

6. Literaturverzeichnis

- Ammendola,A., Geiselhöringer,A., Hofmann,F., and Schlossmann,J. (2001). Molecular determinants of the interaction between the inositol 1,4,5-trisphosphate receptor-associated cGMP kinase substrate (IRAG) and cGMP kinase Ibeta. *J.Biol.Chem.* 276, 24153-24159.
- Andoh,T., Chiueh,C.C., and Chock,P.B. (2003). Cyclic GMP-dependent protein kinase regulates the expression of thioredoxin and thioredoxin peroxidase-1 during hormesis in response to oxidative stress-induced apoptosis. *J.Biol.Chem.* 278, 885-890.
- Arancio,O., Antonova,I., Gambaryan,S., Lohmann,S.M., Wood,J.S., Lawrence,D.S., and Hawkins,R.D. (2001). Presynaptic role of cGMP-dependent protein kinase during long-lasting potentiation. *J.Neurosci.* 21, 143-149.
- Arber,S., Ladle,D.R., Lin,J.H., Frank,E., and Jessell,T.M. (2000). ETS gene Er81 controls the formation of functional connections between group Ia sensory afferents and motor neurons. *Cell* 101, 485-498.
- Aswad,D.W. and Greengard,P. (1981). A specific substrate from rabbit cerebellum for guanosine 3':5'-monophosphate-dependent protein kinase. I. Purification and characterization. *J.Biol.Chem.* 256, 3487-3493.
- Aszodi,A., Pfeifer,A., Ahmad,M., Glauner,M., Zhou,X.H., Ny,L., Andersson,K.E., Kehrel,B., Offermanns,S., and Fassler,R. (1999). The vasodilator-stimulated phosphoprotein (VASP) is involved in cGMP- and cAMP-mediated inhibition of agonist-induced platelet aggregation, but is dispensable for smooth muscle function. *EMBO J.* 18, 37-48.
- Bachmann,C., Fischer,L., Walter,U., and Reinhard,M. (1999). The EVH2 domain of the vasodilator-stimulated phosphoprotein mediates tetramerization, F-actin binding, and actin bundle formation. *J.Biol.Chem.* 274, 23549-23557.
- Bear,J.E., Svitkina,T.M., Krause,M., Schafer,D.A., Loureiro,J.J., Strasser,G.A., Maly,I.V., Chaga,O.Y., Cooper,J.A., Borisy,G.G., and Gertler,F.B. (2002). Antagonism between Ena/VASP proteins and actin filament capping regulates fibroblast motility. *Cell* 109, 509-521.
- Beavo,J.A., Conti,M., and Heaslip,R.J. (1994). Multiple cyclic nucleotide phosphodiesterases. *Mol.Pharmacol.* 46, 399-405.
- Becker,E.B. and Bonni,A. (2004). Cell cycle regulation of neuronal apoptosis in development and disease. *Prog.Neurobiol.* 72, 1-25.
- Bestor,T.H. (2000). The DNA methyltransferases of mammals. *Hum.Mol.Genet.* 9, 2395-2402.
- Bird,A. (2002). DNA methylation patterns and epigenetic memory. *Genes Dev.* 16, 6-21.
- Bloom,S.E. and Goodpasture,C. (1976). An improved technique for selective silver staining of nucleolar organizer regions in human chromosomes. *Hum.Genet.* 34, 199-206.
- Bottomley,M.J. (2004). Structures of protein domains that create or recognize histone modifications. *EMBO Rep.* 5, 464-469.
- Bourgoin,S. and Grinstein,S. (1992). Peroxides of vanadate induce activation of phospholipase D in HL-60 cells. Role of tyrosine phosphorylation. *J.Biol.Chem.* 267, 11908-11916.
- Bresnick,A.R. (1999). Molecular mechanisms of nonmuscle myosin-II regulation. *Curr.Opin.Cell Biol.* 11, 26-33.

- Bridgman,P.C. (2002). Growth cones contain myosin II bipolar filament arrays. *Cell Motil.Cytoskeleton* 52, 91-96.
- Bridgman,P.C., Dave,S., Asnes,C.F., Tullio,A.N., and Adelstein,R.S. (2001). Myosin IIB is required for growth cone motility. *J.Neurosci.* 21, 6159-6169.
- Brown,M.E. and Bridgman,P.C. (2003). Retrograde flow rate is increased in growth cones from myosin IIB knockout mice. *J.Cell Sci.* 116, 1087-1094.
- Browning,D.D., Mc,S.M., Marty,C., and Ye,R.D. (2001). Functional analysis of type 1alpha cGMP-dependent protein kinase using green fluorescent fusion proteins. *J.Biol.Chem.* 276, 13039-13048.
- Bruning,G. and Mayer,B. (1996). Prenatal development of nitric oxide synthase in the mouse spinal cord. *Neurosci.Lett.* 202, 189-192.
- Burridge,K. (1999). Crosstalk between Rac and Rho. *Science* 283, 2028-2029.
- Butt,E., Abel,K., Krieger,M., Palm,D., Hoppe,V., Hoppe,J., and Walter,U. (1994). cAMP- and cGMP-dependent protein kinase phosphorylation sites of the focal adhesion vasodilator-stimulated phosphoprotein (VASP) in vitro and in intact human platelets. *J.Biol.Chem.* 269, 14509-14517.
- Butt,E., Gambaryan,S., Gottfert,N., Galler,A., Marcus,K., and Meyer,H.E. (2003). Actin binding of human LIM and SH3 protein is regulated by cGMP- and cAMP-dependent protein kinase phosphorylation on serine 146. *J.Biol.Chem.* 278, 15601-15607.
- Butt,E., Nolte,C., Schulz,S., Beltman,J., Beavo,J.A., Jastorff,B., and Walter,U. (1992). Analysis of the functional role of cGMP-dependent protein kinase in intact human platelets using a specific activator 8-para-chlorophenylthio-cGMP. *Biochem.Pharmacol.* 43, 2591-2600.
- Campbell,D.S. and Holt,C.E. (2001). Chemotropic responses of retinal growth cones mediated by rapid local protein synthesis and degradation. *Neuron* 32, 1013-1026.
- Caroni,P. (1998). Driving the growth cone. *Science* 281, 1465-1466.
- Casteel,D.E., Zhuang,S., Gudi,T., Tang,J., Vuica,M., Desiderio,S., and Pilz,R.B. (2002). cGMP-dependent protein kinase I beta physically and functionally interacts with the transcriptional regulator TFII-I. *J.Biol.Chem.* 277, 32003-32014.
- Cavenagh,M.M., Breiner,M., Schurmann,A., Rosenwald,A.G., Terui,T., Zhang,C., Randazzo,P.A., Adams,M., Joost,H.G., and Kahn,R.A. (1994). ADP-ribosylation factor (ARF)-like 3, a new member of the ARF family of GTP-binding proteins cloned from human and rat tissues. *J.Biol.Chem.* 269, 18937-18942.
- Chang,D.F., Belaguli,N.S., Iyer,D., Roberts,W.B., Wu,S.P., Dong,X.R., Marx,J.G., Moore,M.S., Beckerle,M.C., Majesky,M.W., and Schwartz,R.J. (2003). Cysteine-rich LIM-only proteins CRP1 and CRP2 are potent smooth muscle differentiation cofactors. *Dev.Cell* 4, 107-118.
- Chen,H., Bagri,A., Zupicich,J.A., Zou,Y., Stoeckli,E., Pleasure,S.J., Lowenstein,D.H., Skarnes,W.C., Chedotal,A., and Tessier-Lavigne,M. (2000). Neuropilin-2 regulates the development of selective cranial and sensory nerves and hippocampal mossy fiber projections. *Neuron* 25, 43-56.
- Chen,T., Ueda,Y., Xie,S., and Li,E. (2002). A novel Dnmt3a isoform produced from an alternative promoter localizes to euchromatin and its expression correlates with active de novo methylation. *J.Biol.Chem.* 277, 38746-38754.
- Chen,Z.F., Rebelo,S., White,F., Malmberg,A.B., Baba,H., Lima,D., Woolf,C.J., Basbaum,A.I., and Anderson,D.J. (2001). The paired homeodomain protein DRG11 is required for the projection of cutaneous sensory afferent fibers to the dorsal spinal cord. *Neuron* 31, 59-73.

