

7. Literatur

- ADAMS, R. D., VICTOR, M. (1993). The neurology of aging. *Principles of Neurology*. R. D. ADAMS und M. VICTOR. New York, McGraw-Hill: 526-536.
- AGUADO, F., BALLABRIGA, J., POZAS, E., FERRER, I. (1998). TrkA immunoreactivity in reactive astrocytes in human neurodegenerative diseases and colchicine-treated rats. *Acta Neuropathol (Berl)* 96(5): 495-501.
- ALLEN, S. J., MACGOWAN, S. H., TREANOR, J. J., FEENEY, R., WILCOCK, G. K., DAWBARN, D. (1991). Normal beta-NGF content in Alzheimer's disease cerebral cortex and hippocampus. *Neurosci Lett* 131(1): 135-9.
- ALTAR, C. A., DISTEFANO, P. S. (1998). Neurotrophin trafficking by anterograde transport. *Trends Neurosci* 21(10): 433-7.
- ALZHEIMER, A. (1907). Über eine eigenartige Erkrankung der Hirnrinde. *Allgemeine Zeitschrift für Psychiatrie und psychisch-gerichtliche Medizin* 64: 146-148.
- ALZHEIMER, A. (1911). Über eigenartige Krankheitsfälle des späteren Alters. *Zeitschrift für die gesamte Neurologie und Psychiatrie* 4: 356-385.
- ANTON, E. S., WESKAMP, G., REICHARDT, L. F., MATTHEW, W. D. (1994). Nerve growth factor and its low-affinity receptor promote Schwann cell migration. *Proc Natl Acad Sci U S A* 91(7): 2795-9.
- APPEL, S. H. (1981). A unifying hypothesis for the cause of amyotrophic lateral sclerosis, parkinsonism, and Alzheimer disease. *Ann Neurol* 10(6): 499-505.
- ARENAS, E., PERSSON, H. (1994). Neurotrophin-3 prevents the death of adult central noradrenergic neurons in vivo. *Nature* 367(6461): 368-71.
- ARENDT, T., BIGL, V., ARENDT, A., TENNSTEDT, A. (1983). Loss of neurons in the nucleus basalis of Meynert in Alzheimer's disease, paralysis agitans and Korsakoff's Disease. *Acta Neuropathol (Berl)* 61(2): 101-8.
- ARENDT, T., BRUCKNER, M. K., KRELL, T., PAGLIUSI, S., KRUSKA, L., HEUMANN, R. (1995). Degeneration of rat cholinergic basal forebrain neurons and reactive changes in nerve growth factor expression after chronic neurotoxic injury--II. Reactive expression of the nerve growth factor gene in astrocytes. *Neuroscience* 65(3): 647-59.
- ARENDT, T., SCHINDLER, C., BRUCKNER, M. K., ESCHRICH, K., BIGL, V., ZEDLICK, D., MARCOVA, L. (1997). Plastic neuronal remodeling is impaired in patients with Alzheimer's disease carrying apolipoprotein epsilon 4 allele. *J Neurosci* 17(2): 516-29.
- ASSOULINE, J. G., BOSCH, P., LIM, R., KIM, I. S., JENSEN, R., PANTAZIS, N. J. (1987). Rat astrocytes and Schwann cells in culture synthesize nerve growth factor-like neurite-promoting factors. *Brain Res* 428(1): 103-18.
- AUBURGER, G., HEUMANN, R., HELLWEG, R., KORSCHING, S., THOENEN, H. (1987). Developmental changes of nerve growth factor and its mRNA in the rat hippocampus: comparison with choline acetyltransferase. *Dev Biol* 120(2): 322-8.
- AVILA, M. A., VARELA-NIETO, I., ROMERO, G., MATO, J. M., GIRALDEZ, F., VAN DE WATER, T. R., REPRESA, J. (1993). Brain-derived neurotrophic factor and neurotrophin-3 support the survival and neuritogenesis response of developing cochleovestibular ganglion neurons. *Dev Biol* 159(1): 266-75.

- AYER-LELIEVRE, C., OLSON, L., EBENDAL, T., SEIGER, A., PERSSON, H. (1988). Expression of the beta-nerve growth factor gene in hippocampal neurons. *Science* 240(4857): 1339-41.
- AYER-LELIEVRE, C. S., EBENDAL, T., OLSON, L., SEIGER, A. (1983). Localization of nerve growth factor-like immunoreactivity in rat nervous tissue. *Med Biol* 61(6): 296-304.
- BACIA, A., ALOE, L., FUSCO, M., VANTINI, G., LEON, A., ODERFELD-NOWAK, B. (1992). Cellular localization of nerve growth factor-like immunoreactivity in hippocampus and septum of adult rat brain. *Acta Neurobiol Exp (Wars)* 52(1): 1-7.
- BACSKAI, B. J., KAJDASZ, S. T., MCLELLAN, M. E., GAMES, D., SEUBERT, P., SCHENK, D., HYMAN, B. T. (2002). Non-Fc-mediated mechanisms are involved in clearance of amyloid-beta in vivo by immunotherapy. *J Neurosci* 22(18): 7873-8.
- BAKER, S. J., REDDY, E. P. (1998). Modulation of life and death by the TNF receptor superfamily. *Oncogene* 17(25): 3261-70.
- BARBACID, M. (1993). The Trk family of neurotrophin receptors: molecular characterization and oncogenic activation in human tumors. *Molecular genetics of nervous system tumors*. A. J. LEVINE und H. H. SCHMIDEK. New York, Wiley and Sons, Inc.: 123-135.
- BARBACID, M. (1994). The Trk family of neurotrophin receptors. *J Neurobiol* 25(11): 1386-403.
- BARBACID, M. (1995a). Structural and functional properties of the TRK family of neurotrophin receptors. *Ann N Y Acad Sci* 766: 442-58.
- BARBACID, M. (1995b). Neurotrophic factors and their receptors. *Curr Opin Cell Biol* 7(2): 148-55.
- BARD, F., CANNON, C., BARBOUR, R., BURKE, R. L., GAMES, D., GRAJEDA, H., GUIDO, T., HU, K., HUANG, J., JOHNSON-WOOD, K., KHAN, K., KHOLODENKO, D., LEE, M., LIEBERBURG, I., MOTTER, R., NGUYEN, M., SORIANO, F., VASQUEZ, N., WEISS, K., WELCH, B., SEUBERT, P., SCHENK, D., YEDNOCK, T. (2000). Peripherally administered antibodies against amyloid beta-peptide enter the central nervous system and reduce pathology in a mouse model of Alzheimer disease. *Nat Med* 6(8): 916-9.
- BARDE, Y. A. (1989). Trophic factors and neuronal survival. *Neuron* 2(6): 1525-34.
- BARDE, Y. A. (1994). Neurotrophic factors: an evolutionary perspective. *J Neurobiol* 25(11): 1329-33.
- BARINAGA, M. (1994). Neurotrophic factors enter the clinic. *Science* 264(5160): 772-4.
- BARKER, P. A., LOMEN-HOERTH, C., GENSCHE, E. M., MEAKIN, S. O., GLASS, D. J., SHOOTER, E. M. (1993). Tissue-specific alternative splicing generates two isoforms of the trkB receptor. *J Biol Chem* 268(20): 15150-7.
- BARTUS, R. T., DEAN, R. L., 3RD, BEER, B., LIPPA, A. S. (1982). The cholinergic hypothesis of geriatric memory dysfunction. *Science* 217(4558): 408-14.
- BESSER, M., WANK, R. (1999). Cutting edge: clonally restricted production of the neurotrophins brain-derived neurotrophic factor and neurotrophin-3 mRNA by human immune cells and Th1/Th2-polarized expression of their receptors. *J Immunol* 162(11): 6303-6.
- BIRREN, S. J., LO, L., ANDERSON, D. J. (1993). Sympathetic neuroblasts undergo a developmental switch in trophic dependence. *Development* 119(3): 597-610.

