B. Literaturverzeichnis

1. F. Aguado, M. A. Carmona, E. Pozas, et al. BDNF regulates spontaneous correlated activity at early developmental stages by increasing synaptogenesis and expression of the K+/Cl- co-transporter KCC2. *Development*, 2003;130(7):1267-1280.

2. H. Bading, D. D. Ginty, und M. E. Greenberg. Regulation of gene expression in hippocampal neurons by distinct calcium signaling pathways. *Science*, 1993;260(5105):181-186.

3. V. Balakrishnan, M. Becker, S. Lohrke, H. G. Nothwang, E. Guresir, und E. Friauf. Expression and function of chloride transporters during development of inhibitory neurotransmission in the auditory brainstem. *J.Neurosci.*, 2003;23(10):4134-4145.

4. Z. C. Baquet, P. C. Bickford, und K. R. Jones. Brain-derived neurotrophic factor is required for the establishment of the proper number of dopaminergic neurons in the substantia nigra pars compacta. *J.Neurosci.*, 2005;25(26):6251-6259.

5. M. Barbacid. The Trk family of neurotrophin receptors. *J.Neurobiol.*, 1994; 25(11):1386-1403.

6. M. Barbacid. Structural and functional properties of the TRK family of neurotrophin receptors. *Ann.N.Y.Acad.Sci.*, 1995;766442-458.

7. P. Bartho, J. A. Payne, T. F. Freund, und L. Acsady. Differential distribution of the KCl cotransporter KCC2 in thalamic relay and reticular nuclei. *Eur.J.Neurosci.*, 2004;20(4):965-975.

8. M. S. Beattie, A. W. Harrington, R. Lee, et al. ProNGF induces p75-mediated death of oligodendrocytes following spinal cord injury. *Neuron*, 2002;36(3):375-386.

9. M. Becker, H. G. Nothwang, und E. Friauf. Differential expression pattern of chloride transporters NCC, NKCC2, KCC1, KCC3, KCC4, and AE3 in the developing rat auditory brainstem. *Cell Tissue Res.*, 2003;312(2):155-165.

10. Y. Ben Ari, R. Khazipov, X. Leinekugel, O. Caillard, und J. L. Gaiarsa. GABAA, NMDA and AMPA receptors: a developmentally regulated 'menage a trois'. *Trends Neurosci.*, 1997;20(11):523-529.

11. Y. Ben Ari und G. L. Holmes. The multiple facets of gamma-aminobutyric acid dysfunction in epilepsy. *Curr.Opin.Neurol.*, 2005;18(2):141-145.

12. U. Bergman, F. W. Rosa, C. Baum, B. E. Wiholm, und G. A. Faich. Effects of exposure to benzodiazepine during fetal life. *Lancet*, 1992;340(8821):694-696.

13. D. K. Binder, M. J. Routbort, und J. O. McNamara. Immunohistochemical evidence of seizure-induced activation of trk receptors in the mossy fiber pathway of adult rat hippocampus. *J.Neurosci.*, 1999;19(11):4616-4626.

14. K. E. Binns. The synaptic pharmacology underlying sensory processing in the superior colliculus. *Prog.Neurobiol.*, 1999;59(2):129-159.

15. F. E. Bloom und L. L. Iversen. Localizing 3H-GABA in nerve terminals of rat cerebral cortex by electron microscopic autoradiography. *Nature*, 1971;229(5287):628-630.

16. R. Blum, K. W. Kafitz, und A. Konnerth. Neurotrophin-evoked depolarization requires the sodium channel Na(V)1.9. *Nature*, 2002;419(6908):687-693.

17. J. Bormann, O. P. Hamill, und B. Sakmann. Mechanism of anion permeation through channels gated by glycine and gamma-aminobutyric acid in mouse cultured spinal neurones. *J.Physiol*, 1987;385243-286.

18. I. Brunig, S. Penschuck, B. Berninger, J. Benson, und J. M. Fritschy. BDNF reduces miniature inhibitory postsynaptic currents by rapid downregulation of GABA(A) receptor surface expression. *Eur.J.Neurosci.*, 2001;13(7):1320-1328.

19. R. F. Bulleit und T. Hsieh. MEK inhibitors block BDNF-dependent and -independent expression of GABA(A) receptor subunit mRNAs in cultured mouse cerebellar granule neurons. *Brain Res.Dev.Brain Res.*, 2000;119(1):1-10.

20. M. Caleo, E. Menna, S. Chierzi, M. C. Cenni, und L. Maffei. Brain-derived neurotrophic factor is an anterograde survival factor in the rat visual system. *Curr.Biol.*, 2000;10(19):1155-1161.

21. M. Canossa, O. Griesbeck, B. Berninger, G. Campana, R. Kolbeck, und H. Thoenen. Neurotrophin release by neurotrophins: implications for activity-dependent neuronal plasticity. *Proc.Natl.Acad.Sci.U.S.A*, 1997;94(24):13279-13286.

22. M. V. Chao und B. L. Hempstead. p75 and Trk: a two-receptor system. *Trends Neurosci.*, 1995;18(7):321-326.

23. E. Cherubini, J. L. Gaiarsa, und Y. Ben Ari. GABA: an excitatory transmitter in early postnatal life. *Trends Neurosci.*, 1991;14(12):515-519.