- Cheng,T.P., Murakami,N., and Elzinga,M. (1992). Localization of myosin IIB at the leading edge of growth cones from rat dorsal root ganglionic cells. *FEBS Lett.* *311*, 91-94.
- Chilton,J.K. and Guthrie,S. (2003). Cranial expression of class 3 secreted semaphorins and their neuropilin receptors. *Dev.Dyn.* *228*, 726-733.
- Chuang,L.S., Ian,H.I., Koh,T.W., Ng,H.H., Xu,G., and Li,B.F. (1997). Human DNA-(cytosine-5) methyltransferase-PCNA complex as a target for p21WAF1. *Science* *277*, 1996-2000.
- Ciani,E., Guidi,S., Bartesaghi,R., and Contestabile,A. (2002a). Nitric oxide regulates cGMP-dependent cAMP-responsive element binding protein phosphorylation and Bcl-2 expression in cerebellar neurons: implication for a survival role of nitric oxide. *J.Neurochem.* *82*, 1282-1289.
- Ciani,E., Virgili,M., and Contestabile,A. (2002b). Akt pathway mediates a cGMP-dependent survival role of nitric oxide in cerebellar granule neurones. *J.Neurochem.* *81*, 218-228.
- Collins,S.P. and Uhler,M.D. (1999). Cyclic AMP- and cyclic GMP-dependent protein kinases differ in their regulation of cyclic AMP response element-dependent gene transcription. *J.Biol.Chem.* *274*, 8391-8404.
- Das,P.M. and Singal,R. (2004). DNA methylation and cancer. *J.Clin.Oncol.* *22*, 4632-4642.
- Datta,J., Ghoshal,K., Sharma,S.M., Tajima,S., and Jacob,S.T. (2003). Biochemical fractionation reveals association of DNA methyltransferase (Dnmt) 3b with Dnmt1 and that of Dnmt 3a with a histone H3 methyltransferase and Hdac1. *J.Cell Biochem.* *88*, 855-864.
- Davis,L., Dou,P., DeWit,M., and Kater,S.B. (1992). Protein synthesis within neuronal growth cones. *J.Neurosci.* *12*, 4867-4877.
- Dawid,I.B., Breen,J.J., and Toyama,R. (1998). LIM domains: multiple roles as adapters and functional modifiers in protein interactions. *Trends Genet.* *14*, 156-162.
- de Vente,J., Asan,E., Gambaryan,S., Markerink-van Ittersum,M., Axer,H., Gallatz,K., Lohmann,S.M., and Palkovits,M. (2001). Localization of cGMP-dependent protein kinase type II in rat brain. *Neuroscience* *108*, 27-49.
- de,l.T., Jr., Hopker,V.H., Ming,G.L., Poo,M.M., Tessier-Lavigne,M., Hemmati-Brivanlou,A., and Holt,C.E. (1997). Turning of retinal growth cones in a netrin-1 gradient mediated by the netrin receptor DCC. *Neuron* *19*, 1211-1224.
- Demyanenko,G.P., Halberstadt,A.I., Pryzwansky,K.B., Werner,C., Hofmann,F., and Maness,P.F. (2005). Abnormal neocortical development in mice lacking cGMP-dependent protein kinase I. *Brain Res.Dev.Brain Res.* *160*, 1-8.
- Dickson,B.J. (2002). Molecular mechanisms of axon guidance. *Science* *298*, 1959-1964.
- Diefenbach,T.J., Latham,V.M., Yimlamai,D., Liu,C.A., Herman,I.M., and Jay,D.G. (2002). Myosin 1c and myosin IIB serve opposing roles in lamellipodial dynamics of the neuronal growth cone. *J.Cell Biol.* *158*, 1207-1217.
- Ding,Y.Q., Yin,J., Kania,A., Zhao,Z.Q., Johnson,R.L., and Chen,Z.F. (2004). Lmx1b controls the differentiation and migration of the superficial dorsal horn neurons of the spinal cord. *Development* *131*, 3693-3703.
- Dionne,M.S., Brunet,L.J., Eimon,P.M., and Harland,R.M. (2002). Noggin is required for correct guidance of dorsal root ganglion axons. *Dev.Biol.* *251*, 283-293.
- Dulhunty,A., Gage,P., Curtis,S., Chelvanayagam,G., and Board,P. (2001). The glutathione transferase structural family includes a nuclear chloride channel and a ryanodine receptor calcium release channel modulator. *J.Biol.Chem.* *276*, 3319-3323.

- Dutta,R., McDonough,J., Yin,X., Peterson,J., Chang,A., Torres,T., Gudz,T., Macklin,W.B., Lewis,D.A., Fox,R.J., Rudick,R., Mironics,K., and Trapp,B.D. (2006). Mitochondrial dysfunction as a cause of axonal degeneration in multiple sclerosis patients. *Ann.Neurol.*
- Duus,P. (1995). *Neurologisch-topische Diagnostik* (6.Auflage). (Georg Thieme Verlag Stuttgart, New York).
- Easter,S.S., Jr., Ross,L.S., and Frankfurter,A. (1993). Initial tract formation in the mouse brain. *J.Neurosci.* *13*, 285-299.
- Easwaran,H.P., Schermelleh,L., Leonhardt,H., and Cardoso,M.C. (2004). Replication-independent chromatin loading of Dnmt1 during G2 and M phases. *EMBO Rep.* *5*, 1181-1186.
- Edstrom,A. and Ekstrom,P.A. (2003). Role of phosphatidylinositol 3-kinase in neuronal survival and axonal outgrowth of adult mouse dorsal root ganglia explants. *J.Neurosci.Res.* *74*, 726-735.
- el Daher,S.S., Eigenthaler,M., Walter,U., Furuichi,T., Miyawaki,A., Mikoshiba,K., Kakkar,V.V., and Authi,K.S. (1996). Distribution and activation of cAMP- and cGMP-dependent protein kinases in highly purified human platelet plasma and intracellular membranes. *Thromb.Haemost.* *76*, 1063-1071.
- El Husseini,A.E., Bladen,C., and Vincent,S.R. (1995). Molecular characterization of a type II cyclic GMP-dependent protein kinase expressed in the rat brain. *J.Neurochem.* *64*, 2814-2817.
- El Husseini,A.E., Bladen,C., Williams,J.A., Reiner,P.B., and Vincent,S.R. (1998). Nitric oxide regulates cyclic GMP-dependent protein kinase phosphorylation in rat brain. *J.Neurochem.* *71*, 676-683.
- El Husseini,A.E., Williams,J., Reiner,P.B., Pelech,S., and Vincent,S.R. (1999). Localization of the cGMP-dependent protein kinases in relation to nitric oxide synthase in the brain. *J.Chem.Neuroanat.* *17*, 45-55.
- Eng,S.R., Gratwick,K., Rhee,J.M., Fedtsova,N., Gan,L., and Turner,E.E. (2001). Defects in sensory axon growth precede neuronal death in Brn3a-deficient mice. *J.Neurosci.* *21*, 541-549.
- Fan,G., Beard,C., Chen,R.Z., Csankovszki,G., Sun,Y., Siniaia,M., Biniszkewicz,D., Bates,B., Lee,P.P., Kuhn,R., Trumpp,A., Poon,C., Wilson,C.B., and Jaenisch,R. (2001). DNA hypomethylation perturbs the function and survival of CNS neurons in postnatal animals. *J.Neurosci.* *21*, 788-797.
- Farinas,I., Cano-Jaimez,M., Bellmunt,E., and Soriano,M. (2002). Regulation of neurogenesis by neurotrophins in developing spinal sensory ganglia. *Brain Res.Bull.* *57*, 809-816.
- Farinas,I., Jones,K.R., Backus,C., Wang,X.Y., and Reichardt,L.F. (1994). Severe sensory and sympathetic deficits in mice lacking neurotrophin-3. *Nature* *369*, 658-661.
- Fatemi,M., Hermann,A., Gowher,H., and Jeltsch,A. (2002). Dnmt3a and Dnmt1 functionally cooperate during de novo methylation of DNA. *Eur.J.Biochem.* *269*, 4981-4984.
- Feil,R., Hartmann,J., Luo,C., Wolfsgruber,W., Schilling,K., Feil,S., Barski,J.J., Meyer,M., Konnerth,A., De Zeeuw,C.I., and Hofmann,F. (2003a). Impairment of LTD and cerebellar learning by Purkinje cell-specific ablation of cGMP-dependent protein kinase I. *J.Cell Biol.* *163*, 295-302.
- Feil,R., Hofmann,F., and Kleppisch,T. (2005a). Function of cGMP-dependent protein kinases in the nervous system. *Rev.Neurosci.* *16*, 23-41.
- Feil,R., Lohmann,S.M., de Jonge,H., Walter,U., and Hofmann,F. (2003b). Cyclic GMP-dependent protein kinases and the cardiovascular system: insights from genetically modified mice. *Circ.Res.* *93*, 907-916.