- BLASS, J. P. (1993). Pathophysiology of the Alzheimer's syndrome. *Neurology* 43(Suppl 4): S25-S38.
- BLESCH, A., GRILL, R. J., TUSZYNSKI, M. H. (1998). Neurotrophin gene therapy in CNS models of trauma and degeneration. *Prog Brain Res* 117: 473-84.
- BOISSIERE, F., FAUCHEUX, B., AGID, Y., HIRSCH, E. C. (1997a). Expression of catalytic trkB gene in the striatum and the basal forebrain of patients with Alzheimer's disease: an in situ hybridization study. *Neurosci Lett* 221(2-3): 141-4.
- BOISSIERE, F., FAUCHEUX, B., RUBERG, M., AGID, Y., HIRSCH, E. C. (1997b). Decreased TrkA gene expression in cholinergic neurons of the striatum and basal forebrain of patients with Alzheimer's disease. *Exp Neurol* 145(1): 245-52.
- BONDAREFF, W., MOUNTJOY, C. Q., ROTH, M., ROSSOR, M. N., IVERSEN, L. L., REYNOLDS, G. P. (1987). Age and histopathologic heterogeneity in Alzheimer's disease. Evidence for subtypes. *Arch Gen Psychiatry* 44(5): 412-7.
- BONHOEFFER, T. (1996). Neurotrophins and activity-dependent development of the neocortex. *Curr Opin Neurobiol* 6(1): 119-26.
- BORNEMANN, K. D., STAUFENBIEL, M. (2000). Transgenic mouse models of Alzheimer's disease. *Ann N Y Acad Sci* 908: 260-6.
- BORNEMANN, K. D., WIEDERHOLD, K. H., PAULI, C., ERMINI, F., STALDER, M., SCHNELL, L., SOMMER, B., JUCKER, M., STAUFENBIEL, M. (2001). Abeta-induced inflammatory processes in microglia cells of APP23 transgenic mice. *Am J Pathol* 158(1): 63-73.
- BOWEN, D. M., DAVISON, A. N. (1986). Biochemical studies of nerve cells and energy metabolism in Alzheimer's disease. *Br Med Bull* 42(1): 75-80.
- BRAAK, H., BRAAK, E. (1993). Pathology of Alzheimer's disease. *Neurodegenerative Diseases*. D. B. CALNE. Philadelphia, Saunders: 585-613.
- BREDESEN, D. E., RABIZADEH, S. (1997). p75NTR and apoptosis: Trk-dependent and Trk-independent effects. *Trends Neurosci* 20(7): 287-90.
- BRUN, A., GUSTAFSON, L. (1976). Distribution of cerebral degeneration in Alzheimer's disease. A clinico-pathological study. *Arch Psychiatr Nervenkr* 223(1): 15-33.
- BUEKER, E. D. (1948). Implantation of tumors in the hind limb of the embryonic chick and the developmental response of the lumbosacral nervous system. *Anat Rec* 102: 369-389.
- BURBACH, G. J., HELLWEG, R., HAAS, C. A., DEL TURCO, D., DEICKE, U., ABRAMOWSKI, D., JUCKER, M., STAUFENBIEL, M., DELLER, T. (2004). Induction of brain-derived neurotrophic factor in plaque-associated glial cells of aged APP23 transgenic mice. *J Neurosci* 24(10): 2421-30.
- BUTCHER, L. L., SEMBA, K. (1989). Reassessing the cholinergic basal forebrain: nomenclature schemata and concepts. *Trends Neurosci* 12(12): 483-5.
- CALHOUN, M. E., WIEDERHOLD, K. H., ABRAMOWSKI, D., PHINNEY, A. L., PROBST, A., STURCHLER-PIERRAT, C., STAUFENBIEL, M., SOMMER, B., JUCKER, M. (1998). Neuron loss in APP transgenic mice. *Nature* 395(6704): 755-6.
- CALHOUN, M. E., BURGERMEISTER, P., PHINNEY, A. L., STALDER, M., TOLNAY, M., WIEDERHOLD, K. H., ABRAMOWSKI, D., STURCHLER-PIERRAT, C., SOMMER, B., STAUFENBIEL, M., JUCKER, M. (1999). Neuronal overexpression of mutant amyloid precursor protein results in prominent deposition of cerebrovascular amyloid. *Proc Natl Acad Sci U S A* 96(24): 14088-93.

- CAPSONI, S., UGOLINI, G., COMPARINI, A., RUBERTI, F., BERARDI, N., CATTANEO, A. (2000). Alzheimer-like neurodegeneration in aged antineurotrophin growth factor transgenic mice. *Proc Natl Acad Sci U S A* 97(12): 6826-31.
- CARNAHAN, J., NAWA, H. (1995). Regulation of neuropeptide expression in the brain by neurotrophins. Potential role in vivo. *Mol Neurobiol* 10(2-3): 135-49.
- CARTER, B. D., KALTSCHEIM, C., KALTSCHEIM, B., OFFENHAUSER, N., BOHM-MATTHAEI, R., BAEUERLE, P. A., BARDE, Y. A. (1996). Selective activation of NF-kappa B by nerve growth factor through the neurotrophin receptor p75. *Science* 272(5261): 542-5.
- CASTREN, E., PITKANEN, M., SIRVIO, J., PARSADANIAN, A., LINDHOLM, D., THOENEN, H., RIEKKINEN, P. J. (1993). The induction of LTP increases BDNF and NGF mRNA but decreases NT-3 mRNA in the dentate gyrus. *Neuroreport* 4(7): 895-8.
- CAVICCHIOLI, L., FLANIGAN, T. P., VANTINI, G., FUSCO, M., POLATO, P., TOFFANO, G., WALSH, F. S., LEON, A. (1989). NGF Amplifies Expression of NGF Receptor Messenger RNA in Forebrain Cholinergic Neurons of Rats. *Eur J Neurosci* 1(3): 258-262.
- CHALAZONITIS, A. (2004). Neurotrophin-3 in the development of the enteric nervous system. *Prog Brain Res* 146: 243-63.
- CHAO, M., CASACCIA-BONNEFIL, P., CARTER, B., CHITTKA, A., KONG, H., YOON, S. O. (1998). Neurotrophin receptors: mediators of life and death. *Brain Res Brain Res Rev* 26(2-3): 295-301.
- CHAO, M. V. (1990). Nerve growth factor. *Handbuch der experimentellen Pharmakologie*. M. B. SPORN und A. B. ROBERTS. Berlin Heidelberg, Springer. 95(II): 135-165.
- CHAO, M. V. (1994). The p75 neurotrophin receptor. *J Neurobiol* 25(11): 1373-85.
- CHAO, M. V., BOTHWELL, M. (2002). Neurotrophins: to cleave or not to cleave. *Neuron* 33(1): 9-12.
- CHAPMAN, P. F., WHITE, G. L., JONES, M. W., COOPER-BLACKETER, D., MARSHALL, V. J., IRIZARRY, M., YOUNKIN, L., GOOD, M. A., BLISS, T. V., HYMAN, B. T., YOUNKIN, S. G., HSIAO, K. K. (1999). Impaired synaptic plasticity and learning in aged amyloid precursor protein transgenic mice. *Nat Neurosci* 2(3): 271-6.
- CHEN, G., CHEN, K. S., KNOX, J., INGLIS, J., BERNARD, A., MARTIN, S. J., JUSTICE, A., MCCONLOGUE, L., GAMES, D., FREEDMAN, S. B., MORRIS, R. G. (2000). A learning deficit related to age and beta-amyloid plaques in a mouse model of Alzheimer's disease. *Nature* 408(6815): 975-9.
- CHOZICK, B. (1987). The nucleus basalis of Meynert in neurological dementing disease: a review. *Int J Neurosci* 37(1-2): 31-48.
- CHRISTENSEN, H., MALTBY, N., JORM, A. F., CREASEY, H., BROE, G. A. (1992). Cholinergic 'blockade' as a model of the cognitive deficits in Alzheimer's disease. *Brain* 115 (Pt 6): 1681-99.
- CLARRIS, H. J., NURCOMBE, V., SMALL, D. H., BEYREUTHER, K., MASTERS, C. L. (1994). Secretion of nerve growth factor from septum stimulates neurite outgrowth and release of the amyloid protein precursor of Alzheimer's disease from hippocampal explants. *J Neurosci Res* 38(3): 248-58.

