 **Postnatal Disruption of the Disintegrin/Metalloproteinase ADAM10 in Brain Causes Epileptic Seizures, Learning Deficits, Altered Spine Morphology, and Defective Synaptic Functions**  
Johannes Prox, Christian Bernreuther, Hermann Altmepfen, Jasper Grendel, Markus Glatzel, Rudi D'Hooge, Stijn Stroobants, Tariq Ahmed, Detlef Balschun, Michael Willem, Sven Lammich, Dirk Isbrandt, Michaela Schweizer, Katrien Horré, Bart De Strooper, and Paul Saftig

- 12940 **Rines E3 Ubiquitin Ligase Regulates MAO-A Levels and Emotional Responses**  
Miyuki Kabayama, Kazuto Sakoori, Kazuyuki Yamada, Veravej G. Ornthanalai,  
Maya Ota, Naoko Morimura, Kei-ichi Katayama, Niall P. Murphy,  
and Jun Aruga
- 12987 **Goofy Coordinates the Acuity of Olfactory Signaling**  
Tomomi Kaneko-Goto, Yuki Sato, Sayako Katada, Emi Kinameri,  
Sei-ichi Yoshihara, Atsushi Nishiyori, Mitsuhiro Kimura, Hiroko Fujita,  
Kazushige Touhara, Randall R. Reed, and Yoshihiro Yoshihara
- 13025 **A Sodium-Pump-Mediated Afterhyperpolarization in Pyramidal Neurons**  
Allan T. Gullledge, Sameera Dasari, Keita Onoue, Emily K. Stephens,  
J. Michael Hasse, and Daniel Avesar
- 13179 **How to Scale Down Postsynaptic Strength**  
Vedakumar Tataavarty, Qian Sun, and Gina G. Turrigiano
- 13190 **Ordered Recruitment of Dynactin to the Microtubule Plus-End is Required for Efficient Initiation of Retrograde Axonal Transport**  
Armen J. Moughamian, Gregory E. Osborn, Jacob E. Lazarus, Sandra Maday,  
and Erika L.F. Holzbaaur
- 13204 **Super-Resolution Imaging Reveals That AMPA Receptors Inside Synapses Are Dynamically Organized in Nanodomains Regulated by PSD95**  
Deepak Nair, Eric Hosity, Jennifer D. Petersen, Audrey Constals,  
Gregory Giannone, Daniel Choquet, and Jean-Baptiste Sibarita

#### DEVELOPMENT/PLASTICITY/REPAIR

- 12954 **Synaptic Inputs Compete during Rapid Formation of the Calyx of Held: A New Model System for Neural Development**  
Paul S. Holcomb, Brian K. Hoffpauir, Mitchell C. Hoyson, Dakota R. Jackson,  
Thomas J. Deerinck, Glenn S. Marrs, Marlin Dehoff, Jonathan Wu,  
Mark H. Ellisman, and George A. Spirou
- 13010 **Atypical Retinotopic Organization of Visual Cortex in Patients with Central Brain Damage: Congenital and Adult Onset**  
Danielle C. Reitsma, Jedidiah Mathis, John L. Ulmer, Wade Mueller,  
Mary J. Maciejewski, and Edgar A. DeYoe
- 13053 **Onecut1 Is Essential for Horizontal Cell Genesis and Retinal Integrity**  
Fuguo Wu, Renzhong Li, Yumiko Umino, Tadeusz J. Kaczynski, Darshan Sapkota,  
Shengguo Li, Mengqing Xiang, Steven J. Fliesler, David M. Sherry,  
Maureen Gannon, Eduardo Solessio, and Xiuqian Mu
- 13101 **Elevated MMP-9 in the Lumbar Cord Early after Thoracic Spinal Cord Injury Impedes Motor Relearning in Mice**  
Christopher N. Hansen, Lesley C. Fisher, Rochelle J. Deibert,  
Lyn B. Jakeman, Haoqian Zhang, Linda Noble-Haesslein, Susan White,  
and D. Michele Basso
- 13171 **Adrenergic Gating of Hebbian Spike-Timing-Dependent Plasticity in Cortical Interneurons**  
Shiyong Huang, Richard L. Huganir, and Alfredo Kirkwood

#### SYSTEMS/CIRCUITS

- 12929 **Rich Club Organization and Intermodule Communication in the Cat Connectome**  
Marcel A. de Reus and Martijn P. van den Heuvel

