

Literature About npi SEC 03/05/10 Single Electrode Clamp Systems

Recording Methods and Voltage Clamp Technique

- ❑ Dietzel, I. D., Bruns, D., Polder, H. R. and Lux, H. D. (1992). Voltage Clamp Recording, in Kettenmann, H. and R. Grantyn (eds.) *Practical Electrophysiological Methods*, Wiley-Liss, NY.
- ❑ **Lalley, P. M., Moschovakis, A. K. and Windhorst, U. (1999). Electrical Activity of Individual Neurons in Situ: Extra- and Intracellular Recording, in: U. Windhorst and H. Johansson (eds.) *Modern Techniques in Neuroscience Research*, Springer, Berlin, New York**
- ❑ Misgeld, U., Müller, W. and Polder, H. R. (1989). Potentiation and Suppression by Eserine of Muscarinic Synaptic Transmission in the Guinea-Pig Hippocampal Slice. *J.Physiol.*, **409**, 191-206.
- ❑ Polder, H. R. and Swandulla, D. (2001). The use of control theory for the design of voltage clamp systems: a simple and standardized procedure for evaluating system parameters. *J.Neurosci.Meth.* **109**, 97-109.
- ❑ Polder, H.R., M. Weskamp, K. Linz & R. Meyer (2004) Voltage-Clamp and Patch-Clamp Techniques, Chapter 3.4, 272-323 in: Dhein, Stefan; Mohr, Friedrich Wilhelm; Delmar, Mario (Eds.) *Practical Methods in Cardiovascular Research*, Springer, Berlin, Heidelberg and New York 2004.
- ❑ Richter, D. W., Pierrefiche, O., Lalley, P. M. and Polder, H. R. (1996). Voltage-clamp analysis of neurons within deep layers of the brain. *J.Neurosci.Meth.* **67**, 121-131.
- ❑ Sutor, B., Grimm, C., & Polder, H. R. (2003). Voltage-clamp-controlled current-clamp recordings from neurons: an electrophysiological technique enabling the detection of fast potential changes at preset holding potentials. *Pflugers Arch.* **446**, 133-141.

Selection of switching frequency, electrode time constant, capacity compensation

- ❑ Juusola, M. (1994). Measuring complex admittance and receptor current by single electrode voltage-clamp. *J.Neurosci.Meth.* **53**, 1-6.
- ❑ Torkkeli, P. H. & French, A. S. (1994). Characterization of a transient outward current in a rapidly adapting insect mechanosensory neuron. *Pflugers Arch.* **429**, 72-78.
- ❑ Weckström, M, Kouvalainen, E. and Juusola, M. (1992). Measurement of cell impedance in frequency domain using discontinuous current clamp and white-noise modulated current injection. *Pflügers Arch.* **421**, 469-472.

Dynamic Hybrid Clamp (DHC)

- ❑ Dietrich, D., Clusmann, H. and T. Kral (2002). Improved hybrid clamp: resolution of tail currents following single action potentials. *J.Neurosci.Meth.* **116**, 55-63.
- ❑ Muller, A., Kukley, M., Uebachs, M., Beck, H., & Dietrich, D. (2007). Nanodomains of single Ca²⁺ channels contribute to action potential repolarization in cortical neurons. *J Neurosci.* **27**, 483-495.

Voltage-clamp-controlled current-clamp (VCcCC)

- ❑ Pfeiffer, K., Panek, I., Hoyer, U., French, A. S., & Torkkeli, P. H. (2009). Random stimulation of spider mechanosensory neurons reveals long-lasting excitation by GABA and muscimol. *J. Neurophysiol.* **101**, 54-66.
- ❑ Pfeiffer, K. & French, A. S. (2009). GABAergic excitation of spider mechanoreceptors increases information capacity by increasing entropy rather than decreasing jitter. *J Neurosci.* **29**, 10989-10994.
- ❑ Schubert, D., Kotter, R., Luhmann, H. J., & Staiger, J. F. (2006). Morphology, electrophysiology and functional input connectivity of pyramidal neurons characterizes a genuine layer va in the primary somatosensory cortex. *Cereb Cortex.* **16**, 223-236.

Comparison of recording methods (sharp electrode, whole cell, perforated patch)

- ❑ Jarolimek, W. and Miseld, U. (1993). 4-Aminopyridine-induced synaptic GABA-B currents in granule cells of the guinea-pig hippocampus. *Pflügers Arch.* **425**, 491-498.
- ❑ Kapur, A., Yeckel, M. F., Gray, R. and Johnston, D. (1998). L-Type calcium channels are required for one form of hippocampal mossy fiber LTP. *J. Neurophysiol.* **79**, 2181-2190.
- ❑ Magistretti, J., Mantegazza, M., Guatteo, E. and Wanke, E. (1996). Action potentials recorded with patch-clamp amplifiers: are they genuine? *Trends Neurosci.* **19**, 530-534.

Recordings of fast Na⁺ channels

- ❑ Inceoglu, A. B., Hayashida, Y., Lango, J., Ishida, A. T., & Hammock, B. D. (2002). A single charged surface residue modifies the activity of ikitoxin, a beta-type Na⁺ channel toxin from *Parabuthus transvaalicus*. *Eur. J Biochem.* **269**, 5369-5376.
- ❑ Hayashida, Y., Partida, G. J., & Ishida, A. T. (2004). Dissociation of retinal ganglion cells without enzymes. *J Neurosci. Methods* **137**, 25-35.
- ❑ Hayashida, Y. & Ishida, A. T. (2004). Dopamine receptor activation can reduce voltage-gated Na⁺ current by modulating both entry into and recovery from inactivation. *Journal of Neurophysiology* **92**, 3134-3141.

Coating of sharp microelectrodes for VC recordings

- ❑ Juusola, M., Seyfarth E. A. and French, A. S. (1997). Fast coating of glass-capillary microelectrodes for single-electrode voltage clamp, *J. Neurosci. Meth.* **71**, 199-204.

Recordings with high resistance (150-400 MΩ) sharp microelectrodes

- ❑ Boyle, R., Rabbitt, R. D., & Highstein, S. M. (2009). Efferent control of hair cell and afferent responses in the semicircular canals. *J Neurophysiol.* **102**, 1513-1525.
- ❑ Highstein, S. M., Rabbitt, R. D., Holstein, G. R., & Boyle, R. D. (2005). Determinants of spatial and temporal coding by semicircular canal afferents. *J. Neurophysiol.* **93**, 2359-2370.
- ❑ Niven, J. E., Vahasoyrinki, M., Kauranen, M., Hardie, R. C., Juusola, M., & Weckstrom, M. (2003). The contribution of Shaker K⁺ channels to the information capacity of *Drosophila* photoreceptors. *Nature* **421**, 630-634.
- ❑ Rabbitt, R. D., Boyle, R., Holstein, G. R., & Highstein, S. M. (2005). Hair-cell versus afferent adaptation in the semicircular canals. *Journal of Neurophysiology* **93**, 424-436.
- ❑ Wolfram, V. & Juusola, M. (2004). The Impact of Rearing Conditions and Short-Term Light Exposure on Signaling Performance in *Drosophila* Photoreceptors. *Journal of Neurophysiology* **92**, 1918-1927.
- ❑ Zheng, L., Nikolaev, A., Wardill, T. J., O'Kane, C. J., de Polavieja, G. G., & Juusola, M. (2009). Network adaptation improves temporal representation of naturalistic stimuli in *Drosophila* eye: I dynamics. *PLoS. ONE.* **4**, e4307.

Capacitive transients in VC recordings

- ❑ Sutor, B., Hablitz, J. J. (1989). Excitatory postsynaptic potentials in rat neocortical neurons in vitro. I. Electrophysiological evidence for two distinct EPSPs. *J.Neurophysiol.* **61**, 607-620.

Leak subtraction

- ❑ Sutor, B., Zieglgänsberger, W. (1987). A low-voltage activated, transient calcium current is responsible for the time-dependent depolarizing inward rectification of rat neocortical neurons in vitro. *Pflügers Arch.* **410**, 102-111.

Double cell voltage clamp method

- ❑ Dhein, St. (1998). *Cardiac Gap Junction Channels, Physiology, Regulation, Pathophysiology and Pharmacology*, Karger, Basel.
- ❑ Hartveit, E. & Veruki, M. L. (2010). Accurate measurement of junctional conductance between electrically coupled cells with dual whole-cell voltage-clamp under conditions of high series resistance. *J Neurosci.Methods.* **187**, 13-25.
- ❑ Müller, A., Lauven, M., Berkels, R., Dhein, S., Polder, H. R. and Klaus, W. (1999). Switched single electrode amplifiers allow precise measurement of gap junction conductance. *Amer.J.Physiol. (Cell)* **276** (4), C980-C988.