- COHEN, R. I., MARMUR, R., NORTON, W. T., MEHLER, M. F., KESSLER, J. A. (1996). Nerve growth factor and neurotrophin-3 differentially regulate the proliferation and survival of developing rat brain oligodendrocytes. *J Neurosci* 16(20): 6433-42.
- COLLERTON, D. (1986). Cholinergic function and intellectual decline in Alzheimer's disease. *Neuroscience* 19(1): 1-28.
- CONNOR, B., YOUNG, D., LAWLOR, P., GAI, W., WALDVOGEL, H., FAULL, R. L., DRAGUNOW, M. (1996). Trk receptor alterations in Alzheimer's disease. *Brain Res Mol Brain Res* 42(1): 1-17.
- CONNOR, B., DRAGUNOW, M. (1998). The role of neuronal growth factors in neurodegenerative disorders of the human brain. *Brain Res Brain Res Rev* 27(1): 1-39.
- COOPER, J. D., SALEHI, A., DELCROIX, J. D., HOWE, C. L., BELICHENKO, P. V., CHUA-COUZENS, J., KILBRIDGE, J. F., CARLSON, E. J., EPSTEIN, C. J., MOBLEY, W. C. (2001). Failed retrograde transport of NGF in a mouse model of Down's syndrome: reversal of cholinergic neurodegenerative phenotypes following NGF infusion. *Proc Natl Acad Sci U S A* 98(18): 10439-44.
- COYLE, J. T., PRICE, D. L., DELONG, M. R. (1983). Alzheimer's disease: a disorder of cortical cholinergic innervation. *Science* 219: 1184-1190.
- CRONK, K. M., WILKINSON, G. A., GRIMES, R., WHEELER, E. F., JHAVERI, S., FUNDIN, B. T., SILOS-SANTIAGO, I., TESSAROLLO, L., REICHARDT, L. F., RICE, F. L. (2002). Diverse dependencies of developing Merkel innervation on the trkB and both full-length and truncated isoforms of trkC. *Development* 129(15): 3739-50.
- CROWLEY, C., SPENCER, S. D., NISHIMURA, M. C., CHEN, K. S., PITTS-MEEK, S., ARMANINI, M. P., LING, L. H., MACMAHON, S. B., SHELTON, D. L., LEVINSON, A. D., ET AL. (1994). Mice lacking nerve growth factor display perinatal loss of sensory and sympathetic neurons yet develop basal forebrain cholinergic neurons. *Cell* 76(6): 1001-11.
- CRUTCHER, K. A., SCOTT, S. A., LIANG, S., EVERSON, W. V., WEINGARTNER, J. (1993). Detection of NGF-like activity in human brain tissue: increased levels in Alzheimer's disease. *J Neurosci* 13(6): 2540-50.
- CUMMINGS, J. L., BENSON, D. F. (1987). The role of the nucleus basalis of Meynert in dementia: review and reconsideration. *Alzheimer Dis Assoc Disord* 1(3): 128-55.
- DA PENHA BERZAGHI, M., COOPER, J., CASTREN, E., ZAFRA, F., SOFRONIEW, M., THOENEN, H., LINDHOLM, D. (1993). Cholinergic regulation of brain-derived neurotrophic factor (BDNF) and nerve growth factor (NGF) but not neurotrophin-3 (NT-3) mRNA levels in the developing rat hippocampus. *J Neurosci* 13(9): 3818-26.
- DAS, P., HOWARD, V., LOOSBROCK, N., DICKSON, D., MURPHY, M. P., GOLDE, T. E. (2003). Amyloid-beta immunization effectively reduces amyloid deposition in FcRgamma/- knock-out mice. *J Neurosci* 23(24): 8532-8.
- DAVIES, A. M. (1996). The neurotrophic hypothesis: where does it stand? *Philos Trans R Soc Lond B Biol Sci* 351(1338): 389-94.
- DAVIES, P., MALONEY, A. J. (1976). Selective loss of central cholinergic neurons in Alzheimer's disease. *Lancet* 2(8000): 1403.
- DECHANT, G., BIFFO, S., OKAZAWA, H., KOLBECK, R., POTTGIESSER, J., BARDE, Y. A. (1993). Expression and binding characteristics of the BDNF receptor chick trkB. *Development* 119(2): 545-58.

- DECHANT, G., TSOULFAS, P., PARADA, L. F., BARDE, Y. A. (1997). The neurotrophin receptor p75 binds neurotrophin-3 on sympathetic neurons with high affinity and specificity. *J Neurosci* 17(14): 5281-7.
- DEMATTOS, R. B., BALES, K. R., CUMMINS, D. J., DODART, J. C., PAUL, S. M., HOLTZMAN, D. M. (2001). Peripheral anti-A beta antibody alters CNS and plasma A beta clearance and decreases brain A beta burden in a mouse model of Alzheimer's disease. *Proc Natl Acad Sci U S A* 98(15): 8850-5.
- DRAGUNOW, M., MACGIBBON, G. A., LAWLOR, P., BUTTERWORTH, N., CONNOR, B., HENDERSON, C., WALTON, M., WOODGATE, A., HUGHES, P., FAULL, R. L. (1997). Apoptosis, neurotrophic factors and neurodegeneration. *Rev Neurosci* 8(3-4): 223-65.
- DUFF, K. (1997). Alzheimer transgenic mouse models come of age. *Trends Neurosci* 20(7): 279-80.
- DUNNETT, S. B., BARTH, T. M. (1991). Animal models of Alzheimer's disease and dementia (with an emphasis on cortical cholinergic systems). *Behavioural Models in Psychopharmacology*. P. WILLNER. London, Cambridge University Press: 359-418.
- DUNNETT, S. B. (1994). Animal models of Alzheimer's disease. *Dementia*. A. BURNS und F. LEVY. London, Chapman & Hall: 239-265.
- DURANY, N., MICHEL, T., KURT, J., CRUZ-SANCHEZ, F. F., CERVAS-NAVARRO, J., RIEDERER, P. (2000). Brain-derived neurotrophic factor and neurotrophin-3 levels in Alzheimer's disease brains. *Int J Dev Neurosci* 18(8): 807-813.
- EBADI, M., BASHIR, R. M., HEIDRICK, M. L., HAMADA, F. M., REFAEY, H. E., HAMED, A., HELAL, G., BAXI, M. D., CERUTIS, D. R., LASSI, N. K. (1997). Neurotrophins and their receptors in nerve injury and repair. *Neurochem Int* 30(4-5): 347-74.
- EBENDAL, T. (1992). Function and evolution in the NGF family and its receptors. *J Neurosci Res* 32(4): 461-70.
- EIDE, F. F., LOWENSTEIN, D. H., REICHARDT, L. F. (1993). Neurotrophins and their receptors--current concepts and implications for neurologic disease. *Exp Neurol* 121(2): 200-14.
- EMMETT, C. J., ASWANI, S. P., STEWART, G. R., FAIRCHILD, D., JOHNSON, R. M. (1995). Dose-response comparison of recombinant human nerve growth factor and recombinant human basic fibroblast growth factor in the fimbria fornix model of acute cholinergic degeneration. *Brain Res* 673(2): 199-207.
- EMMETT, C. J., MCNEELEY, P. A., JOHNSON, R. M. (1997). Evaluation of human astrocytoma and glioblastoma cell lines for nerve growth factor release. *Neurochem Int* 30(4-5): 465-74.
- ERNFORS, P., IBANEZ, C. F., EBENDAL, T., OLSON, L., PERSSON, H. (1990). Molecular cloning and neurotrophic activities of a protein with structural similarities to nerve growth factor: developmental and topographical expression in the brain. *Proc Natl Acad Sci U S A* 87(14): 5454-8.
- EVANS, D. A., FUNKENSTEIN, H. H., ALBERT, M. S., SCHERR, P. A., COOK, N. R., CHOWN, M. J., HEBERT, L. E., HENNEKENS, C. H., TAYLOR, J. O. (1989). Prevalence of Alzheimer's disease in a community population of older persons. Higher than previously reported. *Jama* 262(18): 2551-6.
- FAHNESTOCK, M., SCOTT, S. A., JETTE, N., WEINGARTNER, J. A., CRUTCHER, K. A. (1996). Nerve growth factor mRNA and protein levels measured in the same tissue