24. E. Cherubini und F. Conti. Generating diversity at GABAergic synapses. *Trends Neurosci.*, 2001;24(3):155-162.

25. I. Choi, C. Aalkjaer, E. L. Boulpaep, und W. F. Boron. An electroneutral sodium/bicarbonate cotransporter NBCn1 and associated sodium channel. *Nature*, 2000;405(6786):571-575.

26. I. Chudotvorova, A. Ivanov, S. Rama, et al. Early expression of KCC2 in rat hippocampal cultures augments expression of functional GABA synapses. *J.Physiol*, 2005;566(Pt 3):671-9.

27. S. E. Clark, M. Garret, und B. Platt. Postnatal alterations of GABA receptor profiles in the rat superior colliculus. *Neuroscience*, 2001;104(2):441-454.

28. F. Crestani, M. Lorez, K. Baer, et al. Decreased GABAA-receptor clustering results in enhanced anxiety and a bias for threat cues. *Nat.Neurosci.*, 1999;2(9):833-839.

29. F. Crestani, J. R. Martin, H. Mohler, und U. Rudolph. Mechanism of action of the hypnotic zolpidem in vivo. *Br.J.Pharmacol.*, 2000;131(7):1251-1254.

30. S. J. Czuczwar und P. N. Patsalos. The new generation of GABA enhancers. Potential in the treatment of epilepsy. *CNS.Drugs*, 2001;15(5):339-350.

31. K. P. Das, S. L. Chao, L. D. White, et al. Differential patterns of nerve growth factor, brain-derived neurotrophic factor and neurotrophin-3 mRNA and protein levels in developing regions of rat brain. *Neuroscience*, 2001;103(3):739-761.

32. A. M. Davies, K. F. Lee, und R. Jaenisch. p75-deficient trigeminal sensory neurons have an altered response to NGF but not to other neurotrophins. *Neuron*, 1993;11(4):565-574.

33. P. Davies, B. Anderton, J. Kirsch, A. Konnerth, R. Nitsch, und M. Sheetz. First one in, last one out: the role of gabaergic transmission in generation and degeneration. *Prog.Neurobiol.*, 1998;55(6):651-658.

34. M. D. Edwards, A. M. White, und B. Platt. Characterisation of rat superficial superior colliculus neurones: firing properties and sensitivity to GABA. *Neuroscience*, 2002;110(1):93-104.

35. J. Eilers, T. D. Plant, N. Marandi, und A. Konnerth. GABA-mediated Ca2+ signalling in developing rat cerebellar Purkinje neurones. *J.Physiol*, 2001;536(Pt 2):429-437.

36. H. Einat, P. Yuan, T. D. Gould, et al. The role of the extracellular signal-regulated kinase signaling pathway in mood modulation. *J.Neurosci.*, 2003;23(19):7311-7316.

37. R. Enz, J. H. Brandstatter, E. Hartveit, H. Wassle, und J. Bormann. Expression of GABA receptor rho 1 and rho 2 subunits in the retina and brain of the rat. *Eur.J.Neurosci.*, 1995;7(7):1495-1501.

38. P. Ernfors, K. F. Lee, und R. Jaenisch. Mice lacking brain-derived neurotrophic factor develop with sensory deficits. *Nature*, 1994;368(6467):147-150.

39. M. Fiore, G. Dell'Omo, E. Alleva, und H. P. Lipp. A comparison of behavioural effects of prenatally administered oxazepam in mice exposed to open-fields in the laboratory and the real world. *Psychopharmacology (Berl)*, 1995;122(1):72-77.

40. M. Frerking, R. C. Malenka, und R. A. Nicoll. Brain-derived neurotrophic factor (BDNF) modulates inhibitory, but not excitatory, transmission in the CA1 region of the hippocampus. *J.Neurophysiol.*, 1998;80(6):3383-3386.

41. T. F. Freund und G. Buzsaki. Interneurons of the hippocampus. *Hippocampus*, 1996;6(4):347-470.

42. J. M. Fritschy, C. Schweizer, I. Brunig, und B. Luscher. Pre- and post-synaptic mechanisms regulating the clustering of type A gamma-aminobutyric acid receptors (GABAA receptors). *Biochem.Soc.Trans.*, 2003;31(Pt 4):889-892.

43. D. O. Frost, Y. T. Ma, T. Hsieh, M. E. Forbes, und J. E. Johnson. Developmental changes in BDNF protein levels in the hamster retina and superior colliculus. *J.Neurobiol.*, 2001;49(3):173-187.

44. S. Furukawa, Y. Sugihara, F. Iwasaki, et al. Brain-derived neurotrophic factor-like immunoreactivity in the adult rat central nervous system predominantly distributed in neurons with substantial amounts of brain-derived neurotrophic factor messenger RNA or responsiveness to brain-derived neurotrophic factor. *Neuroscience*, 1998;82(3):653-670.

45. K. Ganguly, A. F. Schinder, S. T. Wong, und M. Poo. GABA itself promotes the developmental switch of neuronal GABAergic responses from excitation to inhibition. *Cell*, 2001;105(4):521-532.

46. L. R. Gauthier, B. C. Charrin, M. Borrell-Pages, et al. Huntingtin controls neurotrophic support and survival of neurons by enhancing BDNF vesicular transport along microtubules. *Cell*, 2004;118(1):127-138.