Double Cell Recordings / Gap Junctions

- ❑ Bedner, P., Niessen, H., Odermatt, B., Willecke, K., & Harz, H. (2003). A method to determine the relative cAMP permeability of connexin channels. *Exp.Cell Res.* **291**, 25-35.
- ❑ Bedner, P., Niessen, H., Odermatt, B., Kretz, M., Willecke, K., & Harz, H. (2005). Selective permeability of different connexin channels to the second messenger cyclic AMP. *J Biol.Chem.*
- ❑ Dhein, S., Wenig, S., Grover, R., Tudyka, T., Gottwald, M., Schaefer, T. & Polontchouk, L. (2002) Protein kinase Calpha mediates the effect of antiarrhythmic peptide on gap junction conductance. *Cell Adhes Commun*, **8**, 257-264.
- ❑ Dupont, E., Hanganu, I. L., Kilb, W., Hirsch, S., & Luhmann, H. J. (2006). Rapid developmental switch in the mechanisms driving early cortical columnar networks. *Nature.* **439**, 79-83.
- ❑ Hagen, A., Dietze, A., & Dhein, S. (2009). Human cardiac gap-junction coupling: effects of antiarrhythmic peptide AAP10. *Cardiovasc.Res.* **83**, 405-415.
- ❑ Polontchouk, L., Ebel, B., Jackels, M., & Dhein, S. (2002). Chronic effects of endothelin 1 and angiotensin II on gap junctions and intercellular communication in cardiac cells. *FASEB J* **16**, 87-89.
- ❑ Veruki, M. L., Oltedal, L., & Hartveit, E. (2008). Electrical Synapses Between AII Amacrine Cells: Dynamic Range and Functional Consequences of Variation in Junctional Conductance. *J.Neurophysiol.* **100**, 3305-3322.
- ❑ Veruki, M. L. & Hartveit, E. (2009). Meclofenamic acid blocks electrical synapses of retinal AII amacrine and ON-cone bipolar cells. *J.Neurophysiol.*
- ❑ Veruki, M. L., Oltedal, L., & Hartveit, E. (2010). Electrical coupling and passive membrane properties of AII amacrine cells. *J Neurophysiol.* **103**, 1456-1466.
- ❑ Weng, S., Lauven, M., Schaefer, T., Polontchouk, L., Grover, R. & Dhein, S. (2002) Pharmacological modification of gap junction coupling by an antiarrhythmic peptide via protein kinase C activation. *FASEB J.*, **16**, 1114-1116.
- ❑ Xing, D., Kjolbye, A. L., Nielsen, M. S., Petersen, J. S., Harlow, K. W., Holstein-Rathlou, N. H., & Martins, J. B. (2003). ZP123 increases gap junctional conductance and prevents reentrant ventricular tachycardia during myocardial ischemia in open chest dogs. *J Cardiovasc. Electrophysiol.* **14**, 510-520.

Simultaneous recordings with two SEC amplifiers

- ❑ Farrow, K., Haag, J., & Borst, A. (2006). Nonlinear, binocular interactions underlying flow field selectivity of a motion-sensitive neuron. *Nat.Neurosci.* **9**, 1312-1320.
- ❑ Ali, A. B. & Todorova, M. (2010). Asynchronous release of GABA via tonic cannabinoid receptor activation at identified interneuron synapses in rat CA1. *Eur.J Neurosci.* **31**, 1196-1207.
- ❑ Haag, J. and Borst, A. (1996). Amplification of high-frequency synaptic inputs by active dendritic membrane processes. *Nature* **379**, 639-641.
- ❑ Haag, J. and Borst, A. (2001). Recurrent Network Interactions Underlying Flow-Field Selectivity of Visual Interneurons. *J.Neurosci* **21** (15), 5685–5692.
- ❑ Haag, J. and Borst, A. (2002). Dendro-Dendritic Interactions between Motion-Sensitive Large-Field Neurons in the Fly. *J.Neurosci* **22** (8), 3227–3233.
- ❑ Haag, J. & Borst, A. (2004). Neural mechanism underlying complex receptive field properties of motion-sensitive interneurons. *Nat.Neurosci* **7**, 628-634.
- ❑ Haag, J. and Borst, A. (2007). Reciprocal inhibitory connections within a neural network for rotational optic-flow processing. *Frontiers in Neurosci* **1** (1), 111-121.
- ❑ Haag, J., Wertz, A., & Borst, A. (2007). Integration of lobula plate output signals by DNOVS1, an identified premotor descending neuron. *J Neurosci.* **27**, 1992-2000.
- ❑ Wertz, A., Borst, A., & Haag, J. (2008). Nonlinear integration of binocular optic flow by DNOVS2, a descending neuron of the fly. *Journal of Neuroscience* **19;28**, 3131-3140.

Simultaneous intracellular recordings during voltammetric measurements

- ❑ Kudernatsch, M., Sutor, B. (1994). Cholinergic modulation of dopamine overflow in the rat neostriatum: a fast cyclic voltammetric study in vitro. *Neurosci. Letters* **181**, 107-112.
- ❑ Schlösser, B., Kudernatsch, M. B., Sutor, B. and ten Bruggencate, G. (1995). d -, m - and k - opioid receptor agonists inhibit dopamine overflow in rat neostriatal slices. *Neurosci. Letters* **191**, 126-130.

Intra- and extracellular drug application during single electrode clamping

- ❑ Scuvee-Moreau, J., Liegeois, J. F., Massotte, L., & Seutin, V. (2002). Methyl-laudoanine: a new pharmacological tool to investigate the function of small-conductance Ca(2+)-activated K(+) channels. *J Pharmacol.Exp.Ther.* **302**, 1176-1183.
- ❑ Dutschmann, M., Bischoff, M., Busselberg, D., & Richter, W. (2003). Histaminergic modulation of the intact respiratory network of adult mice. *Pflugers Arch.* **445**, 570-576.
- ❑ Eder, M., Becker, K., Rammes, G., Schierloh, A., Azad, S. C., Zieglgansberger, W., & Dodt, H. U. (2003). Distribution and Properties of Functional Postsynaptic Kainate Receptors on Neocortical Layer V Pyramidal Neurons. *J Neurosci.* **23**, 6660-6670.
- ❑ Hanganu, I. L., Kilb, W. and Luhmann, H. J. (2001). Spontaneous synaptic activity of subplate neurons in neonatal rat somatosensory cortex. *Cerebral Cortex* **11** (5), 400-410.
- ❑ Hanganu, I. L. & Luhmann, H. J. (2004). Functional nicotinic acetylcholine receptors on subplate neurons in neonatal rat somatosensory cortex. *Journal of Neurophysiology* **92**, 189-198.
- ❑ Heck, N., Kilb, W., Reiprich, P., Kubota, H., Furukawa, T., Fukuda, A., & Luhmann, H. J. (2007). GABA-A Receptors Regulate Neocortical Neuronal Migration In Vitro and In Vivo. *Cereb Cortex.* **17**, 138-148.
- ❑ Lalley, P. M. (1999). Microiontophoresis and Pressure Ejection, in: U. Windhorst, and H. Johansson (eds) *Modern Techniques in Neuroscience Research*, Springer, Berlin, New York.
- ❑ Lalley, P. M., A. K. Moschovakis and U. Windhorst (1999). Electrical Activity of Individual Neurons in Situ: Extra- and Intracellular Recording, in: U. Windhorst and H. Johansson (eds.) *Modern Techniques in Neuroscience Research*, Springer, Berlin, New York.

- ❑ Lalley, P. M. (2003). μ -Opioid receptor agonist effects on medullary respiratory neurons in the cat: evidence for involvement in certain types of ventilatory disturbances. *Am.J Physiol Regul.Integr.Comp Physiol* **285**, R1287-R1304.
- ❑ Ponimaskin, E., Dumuis, A., Gaven, F., Barthet, G., Heine, M., Glebov, K., Richter, D. W., & Oppermann, M. (2005). Palmitoylation of the 5-Hydroxytryptamine_{4a} Receptor Regulates Receptor Phosphorylation, Desensitization, and β -Arrestin-Mediated Endocytosis. *Molecular Pharmacology* **67**, 1434-1443.
- ❑ Richter, D. W., Pierrefiche, O., Lalley, P. M. & Polder, H. R. (1996). Voltage-clamp analysis of neurons within deep layers of the brain. *J.Neurosci.Meth.* **67**, 121-131.
- ❑ Rupprecht, R., Rammes, G., Eser, D., Baghai, T. C., Schule, C., Nothdurfter, C., Troxler, T., Gentsch, C., Kalkman, H. O., Chaperon, F., Uzunov, V., McAllister, K. H., Bertaina-Anglade, V., La Rochelle, C. D., Tuerck, D., Floesser, A., Kiese, B., Schumacher, M., Landgraf, R., Holsboer, F., & Kucher, K. (2009). Translocator protein (18 kD) as target for anxiolytics without benzodiazepine-like side effects. *Science*. **325**, 490-493.
- ❑ Schubert, D., Staiger, J. F., Cho, N., Koetter, R., Zilles, K. and Luhmann, H. J. (2001). Layer-Specific Intracolumnar and Transcolumnar Functional Connectivity of Layer V Pyramidal Cells in Rat Barrel Cortex. *J.Neurosci* **21** (10), 3580–3592.
- ❑ Schubert, D., Kotter, R., Zilles, K., Luhmann, H. J., & Staiger, J. F. (2003). Cell Type-Specific Circuits of Cortical Layer IV Spiny Neurons. *J Neurosci.* **23**, 2961-2970.
- ❑ Schubert, D., Kotter, R., Luhmann, H. J., & Staiger, J. F. (2005). Morphology, Electrophysiology and Functional Input Connectivity of Pyramidal Neurons Characterizes a Genuine Layer Va in the Primary Somatosensory Cortex. *Cerebral Cortex* **15**, 1000-1010.
- ❑ Weiss, T., Veh, R. W., & Heinemann, U. (2003). Dopamine depresses cholinergic oscillatory network activity in rat hippocampus. *Eur.J Neurosci.* **18**, 2573-2580.

