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Program Cover
This hippocampal neuron, 14 d in vitro, lacks NMDA receptor subunit GluN2B. It was immunostained for the AMPA receptor subunit GluA1 (green), the vesicular glutamate transporter VGLUT1 (red), and the microtubule-associated protein MAP2 (blue). An edge-detect filter was used to enhance color and cluster contour. In the absence of the GluN2B subunit, synaptic clustering of AMPA receptors is increased as a result of impaired anchoring of the synaptic proteasome.
Courtesy, with permission: Joana S. Ferreira, Jeannette Schmidt, Pedro Rio, Rodolfo Águas, Amanda Rooyakkers, Ka Wan Li, August B. Smit, Ann Marie Craig, and Ana Luisa Carvalho, 2015, *The Journal of Neuroscience 35(22): 8462-8479.*

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Choroid plexus epithelial cells (CPECs) differentiated from human embryonic stem cell-derived neuroepithelial progenitors. CPEC markers TTR and ZO1 are marked in red and green, respectively, with Hoechst nuclear counterstaining in blue.
Courtesy, with permission: Momoko Watanabe, Young-Jin Kang, Lauren M. Davies, Sanket Meghpara, Kimbley Lau, Chi-Yeh Chung, Jaymin Kathiriya, Anna-Katerina Hadjantonakis, and Edwin S. Monuki, 2012, *The Journal of Neuroscience, 32(45): 15934-15945.*

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This image shows dentate granule cells in the hippocampus of an adult mouse that lacks TRIM9 ubiquitin ligase. These cells, labeled with red and green florescent proteins, exhibit occasional ectopic migration into the molecular layer.
Courtesy, with permission: Cortney C. Winkle, Reid H. J. Olsen, Hyojin Kim, Sheryl S. Moy, Juan Song, and Stephanie L. Gupton, 2016, *The Journal of Neuroscience 36(18): 4940-4958.*

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Fluorescence micrograph of a glial microdot island containing reciprocally connected hippocampal neurons, a GABAergic (blue) and a glutamatergic (red) neuron. MPTS (red) or Alexa-568 (blue) was infused during double whole-cell recordings. Both neurons were transduced with Synaptophysin-pHluorin, which allowed the identification of active glutamatergic and GABAergic synapses after train stimulation of either neuron (glutamatergic synapses: green spots; GABAergic synapses: white spots). Comparing the number of active synapses to the rate of mEPSC and mIPSC showed that innervation by a GABAergic neuron downregulates spontaneous release rates in glutamatergic neurons.
Courtesy, with permission: Keimpe D. B. Wierda and Jakob B. Sørensen, *The Journal of Neuroscience, 5 February 2014, 34(6): 2100-2110.*

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A cross section through a mouse quadriceps nerve showing discontinuous Drp2 staining (green) in the plasma membrane of Schwann cells, with axons stained for neurofilament (blue) and myelin stained for P0 (red).
Courtesy, with permission: Diane L. Sherman, Lai Man N. Wu, Matthew Grove, C. Stewart Gillespie, and Peter J. Brophy, *The Journal of Neuroscience, 4 July 2012, 32(27): 9419-9428.*

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Confocal micrograph of motor cortical neurons (orange) that project to the auditory cortex in mice. The neurons were labeled by injecting a retrogradely transported virus encoding Cre into the auditory cortex of a mouse that expresses a fluorescent protein in a Cre-dependent manner. DAPI is in blue.
Courtesy, with permission: Anders Nelson, David M. Schneider, Jun Takatoh, Katsuyasu Sakurai, Fan Wang, and Richard Mooney, *The Journal of Neuroscience 4 September 2013, 33(36): 14342-14353.*

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Confocal image of a hippocampal neuron grown on a glial cell microisland. The neuron was labeled with anti-MAP2 antibody (red). Blue staining (DAPI) identifies cell nuclei. Autaptic cultures of single hippocampal neurons were used to investigate the effects of intracellular accumulation of amyloid-βprotein on glutamatergic synaptic transmission.

Courtesy, with permission: Cristian Ripoli,Sara Cocco, Domenica D. Li Puma, Roberto Piacentini, Alessia Mastrodonato, Federico Scala, Daniela Puzzo, Marcello D'Ascenzo, and Claudio Grassi, 2014, *The Journal of Neuroscience, 17 September 2014, 34(38).*

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This image displays a dense localization of fluorescently labeled perineuronal nets (green) around mouse hippocampal CA2 pyramidal neurons (red) and proximal neurites. Perineuronal nets are stained with Wisteria floribunda agglutinin, CA2 neurons are labeled using a mouse line expressing EGFP under control of the Amigo2 promoter (Gensat). Nuclei are stained with DAPI (blue).