- Feil,S., Zimmermann,P., Knorn,A., Brummer,S., Schlossmann,J., Hofmann,F., and Feil,R. (2005b). Distribution of cGMP-dependent protein kinase type I and its isoforms in the mouse brain and retina. *Neuroscience* *135*, 863-868.
- Feng,J., Chang,H., Li,E., and Fan,G. (2005). Dynamic expression of de novo DNA methyltransferases Dnmt3a and Dnmt3b in the central nervous system. *J.Neurosci.Res.* *79*, 734-746.
- Fiscus,R.R. (2002). Involvement of cyclic GMP and protein kinase G in the regulation of apoptosis and survival in neural cells. *Neurosignals*. *11*, 175-190.
- Francis,S.H. and Corbin,J.D. (1994a). Progress in understanding the mechanism and function of cyclic GMP-dependent protein kinase. *Adv.Pharmacol.* *26*, 115-170.
- Francis,S.H. and Corbin,J.D. (1994b). Structure and function of cyclic nucleotide-dependent protein kinases. *Annu.Rev.Physiol* *56*, 237-272.
- Fuks,F., Burgers,W.A., Godin,N., Kasai,M., and Kouzarides,T. (2001). Dnmt3a binds deacetylases and is recruited by a sequence-specific repressor to silence transcription. *EMBO J.* *20*, 2536-2544.
- Fuks,F., Hurd,P.J., Deplus,R., and Kouzarides,T. (2003). The DNA methyltransferases associate with HP1 and the SUV39H1 histone methyltransferase. *Nucleic Acids Res.* *31*, 2305-2312.
- Gambaryan,S., Hauser,W., Kobsar,A., Glazova,M., and Walter,U. (2001). Distribution, cellular localization, and postnatal development of VASP and Mena expression in mouse tissues. *Histochem.Cell Biol.* *116*, 535-543.
- Gamm,D.M., Barthel,L.K., Raymond,P.A., and Uhler,M.D. (2000). Localization of cGMP-dependent protein kinase isoforms in mouse eye. *Invest Ophthalmol.Vis.Sci.* *41*, 2766-2773.
- Gamm,D.M., Francis,S.H., Angelotti,T.P., Corbin,J.D., and Uhler,M.D. (1995). The type II isoform of cGMP-dependent protein kinase is dimeric and possesses regulatory and catalytic properties distinct from the type I isoforms. *J.Biol.Chem.* *270*, 27380-27388.
- Geiselhöringer,A., Gaisa,M., Hofmann,F., and Schlossmann,J. (2004). Distribution of IRAG and cGKI-isoforms in murine tissues. *FEBS Lett.* *575*, 19-22.
- Gertler,F.B., Niebuhr,K., Reinhard,M., Wehland,J., and Soriano,P. (1996). Mena, a relative of VASP and Drosophila Enabled, is implicated in the control of microfilament dynamics. *Cell* *87*, 227-239.
- Glass,D.B. and Krebs,E.G. (1979). Comparison of the substrate specificity of adenosine 3':5'-monophosphate- and guanosine 3':5'-monophosphate-dependent protein kinases. Kinetic studies using synthetic peptides corresponding to phosphorylation sites in histone H2B. *J.Biol.Chem.* *254*, 9728-9738.
- Glickman,J.F., Pavlovich,J.G., and Reich,N.O. (1997). Peptide mapping of the murine DNA methyltransferase reveals a major phosphorylation site and the start of translation. *J.Biol.Chem.* *272*, 17851-17857.
- Goh,K.L., Cai,L., Cepko,C.L., and Gertler,F.B. (2002). Ena/VASP proteins regulate cortical neuronal positioning. *Curr.Biol.* *12*, 565-569.
- Gorg,A., Postel,W., and Gunther,S. (1988). The current state of two-dimensional electrophoresis with immobilized pH gradients. *Electrophoresis* *9*, 531-546.
- Goto,K., Numata,M., Komura,J.I., Ono,T., Bestor,T.H., and Kondo,H. (1994). Expression of DNA methyltransferase gene in mature and immature neurons as well as proliferating cells in mice. *Differentiation* *56*, 39-44.

- Gowher,H., Stockdale,C.J., Goyal,R., Ferreira,H., Owen-Hughes,T., and Jeltsch,A. (2005). De novo methylation of nucleosomal DNA by the mammalian Dnmt1 and Dnmt3A DNA methyltransferases. *Biochemistry* *44*, 9899-9904.
- Graef,I.A., Wang,F., Charron,F., Chen,L., Neilson,J., Tessier-Lavigne,M., and Crabtree,G.R. (2003). Neurotrophins and netrins require calcineurin/NFAT signaling to stimulate outgrowth of embryonic axons. *Cell* *113*, 657-670.
- Grohmann,M., Spada,F., Schermelleh,L., Alenina,N., Bader,M., Cardoso,M.C., and Leonhardt,H. (2005). Restricted mobility of Dnmt1 in preimplantation embryos: implications for epigenetic reprogramming. *BMC.Dev.Biol.* *5*, 18.
- Gudi,T., Casteel,D.E., Vinson,C., Boss,G.R., and Pilz,R.B. (2000). NO activation of fos promoter elements requires nuclear translocation of G-kinase I and CREB phosphorylation but is independent of MAP kinase activation. *Oncogene* *19*, 6324-6333.
- Gudi,T., Chen,J.C., Casteel,D.E., Seasholtz,T.M., Boss,G.R., and Pilz,R.B. (2002). cGMP-dependent protein kinase inhibits serum-response element-dependent transcription by inhibiting rho activation and functions. *J.Biol.Chem.* *277*, 37382-37393.
- Gudi,T., Huvar,I., Meinecke,M., Lohmann,S.M., Boss,G.R., and Pilz,R.B. (1996). Regulation of gene expression by cGMP-dependent protein kinase. Transactivation of the c-fos promoter. *J.Biol.Chem.* *271*, 4597-4600.
- Gudi,T., Lohmann,S.M., and Pilz,R.B. (1997). Regulation of gene expression by cyclic GMP-dependent protein kinase requires nuclear translocation of the kinase: identification of a nuclear localization signal. *Mol.Cell Biol.* *17*, 5244-5254.
- Ha,K.S., Kim,K.M., Kwon,Y.G., Bai,S.K., Nam,W.D., Yoo,Y.M., Kim,P.K., Chung,H.T., Billiar,T.R., and Kim,Y.M. (2003). Nitric oxide prevents 6-hydroxydopamine-induced apoptosis in PC12 cells through cGMP-dependent PI3 kinase/Akt activation. *FASEB J.* *17*, 1036-1047.
- Halbrugge,M., Friedrich,C., Eigenthaler,M., Schanzenbacher,P., and Walter,U. (1990). Stoichiometric and reversible phosphorylation of a 46-kDa protein in human platelets in response to cGMP- and cAMP-elevating vasodilators. *J.Biol.Chem.* *265*, 3088-3093.
- Hall,A. and Nobes,C.D. (2000). Rho GTPases: molecular switches that control the organization and dynamics of the actin cytoskeleton. *Philos.Trans.R.Soc.Lond B Biol.Sci.* *355*, 965-970.
- Hanahan,D. (1985). Techniques for transformation of E.coli. In DNA cloning, a practical approach (Volume I), D. M. Glover, ed. (Washington D.C.:IRL Press Oxford), pp. 109-135.
- Harbeck,B., Huttelmaier,S., Schluter,K., Jockusch,B.M., and Illenberger,S. (2000). Phosphorylation of the vasodilator-stimulated phosphoprotein regulates its interaction with actin. *J.Biol.Chem.* *275*, 30817-30825.
- Hartshorne,D.J., Ito,M., and Erdodi,F. (1998). Myosin light chain phosphatase: subunit composition, interactions and regulation. *J.Muscle Res.Cell Motil.* *19*, 325-341.
- Hashimoto,E., Takeda,M., Nishizuka,Y., Hamana,K., and Iwai,K. (1976). Studies on the sites in histones phosphorylated by adenosine 3':5'-monophosphate-dependent and guanosine 3':5'-monophosphate-dependent protein kinases. *J.Biol.Chem.* *251*, 6287-6293.
- Hata,K., Okano,M., Lei,H., and Li,E. (2002). Dnmt3L cooperates with the Dnmt3 family of de novo DNA methyltransferases to establish maternal imprints in mice. *Development* *129*, 1983-1993.
- Hermann,A., Gowher,H., and Jeltsch,A. (2004). Biochemistry and biology of mammalian DNA methyltransferases. *Cell Mol.Life Sci.* *61*, 2571-2587.