Tracer injection and intracellular recording

- ❑ Baden, T. & Hedwig, B. (2009). Dynamics of free intracellular Ca²⁺ during synaptic and spike activity of cricket tibial motoneurons. *Eur.J.Neurosci.* **29**, 1357-1368.
- ❑ Heinze, S. & Homberg, U. (2009). Linking the input to the output: new sets of neurons complement the polarization vision network in the locust central complex. *Journal of Neuroscience* **29**, 4911-4921.
- ❑ Poulet, J. F. & Hedwig, B. (2006). The cellular basis of a corollary discharge. *Science*. **311**, 518-522.
- ❑ Röhrig, G., Klaus, G., & Sutor, B. (1996). Intracellular acidification reduced gap junction coupling between immature rat neocortical pyramidal neurons. *J.Physiol.* **490** (1), 31-49.
- ❑ Staiger, J. F., Zuschratter, W., Luhmann, H. J., & Schubert, D. (2009). Local circuits targeting parvalbumin-containing interneurons in layer IV of rat barrel cortex. *Brain Struct.Funct.*
- ❑ Wirth, M. J., Kuenzel, T., Luksch, H., & Wagner, H. (2008). Identification of auditory neurons by retrograde labelling for patch-clamp recordings in a mixed culture of chick brainstem. *Neurosci.Methods.* **169**, 55-64.

Visualization, imaging and infrared video microscopy

- ❑ Dodt, H. U and Zieglgänsberger, W. (1994). Infrared videomicroscopy: a new look at neuronal structure and function, *Trends in Neurosciences*, **19** (11), 453-458.
- ❑ Haag, J., Denk, W., & Borst, A. (2004). Fly motion vision is based on Reichardt detectors regardless of the signal-to-noise ratio. *Proc.Natl.Acad.Sci.U.S.A* **101**, 16333-16338.
- ❑ Hoyer, U., Torkkeli, P. H., & French, A. S. (2007). Ratiometric calcium concentration estimation using LED excitation during mechanotransduction in single sensory neurons. *J Neurosci.Methods.* **164**, 255-260.

- ❑ Jacob, S. N., Choe, C. U., Uhlen, P., DeGray, B., Yeckel, M. F., & Ehrlich, B. E. (2005). Signaling microdomains regulate inositol 1,4,5-trisphosphate-mediated intracellular calcium transients in cultured neurons. *Journal of Neuroscience* **25**, 2853-2864.
- ❑ Kapur A., M. Yeckel and Johnston, D. (2001). Hippocampal mossy fiber activity evokes Ca²⁺ release in CA3 pyramidal neurons via a metabotropic glutamate receptor pathway. *Neuroscience* **107** (1), 59-69.
- ❑ Single, S. and Borst, A. (1998). Dendritic Integration and Its Role in Computing Image Velocity. *Science* **281**, 1848-50.
- ❑ Single, S. and Borst, A. (2002) Different Mechanisms of Calcium Entry Within Different Dendritic Compartments. *J.Neurophysiol.* **87**, 1616–1624.
- ❑ Schierloh, A., Eder, M., Zieglgansberger, W., & Dodt, H. U. (2004). Effects of sensory deprivation on columnar organization of neuronal circuits in the rat barrel cortex. *Eur J Neurosci* **20**, 1118-1124.

Recordings from cardiac cells

- ❑ Bollensdorff, C., Knopp, A., Biskup, C., Zimmer, T., & Benndorf, K. (2004). Na⁺ current through KATP channels: consequences for Na⁺ and K⁺ fluxes during early myocardial ischemia. *Am.J.Physiol Heart Circ.Physiol* **286**, H283-H295.
- ❑ Hagen, A., Dietze, A., & Dhein, S. (2009). Human cardiac gap-junction coupling: effects of antiarrhythmic peptide AAP10. *Cardiovasc.Res.* **83**, 405-415.
- ❑ Halbach, M., Pillekamp, F., Brockmeier, K., Hescheler, J., Muller-Ehmsen, J., & Reppel, M. (2006). Ventricular Slices of Adult Mouse Hearts - a new Multicellular In Vitro Model for Electrophysiological Studies. *Cell Physiol Biochem.* **18**, 1-8.
- ❑ Halbach, M., Pfannkuche, K., Pillekamp, F., Ziomka, A., Hannes, T., Reppel, M., Hescheler, J., & Muller-Ehmsen, J. (2007). Electrophysiological maturation and integration of murine fetal cardiomyocytes after transplantation. *Circ.Res.* **101**, 484-492.
- ❑ Linz, K. and Meyer, R. (1997) Modulation of L-type calcium current by internal potassium in guinea pig ventricular myocytes. *Cardiovascular Research* **33**, 110-122.
- ❑ Lu, J., Dalton IV, J. F., Stokes, D. R. and Calabrese, R. L. (1997). Functional role of Ca²⁺ currents in graded and spike- synaptic transmission between leech heart interneurons. *J.Europhysiol.* **77**, 1779–1794.
- ❑ Müller, A. et. al. (1997). Increase in gap junction conductance by an antiarrhythmic peptide. *Europ.J.Pharmacol* **327**, 65-72.
- ❑ Müller, A. et. al. (1997). Actions of the antiarrhythmic peptide AAP10 on intracellular coupling. *Naunyn-Schmiedeberg's Arch. Pharmacol.* **356**, 76-82.
- ❑ Pfannkuche, K., Liang, H., Hannes, T., Xi, J., Fatima, A., Nguemo, F., Matzkies, M., Wernig, M., Jaenisch, R., Pillekamp, F., Halbach, M., Schunkert, H., Saric, T., Hescheler, J., & Reppel, M. (2009). Cardiac myocytes derived from murine reprogrammed fibroblasts: intact hormonal regulation, cardiac ion channel expression and development of contractility. *Cell Physiol Biochem.* **24**, 73-86.
- ❑ Pillekamp, F., Reppel, M., Dinkelacker, V., Duan, Y., Jazmati, N., Bloch, W., Brockmeier, K., Hescheler, J., Fleischmann, B. K., & Koehling, R. (2005). Establishment and characterization of a mouse embryonic heart slice preparation. *Cell Physiol Biochem.* **16**, 127-132.
- ❑ Pillekamp, F., Halbach, M., Reppel, M., Rubenchyk, O., Pfannkuche, K., Xi, J. Y., Bloch, W., Sreeram, N., Brockmeier, K., & Hescheler, J. (2007). Neonatal murine heart slices. A robust model to study ventricular isometric contractions. *Cell Physiol Biochem.* **20**, 837-846.

- ❑ Pillekamp, F., Halbach, M., Reppel, M., Pfannkuche, K., Nazzal, R., Nguemo, F., Matzkies, M., Rubenchyk, O., Hannes, T., Khalil, M., Bloch, W., Sreeram, N., Brockmeier, K., & Hescheler, J. (2009). Physiological differences between transplanted and host tissue cause functional decoupling after in vitro transplantation of human embryonic stem cell-derived cardiomyocytes. *Cell Physiol Biochem.* **23**, 65-74.
- ❑ Räcke, H. F. et al. (1994). Fosinoprilate prolongs the action potential: reduction of I_K and enhancement of L-type calcium current in guinea pig ventricular myocytes. *Cardiovascular Research* **28**, 201-208.