- from normal and Alzheimer's disease parietal cortex. *Brain Res Mol Brain Res* 42(1): 175-8.
- FAHNESTOCK, M., MICHALSKI, B., XU, B., COUGHLIN, M. D. (2001). The precursor pro-nerve growth factor is the predominant form of nerve growth factor in brain and is increased in Alzheimer's disease. *Mol Cell Neurosci* 18(2): 210-20.
- FAHNESTOCK, M., YU, G., MICHALSKI, B., MATHEW, S., COLQUHOUN, A., ROSS, G. M., COUGHLIN, M. D. (2004). The nerve growth factor precursor proNGF exhibits neurotrophic activity but is less active than mature nerve growth factor. *J Neurochem* 89(3): 581-92.
- FARINAS, I., JONES, K. R., BACKUS, C., WANG, X. Y., REICHARDT, L. F. (1994). Severe sensory and sympathetic deficits in mice lacking neurotrophin-3. *Nature* 369(6482): 658-61.
- FEWSTER, P. H., GRIFFIN-BROOKS, S., MACGREGOR, J., OJALVO-ROSE, E., BALL, M. J. (1991). A topographical pathway by which histopathological lesions disseminate through the brain of patients with Alzheimer's disease. *Dementia*(2): 121-132.
- FISCHER, W., WICTORIN, K., BJORKLUND, A., WILLIAMS, L. R., VARON, S., GAGE, F. H. (1987). Amelioration of cholinergic neuron atrophy and spatial memory impairment in aged rats by nerve growth factor. *Nature* 329(6134): 65-8.
- FISCHER, W., BJORKLUND, A., CHEN, K., GAGE, F. H. (1991). NGF improves spatial memory in aged rodents as a function of age. *J Neurosci* 11(7): 1889-906.
- FRIEDMAN, W. J., IBANEZ, C. F., HALLBOOK, F., PERSSON, H., CAIN, L. D., DREYFUS, C. F., BLACK, I. B. (1993). Differential actions of neurotrophins in the locus coeruleus and basal forebrain. *Exp Neurol* 119(1): 72-8.
- FRIEDMAN, W. J., BLACK, I. B., PERSSON, H., IBANEZ, C. F. (1995). Synergistic trophic actions on rat basal forebrain neurons revealed by a synthetic NGF/BDNF chimaeric molecule. *Eur J Neurosci* 7(4): 656-62.
- FRIEDMAN, W. J., GREENE, L. A. (1999). Neurotrophin signaling via Trks and p75. *Exp Cell Res* 253(1): 131-42.
- FRITZSCH, B., TESSAROLLO, L., COPPOLA, E., REICHARDT, L. F. (2004). Neurotrophins in the ear: their roles in sensory neuron survival and fiber guidance. *Prog Brain Res* 146: 265-78.
- FURUKAWA, K., GUO, Q., SCHELLENBERG, G. D., MATTSON, M. P. (1998). Presenilin-1 mutation alters NGF-induced neurite outgrowth, calcium homeostasis, and transcription factor (AP-1) activation in PC12 cells. *J Neurosci Res* 52(5): 618-24.
- FURUKAWA, S., FURUKAWA, Y., SATOYOSHI, E., HAYASHI, K. (1986). Synthesis and secretion of nerve growth factor by mouse astroglial cells in culture. *Biochem Biophys Res Commun* 136(1): 57-63.
- FURUKAWA, S., FURUKAWA, Y. (1990). Nerve growth factor synthesis and its regulatory mechanisms: an approach to therapeutic induction of nerve growth factor synthesis. *Cerebrovasc Brain Metab Rev* 2(4): 328-44.
- FUSCO, M., VANTINI, G., SCHIAVO, N., ZANOTTI, A., ZANONI, R., FACCI, L., SKAPER, S. D. (1993). Gangliosides and neurotrophic factors in neurodegenerative diseases: from experimental findings to clinical perspectives. *Ann N Y Acad Sci* 695: 314-7.
- GAGE, F. H., WOLFF, J. A., ROSENBERG, M. B., XU, L., YEE, J. K., SHULTS, C., FRIEDMANN, T. (1987). Grafting genetically modified cells to the brain: possibilities for the future. *Neuroscience* 23(3): 795-807.

- GAMES, D., ADAMS, D., ALESSANDRINI, R., BARBOUR, R., BERTHELETTE, P., BLACKWELL, C., CARR, T., CLEMENS, J., DONALDSON, T., GILLESPIE, F., ET AL. (1995). Alzheimer-type neuropathology in transgenic mice overexpressing V717F beta-amyloid precursor protein. *Nature* 373(6514): 523-7.
- GARRETT, N. E., KIDD, B. L., CRUWYS, S. C., TOMLINSON, D. R. (1996). Effect of streptozotocin-diabetes on knee joint inflammation-induced changes in substance P and nerve growth factor in the rat. *Brain Res Mol Brain Res* 42(2): 272-8.
- GARRETT, N. E., MALCANGIO, M., DEWHURST, M., TOMLINSON, D. R. (1997). alpha-Lipoic acid corrects neuropeptide deficits in diabetic rats via induction of trophic support. *Neurosci Lett* 222(3): 191-4.
- GEDDES, J. W., ANDERSON, K. J., COTMAN, C. W. (1986). Senile plaques as aberrant sprout-stimulating structures. *Exp Neurol* 94(3): 767-76.
- GEULA, C. (1998). Abnormalities of neural circuitry in Alzheimer's disease: hippocampus and cortical cholinergic innervation. *Neurology* 51(1 Suppl 1): S18-29; discussion S65-7.
- GIANNAKOPOULOS, P., HOF, P. R., MICHEL, J. P., GUIMON, J., BOURAS, C. (1997). Cerebral cortex pathology in aging and Alzheimer's disease: a quantitative survey of large hospital-based geriatric and psychiatric cohorts. *Brain Res Brain Res Rev* 25(2): 217-45.
- GOEDERT, M., FINE, A., HUNT, S. P., ULLRICH, A. (1986). Nerve growth factor mRNA in peripheral and central rat tissues and in the human central nervous system: lesion effects in the rat brain and levels in Alzheimer's disease. *Brain Res* 387(1): 85-92.
- GOEDERT, M., FINE, A., DAWBARN, D., WILCOCK, G. K., CHAO, M. V. (1989). Nerve growth factor receptor mRNA distribution in human brain: normal levels in basal forebrain in Alzheimer's disease. *Brain Res Mol Brain Res* 5(1): 1-7.
- GOTTFRIES, C. G. (1990). Neurochemical aspects on aging and diseases with cognitive impairment. *J Neurosci Res* 27(4): 541-7.
- GÖTZ, R., KOSTER, R., WINKLER, C., RAULF, F., LOTTSCHEICH, F., SCHARTL, M., THOENEN, H. (1994). Neurotrophin-6 is a new member of the nerve growth factor family. *Nature* 372(6503): 266-9.
- GÖTZ, R., SCHARTL, M. (1994). The conservation of neurotrophic factors during vertebrate evolution. *Comp Biochem Physiol Pharmacol Toxicol Endocrinol* 108(1): 1-10.
- GRIMES, M. L., ZHOU, J., BEATTIE, E. C., YUEN, E. C., HALL, D. E., VALLETTA, J. S., TOPP, K. S., LAVAIL, J. H., BUNNETT, N. W., MOBLEY, W. C. (1996). Endocytosis of activated TrkA: evidence that nerve growth factor induces formation of signaling endosomes. *J Neurosci* 16(24): 7950-64.
- GWAG, B. J., SESSLER, F., KIMMERER, K., SPRINGER, J. E. (1994). Neurotrophic factor mRNA expression in dentate gyrus is increased following angular bundle transection. *Brain Res* 647(1): 23-9.
- HA, D. H., ROBERTSON, R. T., ROSHANAEI, M., WEISS, J. H. (1999). Enhanced survival and morphological features of basal forebrain cholinergic neurons in vitro: role of neurotrophins and other potential cortically derived cholinergic trophic factors. *J Comp Neurol* 406(2): 156-70.
- HAGG, T., VARON, S. (1993). Neurotropism of nerve growth factor for adult rat septal cholinergic axons in vivo. *Exp Neurol* 119(1): 37-45.