- Herzig,R.P., Scacco,S., and Scarpulla,R.C. (2000). Sequential serum-dependent activation of CREB and NRF-1 leads to enhanced mitochondrial respiration through the induction of cytochrome c. *J.Biol.Chem.* 275, 13134-13141.
- Hofmann,F., Ammendola,A., and Schlossmann,J. (2000). Rising behind NO: cGMP-dependent protein kinases. *J.Cell Sci. 113 (Pt 10)*, 1671-1676.
- Hofmann,F. and Sold,G. (1972). A protein kinase activity from rat cerebellum stimulated by guanosine-3':5'-monophosphate. *Biochem.Biophys.Res.Commun.* 49, 1100-1107.
- Hong,K., Hinck,L., Nishiyama,M., Poo,M.M., Tessier-Lavigne,M., and Stein,E. (1999). A ligand-gated association between cytoplasmic domains of UNC5 and DCC family receptors converts netrin-induced growth cone attraction to repulsion. *Cell* 97, 927-941.
- Huang,E.J. and Reichardt,L.F. (2001). Neurotrophins: roles in neuronal development and function. *Annu.Rev.Neurosci.* 24, 677-736.
- Huber,A., Neuhuber,W.L., Klugbauer,N., Ruth,P., and Allescher,H.D. (2000). Cysteine-rich protein 2, a novel substrate for cGMP kinase I in enteric neurons and intestinal smooth muscle. *J.Biol.Chem.* 275, 5504-5511.
- Idriss,S.D., Gudi,T., Casteel,D.E., Kharitonov,V.G., Pilz,R.B., and Boss,G.R. (1999). Nitric oxide regulation of gene transcription via soluble guanylate cyclase and type I cGMP-dependent protein kinase. *J.Biol.Chem.* 274, 9489-9493.
- Inano,K., Suetake,I., Ueda,T., Miyake,Y., Nakamura,M., Okada,M., and Tajima,S. (2000). Maintenance-type DNA methyltransferase is highly expressed in post-mitotic neurons and localized in the cytoplasmic compartment. *J.Biochem.(Tokyo)* 128, 315-321.
- Inoue,K., Ozaki,S., Ito,K., Iseda,T., Kawaguchi,S., Ogawa,M., Bae,S.C., Yamashita,N., Itohara,S., Kudo,N., and Ito,Y. (2003). Runx3 is essential for the target-specific axon pathfinding of trkc-expressing dorsal root ganglion neurons. *Blood Cells Mol.Dis.* 30, 157-160.
- Jaenisch,R. (1997). DNA methylation and imprinting: why bother? *Trends Genet.* 13, 323-329.
- Jaenisch,R. and Bird,A. (2003). Epigenetic regulation of gene expression: how the genome integrates intrinsic and environmental signals. *Nat.Genet. 33 Suppl*, 245-254.
- Job,C. and Eberwine,J. (2001). Localization and translation of mRNA in dendrites and axons. *Nat.Rev.Neurosci.* 2, 889-898.
- Jurado,S., Sanchez-Prieto,J., and Torres,M. (2004). Elements of the nitric oxide/cGMP pathway expressed in cerebellar granule cells: biochemical and functional characterisation. *Neurochem.Int.* 45, 833-843.
- Kaupp,U.B. and Altenhofen,W. (1992). Cyclic nucleotide-gated channels of vertebrate photoreceptor cells and olfactory epithelium. *Soc.Gen.Physiol Ser.* 47, 133-150.
- Kaupp,U.B. and Seifert,R. (2002). Cyclic nucleotide-gated ion channels. *Physiol Rev.* 82, 769-824.
- Keicher,C., Gambaryan,S., Schulze,E., Marcus,K., Meyer,H.E., and Butt,E. (2004). Phosphorylation of mouse LASP-1 on threonine 156 by cAMP- and cGMP-dependent protein kinase. *Biochem.Biophys.Res.Commun.* 324, 308-316.
- Keilbach,A., Ruth,P., and Hofmann,F. (1992). Detection of cGMP dependent protein kinase isozymes by specific antibodies. *Eur.J.Biochem.* 208, 467-473.
- Khatri,J.J., Joyce,K.M., Brozovich,F.V., and Fisher,S.A. (2001). Role of myosin phosphatase isoforms in cGMP-mediated smooth muscle relaxation. *J.Biol.Chem.* 276, 37250-37257.

- Kim,G.D., Ni,J., Kelesoglu,N., Roberts,R.J., and Pradhan,S. (2002). Co-operation and communication between the human maintenance and de novo DNA (cytosine-5) methyltransferases. *EMBO J.* 21, 4183-4195.
- Kim,Y.M., Chung,H.T., Kim,S.S., Han,J.A., Yoo,Y.M., Kim,K.M., Lee,G.H., Yun,H.Y., Green,A., Li,J., Simmons,R.L., and Billiar,T.R. (1999). Nitric oxide protects PC12 cells from serum deprivation-induced apoptosis by cGMP-dependent inhibition of caspase signaling. *J.Neurosci.* 19, 6740-6747.
- Kitsukawa,T., Shimizu,M., Sanbo,M., Hirata,T., Taniguchi,M., Bekku,Y., Yagi,T., and Fujisawa,H. (1997). Neuropilin-semaphorin III/D-mediated chemorepulsive signals play a crucial role in peripheral nerve projection in mice. *Neuron* 19, 995-1005.
- Klein,R. (1994). Role of neurotrophins in mouse neuronal development. *FASEB J.* 8, 738-744.
- Kleppisch,T., Pfeifer,A., Klatt,P., Ruth,P., Montkowski,A., Fassler,R., and Hofmann,F. (1999). Long-term potentiation in the hippocampal CA1 region of mice lacking cGMP-dependent kinases is normal and susceptible to inhibition of nitric oxide synthase. *J.Neurosci.* 19, 48-55.
- Kleppisch,T., Wolfsgruber,W., Feil,S., Allmann,R., Wotjak,C.T., Goebbels,S., Nave,K.A., Hofmann,F., and Feil,R. (2003). Hippocampal cGMP-dependent protein kinase I supports an age- and protein synthesis-dependent component of long-term potentiation but is not essential for spatial reference and contextual memory. *J.Neurosci.* 23, 6005-6012.
- Klose,J. (1975). Protein mapping by combined isoelectric focusing and electrophoresis of mouse tissues. A novel approach to testing for induced point mutations in mammals. *Humangenetik.* 26, 231-243.
- Klose,J., Nock,C., Herrmann,M., Stuhler,K., Marcus,K., Bluggel,M., Krause,E., Schalkwyk,L.C., Rastan,S., Brown,S.D., Bussow,K., Himmelbauer,H., and Lehrach,H. (2002). Genetic analysis of the mouse brain proteome. *Nat.Genet.* 30, 385-393.
- Klymkowsky,M.W. and Hanken,J. (1991). Whole-mount staining of *Xenopus* and other vertebrates. *Methods Cell Biol.* 36, 419-441.
- Kodym,R., Calkins,P., and Story,M. (1999). The cloning and characterization of a new stress response protein. A mammalian member of a family of theta class glutathione s-transferase-like proteins. *J.Biol.Chem.* 274, 5131-5137.
- Komalavilas,P., Shah,P.K., Jo,H., and Lincoln,T.M. (1999). Activation of mitogen-activated protein kinase pathways by cyclic GMP and cyclic GMP-dependent protein kinase in contractile vascular smooth muscle cells. *J.Biol.Chem.* 274, 34301-34309.
- Krause,M., Dent,E.W., Bear,J.E., Loureiro,J.J., and Gertler,F.B. (2003). Ena/VASP proteins: regulators of the actin cytoskeleton and cell migration. *Annu.Rev.Cell Dev.Biol.* 19, 541-564.
- Kuo,J.F. and Greengard,P. (1970). Cyclic nucleotide-dependent protein kinases. VI. Isolation and partial purification of a protein kinase activated by guanosine 3',5'-monophosphate. *J.Biol.Chem.* 245, 2493-2498.
- Laemmli,U.K. (1970). Cleavage of structural proteins during the assembly of the head of bacteriophage T4. *Nature* 227, 680-685.
- Lambrechts,A., Kwiatkowski,A.V., Lanier,L.M., Bear,J.E., Vandekerckhove,J., Ampe,C., and Gertler,F.B. (2000). cAMP-dependent protein kinase phosphorylation of EVL, a Mena/VASP relative, regulates its interaction with actin and SH3 domains. *J.Biol.Chem.* 275, 36143-36151.
- Lanier,L.M., Gates,M.A., Witke,W., Menzies,A.S., Wehman,A.M., Macklis,J.D., Kwiatkowski,D., Soriano,P., and Gertler,F.B. (1999). Mena is required for neurulation and commissure formation. *Neuron* 22, 313-325.