LTP / LDP /LTD Investigations

- ❑ Azad, S. C., Monory, K., Marsicano, G., Cravatt, B. F., Lutz, B., Zieglgansberger, W., & Rammes, G. (2004). Circuitry for associative plasticity in the amygdala involves endocannabinoid signaling. *J Neurosci* **24**, 9953-9961.
- ❑ Blank, T., Nijholt, I., Eckart, K., and Spiess, J. (2002). Priming of long-term potentiation in mouse hippocampus by corticotropin-releasing factor and acute stress: implications for hippocampus-dependent learning. *J Neurosci* **22**, 3788-94.
- ❑ Blank, T., Nijholt, I., Grammatopoulos, D. K., Randevara, H. S., Hillhouse, E. W., & Spiess, J. (2003). Corticotropin-releasing factor receptors couple to multiple G-proteins to activate diverse intracellular signaling pathways in mouse hippocampus: role in neuronal excitability and associative learning. *J Neurosci.* **23**, 700-707.
- ❑ DeBock, F., Kurz, J., Azad, S. C., Parsons, C. G., Hapfelmeier, G., Zieglgansberger, W., & Rammes, G. (2003). α 2-Adrenoreceptor activation inhibits LTP and LTD in the basolateral amygdala: involvement of G_{i/o}-protein-mediated modulation of Ca²⁺-channels and inwardly rectifying K⁺-channels in LTD. *Eur.J.Neurosci.* **17**, 1411–1424.
- ❑ Dodt, H., Eder, M., Frick, A., and Zieglgansberger, W. (1999). Precisely localized LTD in the neocortex revealed by infrared-guided laser stimulation. *Science* **286**, 110-113.
- ❑ Eder, M., Zieglgansberger, W., & Dodt, H. U. (2002). Neocortical long-term potentiation and long-term depression: site of expression investigated by infrared-guided laser stimulation. *J.Neurosci.* **22**, 7558-7568.
- ❑ Huang, K. P., Huang, F. L., Jager, T., Li, J., Reymann, K. G., & Balschun, D. (2004). Neurogranin/RC3 enhances long-term potentiation and learning by promoting calcium-mediated signaling. *J Neurosci* **24**, 10660-10669.
- ❑ Marsicano, G., Wotjak, C. T., Azad, S. C., Bisognok, T., Rammes, G., Casciok, M. C., Hermann, H., Tang, J., Hofmann, C., Zieglgansberger, W., Di Marzok, V. & Lutz, B. (2002). The endogenous cannabinoid system controls extinction of aversive memories. *Nature* **418**, 530-533.
- ❑ Nakazawa K., Quirk, M. C., Chitwood, R. A., Watanabe, M., Yeckel, M. F., Sun, L. D., Kato, A., Carr, C. A., Johnston, D., Wilson, M. A. & Tonegawa, M. A. (2002). Requirement for Hippocampal CA3 NMDA Receptors in Associative Memory Recall. *Science* **297**, 211-218.
- ❑ Rammes, G., Palmer, M., Eder, M., Dodt, H. U., Zieglgansberger, W., & Collingridge, G. L. (2003). Activation of mGlu receptors induces LTD without affecting postsynaptic sensitivity of CA1 neurons in rat hippocampal slices. *J Physiol* **546**, 455-460.
- ❑ Rammes, G., Steckler, T., Kresse, A., Schutz, G., Zieglgansberger, W., and Lutz, B. (2000). Synaptic plasticity in the basolateral amygdala in transgenic mice expressing dominant-negative cAMP response element-binding protein (CREB) in forebrain. *Eur.J.Neurosci.* **12**, 2534-2546.
- ❑ Rosenkranz, J. A., Frick, A., & Johnston, D. (2009). Kinase-dependent modification of dendritic excitability after long-term potentiation. *Journal of Physiology* **587**, 115-125.
- ❑ Seeger, T., Fedorova, I., Zheng, F., Miyakawa, T., Koustova, E., Gomez, J., Basile, A. S., Alzheimer, C., & Wess, J. (2004). M2 muscarinic acetylcholine receptor knock-out mice show deficits in behavioral flexibility, working memory, and hippocampal plasticity. *J Neurosci* **24**, 10117-10127.

- ❑ Wang, J., Yeckel, M. F., Johnston, D., & Zucker, R. S. (2004). Photolysis of Postsynaptic Caged Ca²⁺ Can Potentiate and Depress Mossy Fiber Synaptic Responses in Rat Hippocampal CA3 Pyramidal Neurons. *Journal of Neurophysiology* **91**, 1596-1607.
- ❑ Yeckel, M. F., Kapur, A., & Johnston, D. (1999). Multiple forms of LTP in hippocampal CA3 neurons use a common postsynaptic mechanism. *Nat. Neurosci.* **2**, 625-633.

Performance test with active cell model

- ❑ Draguhn, A., Pfeiffer, M., Heinemann, U. and Polder, H. R. (1997). A simple hardware model for the direct observation of voltage-clamp performance under realistic conditions. *J. Neurosci. Meth.* **78**, 105-113.

Intra- and extracellular low noise recording

- ❑ Beckers, U., Egelhaaf, M., & Kurtz, R. (2007). Synapses in the fly motion-vision pathway: evidence for a broad range of signal amplitudes and dynamics. *J Neurophysiol.* **97**, 2032-2041.
- ❑ David, Y., Cacheaux, L. P., Ivens, S., Lapilover, E., Heinemann, U., Kaufer, D., & Friedman, A. (2009). Astrocytic dysfunction in epileptogenesis: consequence of altered potassium and glutamate homeostasis? *J Neurosci.* **29**, 10588-10599.
- ❑ DeBock, F., Kurz, J., Azad, S. C., Parsons, C. G., Hapfelmeier, G., Zieglgänsberger, W., & Rammes, G. (2003). α 2-Adrenoreceptor activation inhibits LTP and LTD in the basolateral amygdala: involvement of G_{i/o}-protein-mediated modulation of Ca²⁺-channels and inwardly rectifying K⁺-channels in LTD. *Eur. J. Neurosci.* **17**, 1411–1424.
- ❑ Kukley, M., Stausberg, P., Adelmann, G., Chessell, I. P., & Dietrich, D. (2004). Ectonucleotidases and nucleoside transporters mediate activation of adenosine receptors on hippocampal mossy fibers by P2X7 receptor agonist 2'-3'-O-(4-benzoylbenzoyl)-ATP. *J Neurosci* **24**, 7128-7139.
- ❑ Lavin, A., Nogueira, L., Lapish, C. C., Wightman, R. M., Phillips, P. E., & Seamans, J. K. (2005). Mesocortical dopamine neurons operate in distinct temporal domains using multimodal signaling. *J Neurosci.* **25**, 5013-5023.
- ❑ Leger, J. F., Stern, E. A., Aertsen, A., & Heck, D. (2004). Synaptic Integration in Rat Frontal Cortex Shaped by Network Activity. *Journal of Neurophysiology.* **93**, 281-293.
- ❑ Ranft, A., Kurz, J., Becker, K., Dodt, H. U., Zieglgansberger, W., Rammes, G., Kochs, E., & Eder, M. (2007). Nitrous oxide (N(2)O) pre- and postsynaptically attenuates NMDA receptor-mediated neurotransmission in the amygdala. *Neuropharmacology.* **52**, 716-723.
- ❑ Rosenkranz, J. A. & Johnston, D. (2006). Dopaminergic regulation of neuronal excitability through modulation of I_h in layer V entorhinal cortex. *J Neurosci.* **26**, 3229-3244.
- ❑ Rosenkranz, J. A. & Johnston, D. (2007). State-dependent modulation of amygdala inputs by dopamine-induced enhancement of sodium currents in layer V entorhinal cortex. *J Neurosci.* **27**, 7054-7069.
- ❑ Seiffert, E., Dreier, J. P., Ivens, S., Bechmann, I., Tomkins, O., Heinemann, U., & Friedman, A. (2004). Lasting blood-brain barrier disruption induces epileptic focus in the rat somatosensory cortex. *J Neurosci* **24**, 7829-7836.
- ❑ Sillaber, I., Rammes, G., Zimmermann, S., Mahal, B., Zieglgänsberger, W., Würst, W., Holsboer, F. & Spanagel, R. (2002). Enhanced and Delayed Stress-Induced Alcohol Drinking in Mice Lacking Functional CRH1 Receptors. *Science* **296**, 931-933.
- ❑ Strauss, U., Kole, M. H., Brauer, A. U., Pahnke, J., Bajorat, R., Rolfs, A., Nitsch, R., & Deisz, R. A. (2004). An impaired neocortical I is associated with enhanced excitability and absence epilepsy. *Eur. J Neurosci.* **19**, 3048-3058.
- ❑ Weiss, T., Veh, R. W., & Heinemann, U. (2003). Dopamine depresses cholinergic oscillatory network activity in rat hippocampus. *Eur. J Neurosci.* **18**, 2573-2580.

- ❑ Zimmerman, G., Njunting, M., Ivens, S., Tolner, E., Behrens, C. J., Gross, M., Soreq, H., Heinemann, U., & Friedman, A. (2008). Acetylcholine-induced seizure-like activity and modified cholinergic gene expression in chronically epileptic rats. *Eur.J.Neurosci.* **27**, 965-975.