47. J. Goggi, I. A. Pullar, S. L. Carney, und H. F. Bradford. Modulation of neurotransmitter release induced by brain-derived neurotrophic factor in rat brain striatal slices in vitro. *Brain Res.*, 2002;941(1-2):34-42.

48. L. J. Goodman, J. Valverde, F. Lim, et al. Regulated release and polarized localization of brain-derived neurotrophic factor in hippocampal neurons. *Mol.Cell Neurosci.*, 1996;7(3):222-238.

49. R. Grantyn, R. Jüttner, und J. Meier. Development and use-dependent modification of synaptic connections in the visual layers of the rodent superior colliculus. *In W.C.Hall und A.Moschovakis (eds.) The superior colliculus. CRC Press, Boca Raton*, 2004;173-210.

50. L. A. Greene und D. R. Kaplan. Early events in neurotrophin signalling via Trk and p75 receptors. *Curr.Opin.Neurobiol.*, 1995;5(5):579-587.

51. O. Griesbeck, M. Canossa, G. Campana, et al. Are there differences between the secretion characteristics of NGF and BDNF? Implications for the modulatory role of neurotrophins in activity-dependent neuronal plasticity. *Microsc.Res.Tech.*, 1999;45(4-5):262-275.

52. G. Grynkiewicz, M. Poenie, und R. Y. Tsien. A new generation of Ca2+ indicators with greatly improved fluorescence properties. *J.Biol.Chem.*, 1985;260(6):3440-3450.

53. A. Gulacsi, C. R. Lee, A. Sik, et al. Cell type-specific differences in chloride-regulatory mechanisms and GABA(A) receptor-mediated inhibition in rat substantia nigra. *J.Neurosci.*, 2003;23(23):8237-8246.

54. A. Haapasalo, I. Sipola, K. Larsson, et al. Regulation of TRKB surface expression by brain-derived neurotrophic factor and truncated TRKB isoforms. *J.Biol.Chem.*, 2002;277(45):43160-43167.

55. A. R. Harvey. Expression of low affinity NGF (p75) receptors in rat superior colliculus: studies in vivo, in vitro, and in fetal tectal grafts. *Exp.Neurol.*, 1994;130(2):237-249.

56. K. Hashimoto, E. Shimizu, und M. Iyo. Critical role of brain-derived neurotrophic factor in mood disorders. *Brain Res.Brain Res.Rev.*, 2004;45(2):104-114.

57. W. Haubensak, F. Narz, R. Heumann, und V. Lessmann. BDNF-GFP containing secretory granules are localized in the vicinity of synaptic junctions of cultured cortical neurons. *J.Cell Sci.*, 1998;111 (Pt 11)1483-1493.

58. C. Henneberger, R. Grantyn, und T. Rothe. Rapid genotyping of newborn gene mutant mice. *J.Neurosci.Methods*, 2000;100(1-2):123-126.

59. C. Henneberger, R. Juttner, T. Rothe, und R. Grantyn. Postsynaptic action of BDNF on GABAergic synaptic transmission in the superficial layers of the mouse superior colliculus. *J.Neurophysiol.*, 2002;88(2):595-603.

60. C. Henneberger, S. Kirischuk S, und R. Grantyn. Brain-derived neurotrophic factor modulates GABAergic synaptic transmission by enhancing presynaptic glutamic acid decarboxylase 65 levels, promoting asynchronous release

and reducing the number of activated postsynaptic receptors. *Neuroscience*, 2005;135(3):749-63.

61. R. M. Holsinger, J. Schnarr, P. Henry, V. T. Castelo, und M. Fahnestock. Quantitation of BDNF mRNA in human parietal cortex by competitive reverse transcription-polymerase chain reaction: decreased levels in Alzheimer's disease. *Brain Res.Mol.Brain Res.*, 2000;76(2):347-354.

62. E. J. Huang und L. F. Reichardt. Neurotrophins: roles in neuronal development and function. *Annu.Rev.Neurosci.*, 2001;24677-736.

63. Z. J. Huang, A. Kirkwood, T. Pizzorusso, et al. BDNF regulates the maturation of inhibition and the critical period of plasticity in mouse visual cortex. *Cell*, 1999;98(6):739-755.

64. C. A. Hübner, D. E. Lorke, und I. Hermans-Borgmeyer. Expression of the Na-K-2Cl-cotransporter NKCC1 during mouse development. *Mech.Dev.*, 2001a;102(1-2):267-269.

65. C. A. Hübner, V. Stein, I. Hermans-Borgmeyer, T. Meyer, K. Ballanyi, und T. J. Jentsch. Disruption of KCC2 reveals an essential role of K-Cl cotransport already in early synaptic inhibition. *Neuron*, 2001b;30(2):515-524.

66. T. Isa und Y. Saito. The direct visuo-motor pathway in mammalian superior colliculus; novel perspective on the interlaminar connection. *Neurosci.Res.*, 2001;41(2):107-113.

67. L. Jasmin, S. D. Rabkin, A. Granato, A. Boudah, und P. T. Ohara. Analgesia and hyperalgesia from GABA-mediated modulation of the cerebral cortex. *Nature*, 2003;424(6946):316-320.