13225 **Correlation between OFF and ON Channels Underlies Dark Target Selectivity in an Insect Visual System**  
Steven D. Wiederman, Patrick A. Shoemaker, and David C. O'Carroll

13238 **Rectifying Electrical Synapses Can Affect the Influence of Synaptic Modulation on Output Pattern Robustness**  
Gabrielle J. Gutierrez and Eve Marder

#### BEHAVIORAL/COGNITIVE

13112 **The Basolateral Amygdala Is Critical for Learning about Neutral Stimuli in the Presence of Danger, and the Perirhinal Cortex Is Critical in the Absence of Danger**  
Nathan M. Holmes, Shauna L. Parkes, A. Simon Killcross,  
and R. Frederick Westbrook

13126 **Behavioral Modulation of Neural Encoding of Click-Trains in the Primary and Nonprimary Auditory Cortex of Cats**  
Chao Dong, Ling Qin, Zhenling Zhao, Renjia Zhong, and Yu Sato

13150 **Brain Activity in Valuation Regions while Thinking about the Future Predicts Individual Discount Rates**  
Nicole Cooper, Joseph W. Kable, B. Kyu Kim, and Gal Zauberman

13157 **A Comparison of Lateral and Medial Intraparietal Areas during a Visual Categorization Task**  
Sruthi K. Swaminathan, Nicolas Y. Masse, and David J. Freedman

#### NEUROBIOLOGY OF DISEASE

12970 **Autonomic Dysreflexia Causes Chronic Immune Suppression after Spinal Cord Injury**  
Yi Zhang, Zhen Guan, Brenda Reader, Todd Shawler, Shweta Mandrekar-Colucci,  
Kun Huang, Zachary Weil, Anna Bratasz, Jonathan Wells, Nicole D. Powell,  
John F. Sheridan, Caroline C. Whitacre, Alexander G. Rabchevsky, Mark S. Nash,  
and Phillip G. Popovich

12997 **Dendritic Spine Instability Leads to Progressive Neocortical Spine Loss in a Mouse Model of Huntington's Disease**  
Reena Prity Murmu, Wen Li, Anthony Holtmaat, and Jia-Yi Li

13042 **Protection of Spiral Ganglion Neurons from Degeneration Using Small-Molecule TrkB Receptor Agonists**  
Qing Yu, Qing Chang, Xia Liu, Yunfeng Wang, Huawei Li, Shusheng Gong,  
Keqiang Ye, and Xi Lin

13066 **Impaired D-Serine-Mediated Cotransmission Mediates Cognitive Dysfunction in Epilepsy**  
Katharina Klatte, Timo Kirschstein, David Otte, Leonie Pothmann,  
Lorenz Müller, Tursonjan Tokay, Maria Kober, Mischa Uebachs,  
Andreas Zimmer, and Heinz Beck

13138 **Arctigenin Effectively Ameliorates Memory Impairment in Alzheimer's Disease Model Mice Targeting Both  $\beta$ -Amyloid Production and Clearance**  
Zhiyuan Zhu, Jianming Yan, Wei Jiang, Xin-gang Yao, Jing Chen, Lili Chen,  
Chenjing Li, Lihong Hu, Hualiang Jiang, and Xu Shen

**13249** *Correction:* The article “Conflicts between Local and Global Spatial Frameworks Dissociate Neural Representations of the Lateral and Medial Entorhinal Cortex” by Joshua P. Neunuebel, D. Yoganarasimha, Geeta Rao, and James J. Knierim appeared on pages 9246–9258 of the May 29, 2013 issue. A correction for that article appears on page 13249.

---

Persons interested in becoming members of the Society for Neuroscience should contact the Membership Department, Society for Neuroscience, 1121 14th St., NW, Suite 1010, Washington, DC 20005, phone 202-962-4000.

Instructions for Authors are available at <http://www.jneurosci.org/misc/itoa.shtml>. Authors should refer to these Instructions online for recent changes that are made periodically.

*Brief Communications* Instructions for Authors are available via Internet ([http://www.jneurosci.org/misc/ifa\\_bc.shtml](http://www.jneurosci.org/misc/ifa_bc.shtml)).

Submissions should be submitted online using the following url: <http://jneurosci.msubmit.net>. Please contact the Central Office, via phone, fax, or e-mail with any questions. Our contact information is as follows: phone, 202-962-4000; fax, 202-962-4945; e-mail, [jn@sfn.org](mailto:jn@sfn.org).