- Lawrence,D.W. and Pryzwansky,K.B. (2001). The vasodilator-stimulated phosphoprotein is regulated by cyclic GMP-dependent protein kinase during neutrophil spreading. *J.Immunol.* *166*, 5550-5556.
- Lebrand,C., Dent,E.W., Strasser,G.A., Lanier,L.M., Krause,M., Svitkina,T.M., Borisy,G.G., and Gertler,F.B. (2004). Critical role of Ena/VASP proteins for filopodia formation in neurons and in function downstream of netrin-1. *Neuron* *42*, 37-49.
- Leonhardt,H., Page,A.W., Weier,H.U., and Bestor,T.H. (1992). A targeting sequence directs DNA methyltransferase to sites of DNA replication in mammalian nuclei. *Cell* *71*, 865-873.
- Levine,A.A., Guan,Z., Barco,A., Xu,S., Kandel,E.R., and Schwartz,J.H. (2005). CREB-binding protein controls response to cocaine by acetylating histones at the fosB promoter in the mouse striatum. *Proc.Natl.Acad.Sci.U.S.A* *102*, 19186-19191.
- Lewin,M.R. and Walters,E.T. (1999). Cyclic GMP pathway is critical for inducing long-term sensitization of nociceptive sensory neurons. *Nat.Neurosci.* *2*, 18-23.
- Lewis,A.K. and Bridgman,P.C. (1996). Mammalian myosin I alpha is concentrated near the plasma membrane in nerve growth cones. *Cell Motil.Cytoskeleton* *33*, 130-150.
- Li,Y.J., Oliveira,S.A., Xu,P., Martin,E.R., Stenger,J.E., Scherzer,C.R., Hauser,M.A., Scott,W.K., Small,G.W., Nance,M.A., Watts,R.L., Hubble,J.P., Koller,W.C., Pahwa,R., Stern,M.B., Hiner,B.C., Jankovic,J., Goetz,C.G., Mastaglia,F., Middleton,L.T., Roses,A.D., Saunders,A.M., Schmechel,D.E., Gullans,S.R., Haines,J.L., Gilbert,J.R., Vance,J.M., Pericak-Vance,M.A., Hulette,C., and Welsh-Bohmer,K.A. (2003). Glutathione S-transferase omega-1 modifies age-at-onset of Alzheimer disease and Parkinson disease. *Hum.Mol.Genet.* *12*, 3259-3267.
- Lin,C.H., Esprefaco,E.M., Mooseker,M.S., and Forscher,P. (1996). Myosin drives retrograde F-actin flow in neuronal growth cones. *Neuron* *16*, 769-782.
- Lin,C.H. and Forscher,P. (1993). Cytoskeletal remodeling during growth cone-target interactions. *J.Cell Biol.* *121*, 1369-1383.
- Lin,C.H. and Forscher,P. (1995). Growth cone advance is inversely proportional to retrograde F-actin flow. *Neuron* *14*, 763-771.
- Linari,M., Hanzal-Bayer,M., and Becker,J. (1999). The delta subunit of rod specific cyclic GMP phosphodiesterase, PDE delta, interacts with the Arf-like protein Arl3 in a GTP specific manner. *FEBS Lett.* *458*, 55-59.
- Ling,Y., Sankpal,U.T., Robertson,A.K., McNally,J.G., Karpova,T., and Robertson,K.D. (2004). Modification of de novo DNA methyltransferase 3a (Dnmt3a) by SUMO-1 modulates its interaction with histone deacetylases (HDACs) and its capacity to repress transcription. *Nucleic Acids Res.* *32*, 598-610.
- Lohmann,S.M., Vaandrager,A.B., Smolenski,A., Walter,U., and De Jonge,H.R. (1997). Distinct and specific functions of cGMP-dependent protein kinases. *Trends Biochem.Sci.* *22*, 307-312.
- Lohmann,S.M. and Walter,U. (2005). Tracking functions of cGMP-dependent protein kinases (cGK). *Front Biosci.* *10*, 1313-1328.
- Lohmann,S.M., Walter,U., Miller,P.E., Greengard,P., and De Camilli,P. (1981). Immunohistochemical localization of cyclic GMP-dependent protein kinase in mammalian brain. *Proc.Natl.Acad.Sci.U.S.A* *78*, 653-657.
- Lonze,B.E., Riccio,A., Cohen,S., and Ginty,D.D. (2002). Apoptosis, axonal growth defects, and degeneration of peripheral neurons in mice lacking CREB. *Neuron* *34*, 371-385.

- Louis,H.A., Pino,J.D., Schmeichel,K.L., Pomies,P., and Beckerle,M.C. (1997). Comparison of three members of the cysteine-rich protein family reveals functional conservation and divergent patterns of gene expression. *J.Biol.Chem.* 272, 27484-27491.
- Lu,Y.F. and Hawkins,R.D. (2002). Ryanodine receptors contribute to cGMP-induced late-phase LTP and CREB phosphorylation in the hippocampus. *J.Neurophysiol.* 88, 1270-1278.
- Lu,Y.F., Kandel,E.R., and Hawkins,R.D. (1999). Nitric oxide signaling contributes to late-phase LTP and CREB phosphorylation in the hippocampus. *J.Neurosci.* 19, 10250-10261.
- Lucas,K.A., Pitari,G.M., Kazerounian,S., Ruiz-Stewart,I., Park,J., Schulz,S., Chepenik,K.P., and Waldman,S.A. (2000). Guanylyl cyclases and signaling by cyclic GMP. *Pharmacol.Rev.* 52, 375-414.
- Mallavarapu,A. and Mitchison,T. (1999). Regulated actin cytoskeleton assembly at filopodium tips controls their extension and retraction. *J.Cell Biol.* 146, 1097-1106.
- Margot,J.B., Cardoso,M.C., and Leonhardt,H. (2001). Mammalian DNA methyltransferases show different subnuclear distributions. *J.Cell Biochem.* 83, 373-379.
- Margot,J.B., Ehrenhofer-Murray,A.E., and Leonhardt,H. (2003). Interactions within the mammalian DNA methyltransferase family. *BMC.Mol.Biol.* 4, 7.
- Mastick,G.S. and Easter,S.S., Jr. (1996). Initial organization of neurons and tracts in the embryonic mouse fore- and midbrain. *Dev.Biol.* 173, 79-94.
- Matsubara,T., Okumura,N., Okumura,A., and Nagai,K. (2005). cGMP-dependent phosphorylation and degradation of myristoylated alanine-rich C-kinase substrate. *Biochem.Biophys.Res.Commun.* 326, 735-743.
- McMahon,J.A., Takada,S., Zimmerman,L.B., Fan,C.M., Harland,R.M., and McMahon,A.P. (1998). Noggin-mediated antagonism of BMP signaling is required for growth and patterning of the neural tube and somite. *Genes Dev.* 12, 1438-1452.
- Menzies,A.S., Aszodi,A., Williams,S.E., Pfeifer,A., Wehman,A.M., Goh,K.L., Mason,C.A., Fassler,R., and Gertler,F.B. (2004). Mena and vasodilator-stimulated phosphoprotein are required for multiple actin-dependent processes that shape the vertebrate nervous system. *J.Neurosci.* 24, 8029-8038.
- Micheva,K.D., Buchanan,J., Holz,R.W., and Smith,S.J. (2003). Retrograde regulation of synaptic vesicle endocytosis and recycling. *Nat.Neurosci.* 6, 925-932.
- Milutinovic,S., Brown,S.E., Zhuang,Q., and Szyf,M. (2004). DNA methyltransferase 1 knock down induces gene expression by a mechanism independent of DNA methylation and histone deacetylation. *J.Biol.Chem.* 279, 27915-27927.
- Ming,G.L., Song,H.J., Berninger,B., Holt,C.E., Tessier-Lavigne,M., and Poo,M.M. (1997). cAMP-dependent growth cone guidance by netrin-1. *Neuron* 19, 1225-1235.
- Ming,G.L., Wong,S.T., Henley,J., Yuan,X.B., Song,H.J., Spitzer,N.C., and Poo,M.M. (2002). Adaptation in the chemotactic guidance of nerve growth cones. *Nature* 417, 411-418.
- Mochly-Rosen,D. (1995). Localization of protein kinases by anchoring proteins: a theme in signal transduction. *Science* 268, 247-251.
- Mueller,B.K. (1999). Growth cone guidance: first steps towards a deeper understanding. *Annu.Rev.Neurosci.* 22, 351-388.
- Nakamura,M., Ichikawa,K., Ito,M., Yamamori,B., Okinaka,T., Isaka,N., Yoshida,Y., Fujita,S., and Nakano,T. (1999). Effects of the phosphorylation of myosin phosphatase by cyclic GMP-dependent protein kinase. *Cell Signal.* 11, 671-676.