Perforated Patch

- ❑ Achilles, K., Okabe, A., Ikeda, M., Shimizu-Okabe, C., Yamada, J., Fukuda, A., Luhmann, H. J., & Kilb, W. (2007). Kinetic properties of Cl uptake mediated by Na⁺-dependent K⁺-2Cl cotransport in immature rat neocortical neurons. *Journal of Neuroscience* **27**, 8616-8627.
- ❑ Hanganu, I. L., Kilb, W., & Luhmann, H. J. (2002). Functional synaptic projections onto subplate neurons in neonatal rat somatosensory cortex. *J.Neurosci.* **22**, 7165-7176.
- ❑ Hayashida, Y., Partida, G. J., & Ishida, A. T. (2004). Dissociation of retinal ganglion cells without enzymes. *J Neurosci.Methods* **137**, 25-35.
- ❑ Hayashida, Y. & Ishida, A. T. (2004). Dopamine receptor activation can reduce voltage-gated Na⁺ current by modulating both entry into and recovery from inactivation. *Journal of Neurophysiology* **92**, 3134-3141.
- ❑ Hayashida, Y., Rodriguez, C. V., Ogata, G., Partida, G. J., Oi, H., Stradleigh, T. W., Lee, S. C., Colado, A. F., & Ishida, A. T. (2009). Inhibition of adult rat retinal ganglion cells by D1-type dopamine receptor activation. *J Neurosci.* **29**, 15001-15016.
- ❑ Inceoglu, A. B., Hayashida, Y., Lango, J., Ishida, A. T., & Hammock, B. D. (2002). A single charged surface residue modifies the activity of ikitoxin, a beta-type Na⁺ channel toxin from *Parabuthus transvaalicus*. *Eur.J Biochem.* **269**, 5369-5376.
- ❑ Kilb, W., Hanganu, I. L., Okabe, A., Sava, B. A., Shimizu-Okabe, C., Fukuda, A., & Luhmann, H. J. (2008). Glycine receptors mediate excitation of subplate neurons in neonatal rat cerebral cortex. *J.Neurophysiol.* **100**, 698-707.
- ❑ Romo-Parra, H., Misgeld, U., & Yanovsky, Y. (2009). Regular firing of a single output neuron reduces its own inhibition through endocannabinoids in substantia nigra pars reticulata of juvenile mice. *Neuroscience.* **160**, 596-605.
- ❑ Vislay-Meltzer, R. L., Kampff, A. R., & Engert, F. (2006). Spatiotemporal specificity of neuronal activity directs the modification of receptive fields in the developing retinotectal system. *Neuron.* **50**, 101-114.
- ❑ Yanovsky, Y., Zhang, W., & Misgeld, U. (2005). Two pathways for the activation of small-conductance potassium channels in neurons of substantia nigra pars reticulata. *Neuroscience* **136**, 1027-1036.
- ❑ Yanovsky, Y., Velte, S., & Misgeld, U. (2006). Ca²⁺ release-dependent hyperpolarizations modulate the firing pattern of juvenile GABA neurons in mouse substantia nigra pars reticulata in vitro. *J Physiol.*

Recordings from Crustacea

- ❑ DiCaprio, R. A. (2003). Nonspiking and Spiking Proprioceptors in the Crab: Nonlinear Analysis of Nonspiking TCMRO Afferents. *J Neurophysiol.* **89**, 1826-1836.
- ❑ DiCaprio, R. A. (2004). Information Transfer Rate of Nonspiking Afferent Neurons in the Crab. *Journal of Neurophysiology* **92**, 302-310.
- ❑ Gamble, E. R. & DiCaprio, R. A. (2003). Nonspiking and Spiking Proprioceptors in the Crab: White Noise Analysis of Spiking CB-Chordotonal Organ Afferents. *J Neurophysiol.* **89**, 1815-1825.
- ❑ Smarandache, C., Hall, W. M., & Mulloney, B. (2009). Coordination of Rhythmic Motor Activity by Gradients of Synaptic Strength in a Neural Circuit That Couples Modular Neural Oscillators. *Journal of Neuroscience* **29**, 9351-9360.

- ❑ Stein, W., Eberle, C. C., & Hedrich, U. B. S. (2005). Motor pattern selection by nitric oxide in the stomatogastric nervous system of the crab. *European Journal of Neuroscience* **21**, 2767-2781.

Recordings from plant cells

- ❑ Raschke, K. (2003). Alternation of the slow with the quick anion conductance in whole guard cells effected by external malate. *Planta* **217**, 651-657.
- ❑ Raschke, K., Shabahang, M., & Wolf, R. (2003). The slow and the quick anion conductance in whole guard cells: their voltage-dependent alternation, and the modulation of their activities. *Planta* **217**, 639-650.

SEC-03 recordings

- ❑ Martin-Pena, A., Acebes, A., Rodriguez, J. R., Sorribes, A., de Polavieja, G. G., Fernandez-Funez, P., & Ferrus, A. (2006). Age-independent synaptogenesis by phosphoinositide 3 kinase. *J Neurosci.* **26**, 10199-10208.

Juxtacellular recordings

- ❑ Both, M., Bahner, F., Bohlen Und, H. O., & Draguhn, A. (2008). Propagation of specific network patterns through the mouse hippocampus. *Hippocampus*.

Extracellular recordings

- ❑ Beckers, U., Egelhaaf, M., & Kurtz, R. (2007). Synapses in the fly motion-vision pathway: evidence for a broad range of signal amplitudes and dynamics. *J Neurophysiol.* **97**, 2032-2041.
- ❑ Moussawi, K., Pacchioni, A., Moran, M., Olive, M. F., Gass, J. T., Lavin, A., & Kalivas, P. W. (2009). N-Acetylcysteine reverses cocaine-induced metaplasticity. *Nat.Neurosci.* **12**, 182-189.
- ❑ Sterlemann, V., Rammes, G., Wolf, M., Liebl, C., Ganea, K., Muller, M. B., & Schmidt, M. V. (2009). Chronic social stress during adolescence induces cognitive impairment in aged mice. *Hippocampus*.

Recordings from muscle cells

- ❑ Weidelt, T., Boldt, W., & Markwardt, F. (1997). Acetylcholine-induced K⁺ currents in smooth muscle cells of intact rat small arteries. *J Physiol.* **500**, 617-630.
- ❑ Jiang, Z. G., Nuttall, A. L., Zhao, H., Dai, C. F., Guan, B. C., Si, J. Q., & Yang, Y. Q. (2005). Electrical coupling and release of K⁺ from endothelial cells co-mediate ACh-induced smooth muscle hyperpolarization in inner ear artery. *J.Physiol.* **564**, 475-487.
- ❑ Wolfle, S. E., Schmidt, V. J., Hoyer, J., Kohler, R., & de Wit, C. (2009). Prominent role of KCa3.1 in endothelium-derived hyperpolarizing factor-type dilations and conducted responses in the microcirculation in vivo. *Cardiovasc.Res.* **82**, 476-483.

Other

- ❑ Akay, T., Haehn, S., Schmitz, J., & Buschges, A. (2004). Signals From Load Sensors Underlie Interjoint Coordination During Stepping Movements of the Stick Insect Leg. *Journal of Neurophysiology* **92**, 42-51.
- ❑ Albrecht, J., Hanganu, I. L., Heck, N., & Luhmann, H. J. (2005). Oxygen and glucose deprivation induces major dysfunction in the somatosensory cortex of the newborn rat. *Eur.J Neurosci.* **22**, 2295-2305.
- ❑ Ausborn, J., Stein, W., & Wolf, H. (2007). Frequency control of motor patterning by negative sensory feedback. *J Neurosci.* **27**, 9319-9328.