- HAMILL, R. W., MARKESBERY, W. R., MCDANIEL, K., COLEMAN, P. D. (1993). Characterization of brain samples in studies of aging, Alzheimer's, and other neurodegenerative diseases. *Neurobiol Aging* 14(6): 539-45.
- HANAOKA, Y., OHI, T., FURUKAWA, S., FURUKAWA, Y., HAYASHI, K., MATSUKURA, S. (1992). Effect of 4-methylcatechol on sciatic nerve growth factor level and motor nerve conduction velocity in experimental diabetic neuropathic process in rats. *Exp Neurol* 115(2): 292-6.
- HANAOKA, Y., OHI, T., FURUKAWA, S., FURUKAWA, Y., HAYASHI, K., MATSUKURA, S. (1994). The therapeutic effects of 4-methylcatechol, a stimulator of endogenous nerve growth factor synthesis, on experimental diabetic neuropathy in rats. *J Neurol Sci* 122(1): 28-32.
- HARDY, J. (1997). Amyloid, the presenilins and Alzheimer's disease. *Trends Neurosci* 20(4): 154-9.
- HARTUNG, H. D. (1993). Quantitative Bestimmung von Nerve Growth Factor im peripheren Nervensystem und dessen Zielgebieten beim experimentellen Diabetes mellitus. Dissertation. München.
- HAYASHI, M. (1996). Neurotrophins and the primate central nervous system: a minireview. *Neurochem Res* 21(7): 739-47.
- HEESE, K., HOCK, C., OTTEN, U. (1998). Inflammatory signals induce neurotrophin expression in human microglial cells. *J Neurochem* 70(2): 699-707.
- HEFTI, F. (1983). Is Alzheimer disease caused by lack of nerve growth factor? *Ann Neurol* 13(1): 109-10.
- HEFTI, F. (1986). Nerve growth factor promotes survival of septal cholinergic neurons after fimbrial transections. *J Neurosci* 6(8): 2155-62.
- HEFTI, F., WEINER, W. J. (1986). Nerve growth factor and Alzheimer's disease. *Ann Neurol* 20(3): 275-81.
- HEFTI, F., MASH, D. C. (1989). Localization of nerve growth factor receptors in the normal human brain and in Alzheimer's disease. *Neurobiol Aging* 10(1): 75-87.
- HEFTI, F., SCHNEIDER, L. S. (1991). Nerve growth factor and Alzheimer's disease. *Clin Neuropharmacol* 14 Suppl 1: S62-76.
- HEFTI, F. (1994). Development of effective therapy for Alzheimer's disease based on neurotrophic factors. *Neurobiol Aging* 15 Suppl 2: S193-4.
- HEFTI, F. (1997). Pharmacology of neurotrophic factors. *Annu Rev Pharmacol Toxicol* 37: 239-67.
- HELLWEG, R., BANDTLOW, C. E., HEUMANN, R., KORSCHING, S. (1988). Nerve growth factor synthesis in cultured rat iris: modulation by endogenous transmitter substances. *Exp Cell Res* 179(1): 18-30.
- HELLWEG, R., HOCK, C., HARTUNG, H. D. (1989). An improved rapid and highly sensitive enzyme immunoassay for nerve growth factor. *Technique, J Methods Cell Mol Biol* 1: 43-49.
- HELLWEG, R., FISCHER, W., HOCK, C., GAGE, F. H., BJORKLUND, A., THOENEN, H. (1990). Nerve growth factor levels and choline acetyltransferase activity in the brain of aged rats with spatial memory impairments. *Brain Res* 537(1-2): 123-30.
- HELLWEG, R., HARTUNG, H. D. (1990). Endogenous levels of nerve growth factor (NGF) are altered in experimental diabetes mellitus: a possible role for NGF in the pathogenesis of diabetic neuropathy. *J Neurosci Res* 26(2): 258-67.

- HELLWEG, R., WOHRLE, M., HARTUNG, H. D., STRACKE, H., HOCK, C., FEDERLIN, K. (1991). Diabetes mellitus-associated decrease in nerve growth factor levels is reversed by allogeneic pancreatic islet transplantation. *Neurosci Lett* 125(1): 1-4.
- HELLWEG, R. (1992). [Nerve growth factor (NGF): pathophysiologic importance and possible therapeutic consequences]. *Nervenarzt* 63(1): 52-6.
- HELLWEG, R., NITSCH, R., HOCK, C., JAKSCH, M., HOYER, S. (1992). Nerve growth factor and choline acetyltransferase activity levels in the rat brain following experimental impairment of cerebral glucose and energy metabolism. *J Neurosci Res* 31(3): 479-86.
- HELLWEG, R., JOCKERS-SCHERÜBL, M. (1994). Neurotrophic factors in memory disorders. *Life Sci* 55(25-26): 2165-9.
- HELLWEG, R., RAIVICH, G. (1994). Nerve growth factor: pathophysiological and therapeutic implications. *Pharmacopsychiatry* 27 Suppl 1: 15-7.
- HELLWEG, R., RAIVICH, G., HARTUNG, H. D., HOCK, C., KREUTZBERG, G. W. (1994). Axonal transport of endogenous nerve growth factor (NGF) and NGF receptor in experimental diabetic neuropathy. *Exp Neurol* 130(1): 24-30.
- HELLWEG, R., BAETHGE, C., HARTUNG, H. D., BRUCKNER, M. K., ARENDT, T. (1996a). NGF level in the rat sciatic nerve is decreased after long-term consumption of ethanol. *Neuroreport* 7(3): 777-80.
- HELLWEG, R., GERICKE, C., VAHAR-MATIAR, K., STECKLER, T., ARENDT, T. (1996b). Nerve growth factor und Cholinazetyltransferase im alternden Gehirn der Ratte und nach Läsion des basalen Vorderhirns. *Biologische Psychiatrie* 1994. H. J. MÖLLER, F. MÜLLER-SPAHN und G. KURTZ. Wien, Springer-Verlag: 75-78.
- HELLWEG, R., HUMPEL, C., LOWE, A., HORTNAGL, H. (1997). Moderate lesion of the rat cholinergic septohippocampal pathway increases hippocampal nerve growth factor synthesis: evidence for long-term compensatory changes? *Brain Res Mol Brain Res* 45(1): 177-81.
- HELLWEG, R., GERICKE, C. A., JENDROSKA, K., HARTUNG, H. D., CERVOS-NAVARRO, J. (1998a). NGF content in the cerebral cortex of non-demented patients with amyloid-plaques and in symptomatic Alzheimer's disease. *Int J Dev Neurosci* 16(7-8): 787-94.
- HELLWEG, R., VON RICHTHOFEN, S., ANDERS, D., BAETHGE, C., ROPKE, S., HARTUNG, H. D., GERICKE, C. A. (1998b). The time course of nerve growth factor content in different neuropsychiatric diseases--a unifying hypothesis. *J Neural Transm* 105(8-9): 871-903.
- HENDERSON, C. E. (1996). Role of neurotrophic factors in neuronal development. *Curr Opin Neurobiol* 6(1): 64-70.
- HENDRY, I. A., STOCKEL, K., THOENEN, H., IVERSEN, L. L. (1974). The retrograde axonal transport of nerve growth factor. *Brain Res* 68(1): 103-21.
- HOCK, C. (1991). Quantitative Bestimmung von Nerve Growth Factor-Gehalt und Cholinazetyltransferase im Gehirn von alten Ratten mit räumlichen Lernstörungen. Dissertation. München.
- HOCK, C., HEESE, K., MULLER-SPAHN, F., HULETTE, C., ROSENBERG, C., OTTEN, U. (1998). Decreased trkA neurotrophin receptor expression in the parietal cortex of patients with Alzheimer's disease. *Neurosci Lett* 241(2-3): 151-4.
- HOCK, C., HEESE, K., HULETTE, C., ROSENBERG, C., OTTEN, U. (2000a). Region-specific neurotrophin imbalances in Alzheimer disease: decreased levels of brain-