- Neuhoff,V., Arold,N., Taube,D., and Ehrhardt,W. (1988). Improved staining of proteins in polyacrylamide gels including isoelectric focusing gels with clear background at nanogram sensitivity using Coomassie Brilliant Blue G-250 and R-250. *Electrophoresis* 9, 255-262.
- Newell-Price,J., Clark,A.J., and King,P. (2000). DNA methylation and silencing of gene expression. *Trends Endocrinol.Metab* 11, 142-148.
- Nishiyama,M., Hoshino,A., Tsai,L., Henley,J.R., Goshima,Y., Tessier-Lavigne,M., Poo,M.M., and Hong,K. (2003). Cyclic AMP/GMP-dependent modulation of Ca²⁺ channels sets the polarity of nerve growth-cone turning. *Nature* 423, 990-995.
- Noh,J.S., Sharma,R.P., Veldic,M., Salvacion,A.A., Jia,X., Chen,Y., Costa,E., Guidotti,A., and Grayson,D.R. (2005). DNA methyltransferase 1 regulates reelin mRNA expression in mouse primary cortical cultures. *Proc.Natl.Acad.Sci.U.S.A* 102, 1749-1754.
- O'Farrell,P.H. (1975). High resolution two-dimensional electrophoresis of proteins. *J.Biol.Chem.* 250, 4007-4021.
- Ohki,T., Hongo,S., Nakada,N., Maeda,A., and Takeda,M. (2002). Inhibition of neurite outgrowth by reduced level of NDRG4 protein in antisense transfected PC12 cells. *Brain Res.Dev.Brain Res.* 135, 55-63.
- Okano,I., Yamamoto,T., Kaji,A., Kimura,T., Mizuno,K., and Nakamura,T. (1993). Cloning of CRP2, a novel member of the cysteine-rich protein family with two repeats of an unusual LIM/double zinc-finger motif. *FEBS Lett.* 333, 51-55.
- Okano,M., Bell,D.W., Haber,D.A., and Li,E. (1999). DNA methyltransferases Dnmt3a and Dnmt3b are essential for de novo methylation and mammalian development. *Cell* 99, 247-257.
- Okano,M., Xie,S., and Li,E. (1998). Cloning and characterization of a family of novel mammalian DNA (cytosine-5) methyltransferases. *Nat.Genet.* 19, 219-220.
- Olsson,I., Larsson,K., Palmgren,R., and Bjellqvist,B. (2002). Organic disulfides as a means to generate streak-free two-dimensional maps with narrow range basic immobilized pH gradient strips as first dimension. *Proteomics*. 2, 1630-1632.
- Oster,H., Werner,C., Magnone,M.C., Mayser,H., Feil,R., Seeliger,M.W., Hofmann,F., and Albrecht,U. (2003). cGMP-dependent protein kinase II modulates mPer1 and mPer2 gene induction and influences phase shifts of the circadian clock. *Curr.Biol.* 13, 725-733.
- Ozaki,S. and Snider,W.D. (1997). Initial trajectories of sensory axons toward laminar targets in the developing mouse spinal cord. *J.Comp Neurol.* 380, 215-229.
- Papapetropoulos,A., Zhou,Z., Gerassimou,C., Yetik,G., Venema,R.C., Roussos,C., Sessa,W.C., and Catravas,J.D. (2005). Interaction between the 90-kDa heat shock protein and soluble guanylyl cyclase: physiological significance and mapping of the domains mediating binding. *Mol.Pharmacol.* 68, 1133-1141.
- Patapoutian,A. (2001). Making the pain connection. *Neuron* 31, 4-6.
- Patel,T.D., Kramer,I., Kucera,J., Niederkofler,V., Jessell,T.M., Arber,S., and Snider,W.D. (2003). Peripheral NT3 signaling is required for ETS protein expression and central patterning of proprioceptive sensory afferents. *Neuron* 38, 403-416.
- Pennington,K., McGregor,E., Beasley,C.L., Everall,I., Cotter,D., and Dunn,M.J. (2004). Optimization of the first dimension for separation by two-dimensional gel electrophoresis of basic proteins from human brain tissue. *Proteomics*. 4, 27-30.
- Perdew,G.H., Schaup,H.W., and Selivonchick,D.P. (1983). The use of a zwitterionic detergent in two-dimensional gel electrophoresis of trout liver microsomes. *Anal.Biochem.* 135, 453-455.

- Pfeifer,A., Klatt,P., Massberg,S., Ny,L., Sausbier,M., Hirneiss,C., Wang,G.X., Korth,M., Aszodi,A., Andersson,K.E., Krombach,F., Mayerhofer,A., Ruth,P., Fassler,R., and Hofmann,F. (1998). Defective smooth muscle regulation in cGMP kinase I-deficient mice. *EMBO J.* *17*, 3045-3051.
- Pfeifer,A., Ruth,P., Dostmann,W., Sausbier,M., Klatt,P., and Hofmann,F. (1999). Structure and function of cGMP-dependent protein kinases. *Rev.Physiol.Biochem.Pharmacol.* *135*, 105-149.
- Pilz,R.B. and Casteel,D.E. (2003). Regulation of gene expression by cyclic GMP. *Circ.Res.* *93*, 1034-1046.
- Polleux,F., Morrow,T., and Ghosh,A. (2000). Semaphorin 3A is a chemoattractant for cortical apical dendrites. *Nature* *404*, 567-573.
- Postnikov,A., Betin,V., Murad,F., and Kots,A. (2005). Regulation of soluble guanylate cyclase activity by direct interaction with heat shock protein Hsp90. *BMC Pharmacology* *5*, 44.
- Pryzwansky,K.B., Wyatt,T.A., and Lincoln,T.M. (1995). Cyclic guanosine monophosphate-dependent protein kinase is targeted to intermediate filaments and phosphorylates vimentin in A23187-stimulated human neutrophils. *Blood* *85*, 222-230.
- Pryzwansky,K.B., Wyatt,T.A., Nichols,H., and Lincoln,T.M. (1990). Compartmentalization of cyclic GMP-dependent protein kinase in formyl-peptide stimulated neutrophils. *Blood* *76*, 612-618.
- Qian,Y., Chao,D.S., Santillano,D.R., Cornwell,T.L., Nairn,A.C., Greengard,P., Lincoln,T.M., and Bredt,D.S. (1996). cGMP-dependent protein kinase in dorsal root ganglion: relationship with nitric oxide synthase and nociceptive neurons. *J.Neurosci.* *16*, 3130-3138.
- Rabilloud,T. (1998). Use of thiourea to increase the solubility of membrane proteins in two-dimensional electrophoresis. *Electrophoresis* *19*, 758-760.
- Reik,W., Dean,W., and Walter,J. (2001). Epigenetic reprogramming in mammalian development. *Science* *293*, 1089-1093.
- Reinhard,M., Giehl,K., Abel,K., Haffner,C., Jarchau,T., Hoppe,V., Jockusch,B.M., and Walter,U. (1995). The proline-rich focal adhesion and microfilament protein VASP is a ligand for profilins. *EMBO J.* *14*, 1583-1589.
- Reinhard,M., Jarchau,T., and Walter,U. (2001). Actin-based motility: stop and go with Ena/VASP proteins. *Trends Biochem.Sci.* *26*, 243-249.
- Revermann,M., Maronde,E., Ruth,P., and Korf,H.W. (2002). Protein kinase G I immunoreaction is colocalized with arginine-vasopressin immunoreaction in the rat suprachiasmatic nucleus. *Neurosci.Lett.* *334*, 119-122.
- Robertson,K.D., Ait-Si-Ali,S., Yokochi,T., Wade,P.A., Jones,P.L., and Wolffe,A.P. (2000). DNMT1 forms a complex with Rb, E2F1 and HDAC1 and represses transcription from E2F-responsive promoters. *Nat.Genet.* *25*, 338-342.
- Rochlin,M.W., Itoh,K., Adelstein,R.S., and Bridgman,P.C. (1995). Localization of myosin II A and B isoforms in cultured neurons. *J.Cell Sci.* *108* (*Pt 12*), 3661-3670.
- Rountree,M.R., Bachman,K.E., and Baylin,S.B. (2000). DNMT1 binds HDAC2 and a new co-repressor, DMAP1, to form a complex at replication foci. *Nat.Genet.* *25*, 269-277.
- Roy,A.L. (2001). Biochemistry and biology of the inducible multifunctional transcription factor TFII-I. *Gene* *274*, 1-13.
- Ruth,P., Pfeifer,A., Kamm,S., Klatt,P., Dostmann,W.R., and Hofmann,F. (1997). Identification of the amino acid sequences responsible for high affinity activation of cGMP kinase Ialpha. *J.Biol.Chem.* *272*, 10522-10528.