68. R. Jüttner, J. Meier, und R. Grantyn. Slow IPSC kinetics, low levels of alpha1 subunit expression and paired-pulse depression are distinct properties of

neonatal inhibitory GABAergic synaptic connections in the mouse superior colliculus. *Eur.J.Neurosci.*, 2001;13(11):2088-2098.

69. K. W. Kafitz, C. R. Rose, H. Thoenen, und A. Konnerth. Neurotrophin-evoked rapid excitation through TrkB receptors. *Nature*, 1999;401(6756):918-921.

70. Y. Kakazu, N. Akaike, S. Komiyama, und J. Nabekura. Regulation of intracellular chloride by cotransporters in developing lateral superior olive neurons. *J.Neurosci.*, 1999;19(8):2843-2851.

71. M. R. Kaplan, D. B. Mount, und E. Delpire. Molecular mechanisms of NaCl cotransport. *Annu.Rev.Physiol*, 1996;58649-668.

72. D. L. Kaufman, C. R. Houser, und A. J. Tobin. Two forms of the gamma-aminobutyric acid synthetic enzyme glutamate decarboxylase have distinct intraneuronal distributions and cofactor interactions. *J.Neurochem.*, 1991;56(2):720-723.

73. C. K. Kellogg, J. Yao, und G. L. Pleger. Sex-specific effects of in utero manipulation of GABA(A) receptors on pre- and postnatal expression of BDNF in rats. *Brain Res.Dev.Brain Res.*, 2000;121(2):157-167.

74. W. Kelsch, S. Hormuzdi, E. Straube, A. Lewen, H. Monyer, und U. Misgeld. Insulin-like growth factor 1 and a cytosolic tyrosine kinase activate chloride outward transport during maturation of hippocampal neurons. *J.Neurosci.*, 2001;21(21):8339-8347.

75. S. Kirischuk, J. Akyeli, R. Iosub, und R. Grantyn. Pre- and postsynaptic contribution of GABAC receptors to GABAergic synaptic transmission in rat collicular slices and cultures. *Eur.J.Neurosci.*, 2003;18(4):752-758.

76. S. Kirischuk, R. Jüttner, und R. Grantyn. Time-matched pre- and postsynaptic changes of GABAergic synaptic transmission in the developing mouse superior colliculus. *J.Physiol*, 2005;563(Pt 3):795-807.

77. J. Kirsch und H. Betz. Glycine-receptor activation is required for receptor clustering in spinal neurons. *Nature* , 1998;392(6677):717-720.

78. S. Kobayashi, C. W. Morgans, J. R. Casey, und R. R. Kopito. AE3 anion exchanger isoforms in the vertebrate retina: developmental regulation and differential expression in neurons and glia. *J.Neurosci.*,1994;14(10):6266-6279.

79. K. Kohara, A. Kitamura, M. Morishima, und T. Tsumoto. Activity-dependent transfer of brain-derived neurotrophic factor to postsynaptic neurons. *Science*, 2001;291(5512):2419-2423.

80. M. Kojima, N. Takei, T. Numakawa, et al. Biological characterization and optical imaging of brain-derived neurotrophic factor-green fluorescent protein suggest an activity-dependent local release of brain-derived neurotrophic factor in neurites of cultured hippocampal neurons. *J.Neurosci.Res.*, 2001;64(1):1-10.

81. M. Korte, P. Carroll, E. Wolf, G. Brem, H. Thoenen, und T. Bonhoeffer. Hippocampal long-term potentiation is impaired in mice lacking brain-derived neurotrophic factor. *Proc.Natl.Acad.Sci.U S A*, 1995;92(19):8856-8860.

82. K. Kraszewski und R. Grantyn. Unitary, quantal and miniature GABA-activated synaptic chloride currents in cultured neurons from the rat superior colliculus. *Neuroscience*, 1992;47(3):555-570.

83. K. Kuriyama, M. Hirouchi, und H. Kimura. Neurochemical and molecular pharmacological aspects of the GABA(B) receptor. *Neurochem.Res.*, 2000;25(9-10):1233-1239.

84. A. Kyrozis und D. B. Reichling. Perforated-patch recording with gramicidin avoids artifactual changes in intracellular chloride concentration. *J.Neurosci.Methods*, 1995;57(1):27-35.

85. L. Laegreid, G. Hagberg, und A. Lundberg. Neurodevelopment in late infancy after prenatal exposure to benzodiazepines--a prospective study. *Neuropediatrics*, 1992;23(2):60-67.

86. T. Lang, I. Wacker, J. Steyer, et al. Ca2+-triggered peptide secretion in single cells imaged with green fluorescent protein and evanescent-wave microscopy. *Neuron*, 1997;18(6):857-863.

87. H. Lee, C. X. Chen, Y. J. Liu, E. Aizenman, und K. Kandler. KCC2 expression in immature rat cortical neurons is sufficient to switch the polarity of GABA responses. *Eur.J.Neurosci.*, 2005;21(9):2593-2599.

88. R. Lee, P. Kermani, K. K. Teng, und B. L. Hempstead. Regulation of cell survival by secreted proneurotrophins. *Science*, 2001;294(5548):1945-1948.