- derived neurotrophic factor and increased levels of nerve growth factor in hippocampus and cortical areas. *Arch Neurol* 57(6): 846-51.
- HOCK, C. H., HEESE, K., OLIVIERI, G., HULETTE, C. H., ROSENBERG, C., NITSCH, R. M., OTTEN, U. (2000b). Alterations in neurotrophins and neurotrophin receptors in Alzheimer's disease. *J Neural Transm Suppl* 59: 171-4.
- HOHN, A., LEIBROCK, J., BAILEY, K., BARDE, Y. A. (1990). Identification and characterization of a novel member of the nerve growth factor/brain-derived neurotrophic factor family. *Nature* 344(6264): 339-41.
- HOLCOMB, L., GORDON, M. N., MCGOWAN, E., YU, X., BENKOVIC, S., JANTZEN, P., WRIGHT, K., SAAD, I., MUELLER, R., MORGAN, D., SANDERS, S., ZEHR, C., O'CAMPO, K., HARDY, J., PRADA, C. M., ECKMAN, C., YOUNKIN, S., HSIAO, K., DUFF, K. (1998). Accelerated Alzheimer-type phenotype in transgenic mice carrying both mutant amyloid precursor protein and presenilin 1 transgenes. *Nat Med* 4(1): 97-100.
- HOLTZMAN, D. M., LI, Y., PARADA, L. F., KINSMAN, S., CHEN, C. K., VALLETTA, J. S., ZHOU, J., LONG, J. B., MOBLEY, W. C. (1992). p140^{trk} mRNA marks NGF-responsive forebrain neurons: evidence that trk gene expression is induced by NGF. *Neuron* 9(3): 465-78.
- HOLTZMAN, D. M., LI, Y., CHEN, K., GAGE, F. H., EPSTEIN, C. J., MOBLEY, W. C. (1993). Nerve growth factor reverses neuronal atrophy in a Down syndrome model of age-related neurodegeneration. *Neurology* 43(12): 2668-73.
- HOLTZMAN, D. M., MOBLEY, W. C. (1994). Neurotrophic factors and neurologic disease. *West J Med* 161(3): 246-54.
- HOLTZMAN, D. M., KILBRIDGE, J., LI, Y., CUNNINGHAM, E. T., JR., LENN, N. J., CLARY, D. O., REICHARDT, L. F., MOBLEY, W. C. (1995). TrkA expression in the CNS: evidence for the existence of several novel NGF-responsive CNS neurons. *J Neurosci* 15(2): 1567-76.
- HOLTZMAN, D. M., SANTUCCI, D., KILBRIDGE, J., CHUA-COUZENS, J., FONTANA, D. J., DANIELS, S. E., JOHNSON, R. M., CHEN, K., SUN, Y., CARLSON, E., ALLEVA, E., EPSTEIN, C. J., MOBLEY, W. C. (1996). Developmental abnormalities and age-related neurodegeneration in a mouse model of Down syndrome. *Proc Natl Acad Sci U S A* 93(23): 13333-8.
- HORIGOME, K., PRYOR, J. C., BULLOCK, E. D., JOHNSON, E. M., JR. (1993). Mediator release from mast cells by nerve growth factor. Neurotrophin specificity and receptor mediation. *J Biol Chem* 268(20): 14881-7.
- HÖRTNAGL, H., HELLWEG, R. (1997a). Pathophysiological aspects of human neurodegenerative diseases. *Wien Klin Wochenschr* 109(16): 623-35.
- HÖRTNAGL, H., HELLWEG, R. (1997b). Insights into the role of the cholinergic component of the septohippocampal pathway: what have we learned from experimental lesion studies? *Brain Res Bull* 43(3): 245-55.
- HOYER, S. (1994). Neurodegeneration, Alzheimer's disease, and beta-amyloid toxicity. *Life Sci* 55(25-26): 1977-83.
- HSIAO, K., CHAPMAN, P., NILSEN, S., ECKMAN, C., HARIGAYA, Y., YOUNKIN, S., YANG, F., COLE, G. (1996). Correlative memory deficits, Abeta elevation, and amyloid plaques in transgenic mice. *Science* 274(5284): 99-102.
- HSIAO, K. (1998a). Transgenic mice expressing Alzheimer amyloid precursor proteins. *Exp Gerontol* 33(7-8): 883-9.

- HSIAO, K. (1998b). Strain dependent and invariant features of transgenic mice expressing Alzheimer amyloid precursor proteins. *Prog Brain Res* 117: 335-41.
- HSIAO, K. K., BORCHELT, D. R., OLSON, K., JOHANNSDOTTIR, R., KITT, C., YUNIS, W., XU, S., ECKMAN, C., YOUNKIN, S., PRICE, D., ET AL. (1995). Age-related CNS disorder and early death in transgenic FVB/N mice overexpressing Alzheimer amyloid precursor proteins. *Neuron* 15(5): 1203-18.
- HYMAN, B. T., VAN HORSEN, G. W., DAMASIO, A. R., BARNES, C. L. (1984). Alzheimer's disease: cell-specific pathology isolates the hippocampal formation. *Science* 225(4667): 1168-70.
- IBANEZ, C. F. (1995). Neurotrophic factors: from structure-function studies to designing effective therapeutics. *Trends Biotechnol* 13(6): 217-27.
- IBANEZ, C. F. (1998). Emerging themes in structural biology of neurotrophic factors. *Trends Neurosci* 21(10): 438-44.
- IP, N. Y., LI, Y., YANCOPOULOS, G. D., LINDSAY, R. M. (1993a). Cultured hippocampal neurons show responses to BDNF, NT-3, and NT-4, but not NGF. *J Neurosci* 13(8): 3394-405.
- IP, N. Y., STITT, T. N., TAPLEY, P., KLEIN, R., GLASS, D. J., FANDL, J., GREENE, L. A., BARBACID, M., YANCOPOULOS, G. D. (1993b). Similarities and differences in the way neurotrophins interact with the Trk receptors in neuronal and nonneuronal cells. *Neuron* 10(2): 137-49.
- IP, N. Y., YANCOPOULOS, G. D. (1994). Neurotrophic factors and their receptors. *Ann Neurol* 35 Suppl: S13-6.
- ITAGAKI, S., MCGEER, P. L., AKIYAMA, H., ZHU, S., SELKOE, D. (1989). Relationship of microglia and astrocytes to amyloid deposits of Alzheimer disease. *J Neuroimmunol* 24(3): 173-82.
- JABER, M., MERLIO, J. P., BLOCH, B. (1994). Expression of polyadenylated and non-polyadenylated trkB transcripts in the rodent central nervous system. *Neuroscience* 61(2): 245-56.
- JACKSON, A. C., PARK, H. (1999). Experimental rabies virus infection of p75 neurotrophin receptor-deficient mice. *Acta Neuropathol (Berl)* 98(6): 641-4.
- JANIS, L. S., GLASIER, M. M., MARTIN, G., STACKMAN, R. W., WALSH, T. J., STEIN, D. G. (1995). A single intraseptal injection of nerve growth factor facilitates radial maze performance following damage to the medial septum in rats. *Brain Res* 679(1): 99-109.
- JANUS, C., PEARSON, J., MCLAURIN, J., MATHEWS, P. M., JIANG, Y., SCHMIDT, S. D., CHISHTI, M. A., HORNE, P., HESLIN, D., FRENCH, J., MOUNT, H. T., NIXON, R. A., MERCKEN, M., BERGERON, C., FRASER, P. E., ST GEORGE-HYSLOP, P., WESTAWAY, D. (2000). A beta peptide immunization reduces behavioural impairment and plaques in a model of Alzheimer's disease. *Nature* 408(6815): 979-82.
- JETTE, N., COLE, M. S., FAHNESTOCK, M. (1994). NGF mRNA is not decreased in frontal cortex from Alzheimer's disease patients. *Brain Res Mol Brain Res* 25(3-4): 242-50.
- JORM, A. F., KORTEN, A. E., HENDERSON, A. S. (1987). The prevalence of dementia: a quantitative integration of the literature. *Acta Psychiatr Scand* 76(5): 465-79.
- KAISHO, Y., YOSHIMURA, K., NAKAHAMA, K. (1990). Cloning and expression of a cDNA encoding a novel human neurotrophic factor. *FEBS Lett* 266(1-2): 187-91.