- ❑ Balasubramanian, S., Stemkowski, P. L., Stebbing, M. J., & Smith, P. A. (2006). Sciatic Chronic Constriction Injury Produces Cell-type Specific Changes in the Electrophysiological Properties of Rat Substantia Gelatinosa Neurons. *J Neurophysiol.*
- ❑ Beckers, U., Egelhaaf, M., & Kurtz, R. (2009). Precise timing in fly motion vision is mediated by fast components of combined graded and spike signals. *Neuroscience.* **160**, 639-650.
- ❑ Beraneck, M., Pfanzelt, S., Vassias, I., Rohregger, M., Vibert, N., Vidal, P. P., Moore, L. E., & Straka, H. (2007). Differential intrinsic response dynamics determine synaptic signal processing in frog vestibular neurons. *J Neurosci.* **27**, 4283-4296.
- ❑ Behrens, C. J., van den Boom, L. P., & Heinemann, U. (2007). Effects of the GABA(A) receptor antagonists bicuculline and gabazine on stimulus-induced sharp wave-ripple complexes in adult rat hippocampus in vitro. *Eur.J Neurosci.* **25**, 2170-2181.
- ❑ Bickmeyer, U., Heine, M., Manzke, T., & Richter, D. W. (2002). Differential modulation of I_h by 5-HT receptors in mouse CA1 hippocampal neurons. *Eur.J.Neurosci.* **16**, 209-218.
- ❑ Biesdorf, S., Malinvaud, D., Reichenberger, I., Pfanzelt, S., & Straka, H. (2008). Differential inhibitory control of semicircular canal nerve afferent-evoked inputs in second-order vestibular neurons by glycinergic and GABAergic circuits. *J.Neurophysiol.* **99** , 1758-1769.
- ❑ Blanks, A. M., Zhao, Z. H., Shmygol, A., Bru-Mercier, G., Astle, S., & Thornton, S. (2007). Characterization of the molecular and electrophysiological properties of the T-type calcium channel in human myometrium. *J Physiol.* **581**, 915-926.
- ❑ Bucher, D., Akay, T., DiCaprio, R. A., & Buschges, A. (2003). Interjoint coordination in the stick insect leg-control system: the role of positional signaling. *J Neurophysiol.* **89** , 1245-1255.
- ❑ Chen, Y., Balasubramanian, S., Lai, A. Y., Todd, K. G., & Smith, P. A. (2009). Effects of Sciatic Nerve Axotomy on Excitatory Synaptic Transmission in Rat Substantia Gelatinosa. *J Neurophysiol.*
- ❑ Cornil, C. A., Balthazart, J., Motte, P., Massotte, L., & Seutin, V. (2002). Dopamine activates noradrenergic receptors in the preoptic area. *J Neurosci.* **22**, 9320-9330.
- ❑ Daw, M. I., Bannister, N. V., & Isaac, J. T. (2006). Rapid, activity-dependent plasticity in timing precision in neonatal barrel cortex. *J Neurosci.* **26**, 4178-4187.
- ❑ Decker, J. M., Wojtowicz, A. M., Ul, H. R., Braunewell, K. H., Heinemann, U., & Behrens, C. J. (2009). C-type natriuretic peptide decreases hippocampal network oscillations in adult rats in vitro. *Neuroscience.* **164**, 1764-1775.
- ❑ Dong, Y., Nasif, F. J., Tsui, J. J., Ju, W. Y., Cooper, D. C., Hu, X. T., Malenka, R. C., & White, F. J. (2005). Cocaine-induced plasticity of intrinsic membrane properties in prefrontal cortex pyramidal neurons: adaptations in potassium currents. *Journal of Neuroscience* **25**, 936-940.
- ❑ Dutschmann, M. & Herbert, H. (2006). The Kolliker-Fuse nucleus gates the postinspiratory phase of the respiratory cycle to control inspiratory off-switch and upper airway resistance in rat. *Eur.J Neurosci.* **24**, 1071-1084.
- ❑ Elyada, Y. M., Haag, J., & Borst, A. (2009). Different receptive fields in axons and dendrites underlie robust coding in motion-sensitive neurons. *Nat.Neurosci.* **12**, 327-332.
- ❑ Evans, C. G., Ludwar, B. C., & Cropper, E. C. (2007). A mechanoafferent neuron with an inexcitable somatic region: Consequences for the regulation of spike propagation and afferent transmission. *J Neurophysiol.*
- ❑ Farrow, K., Haag, J., & Borst, A. (2003). Input organization of multifunctional motion-sensitive neurons in the blowfly. *J Neurosci.* **23**, 9805-9811.
- ❑ Farrow, K., Borst, A., & Haag, J. (2005). Sharing receptive fields with your neighbors: tuning the vertical system cells to wide field motion. *Journal of Neuroscience* **25**, 3985-3993.
- ❑ Fischer, M., Reuter, J., Gerich, F. J., Hildebrandt, B., Hagele, S., Katschinski, D., & Muller, M. (2009). Enhanced hypoxia susceptibility in hippocampal slices from a mouse model of rett syndrome. *J.Neurophysiol.* **101**, 1016-1032.

- ❑ Fitzpatrick, J. S., Hagenston, A. M., Hertle, D. N., Gipson, K. E., Bertetto-D'Angelo, L., & Yeckel, M. F. (2009). Inositol-1,4,5-trisphosphate receptor-mediated Ca²⁺ waves in pyramidal neuron dendrites propagate through hot spots and cold spots. *Journal of Physiology* **587**, 1439-1459.
- ❑ Funke, F., Kron, M., Dutschmann, M., & Muller, M. (2009). Infant Brain Stem Is Prone to the Generation of Spreading Depression During Severe Hypoxia. *Journal of Neurophysiology* **101**, 2395-2410.
- ❑ Gabbiani, F., Krapp, H. G., Koch, C., & Laurent, G. (2002). Multiplicative computation in a visual neuron sensitive to looming. *Nature* **420**, 320-324.
- ❑ Gabriel, J. P., Scharstein, H., Schmidt, J., & Buschges, A. (2003). Control of flexor motoneuron activity during single leg walking of the stick insect on an electronically controlled treadmill. *J Neurobiol.* **56**, 237-251.
- ❑ Gingl, E. & French, A. S. (2003). Active signal conduction through the sensory dendrite of a spider mechanoreceptor neuron. *J Neurosci.* **23**, 6096-6101.
- ❑ Gingl, E., French, A. S., Panek, I., Meisner, S., & Torkkeli, P. H. (2004). Dendritic excitability and localization of GABA-mediated inhibition in spider mechanoreceptor neurons. *European Journal of Neuroscience* **20**, 59-65.
- ❑ Gingl, E. & Tichy, H. (2006). Continuous Tonic Spike Activity in Spider Warm Cells in the Absence of Sensory Input. *Journal of Neurophysiology* **96**, 989-997.
- ❑ Goffin, D., Ali, A. B., Rampersaud, N., Harkavyi, A., Fuchs, C., Whitton, P. S., Nairn, A. C., & Jovanovic, J. N. (2010). Dopamine-dependent tuning of striatal inhibitory synaptogenesis. *J Neurosci.* **30**, 2935-2950.
- ❑ Grass, D., Pawlowski, P. G., Hirrlinger, J., Papadopoulos, N., Richter, D. W., Kirchhoff, F., & Hulsman, S. (2004). Diversity of functional astroglial properties in the respiratory network. *J Neurosci.* **24**, 1358-1365.
- ❑ Grewe, J., Matos, N., Egelhaaf, M., & Warzecha, A. K. (2006). Implications of Functionally Different Synaptic Inputs for Neuronal Gain and Computational Properties of Fly Visual Interneurons. *Journal of Neurophysiology*
- ❑ Grewe, J., Weckstrom, M., Egelhaaf, M., & Warzecha, A. K. (2007). Information and discriminability as measures of reliability of sensory coding. *PLoS.ONE.* **19**;2, e1328.
- ❑ Hadjilambrea, G., Mix, E., Rolfs, A., Muller, J., & Strauss, U. (2005). Neuromodulation by a Cytokine: Interferon- β Differentially Augments Neocortical Neuronal Activity and Excitability. *Journal of Neurophysiology* **93**, 843-852.
- ❑ Hagenston, A. M., Rudnick, N. D., Boone, C. E., & Yeckel, M. F. (2009). 2-Aminoethoxydiphenyl-borate (2-APB) increases excitability in pyramidal neurons. *Cell Calcium.* **45**, 310-317.
- ❑ Haseneder, R., Kratzer, S., Kochs, E., Hofelmann, D., Auberson, Y., Eder, M., & Rammes, G. (2009). The xenon-mediated antagonism against the NMDA receptor is non-selective for receptors containing either NR2A or NR2B subunits in the mouse amygdala. *Eur.J Pharmacol.* **619**, 33-37.
- ❑ Haseneder, R., Kratzer, S., Kochs, E., Mattusch, C., Eder, M., & Rammes, G. (2009). Xenon attenuates excitatory synaptic transmission in the rodent prefrontal cortex and spinal cord dorsal horn. *Anesthesiology.* **111**, 1297-1307.
- ❑ Heimonen, K., Salmela, I., Kontiokari, P., & Weckstrom, M. (2006). Large functional variability in cockroach photoreceptors: optimization to low light levels. *J Neurosci.* **26**, 13454-13462.
- ❑ Heinze, S. & Homberg, U. (2009). Linking the input to the output: new sets of neurons complement the polarization vision network in the locust central complex. *J Neurosci.* **29**, 4911-4921.
- ❑ Heinze, S., Gotthardt, S., & Homberg, U. (2009). Transformation of polarized light information in the central complex of the locust. *J Neurosci.* **29**, 11783-11793.