Courtesy, with permission: Kelly E. Carstens, Mary L. Phillips, Lucas Pozzo-Miller, Richard J. Weinberg, and Serena M. Dudek, 8 June 2016, 36(23): 6312-6320.

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Confocal micrograph taken from the lesion core of a spinal cord injury in the rat showing reparative macrophages (green) associated with a key angiogenic cytokine, vascular endothelial growth factor (red), following extracellular matrix modification by means of chondroitinase gene delivery. Bartus et al. demonstrated a novel interaction between matrix modification and modulation of the inflammatory response following spinal cord injury.
Courtesy, with permission: Katalin Bartus, Nicholas D. James, Athanasios Didangelos, Karen D. Bosch, Joost Verhaagen, Rafael J. Yáñez-Muñoz, John H. Rogers, Bernard L. Schneider, Elizabeth M. Muir, and Elizabeth J. Bradbury, *The Journal of Neuroscience, 2 April 2014, 34(14): 4822-4836.*

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A side view of the trunk of a 24-h-old transgenic zebrafish embryo in which motor neurons express green fluorescent protein under the motor neuron specific promotor hb9 is shown. False colors code for relative depths of green fluorescent protein positive somata and axons from deep (blue) to superficial (yellow), indicating rows of ventral motor axons on the left and right side of the trunk. In this embryo, plexinA3 expression has been reduced by morpholino injection resulting in aberrant growth of some motor axons (far left and right).
Courtesy, with permission: Julia Feldner, Michell M. Reimer, Jörn Schweitzer, Björn Wendik, Dirk Meyer, Thomas Becker, and Catherina G. Becker, *The Journal of Neuroscience, 2 May 2007, 27(18): 4978-4983.*

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Abundant α-synuclein inclusions (green) localize throughout axons (magenta).
Courtesy, with permission: Laura A. Volpicelli-Daley, Hisham Abdelmotilib, Zhiyong Liu, Lindsay Stoyka, João Paulo Lima Daher, Austen J. Milnerwood, Vivek K. Unni, Warren D. Hirst, Zhenyu Yue, Hien T. Zhao, Kyle Fraser, Richard E. Kennedy, and Andrew B. West, *The Journal of Neuroscience, 13 July 2016, 36(28): 7415-7427.*

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This confocal micrograph shows an olfactory bulb slice from a postnatal day 14 mouse. Newborn interneurons were labeled by EGFP (green) and gap-mCherry (blue). The dendritic branching of interneurons was seen from the granule cell layer to the external plexiform layer.
Courtesy, with permission: Hiroo Takahashi, Yoichi Ogawa, Sei-ichi Yoshihara, Ryo Asahina, Masahito Kinoshita, Tatsuro Kitano, Michiko Kitsuki, Kana Tatsumi, Mamiko Okuda, Kouko Tatsumi, Akio Wanaka, Hirokazu Hirai, Peter L. Stern, and Akio Tsuboi, *The Journal of Neuroscience, 13 August 2016, 36(31): 8210-8227.*

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The input–output gain of individual motor neurons, stained for choline acetyltransferase (green) in this saggital view of the ventral horn of spinal cord (down is ventral), is modulated by the premotor interneuron network (red cells stained with Nissl) to optimize the control of muscular force. Image courtesy of Peter C. Petersen, Kristian Jensen, and the core facility for integrative microscopy, University of Copenhagen.
Courtesy, with permission: Mikkel Vestergaard and Rune W. Berg, *The Journal of Neuroscience, 25 February 2015, 35(8): 3711-3723.*

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A thalamocortical slice from a 4-dayold mouse brain in which neurons in the ventrobasal thalamus express Cre recombinase and tdTomato, allowing visualization of thalamocortical axons (red) innervating the barrel cortex. Layer 6 corticothalamic neurons (green) were labeled by an antibody to the transcription factor TBR1, and all other cell bodies were counterstained with ToPro (blue). The same Cre line was crossed with a channelrhodopsin reporter for optogenetically guided dual recording experiments from connected thalamic and cortical neurons, as described in the article by Hu and Agmon.
Courtesy, with permission: Hang Hu and Ariel Agmon, *The Journal of Neuroscience, 29 June 2016, 36(26).*

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Confocal image of a cholinergic single-cell microculture. This neuron has been partially depleted of clathrin by RNAi. It is expressing GFP (pseudocolored orange-yellow) and has been stained to show synapses (red) and clathrin (blue). Autaptic electrophysiological recordings in these cultures, together with electron microscopy, live cell imaging, or immunofluorescence, reveal that clathrin levels set limits for presynaptic plasticity.
Courtesy, with permission: Francisco J. López-Murcia, Stephen J. Royle, and Artur Llobet, *The Journal of Neuroscience, 18 June 2014, 34(25): 8618-8629.*

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