89. X. Leinekugel, I. Khalilov, H. McLean, et al. GABA is the principal fast-acting excitatory transmitter in the neonatal brain. *Adv.Neurol.*, 1999;79189-201.

90. R. Levi-Montalcini, H. Meyer, und V. Hamburger. In vitro experiments on the effects of mouse sarcomas 180 and 37 on the spinal and sympathetic ganglia of the chick embryo. *Cancer Res.*, 1954;14(1):49-57.

91. M. Levivier, S. Przedborski, C. Bencsics, und U. J. Kang. Intrastriatal implantation of fibroblasts genetically engineered to produce brain-derived neurotrophic factor prevents degeneration of dopaminergic neurons in a rat model of Parkinson's disease. *J.Neurosci.*, 1995;15(12):7810-7820.

92. H. Li, J. Tornberg, K. Kaila, M. S. Airaksinen, und C. Rivera. Patterns of cation-chloride cotransporter expression during embryonic rodent CNS development. *Eur.J.Neurosci.*, 2002;16(12):2358-2370.

93. Y. X. Li, Y. Xu, D. Ju, H. A. Lester, N. Davidson, und E. M. Schuman. Expression of a dominant negative TrkB receptor, T1, reveals a requirement for

presynaptic signaling in BDNF-induced synaptic potentiation in cultured hippocampal neurons. *Proc.Natl.Acad.Sci.U.S.A*, 1998;95(18):10884-10889.

94. B. Lom, J. Cogen, A. L. Sanchez, T. Vu, und S. Cohen-Cory. Local and target-derived brain-derived neurotrophic factor exert opposing effects on the dendritic arborization of retinal ganglion cells in vivo. *J.Neurosci.*, 2002;22(17):7639-7649.

95. J. J. LoTurco, D. F. Owens, M. J. Heath, M. B. Davis, und A. R. Kriegstein. GABA and glutamate depolarize cortical progenitor cells and inhibit DNA synthesis.*Neuron*, 1995;15(6):1287-1298.

96. B. Lu und A. Chow. Neurotrophins and hippocampal synaptic transmission and plasticity. *J.Neurosci.Res.*, 1999;58(1):76-87.

97. B. Lu und W. Gottschalk. Modulation of hippocampal synaptic transmission and plasticity by neurotrophins.*Prog.Brain Res.*, 2000;128231-241.

98. J. Lu, M. Karadsheh, und E. Delpire. Developmental regulation of the neuronal-specific isoform of K-Cl cotransporter KCC2 in postnatal rat brains. *J.Neurobiol.*, 1999;39(4):558-568.

99. A. Ludwig, H. Li, M. Saarma, K. Kaila, und C. Rivera. Developmental up-regulation of KCC2 in the absence of GABAergic and glutamatergic transmission. *Eur.J.Neurosci.*, 2003;18(12):3199-3206.

100. P. D. Lukasiewicz, E. D. Eggers, B. T. Sagdullaev, und M. A. McCall. GABAC receptor-mediated inhibition in the retina.*Vision Res.*, 2004;44(28):3289-3296.

101. R. D. Lund und J. S. Lund. Development of synaptic patterns in the superior colliculus of the rat.*Brain Res.*, 1972;42(1):1-20.

102. F. H. Marshall, K. A. Jones, K. Kaupmann, und B. Bettler. GABAB receptors - the first 7TM heterodimers. *Trends Pharmacol.Sci.*, 1999;20(10):396-399.

103. S. Marty, B. Berninger, P. Carroll, und H. Thoenen. GABAergic stimulation regulates the phenotype of hippocampal interneurons through the regulation of brain-derived neurotrophic factor. *Neuron*, 1996;16(3):565-570.

104. K. Matsui, J. Hasegawa, und M. Tachibana. Modulation of excitatory synaptic transmission by GABA(C) receptor-mediated feedback in the mouse inner retina. *J.Neurophysiol.*, 2001;86(5):2285-2298.

105. G. Matthews, G. S. Ayoub, und R. Heidelberger. Presynaptic inhibition by GABA is mediated via two distinct GABA receptors with novel pharmacology. *J.Neurosci.*, 1994;14(3 Pt 1):1079-1090.

106. A. K. McAllister. Subplate neurons: a missing link among neurotrophins, activity, and ocular dominance plasticity? *Proc.Natl.Acad.Sci.U.S.A*, 1999;96(24):13600-13602.

107. M. A. McCall, P. D. Lukasiewicz, R. G. Gregg, und N. S. Peachey. Elimination of the rho1 subunit abolishes GABA(C) receptor expression and alters visual processing in the mouse retina. *J.Neurosci.*, 2002;22(10):4163-4174.

108. B. M. McLean, A. J. Pittman, und D. C. Lo. Brain-derived neurotrophic factor differentially regulates excitatory and inhibitory synaptic transmission in hippocampal cultures. *J.Neurosci.*, 2000;20(9):3221-3232.

109. A. K. Mehta und M. K. Ticku. An update on GABAA receptors. *Brain Res.Brain Res.Rev.*, 1999;29(2-3):196-217.

110. J. Meier, J. Akyeli, S. Kirischuk, und R. Grantyn. GABA(A) receptor activity and PKC control inhibitory synaptogenesis in CNS tissue slices. *Mol.Cell Neurosci.*, 2003;23(4):600-613.