- Rybalkin,S.D., Rybalkina,I.G., Feil,R., Hofmann,F., and Beavo,J.A. (2002). Regulation of cGMP-specific phosphodiesterase (PDE5) phosphorylation in smooth muscle cells. *J.Biol.Chem.* 277, 3310-3317.
- Sakurada,K., Seto,M., and Sasaki,Y. (1998). Dynamics of myosin light chain phosphorylation at Ser19 and Thr18/Ser19 in smooth muscle cells in culture. *Am.J.Physiol* 274, C1563-C1572.
- Salmhofer,H., Neuhuber,W.L., Ruth,P., Huber,A., Russwurm,M., and Allescher,H.D. (2001). Pivotal role of the interstitial cells of Cajal in the nitric oxide signaling pathway of rat small intestine. Morphological evidence. *Cell Tissue Res.* 305, 331-340.
- Sambrook,J., Fritsch,E.F., and Maniatis,T. (1989). Molecular cloning: A laboratory manual (New York: Cold Spring Harbor Lab. Press, Plainview).
- Sauzeau,V., Le Jeune,H., Cario-Toumaniantz,C., Smolenski,A., Lohmann,S.M., Bertoglio,J., Chardin,P., Pacaud,P., and Loirand,G. (2000). Cyclic GMP-dependent protein kinase signaling pathway inhibits RhoA-induced Ca²⁺ sensitization of contraction in vascular smooth muscle. *J.Biol.Chem.* 275, 21722-21729.
- Sauzeau,V., Rolli-Derkinderen,M., Marionneau,C., Loirand,G., and Pacaud,P. (2003). RhoA expression is controlled by nitric oxide through cGMP-dependent protein kinase activation. *J.Biol.Chem.* 278, 9472-9480.
- Schiebler,T.H., Schmidt,W., and Zilles,K. (1999). Anatomie: Zytologie, Histologie, Entwicklungsgeschichte, makroskopische und mikroskopische Anatomie des Menschen; 8. Auflage. (Springer-Verlag Berlin, Heidelberg, New York).
- Schlossmann,J., Feil,R., and Hofmann,F. (2005). Insights into cGMP signalling derived from cGMP kinase knockout mice. *Front Biosci.* 10, 1279-1289.
- Schmeichel,K.L. and Beckerle,M.C. (1994). The LIM domain is a modular protein-binding interface. *Cell* 79, 211-219.
- Schmidt,H., Werner,M., Heppenstall,P.A., Henning,M., More,M.I., Kuhbandner,S., Lewin,G.R., Hofmann,F., Feil,R., and Rathjen,F.G. (2002). cGMP-mediated signaling via cGK1alpha is required for the guidance and connectivity of sensory axons. *J.Cell Biol.* 159, 489-498.
- Shewan,D., Dwivedy,A., Anderson,R., and Holt,C.E. (2002). Age-related changes underlie switch in netrin-1 responsiveness as growth cones advance along visual pathway. *Nat.Neurosci.* 5, 955-962.
- Shimizu,C., Fuda,H., Yanai,H., and Strott,C.A. (2003). Conservation of the hydroxysteroid sulfotransferase SULT2B1 gene structure in the mouse: pre- and postnatal expression, kinetic analysis of isoforms, and comparison with prototypical SULT2A1. *Endocrinology* 144, 1186-1193.
- Shimizu-Alberge,M., Rybalkin,S.D., Rybalkina,I.G., Feil,R., Wolfsgruber,W., Hofmann,F., and Beavo,J.A. (2003). Individual cerebellar Purkinje cells express different cGMP phosphodiesterases (PDEs): in vivo phosphorylation of cGMP-specific PDE (PDE5) as an indicator of cGMP-dependent protein kinase (PKG) activation. *J.Neurosci.* 23, 6452-6459.
- Smolenski,A., Bachmann,C., Reinhard,K., Honig-Liedl,P., Jarchau,T., Hoschuetzky,H., and Walter,U. (1998). Analysis and regulation of vasodilator-stimulated phosphoprotein serine 239 phosphorylation in vitro and in intact cells using a phosphospecific monoclonal antibody. *J.Biol.Chem.* 273, 20029-20035.
- Snellman,J. and Nawy,S. (2004). cGMP-dependent kinase regulates response sensitivity of the mouse on bipolar cell. *J.Neurosci.* 24, 6621-6628.
- Song,H., Ming,G., He,Z., Lehmann,M., McKerracher,L., Tessier-Lavigne,M., and Poo,M. (1998). Conversion of neuronal growth cone responses from repulsion to attraction by cyclic nucleotides. *Science* 281, 1515-1518.

- Song,H.J., Ming,G.L., and Poo,M.M. (1997). cAMP-induced switching in turning direction of nerve growth cones. *Nature* 388, 275-279.
- Sonnenburg,W.K. and Beavo,J.A. (1994). Cyclic GMP and regulation of cyclic nucleotide hydrolysis. *Adv.Pharmacol.* 26, 87-114.
- Steinberg,T.H., Agnew,B.J., Gee,K.R., Leung,W.Y., Goodman,T., Schulenberg,B., Hendrickson,J., Beechem,J.M., Haugland,R.P., and Patton,W.F. (2003). Global quantitative phosphoprotein analysis using Multiplexed Proteomics technology. *Proteomics*. 3, 1128-1144.
- Stottmann,R.W. and Rivas,R.J. (1998). Distribution of TAG-1 and synaptophysin in the developing cerebellar cortex: relationship to Purkinje cell dendritic development. *J.Comp Neurol.* 395, 121-135.
- Straussman,R., Even,L., and Ravid,S. (2001). Myosin II heavy chain isoforms are phosphorylated in an EGF-dependent manner: involvement of protein kinase C. *J.Cell Sci.* 114, 3047-3057.
- Strott,C.A. (2002). Sulfonation and molecular action. *Endocr.Rev.* 23, 703-732.
- Suetake,I., Shinozaki,F., Miyagawa,J., Takeshima,H., and Tajima,S. (2004). DNMT3L stimulates the DNA methylation activity of Dnmt3a and Dnmt3b through a direct interaction. *J.Biol.Chem.* 279, 27816-27823.
- Suk,J., Maurer-Fogy,I., Plank,B., Bertel,O., Wyskovsky,W., Hohenegger,M., and Hellmann,G. (1993). Phosphorylation of serine 2843 in ryanodine receptor-calcium release channel of skeletal muscle by cAMP-, cGMP- and CaM-dependent protein kinase. *Biochim.Biophys.Acta* 1175, 193-206.
- Sun,Q., Ortega,J., Sayed,N., Chang,F.J., and Beuve,A. (2005). Does soluble guanylyl cyclase need a chaperone? *BMC Pharmacology* 5, S12.
- Sung,Y.J., Walters,E.T., and Ambron,R.T. (2004). A neuronal isoform of protein kinase G couples mitogen-activated protein kinase nuclear import to axotomy-induced long-term hyperexcitability in Aplysia sensory neurons. *J.Neurosci.* 24, 7583-7595.
- Surks,H.K. and Mendelsohn,M.E. (2003). Dimerization of cGMP-dependent protein kinase 1alpha and the myosin-binding subunit of myosin phosphatase: role of leucine zipper domains. *Cell Signal.* 15, 937-944.
- Surks,H.K., Mochizuki,N., Kasai,Y., Georgescu,S.P., Tang,K.M., Ito,M., Lincoln,T.M., and Mendelsohn,M.E. (1999). Regulation of myosin phosphatase by a specific interaction with cGMP-dependent protein kinase 1alpha. *Science* 286, 1583-1587.
- Suter,D.M., Espindola,F.S., Lin,C.H., Forscher,P., and Mooseker,M.S. (2000). Localization of unconventional myosins V and VI in neuronal growth cones. *J.Neurobiol.* 42, 370-382.
- Suter,D.M. and Forscher,P. (1998). An emerging link between cytoskeletal dynamics and cell adhesion molecules in growth cone guidance. *Curr.Opin.Neurobiol.* 8, 106-116.
- Takuma,K., Phuagphong,P., Lee,E., Mori,K., Baba,A., and Matsuda,T. (2001). Anti-apoptotic effect of cGMP in cultured astrocytes: inhibition by cGMP-dependent protein kinase of mitochondrial permeable transition pore. *J.Biol.Chem.* 276, 48093-48099.
- Taniguchi,M., Yuasa,S., Fujisawa,H., Naruse,I., Saga,S., Mishina,M., and Yagi,T. (1997). Disruption of semaphorin III/D gene causes severe abnormality in peripheral nerve projection. *Neuron* 19, 519-530.
- Tatematsu,K.I., Yamazaki,T., and Ishikawa,F. (2000). MBD2-MBD3 complex binds to hemi-methylated DNA and forms a complex containing DNMT1 at the replication foci in late S phase. *Genes Cells* 5, 677-688.
- Tegeder,I., Del Turco,D., Schmidtko,A., Sausbier,M., Feil,R., Hofmann,F., Deller,T., Ruth,P., and Geisslinger,G. (2004). Reduced inflammatory hyperalgesia with preservation of acute thermal