- KAPLAN, D. R., STEPHENS, R. M. (1994). Neurotrophin signal transduction by the Trk receptor. *J Neurobiol* 25(11): 1404-17.
- KAPLAN, D. R., MILLER, F. D. (1997). Signal transduction by the neurotrophin receptors. *Curr Opin Cell Biol* 9(2): 213-21.
- KAPLAN, D. R., MILLER, F. D. (2000). Neurotrophin signal transduction in the nervous system. *Curr Opin Neurobiol* 10(3): 381-91.
- KATOH-SEMBA, R., KAISHO, Y., SHINTANI, A., NAGAHAMA, M., KATO, K. (1996). Tissue distribution and immunocytochemical localization of neurotrophin-3 in the brain and peripheral tissues of rats. *J Neurochem* 66(1): 330-7.
- KATOH-SEMBA, R., SEMBA, R., KATO, K. (1998a). An enhanced conversion from tightly bound to loosely bound form of NGF in selected regions of brains from male mice. *Neurochem Int* 33(4): 327-34.
- KATOH-SEMBA, R., SEMBA, R., TAKEUCHI, I. K., KATO, K. (1998b). Age-related changes in levels of brain-derived neurotrophic factor in selected brain regions of rats, normal mice and senescence-accelerated mice: a comparison to those of nerve growth factor and neurotrophin-3. *Neurosci Res* 31(3): 227-34.
- KATOH-SEMBA, R., TAKEUCHI, I. K., SEMBA, R., KATO, K. (2000). Neurotrophin-3 controls proliferation of granular precursors as well as survival of mature granule neurons in the developing rat cerebellum. *J Neurochem* 74(5): 1923-30.
- KLEIN, R., CONWAY, D., PARADA, L. F., BARBACID, M. (1990). The trkB tyrosine protein kinase gene codes for a second neurogenic receptor that lacks the catalytic kinase domain. *Cell* 61(4): 647-56.
- KNOWLES, R. B., GOMEZ-ISLA, T., HYMAN, B. T. (1998). Abeta associated neuropil changes: correlation with neuronal loss and dementia. *J Neuropathol Exp Neurol* 57(12): 1122-30.
- KNUSEL, B., BURTON, L. E., LONGO, F. M., MOBLEY, W. C., KOLIATSOS, V. E., PRICE, D. L., HEFTI, F. (1990). Trophic actions of recombinant human nerve growth factor on cultured rat embryonic CNS cells. *Exp Neurol* 110(3): 274-83.
- KNUSEL, B., GAO, H. (1996). Neurotrophins and Alzheimer's disease: beyond the cholinergic neurons. *Life Sci* 58(22): 2019-27.
- KOLIATSOS, V. E., NAUTA, H. J., CLATTERBUCK, R. E., HOLTZMAN, D. M., MOBLEY, W. C., PRICE, D. L. (1990). Mouse nerve growth factor prevents degeneration of axotomized basal forebrain cholinergic neurons in the monkey. *J Neurosci* 10(12): 3801-13.
- KOLIATSOS, V. E., CLATTERBUCK, R. E., GOURAS, G. K., PRICE, D. L. (1991). Biologic effects of nerve growth factor on lesioned basal forebrain neurons. *Ann N Y Acad Sci* 640: 102-9.
- KOLIATSOS, V. E., PRICE, D. L., GOURAS, G. K., CAYOUETTE, M. H., BURTON, L. E., WINSLOW, J. W. (1994). Highly selective effects of nerve growth factor, brain-derived neurotrophic factor, and neurotrophin-3 on intact and injured basal forebrain magnocellular neurons. *J Comp Neurol* 343(2): 247-62.
- KOLIATSOS, V. E. (1996). Biological therapies for Alzheimer's disease: focus on trophic factors. *Crit Rev Neurobiol* 10(2): 205-38.
- KORDOWER, J. H., GASH, D. M., BOTHWELL, M., HERSH, L., MUFSON, E. J. (1989). Nerve growth factor receptor and choline acetyltransferase remain colocalized in the nucleus basalis (Ch4) of Alzheimer's patients. *Neurobiol Aging* 10(1): 67-74.

- KORDOWER, J. H., MUFSON, E. J., GRANHOLM, A. C., HOFFER, B., FRIDEN, P. M. (1993). Delivery of trophic factors to the primate brain. *Exp Neurol* 124(1): 21-30.
- KORSCHING, S., THOENEN, H. (1983). Nerve growth factor in sympathetic ganglia and corresponding target organs of the rat: correlation with density of sympathetic innervation. *Proc Natl Acad Sci U S A* 80(11): 3513-6.
- KORSCHING, S., THOENEN, H. (1985). Treatment with 6-hydroxydopamine and colchicine decreases nerve growth factor levels in sympathetic ganglia and increases them in the corresponding target tissues. *J Neurosci* 5(4): 1058-61.
- KORSCHING, S., THOENEN, H. (1987). Two-site enzyme immunoassay for nerve growth factor. *Methods Enzymol* 147: 167-85.
- KORSCHING, S. (1993). The neurotrophic factor concept: a reexamination. *J Neurosci* 13(7): 2739-48.
- KOSSMANN, T., HANS, V., IMHOF, H. G., TRENTZ, O., MORGANTI-KOSSMANN, M. C. (1996). Interleukin-6 released in human cerebrospinal fluid following traumatic brain injury may trigger nerve growth factor production in astrocytes. *Brain Res* 713(1-2): 143-52.
- LAHIRI, D. K., NALL, C. (1995). Promoter activity of the gene encoding the beta-amyloid precursor protein is up-regulated by growth factors, phorbol ester, retinoic acid and interleukin-1. *Brain Res Mol Brain Res* 32(2): 233-40.
- LAI, K. O., FU, W. Y., IP, F. C., IP, N. Y. (1998). Cloning and expression of a novel neurotrophin, NT-7, from carp. *Mol Cell Neurosci* 11(1-2): 64-76.
- LAMBALLE, F., TAPLEY, P., BARBACID, M. (1993). trkB encodes multiple neurotrophin-3 receptors with distinct biological properties and substrate specificities. *Embo J* 12(8): 3083-94.
- LANDIN, K., BLENNOW, K., WALLIN, A., GOTTFRIES, C. G. (1993). Low blood pressure and blood glucose levels in Alzheimer's disease. Evidence for a hypometabolic disorder? *J Intern Med* 233(4): 357-63.
- LANGEVIN, C., JAARO, H., BRESSANELLI, S., FAINZILBER, M., TUFFEREAU, C. (2002). Rabies virus glycoprotein (RVG) is a trimeric ligand for the N-terminal cysteine-rich domain of the mammalian p75 neurotrophin receptor. *J Biol Chem* 277(40): 37655-62.
- LAPCHAK, P. A., JENDEN, D. J., HEFTI, F. (1992). Pharmacological stimulation reveals recombinant human nerve growth factor-induced increases of in vivo hippocampal cholinergic function measured in rats with partial fimbrial transections. *Neuroscience* 50(4): 847-56.
- LAPCHAK, P. A. (1993). Nerve growth factor pharmacology: application to the treatment of cholinergic neurodegeneration in Alzheimer's disease. *Exp Neurol* 124(1): 16-20.
- LAUTERBORN, J. C., ISACKSON, P. J., GALL, C. M. (1991). Nerve growth factor mRNA-containing cells are distributed within regions of cholinergic neurons in the rat basal forebrain. *J Comp Neurol* 306(3): 439-46.
- LEE, F. S., KIM, A. H., KHURSIGARA, G., CHAO, M. V. (2001a). The uniqueness of being a neurotrophin receptor. *Curr Opin Neurobiol* 11(3): 281-6.
- LEE, R., KERMANI, P., TENG, K. K., HEMPSTEAD, B. L. (2001b). Regulation of cell survival by secreted proneurotrophins. *Science* 294(5548): 1945-8.
- LEFEBVRE, P. P., MALGRANGE, B., STAECCKER, H., MOGHADASS, M., VAN DE WATER, T. R., MOONEN, G. (1994). Neurotrophins affect survival and neuritogenesis by adult injured auditory neurons in vitro. *Neuroreport* 5(8): 865-8.