111. J. P. Merlio, P. Ernfors, M. Jaber, und H. Persson. Molecular cloning of rat trkC and distribution of cells expressing messenger RNAs for members of the trk family in the rat central nervous system. *Neuroscience*, 1992;51(3):513-532.

112. J. P. Merlio, P. Ernfors, Z. Kokaia, et al. Increased production of the TrkB protein tyrosine kinase receptor after brain insults. *Neuron*, 1993;10(2):151-164.

113. R. Miles. Neurobiology. A homeostatic switch. *Nature*, 1999;397(6716):215-216.

114. R. R. Mize. Immunocytochemical localization of gamma-aminobutyric acid (GABA) in the cat superior colliculus. *J.Comp.Neurol.*, 1988;276(2):169-187.

115. R. R. Mize. The organization of GABAergic neurons in the mammalian superior colliculus. *Prog.Brain Res.*, 1992;90219-248.

116. Y. Mizoguchi, H. Ishibashi, und J. Nabekura. The action of BDNF on GABAA currents changes from potentiating to suppressing during maturation of rat hippocampal CA1 pyramidal neurons. *J.Physiol.*, 2003;548(Pt 3):703-709.

117. I. Mody. Aspects of the homeostaic plasticity of GABAA receptor-mediated inhibition. *J.Physiol*, 2005;562(Pt 1):37-46.

118. D. D. Murphy, N. B. Cole, und M. Segal. Brain-derived neurotrophic factor mediates estradiol-induced dendritic spine formation in hippocampal neurons. *Proc.Natl.Acad.Sci.U.S.A*, 1998;95(19):11412-11417.

119. M. Nishikawa, M. Hirouchi, und K. Kuriyama. Functional coupling of Gi subtype with GABAB receptor/adenylyl cyclase system: analysis using a reconstituted system with purified GTP-binding protein from bovine cerebral cortex. *Neurochem.Int.*, 1997;31(1):21-25.

120. A. Nykjaer, R. Lee, K. K. Teng, et al. Sortilin is essential for proNGF-induced neuronal cell death. *Nature*, 2004;27(6977):843-848.

121. K. Obrietan, X. B. Gao, und A. N. Van Den Pol. Excitatory actions of GABA increase BDNF expression via a MAPK-CREB-dependent mechanism--a positive

feedback circuit in developing neurons. *J. Neurophysiol., 2002.Aug.;88.(2.):1005.-15.*,88(2):1005-1015.

122. Y. Okada. The distribution and function of gamma-aminobutyric acid (GABA) in the superior colliculus. *Prog.Brain Res.*, 1992;90249-262.

123. H. G. Olbrich und H. Braak. Ratio of pyramidal cells versus non-pyramidal cells in sector CA1 of the human Ammon's horn. *Anat.Embryol.(Berl)*, 1985;173(1):105-110.

124. R. W. Olsen, T. M. DeLorey, M. Gordey, und M. H. Kang. GABA receptor function and epilepsy. *Adv.Neurol.*, 1999;79:499-510.

125. D. F. Owens, L. H. Boyce, M. B. Davis, und A. R. Kriegstein. Excitatory GABA responses in embryonic and neonatal cortical slices demonstrated by gramicidin perforated-patch recordings and calcium imaging. *J.Neurosci.*, 1996;16(20):6414-6423.

126. K. Parain, M. G. Murer, Q. Yan, et al. Reduced expression of brain-derived neurotrophic factor protein in Parkinson's disease substantia nigra. *Neuroreport*, 1999;10(3):557-561.

127. J. Paul, K. Gottmann, und V. Lessmann. NT-3 regulates BDNF-induced modulation of synaptic transmission in cultured hippocampal neurons. *Neuroreport*, 2001;12(12):2635-2639.

128. J. A. Payne. Functional characterization of the neuronal-specific K-Cl cotransporter: implications for [K+]o regulation. *Am.J.Physiol*, 1997;273(5 Pt 1):C1516-C1525.

129. K. L. Perkins und R. K. Wong. Ionic basis of the postsynaptic depolarizing GABA response in hippocampal pyramidal cells. *J.Neurophysiol.*, 1996;76(6):3886-3894.

130. M. D. Plotkin, M. R. Kaplan, L. N. Peterson, S. R. Gullans, S. C. Hebert, und E. Delpire. Expression of the Na(+)-K(+)-2Cl- cotransporter BSC2 in the nervous system. *Am.J.Physiol*, 1997;272(1 Pt 1):C173-C183.

131. G. S. Pollock, E. Vernon, M. E. Forbes, et al. Effects of early visual experience and diurnal rhythms on BDNF mRNA and protein levels in the visual system, hippocampus, and cerebellum. *J.Neurosci.*, 2001;21(11):3923-3931.

132. J. S. Rhee, S. Ebihara, und N. Akaike. Gramicidin perforated patch-clamp technique reveals glycine-gated outward chloride current in dissociated nucleus solitarii neurons of the rat. *J.Neurophysiol.*, 1994;72(3):1103-1108.

133. C. Rivera, J. Voipio, J. A. Payne, et al. The K+/Cl- co-transporter KCC2 renders GABA hyperpolarizing during neuronal maturation. *Nature*, 1999;397(6716):251-255.