- nociception in mice lacking cGMP-dependent protein kinase I. *Proc.Natl.Acad.Sci.U.S.A 101*, 3253-3257.
- Tegge,W., Frank,R., Hofmann,F., and Dostmann,W.R. (1995). Determination of cyclic nucleotide-dependent protein kinase substrate specificity by the use of peptide libraries on cellulose paper. *Biochemistry 34*, 10569-10577.
 - Tessier-Lavigne,M. and Goodman,C.S. (1996). The molecular biology of axon guidance. *Science 274*, 1123-1133.
 - Tucker,K.L. (2001). Methylated cytosine and the brain: a new base for neuroscience. *Neuron 30*, 649-652.
 - Tullio,A.N., Accili,D., Ferrans,V.J., Yu,Z.X., Takeda,K., Grinberg,A., Westphal,H., Preston,Y.A., and Adelstein,R.S. (1997). Nonmuscle myosin II-B is required for normal development of the mouse heart. *Proc.Natl.Acad.Sci.U.S.A 94*, 12407-12412.
 - Tullio,A.N., Bridgman,P.C., Tresser,N.J., Chan,C.C., Conti,M.A., Adelstein,R.S., and Hara,Y. (2001). Structural abnormalities develop in the brain after ablation of the gene encoding nonmuscle myosin II-B heavy chain. *J.Comp Neurol. 433*, 62-74.
 - Turek-Plewa,J. and Jagodzinski,P.P. (2005). The role of mammalian DNA methyltransferases in the regulation of gene expression. *Cell Mol.Biol.Lett. 10*, 631-647.
 - Uhler,M.D. (1993). Cloning and expression of a novel cyclic GMP-dependent protein kinase from mouse brain. *J.Biol.Chem. 268*, 13586-13591.
 - Ulupinar,E., Datwani,A., Behar,O., Fujisawa,H., and Erzurumlu,R. (1999). Role of semaphorin III in the developing rodent trigeminal system. *Mol.Cell Neurosci. 13*, 281-292.
 - Uren,D., Hwang,H.K., Hara,Y., Takeda,K., Kawamoto,S., Tullio,A.N., Yu,Z.X., Ferrans,V.J., Tresser,N., Grinberg,A., Preston,Y.A., and Adelstein,R.S. (2000). Gene dosage affects the cardiac and brain phenotype in nonmuscle myosin II-B-depleted mice. *J.Clin.Invest 105*, 663-671.
 - Veldic,M., Caruncho,H.J., Liu,W.S., Davis,J., Satta,R., Grayson,D.R., Guidotti,A., and Costa,E. (2004). DNA-methyltransferase 1 mRNA is selectively overexpressed in telencephalic GABAergic interneurons of schizophrenia brains. *Proc.Natl.Acad.Sci.U.S.A 101*, 348-353.
 - Wang,F.S., Wolenski,J.S., Cheney,R.E., Mooseker,M.S., and Jay,D.G. (1996). Function of myosin-V in filopodial extension of neuronal growth cones. *Science 273*, 660-663.
 - Wang,H.G., Lu,F.M., Jin,I., Udo,H., Kandel,E.R., de Vente,J., Walter,U., Lohmann,S.M., Hawkins,R.D., and Antonova,I. (2005). Presynaptic and postsynaptic roles of NO, cGK, and RhoA in long-lasting potentiation and aggregation of synaptic proteins. *Neuron 45*, 389-403.
 - Wang,X. and Robinson,P.J. (1997). Cyclic GMP-dependent protein kinase and cellular signaling in the nervous system. *J.Neurochem. 68*, 443-456.
 - Wassef,M. and Sotelo,C. (1984). Asynchrony in the expression of guanosine 3':5'-phosphate-dependent protein kinase by clusters of Purkinje cells during the perinatal development of rat cerebellum. *Neuroscience 13*, 1217-1241.
 - Wegener,J.W., Nawrath,H., Wolfsgruber,W., Kuhbandner,S., Werner,C., Hofmann,F., and Feil,R. (2002). cGMP-dependent protein kinase I mediates the negative inotropic effect of cGMP in the murine myocardium. *Circ.Res. 90*, 18-20.
 - Weinshilboum,R.M., Otterness,D.M., Aksoy,I.A., Wood,T.C., Her,C., and Raftogianis,R.B. (1997). Sulfation and sulfotransferases 1: Sulfotransferase molecular biology: cDNAs and genes. *FASEB J. 11*, 3-14.

- Wen,Y.D., Cress,W.D., Roy,A.L., and Seto,E. (2003). Histone deacetylase 3 binds to and regulates the multifunctional transcription factor TFII-I. *J.Biol.Chem.* 278, 1841-1847.
- Wernet,W., Flockerzi,V., and Hofmann,F. (1989). The cDNA of the two isoforms of bovine cGMP-dependent protein kinase. *FEBS Lett.* 251, 191-196.
- White,F.A. and Behar,O. (2000). The development and subsequent elimination of aberrant peripheral axon projections in Semaphorin3A null mutant mice. *Dev.Biol.* 225, 79-86.
- Wyatt,T.A., Lincoln,T.M., and Pryzwansky,K.B. (1991). Vimentin is transiently co-localized with and phosphorylated by cyclic GMP-dependent protein kinase in formyl-peptide-stimulated neutrophils. *J.Biol.Chem.* 266, 21274-21280.
- Xie,S., Wang,Z., Okano,M., Nogami,M., Li,Y., He,W.W., Okumura,K., and Li,E. (1999). Cloning, expression and chromosome locations of the human DNMT3 gene family. *Gene* 236, 87-95.
- Xu,G.L., Bestor,T.H., Bourc'his,D., Hsieh,C.L., Tommerup,N., Bugge,M., Hulten,M., Qu,X., Russo,J.J., and Viegas-Pequignot,E. (1999). Chromosome instability and immunodeficiency syndrome caused by mutations in a DNA methyltransferase gene. *Nature* 402, 187-191.
- Xue,J., Milburn,P.J., Hanna,B.T., Graham,M.E., Rostas,J.A., and Robinson,P.J. (2004). Phosphorylation of septin 3 on Ser-91 by cGMP-dependent protein kinase-I in nerve terminals. *Biochem.J.* 381, 753-760.
- Xue,J., Wang,X., Malladi,C.S., Kinoshita,M., Milburn,P.J., Lengyel,I., Rostas,J.A., and Robinson,P.J. (2000). Phosphorylation of a new brain-specific septin, G-septin, by cGMP-dependent protein kinase. *J.Biol.Chem.* 275, 10047-10056.
- Yamamoto,T., Yao,Y., Harumi,T., and Suzuki,N. (2003). Localization of the nitric oxide/cGMP signaling pathway-related genes and influences of morpholino knock-down of soluble guanylyl cyclase on medaka fish embryogenesis. *Zoolog.Sci.* 20, 181-191.
- Yip,J.W., Yip,Y.P., Nakajima,K., and Capriotti,C. (2000). Reelin controls position of autonomic neurons in the spinal cord. *Proc.Natl.Acad.Sci.U.S.A* 97, 8612-8616.
- Yuasa,K., Michibata,H., Omori,K., and Yanaka,N. (1999). A novel interaction of cGMP-dependent protein kinase I with troponin T. *J.Biol.Chem.* 274, 37429-37434.
- Yuasa,K., Omori,K., and Yanaka,N. (2000). Binding and phosphorylation of a novel male germ cell-specific cGMP-dependent protein kinase-anchoring protein by cGMP-dependent protein kinase Ialpha. *J.Biol.Chem.* 275, 4897-4905.
- Zhuang,S., Nguyen,G.T., Chen,Y., Gudi,T., Eigenthaler,M., Jarchau,T., Walter,U., Boss,G.R., and Pilz,R.B. (2004). Vasodilator-stimulated phosphoprotein activation of serum-response element-dependent transcription occurs downstream of RhoA and is inhibited by cGMP-dependent protein kinase phosphorylation. *J.Biol.Chem.* 279, 10397-10407.
- Zhuo,M., Hu,Y., Schultz,C., Kandel,E.R., and Hawkins,R.D. (1994). Role of guanylyl cyclase and cGMP-dependent protein kinase in long-term potentiation. *Nature* 368, 635-639.
- Zimmerman,L.B., Jesus-Escobar,J.M., and Harland,R.M. (1996). The Spemann organizer signal noggin binds and inactivates bone morphogenetic protein 4. *Cell* 86, 599-606.