- ❑ Hepp, S., Gerich, F. J., & Mueller, M. (2005). Sulfhydryl Oxidation Reduces Hippocampal Susceptibility To Hypoxia-Induced Spreading Depression By Activating BK-Channels. *Journal of Neurophysiology* **94**, 1091-1103.
- ❑ Hirsch, S. & Luhmann, H. J. (2008). Pathway-specificity in N-methyl-d-aspartate receptor-mediated synaptic inputs onto subplate neurons. *Neuroscience*. **153**, 1092-1102.
- ❑ Hoger, U., Torkkeli, P. H., & French, A. S. (2005). Calcium concentration changes during sensory transduction in spider mechanoreceptor neurons. *European Journal of Neuroscience* **22**, 3171-3178.
- ❑ Hoger, U., Meisner, S., Torkkeli, P. H., & French, A. S. (2008). Regional distribution of calcium elevation during sensory transduction in spider mechanoreceptor neurons. *Neurosci.Res.* **62**, 278-285.
- ❑ Hu, X. T., Basu, S., & White, F. J. (2004). Repeated Cocaine Administration Suppresses HVA-Ca²⁺ Potentials and Enhances Activity of K⁺ Channels in Rat Nucleus Accumbens Neurons. *Journal of Neurophysiology* **92**, 1597-1607.
- ❑ Juusola, M. and Hardie, R. C. (2001). Light Adaptation in *Drosophila* Photoreceptors: I. Response Dynamics and Signaling Efficiency at 25° C. *J.Gen.Physiol.* **117**, 3-25.
- ❑ Juusola, M. and Hardie, R. C. (2001). Light Adaptation in *Drosophila* Photoreceptors: II. Rising Temperature Increases the Bandwidth of Reliable Signaling, *J.Gen.Physiol.* **117**, 27-41.
- ❑ Juusola, M., Niven, J. E., & French, A. S. (2003). Shaker k⁺ channels contribute early nonlinear amplification to the light response in *Drosophila* photoreceptors. *J Neurophysiol.* **90**, 2014-2021.
- ❑ Kurtz, R., Beckers, U., Hundsdorfer, B., & Egelhaaf, M. (2009). Mechanisms of after-hyperpolarization following activation of fly visual motion-sensitive neurons. *Eur.J Neurosci.* **30**, 567-577.
- ❑ Kohling, R., Koch, U. R., Hamann, M., & Richter, A. (2004). Increased excitability in corticostriatal synaptic pathway in a model of paroxysmal dystonia. *Neurobiol.Dis.* **16**, 236-245.
- ❑ Kuenzel, T., Wirth, M. J., Luksch, H., Wagner, H., & Mey, J. (2009). Increase of Kv3.1b expression in avian auditory brainstem neurons correlates with synaptogenesis in vivo and in vitro. *Brain Res.* **1302**, 64-75.
- ❑ Ludwar, B. C., Westmark, S., Buschges, A., & Schmidt, J. (2005). Modulation of membrane potential in mesothoracic moto- and interneurons during stick insect front-leg walking. *Journal of Neurophysiology* **94**, 2772-2784.
- ❑ Ludwar, B. C., Evans, C. G., Jing, J., & Cropper, E. C. (2009). Two distinct mechanisms mediate potentiating effects of depolarization on synaptic transmission. *J Neurophysiol.* **102**, 1976-1983.
- ❑ Leger, J. F., Stern, E. A., Aertsen, A., & Heck, D. (2005). Synaptic integration in rat frontal cortex shaped by network activity. *Journal of Neurophysiology* **93**, 281-293.
- ❑ Lu, V. B., Biggs, J. E., Stebbing, M. J., Balasubramanian, S., Todd, K. G., Lai, A. Y., Colmers, W. F., Dawbarn, D., Ballanyi, K., & Smith, P. A. (2009). Brain-derived neurotrophic factor drives the changes in excitatory synaptic transmission in the rat superficial dorsal horn that follow sciatic nerve injury. *Journal of Physiology* **587**, 1013-1032.
- ❑ Malinvaud, D., Vassias, I., Reichenberger, I., Rossert, C., & Straka, H. (2010). Functional Organization of Vestibular Commissural Connections in Frog. *J Neurosci.* **30**, 3310-3325.
- ❑ Manzke, T., Guenther, U., Ponimaskin, E. G., Haller, M., Dutschmann, M., Schwarzacher, S., & Richter, D. W. (2003). 5-HT₄(a) receptors avert opioid-induced breathing depression without loss of analgesia. *Science* **301**, 226-229.
- ❑ Manzke, T., Dutschmann, M., Schlaf, G., Morschel, M., Koch, U. R., Ponimaskin, E., Bidon, O., Lalley, P. M., & Richter, D. W. (2009). Serotonin targets inhibitory synapses to induce modulation of network functions. *Philos.Trans.R.Soc.Lond B Biol.Sci.* **364**, 2589-2602.

- ❑ Marsicano, G., Goodenough, S., Monory, K., Hermann, H., Eder, M., Cannich, A., Azad, S. C., Cascio, M. G., Gutierrez, S. O., van der, S. M., Lopez-Rodriguez, M. L., Casanova, E., Schutz, G., Zieglgansberger, W., Di, M., V, Behl, C., & Lutz, B. (2003). CB1 cannabinoid receptors and on-demand defense against excitotoxicity. *Science* **302**, 84-88.
- ❑ Mentel, T., Krause, A., Pabst, M., El Manira, A., & Buschges, A. (2006). Activity of fin muscles and fin motoneurons during swimming motor pattern in the lamprey. *Eur.J Neurosci.* **23**, 2012-2026.
- ❑ Mentel, T., Cangiano, L., Grillner, S., & Buschges, A. (2008). Neuronal substrates for state-dependent changes in coordination between motoneuron pools during fictive locomotion in the lamprey spinal cord. *Journal of Neuroscience* **28**, 868-879.
- ❑ Milenkovic, I., Rinke, I., Witte, M., Dietz, B., & Rubsamens, R. (2009). P2 receptor-mediated signaling in spherical bushy cells of the mammalian cochlear nucleus. *Journal of Neurophysiology*
- ❑ Mitsis, G. D., French, A. S., Hoger, U., Courellis, S., & Marmarelis, V. Z. (2007). Principal dynamic mode analysis of action potential firing in a spider mechanoreceptor. *Biol.Cybern.* **96**, 113-127.
- ❑ Monory, K., Massa, F., Egertova, M., Eder, M., Blaudzun, H., Westenbroek, R., Kelsch, W., Jacob, W., Marsch, R., Ekker, M., Long, J., Rubenstein, J. L., Goebbels, S., Nave, K. A., During, M., Klugmann, M., Wolfel, B., Dodt, H. U., Zieglgansberger, W., Wotjak, C. T., Mackie, K., Elphick, M. R., Marsicano, G., & Lutz, B. (2006). The endocannabinoid system controls key epileptogenic circuits in the hippocampus. *Neuron.* **51**, 455-466.
- ❑ Muller, A., Kukley, M., Stausberg, P., Beck, H., Muller, W., & Dietrich, D. (2005). Endogenous Ca²⁺ Buffer Concentration and Ca²⁺ Microdomains in Hippocampal Neurons. *Journal of Neuroscience* **25**, 558-565.
- ❑ Naro, F., De, A., V, Coletti, D., Molinaro, M., Zani, B., Vassanelli, S., Reggiani, C., Teti, A., & Adamo, S. (2003). Increase in cytosolic Ca²⁺ induced by elevation of extracellular Ca²⁺ in skeletal myogenic cells. *Am.J.Physiol Cell Physiol* **284**, C969-C976.
- ❑ Nasif, F. J., Sidiropoulou, K., Hu, X. T., & White, F. J. (2005). Repeated cocaine administration increases membrane excitability of pyramidal neurons in the rat medial prefrontal cortex. *J.Pharmacol.Exp.Ther.* **312**, 1305-1313.
- ❑ Nguyen, T. V., Matsuyama, H., Baell, J., Hunne, B., Fowler, C. J., Smith, J. E., Nurgali, K., & Furness, J. B. (2007). Effects of compounds that influence KCNN4 channels on after-hyperpolarizing potentials, and determination of IK channel sequence, in guinea pig enteric neurons. *J Neurophysiol.*
- ❑ Okabe, A., Kilb, W., Shimizu-Okabe, C., Hanganu, I. L., Fukuda, A., & Luhmann, H. J. (2004). Homogenous glycine receptor expression in cortical plate neurons and cajal-retzius cells of neonatal rat cerebral cortex. *Neuroscience* **123**, 715-724.
- ❑ Pan, B. & Zucker, R. S. (2009). A general model of synaptic transmission and short-term plasticity. *Neuron.* **62**, 539-554.
- ❑ Panek, I., French, A. S., Seyfarth, E. A., Sekizawa, S. I., & Torkkeli, P. H. (2002). Peripheral GABAergic inhibition of spider mechanosensory afferents. *Eur.J.Neurosci.* **16**, 96-104.
- ❑ Pangrsic, T., Stusek, P., Belusic, G., & Zupancic, G. (2005). Light dependence of oxygen consumption by blowfly eyes recorded with a magnetic diver balance. *J Comp Physiol A Neuroethol.Sens.Neural Behav.Physiol* **191**, 75-84.
- ❑ Pascual, O., Traiffort, E., Baker, D. P., Galdes, A., Ruat, M., & Champagnat, J. (2005). Sonic hedgehog signalling in neurons of adult ventrolateral nucleus tractus solitarius. *Eur.J Neurosci.* **22**, 389-396.
- ❑ Pfanzelt, S., Rossert, C., Rohregger, M., Glasauer, S., Moore, L. E., & Straka, H. (2008). Differential dynamic processing of afferent signals in frog tonic and phasic second-order vestibular neurons. *Journal of Neuroscience* **28**, 10349-10362.