134. C. Rivera, H. Li, J. Thomas-Crusells, et al. BDNF-induced TrkB activation down-regulates the K+-Cl- cotransporter KCC2 and impairs neuronal Cl- extrusion. *J.Cell Biol.*, 2002;159(5):747-752.

135. C. Rivera, J. Voipio, und K. Kaila. Two developmental switches in GABAergic signalling: the K+-Cl- cotransporter KCC2 and carbonic anhydrase CAVII. *J.Physiol*, 2005;562(Pt 1):27-36.

136. A. A. Roberts, G. L. Pleger, und C. K. Kellogg. Effect of prenatal exposure to diazepam on brain GABA(A) receptor mRNA levels in rats examined at late fetal or adult ages.*Dev.Neurosci.*, 2001;23(2):135-144.

137. J. Rohrbough und N. C. Spitzer. Regulation of intracellular Cl- levels by Na(+)-dependent Cl- cotransport distinguishes depolarizing from hyperpolarizing GABAA receptor-mediated responses in spinal neurons. *J.Neurosci.*, 1996;16(1):82-91.

138. T. Rothe, R. Bahring, P. Carroll, und R. Grantyn. Repetitive firing deficits and reduced sodium current density in retinal ganglion cells developing in the absence of BDNF. *J.Neurobiol.*, 1999;40(3):407-419.

139. R. Sala, A. Viegi, F. M. Rossi, et al. Nerve growth factor and brain-derived neurotrophic factor increase neurotransmitter release in the rat visual cortex.*Eur.J.Neurosci.*, 1998;10(6):2185-2191.

140. W. R. Schäbitz, C. Berger, R. Kollmar, et al. Effect of brain-derived neurotrophic factor treatment and forced arm use on functional motor recovery after small cortical ischemia. *Stroke*, 2004;35(4):992-997.

141. V. Schuler, C. Luscher, C. Blanchet, et al. Epilepsy, hyperalgesia, impaired memory, and loss of pre- and postsynaptic GABA(B) responses in mice lacking GABA(B(1)). Neuron, 2001;31(1):47-58.

142. E. M. Schuman. Neurotrophin regulation of synaptic transmission. Curr.Opin.Neurobiol., 1999;9(1):105-109.

143. B. Singh, C.Henneberger, D. Betances et al. Altered balance of glutamatergic/GABAergic synaptic input and associated changes in dendrite morphology after BDNF expression in BDNF-deficient hippocampal neurons. *J Neurosci.,* 2006 Jul 5;26(27):7189-200.

144. J. J. Soghomonian und D. L. Martin. Two isoforms of glutamate decarboxylase: why? *Trends Pharmacol.Sci.*, 1998;19(12):500-505.

145. V. Stein, I. Hermans-Borgmeyer, T. J. Jentsch, und C. A. Hubner. Expression of the KCl cotransporter KCC2 parallels neuronal maturation and the emergence of low intracellular chloride. *J.Comp Neurol.*, 2004;468(1):57-64.

146. K. Strange, T. D. Singer, R. Morrison, und E. Delpire. Dependence of KCC2 K-Cl cotransporter activity on a conserved carboxy terminus tyrosine residue. *Am.J.Physiol Cell Physiol*, 2000;279(3):C860-C867.

147. D. Sun und S. G. Murali. Na+-K+-2Cl- cotransporter in immature cortical neurons: A role in intracellular Cl- regulation. *J.Neurophysiol.*, 1999;81(4):1939-1948.

148. M. K. Sun, T. J. Nelson, H. Xu, und D. L. Alkon. Calexcitin transformation of GABAergic synapses: from excitation filter to amplifier. *Proc.Natl.Acad.Sci.U.S.A*, 1999;96(12):7023-7028.

149. K. W. Sung, M. Kirby, M. P. McDonald, D. M. Lovinger, und E. Delpire. Abnormal GABAA receptor-mediated currents in dorsal root ganglion neurons isolated from Na-K-2Cl cotransporter null mice. *J.Neurosci.*, 2000;20(20):7531-7538.

150. C. T. Supuran, A. Scozzafava, und A. Casini. Carbonic anhydrase inhibitors. *Med.Res.Rev.*, 2003;23(2):146-189.

151. H. K. Teng, K. K. Teng, R. Lee, et al. ProBDNF induces neuronal apoptosis via activation of a receptor complex of p75NTR and sortilin. *J.Neurosci.*, 2005;25(22):5455-5463.

152. H. Thoenen. Neurotrophins and neuronal plasticity. *Science*, 1995;270(5236):593-598.

153. C. L. Thompson, M. H. Tehrani, E. M. J. Barnes, und F. A. Stephenson. Decreased expression of GABAA receptor alpha6 and beta3 subunits in stargazer mutant mice: a possible role for brain-derived neurotrophic factor in the regulation of cerebellar GABAA receptor expression? *Brain Res.Mol.Brain Res.*, 1998;60(2):282-290.

154. S. Titz, M. Hans, W. Kelsch, A. Lewen, D. Swandulla, und U. Misgeld. Hyperpolarizing inhibition develops without trophic support by GABA in cultured rat midbrain neurons. *J.Physiol*, 2003;550(Pt 3):719-730.

155. F. W. Turek und S. Losee-Olson. A benzodiazepine used in the treatment of insomnia phase-shifts the mammalian circadian clock. *Nature*, 1986;321(6066):167-168.

156. M. H. Tuszynski, U. HS, J. Alksne, et al. Growth factor gene therapy for Alzheimer disease. *Neurosurg.Focus.*, 2002;13(5):e5.

157. N. Upton. Mechanisms of action of new antiepileptic drugs: rational design and serendipitous findings. *Trends Pharmacol.Sci.*, 1994;15(12):456-463.

158. C. Vale, J. Schoorlemmer, und D. H. Sanes. Deafness disrupts chloride transporter function and inhibitory synaptic transmission. *J.Neurosci.*, 2003;23(20):7516-7524.

159. C. Vicario-Abejon, C. Collin, R. D. McKay, und M. Segal. Neurotrophins induce formation of functional excitatory and inhibitory synapses between cultured hippocampal neurons. *J.Neurosci.*, 1998;18(18):7256-7271.

160. M. L. Vizuete, J. L. Venero, C. Vargas, M. Revuelta, A. Machado, und J. Cano. Potential role of endogenous brain-derived neurotrophic factor in long-term neuronal reorganization of the superior colliculus after bilateral visual deprivation. *Neurobiol.Dis.*, 2001;8(5):866-880.

161. H. Wang, Y. Yan, D. B. Kintner, C. Lytle, und D. Sun. GABA-mediated trophic effect on oligodendrocytes requires Na-K-2Cl cotransport activity. *J.Neurophysiol.*, 2003;90(2):1257-1265.

162. J. Wang, D. B. Reichling, A. Kyrozis, und A. B. MacDermott. Developmental loss of GABA- and glycine-induced depolarization and Ca2+ transients in embryonic rat dorsal horn neurons in culture. *Eur.J.Neurosci.*, 1994;6(8):1275-1280.

163. J. Wang, S. Liu, U. Haditsch, et al. Interaction of calcineurin and type-A GABA receptor gamma 2 subunits produces long-term depression at CA1 inhibitory synapses. *J.Neurosci.*, 2003;23(3):826-836.

164. S. S. Warton, M. Perouansky, und R. Grantyn. Development of GABAergic synaptic connections in vivo and in cultures from the rat superior colliculus. *Brain Res.Dev.Brain Res.*, 1990;52(1-2):95-111.

165. G. Weskamp und L. F. Reichardt. Evidence that biological activity of NGF is mediated through a novel subclass of high affinity receptors. *Neuron*, 1991;6(4):649-663.

166. C. Wetmore, Y. H. Cao, R. F. Pettersson, und L. Olson. Brain-derived neurotrophic factor: subcellular compartmentalization and interneuronal transfer as visualized with anti-peptide antibodies. *Proc.Natl.Acad.Sci.U.S.A*, 1991;88(21):9843-9847.

167. J. R. Williams, J. W. Sharp, V. G. Kumari, M. Wilson, und J. A. Payne. The neuron-specific K-Cl cotransporter, KCC2. Antibody development and initial characterization of the protein. *J.Biol.Chem.*, 1999;274(18):12656-12664.

168. W. Wisden, D. J. Laurie, H. Monyer, und P. H. Seeburg. The distribution of 13 GABAA receptor subunit mRNAs in the rat brain. I. Telencephalon, diencephalon, mesencephalon. *J.Neurosci.*, 1992 ;12(3):1040-1062.

169. C. G. Wong, T. Bottiglieri, und O. C. Snead. GABA, gamma-hydroxybutyric acid, and neurological disease. *Ann.Neurol.*, 2003;54 Suppl 6:S3-12.S3-12.

170. N. H. Woo, H. K. Teng, C. J. Siao, et al. Activation of p75NTR by proBDNF facilitates hippocampal long-term depression. *Nat.Neurosci.*, 2005;8(8):1069-1077.

171. W. L. Wu, L. Ziskind-Conhaim, und M. A. Sweet. Early development of glycine- and GABA-mediated synapses in rat spinal cord. *J.Neurosci.*, 1992;12(10):3935-3945.

172. Q. Xu, E. de la Cruz, und S. A. Anderson. Cortical interneuron fate determination: diverse sources for distinct subtypes? *Cereb.Cortex.*, 2003 ;13(6):670-676.

173. J. Yamada, A. Okabe, H. Toyoda, W. Kilb, H. J. Luhmann, und A. Fukuda. Cl- uptake promoting depolarizing GABA actions in immature rat neocortical neurones is mediated by NKCC1. *J.Physiol*, 2004 ;557(Pt 3):829-841.

174. Q. Yan, M. J. Radeke, C. R. Matheson, J. Talvenheimo, A. A. Welcher, und S. C. Feinstein. Immunocytochemical localization of TrkB in the central nervous system of the adult rat. *J.Comp.Neurol.*, 1997;378(1):135-157.

175. L. Zhang, I. Spigelman, und P. L. Carlen. Development of GABA-mediated, chloride-dependent inhibition in CA1 pyramidal neurones of immature rat hippocampal slices. *J.Physiol*, 1991;44425-49.

176. L. Zhu, D. Lovinger, und E. Delpire. Cortical neurons lacking KCC2 expression show impaired regulation of intracellular chloride. *J.Neurophysiol.*, 2005;93(3):1557-1568.