- ❑ Pomper, J. K., Haack, S., Petzold, G. C., Buchheim, K., Gabriel, S., Hoffmann, U., & Heinemann, U. (2005). Repetitive Spreading Depression-Like Events Result in Cell Damage in Juvenile Hippocampal Slice Cultures Maintained in Normoxia. *Journal of Neurophysiology*.
- ❑ Rammes, G., Zieglgansberger, W., & Parsons, C. G. (2008). The fraction of activated N-methyl-D-aspartate receptors during synaptic transmission remains constant in the presence of the glutamate release inhibitor riluzole. *J. Neural Transm.* **115**, 1119-1126.
- ❑ Rammes, G., Starker, L. K., Haseneder, R., Berkmann, J., Plack, A., Zieglgansberger, W., Ohl, F., Kochs, E. F., & Blobner, M. (2009). Isoflurane anaesthesia reversibly improves cognitive function and long-term potentiation (LTP) via an up-regulation in NMDA receptor 2B subunit expression. *Neuropharmacology*. **56**, 626-636.
- ❑ Ranft, A., Kurz, J., Deuringer, M., Haseneder, R., Dodt, H. U., Zieglgansberger, W., Kochs, E., Eder, M., & Hapfelmeier, G. (2004). Isoflurane modulates glutamatergic and GABAergic neurotransmission in the amygdala. *Eur J Neurosci* **20**, 1276-1280.
- ❑ Rastan, A. J., Walther, T., Kostelka, M., Garbade, J., Schubert, A., Stein, A., Dhein, S., & Mohr, F. W. (2005). Morphological, electrophysiological and coupling characteristics of bone marrow-derived mononuclear cells--an in vitro-model. *European Journal of Cardio-Thoracic Surgery* **27**, 104-110.
- ❑ Reiprich, P., Kilb, W., & Luhmann, H. J. (2005). Neonatal NMDA Receptor Blockade Disturbs Neuronal Migration in Rat Somatosensory Cortex In Vivo. *Cerebral Cortex* **15**, 349-358.
- ❑ Ren, J., Lee, S., Pagliardini, S., Gerard, M., Stewart, C. L., Greer, J. J., & Wevrick, R. (2003). Absence of Ndn, encoding the Prader-Willi syndrome-deleted gene necdin, results in congenital deficiency of central respiratory drive in neonatal mice. *J Neurosci.* **23**, 1569-1573.
- ❑ Ren, J. & Greer, J. J. (2006). Modulation of respiratory rhythmogenesis by chloride-mediated conductances during the perinatal period. *J Neurosci.* **26**, 3721-3730.
- ❑ Ren, J. & Greer, J. J. (2006). Neurosteroid modulation of respiratory rhythm in rats during the perinatal period. *J Physiol.* **574**, 535-546.
- ❑ Ren, J., Momose-Sato, Y., Sato, K., & Greer, J. J. (2006). Rhythmic neuronal discharge in the medulla and spinal cord of fetal rats in the absence of synaptic transmission. *J Neurophysiol.* **95**, 527-534.
- ❑ Rogers, S. M., Krapp, H. G., Burrows, M., & Matheson, T. (2007). Compensatory plasticity at an identified synapse tunes a visuomotor pathway. *J Neurosci.* **27**, 4621-4633.
- ❑ Rosenkranz, J. A., Frick, A., & Johnston, D. (2009). Kinase-dependent modification of dendritic excitability after long-term potentiation. *The Journal of Physiology* **587**, 115-125.
- ❑ Sacchi, O., Rossi, M. L., Canella, R., & Fesce, R. (2006). Synaptic and somatic effects of axotomy in the intact, innervated rat sympathetic neuron. *J Neurophysiol.* **95**, 2832-2844.
- ❑ Sacchi, O., Rossi, M. L., Canella, R., & Fesce, R. (2007). Regulation of the subthreshold chloride conductance in the rat sympathetic neuron. *Eur. J Neurosci.* **25**, 1112-1126.
- ❑ Shea, S. D., Koch, H., Baleckaitis, D., Ramirez, J. M., & Margoliash, D. (2010). Neuron-specific cholinergic modulation of a forebrain song control nucleus. *J Neurophysiol.* **103**, 733-745.
- ❑ Salgado, V. L. & Saar, R. (2004). Desensitizing and non-desensitizing subtypes of alpha-bungarotoxin-sensitive nicotinic acetylcholine receptors in cockroach neurons. *J Insect Physiol* **50**, 867-879.
- ❑ Smarandache, C., Hall, W. M., & Mulloney, B. (2009). Coordination of rhythmic motor activity by gradients of synaptic strength in a neural circuit that couples modular neural oscillators. *J Neurosci.* **29**, 9351-9360.
- ❑ Stegen, M., Young, C. C., Haas, C. A., Zentner, J., & Wolfart, J. (2009). Increased leak conductance in dentate gyrus granule cells of temporal lobe epilepsy patients with Ammon's horn sclerosis. *Epilepsia*
- ❑ Stett, A., Bucher, V., Burkhardt, C., Weber, U., & Nisch, W. (2003). Patch-clamping of primary cardiac cells with micro-openings in polyimide films. *Med. Biol. Eng. Comput.* **41**, 233-240.

- ❑ Strauss, U., Zhou, F. W., Henning, J., Bettefeld, A., Wree, A., Kohling, R., Haas, S. J., Benecke, R., Rolfs, A., & Gimsa, U. (2008). Increasing extracellular potassium results in subthalamic neuron activity resembling that seen in a 6-hydroxydopamine lesion. *J.Neurophysiol.* **99**, 2902-2915.
- ❑ Szegedi, V., Juhasz, G., Rozsa, E., Juhasz-Vedres, G., Datki, Z., Fulop, L., Bozso, Z., Lakatos, A., Laczko, I., Farkas, T., Kis, Z., Toth, G., Soos, K., Zarandi, M., Budai, D., Toldi, J., & Penke, B. (2006). Endomorphin-2, an endogenous tetrapeptide, protects against Abeta1-42 in vitro and in vivo. *FASEB J.* **20**, 1191-1193.
- ❑ Thomas, D. R., Dada, A., Jones, G. A., Deisz, R. A., Gigout, S., Langmead, C. J., Werry, T. D., Hendry, N., Hagan, J. J., Davies, C. H., & Watson, J. M. (2010). N-desmethylclozapine (NDMC) is an antagonist at the human native muscarinic M(1) receptor. *Neuropharmacology.* **58**, 1206-1214.
- ❑ Teichgraber, L. A., Lehmann, T. N., Meencke, H. J., Weiss, T., Nitsch, R., & Deisz, R. A. (2009). Impaired function of GABA(B) receptors in tissues from pharmacoresistant epilepsy patients. *Epilepsia.*
- ❑ Tokarski, K., Urban-Ciecko, J., Kossut, M., & Hess, G. (2007). Sensory learning-induced enhancement of inhibitory synaptic transmission in the barrel cortex of the mouse. *Eur.J Neurosci.* **26**, 134-141.
- ❑ Torkkeli, P. H., Sekizawa, Ss. and French, A. S. (2001). Inactivation of voltage-activated Na⁺ currents contributes to different adaptation properties of paired mechanosensory neurons. *J.Neurophysiol* **85**, 1595–1602.
- ❑ Torkkeli, P. H. and French, A. S. (2001). Simulation of Different Firing Patterns in Paired Spider Mechanoreceptor Neurons: The Role of Na Channel Inactivation, *J.Neurophysiol.* **87**, 1363–1368.
- ❑ Vahasoyrinki, M., Niven, J. E., Hardie, R. C., Weckstrom, M., & Juusola, M. (2006). Robustness of neural coding in Drosophila photoreceptors in the absence of slow delayed rectifier K⁺ channels. *J Neurosci.* **26**, 2652-2660.
- ❑ Vassanelli, S. and Fromherz, P. (1999). Transistor Probes Local Potassium Conductances in the Adhesion Region of Cultured Rat Hippocampal Neurons. *J.Neurosci* **19** (16), 6767–6773.
- ❑ Volgushev, M., Malyshev, A., Balaban, P., Chistiakova, M., Volgushev, S., & Wolf, F. (2008). Onset dynamics of action potentials in rat neocortical neurons and identified snail neurons: quantification of the difference. *PLoS.ONE.* **3**, e1962.
- ❑ von Uckermann, G. & Buschges, A. (2009). Premotor interneurons in the local control of stepping motor output for the stick insect single middle leg. *J Neurophysiol.* **102**, 1956-1975.
- ❑ Wang, J., Yeckel, M. F., Johnston, D., & Zucker, R. S. (2004). Photolysis of postsynaptic caged Ca²⁺ can potentiate and depress mossy fiber synaptic responses in rat hippocampal CA3 pyramidal neurons. *Journal of Neurophysiology* **91**, 1596-1607.
- ❑ Wang, S., Teschemacher, A. G., Paton, J. F., & Kasparov, S. (2006). Mechanism of nitric oxide action on inhibitory GABAergic signaling within the nucleus tractus solitarii. *FASEB J.* **20**, 1537-1539.
- ❑ Wertz, A., Gaub, B., Plett, J., Haag, J., & Borst, A. (2009). Robust coding of ego-motion in descending neurons of the fly. *J Neurosci.* **29**, 14993-15000.
- ❑ Westmark, S., Oliveira, E. E., & Schmidt, J. (2009). Pharmacological analysis of tonic activity in motoneurons during stick insect walking. *J Neurophysiol.* **102**, 1049-1061.
- ❑ Wolfram, V. & Juusola, M. (2004). The Impact of Rearing Conditions and Short-Term Light Exposure on Signaling Performance in Drosophila Photoreceptors. *Journal of Neurophysiology* **92**, 1918-1927.
- ❑ Young, C. C., Stegen, M., Bernard, R., Muller, M., Bischofberger, J., Veh, R. W., Haas, C. A., & Wolfart, J. (2009). Upregulation of inward rectifier K⁺ (Kir2) channels in dentate gyrus granule cells in temporal lobe epilepsy. *J Physiol.* **587**, 4213-4233.