- LEMERE, C. A., SPOONER, E. T., LAFRANCOIS, J., MALESTER, B., MORI, C., LEVERONE, J. F., MATSUOKA, Y., TAYLOR, J. W., DEMATTOS, R. B., HOLTZMAN, D. M., CLEMENTS, J. D., SELKOE, D. J., DUFF, K. E. (2003). Evidence for peripheral clearance of cerebral Abeta protein following chronic, active Abeta immunization in PSAPP mice. *Neurobiol Dis* 14(1): 10-8.
- LEVI, A., SHECHTER, Y., NEUFELD, E. J., SCHLESSINGER, J. (1980). Mobility, clustering, and transport of nerve growth factor in embryonal sensory cells and in a sympathetic neuronal cell line. *Proc Natl Acad Sci U S A* 77(6): 3469-73.
- LEVI-MONTALCINI, R., CALISSANO, P. (1979). The nerve-growth factor. *Sci Am* 240(6): 68-77.
- LEVI-MONTALCINI, R. (1987). The nerve growth factor 35 years later. *Science* 237(4819): 1154-62.
- LEVI-MONTALCINI, R., DAL TOSO, R., DELLA VALLE, F., SKAPER, S. D., LEON, A. (1995). Update of the NGF saga. *J Neurol Sci* 130(2): 119-27.
- LEVI-MONTALCINI, R., SKAPER, S. D., DAL TOSO, R., PETRELLI, L., LEON, A. (1996). Nerve growth factor: from neurotrophin to neurokine. *Trends Neurosci* 19(11): 514-20.
- LEWIN, G. R., BARDE, Y. A. (1996). Physiology of the neurotrophins. *Annu Rev Neurosci* 19: 289-317.
- LINDHOLM, D., CASTREN, E., BERZAGHI, M., BLOCHL, A., THOENEN, H. (1994). Activity-dependent and hormonal regulation of neurotrophin mRNA levels in the brain--implications for neuronal plasticity. *J Neurobiol* 25(11): 1362-72.
- LINDHOLM, D., CARROLL, P., TZIMAGIOGIS, G., THOENEN, H. (1996). Autocrine-paracrine regulation of hippocampal neuron survival by IGF-1 and the neurotrophins BDNF, NT-3 and NT-4. *Eur J Neurosci* 8(7): 1452-60.
- LINDNER, M. D., DWORETZKY, S. I., SAMPSON, C., LOY, R. (1994). Relationship of APP mRNA transcripts and levels of NGF and low-affinity NGF receptors to behavioral measures of age-related cognitive dysfunction. *J Neurosci* 14(4): 2282-9.
- LINDSAY, R. M. (1979). Adult rat brain astrocytes support survival of both NGF-dependent and NGF-insensitive neurones. *Nature* 282(5734): 80-2.
- LINDSAY, R. M., ALTAR, C. A., CEDARBAUM, J. M., HYMAN, C., WIEGAND, S. J. (1993). The therapeutic potential of neurotrophic factors in the treatment of Parkinson's disease. *Exp Neurol* 124(1): 103-18.
- LINDSAY, R. M. (1994). Neurotrophic growth factors and neurodegenerative diseases: therapeutic potential of the neurotrophins and ciliary neurotrophic factor. *Neurobiol Aging* 15(2): 249-51.
- LINDSAY, R. M., WIEGAND, S. J., ALTAR, C. A., DISTEFANO, P. S. (1994). Neurotrophic factors: from molecule to man. *Trends Neurosci* 17(5): 182-90.
- LINDVALL, O., KOKAIA, Z., BENGZON, J., ELMER, E., KOKAIA, M. (1994). Neurotrophins and brain insults. *Trends Neurosci* 17(11): 490-6.
- LORIGADOS, L., SODERSTROM, S., EBENDAL, T. (1992). Two-site enzyme immunoassay for beta NGF applied to human patient sera. *J Neurosci Res* 32(3): 329-39.
- LU, B., LEE, J. M., ELLIOTT, R., DREYFUS, C. F., ADLER, J. E., BLACK, I. B. (1991a). Regulation of NGF gene expression in CNS glia by cell-cell contact. *Brain Res Mol Brain Res* 11(3-4): 359-62.

- LU, B., YOKOYAMA, M., DREYFUS, C. F., BLACK, I. B. (1991b). Depolarizing stimuli regulate nerve growth factor gene expression in cultured hippocampal neurons. *Proc Natl Acad Sci U S A* 88(14): 6289-92.
- MACKENZIE, I. R., HAO, C., MUÑOZ, D. G. (1995). Role of microglia in senile plaque formation. *Neurobiol Aging* 16(5): 797-804.
- MAISONPIERRE, P. C., BELLUSCIO, L., SQUINTO, S., IP, N. Y., FURTH, M. E., LINDSAY, R. M., YANCOPOULOS, G. D. (1990). Neurotrophin-3: a neurotrophic factor related to NGF and BDNF. *Science* 247(4949 Pt 1): 1446-51.
- MAISONPIERRE, P. C., LE BEAU, M. M., ESPINOSA, R., 3RD, IP, N. Y., BELLUSCIO, L., DE LA MONTE, S. M., SQUINTO, S., FURTH, M. E., YANCOPOULOS, G. D. (1991). Human and rat brain-derived neurotrophic factor and neurotrophin-3: gene structures, distributions, and chromosomal localizations. *Genomics* 10(3): 558-68.
- MANESS, L. M., KASTIN, A. J., WEBER, J. T., BANKS, W. A., BECKMAN, B. S., ZADINA, J. E. (1994). The neurotrophins and their receptors: structure, function, and neuropathology. *Neurosci Biobehav Rev* 18(1): 143-59.
- MARTIN-ZANCA, D., OSKAM, R., MITRA, G., COPELAND, T., BARBACID, M. (1989). Molecular and biochemical characterization of the human trk proto-oncogene. *Mol Cell Biol* 9(1): 24-33.
- MASTERS, C. L., SIMMS, G., WEINMAN, N. A., MULTHAUP, G., MCDONALD, B. L., BEYREUTHER, K. (1985). Amyloid plaque core protein in Alzheimer disease and Down syndrome. *Proc Natl Acad Sci U S A* 82(12): 4245-9.
- MATTSON, M. P., SCHEFF, S. W. (1994). Endogenous neuroprotection factors and traumatic brain injury: mechanisms of action and implications for therapy. *J Neurotrauma* 11(1): 3-33.
- MCGEER, P. L., SCHULZER, M., MCGEER, E. G. (1996). Arthritis and anti-inflammatory agents as possible protective factors for Alzheimer's disease: a review of 17 epidemiologic studies. *Neurology* 47(2): 425-32.
- MEAKIN, S. O., SHOOTER, E. M. (1992). The nerve growth factor family of receptors. *Trends Neurosci* 15(9): 323-31.
- MENN, B., TIMSIT, S., CALOTHY, G., LAMBALLE, F. (1998). Differential expression of TrkC catalytic and noncatalytic isoforms suggests that they act independently or in association. *J Comp Neurol* 401(1): 47-64.
- MESULAM, M. (1995). Structure and function of cholinergic pathways in the cerebral cortex, limbic system, basal ganglia, and thalamus of the human brain. *Psychopharmacology: The fourth generation of progress*. F. E. BLOOM und D. J. KUPFER. New York, Raven Press: 135-146.
- MESULAM, M. M., MUFSON, E. J., WAINER, B. H., LEVEY, A. I. (1983). Central cholinergic pathways in the rat: an overview based on an alternative nomenclature (Ch1-Ch6). *Neuroscience* 10(4): 1185-201.
- MESULAM, M. M. (1990). Human brain cholinergic pathways. *Prog Brain Res* 84: 231-41.
- MIDDLEMAS, D. S., LINDBERG, R. A., HUNTER, T. (1991). trkB, a neural receptor protein-tyrosine kinase: evidence for a full-length and two truncated receptors. *Mol Cell Biol* 11(1): 143-53.
- MILLER, F. D., KAPLAN, D. R. (2001). Neurotrophin signalling pathways regulating neuronal apoptosis. *Cell Mol Life Sci* 58(8): 1045-53.
- MINAGAR, A., SHAPSHAK, P., FUJIMURA, R., OWNBY, R., HEYES, M., EISDORFER, C. (2002). The role of macrophage/microglia and astrocytes in the pathogenesis of

- three neurologic disorders: HIV-associated dementia, Alzheimer disease, and multiple sclerosis. *J Neurol Sci* 202(1-2): 13-23.
- MORGAN, D., DIAMOND, D. M., GOTTSCHALL, P. E., UGEN, K. E., DICKEY, C., HARDY, J., DUFF, K., JANTZEN, P., DICARLO, G., WILCOCK, D., CONNOR, K., HATCHER, J., HOPE, C., GORDON, M., ARENDASH, G. W. (2000). A beta peptide vaccination prevents memory loss in an animal model of Alzheimer's disease. *Nature* 408(6815): 982-5.
- MORRIS, R. (1984). Developments of a water-maze procedure for studying spatial learning in the rat. *J Neurosci Methods* 11(1): 47-60.
- MUFSON, E. J., BOTHWELL, M., HERSH, L. B., KORDOWER, J. H. (1989). Nerve growth factor receptor immunoreactive profiles in the normal, aged human basal forebrain: colocalization with cholinergic neurons. *J Comp Neurol* 285(2): 196-217.
- MUFSON, E. J., KORDOWER, J. H. (1989). Nerve growth factor receptor expressing human basal forebrain neurons: pathologic alterations in Alzheimer's and Parkinson's disease. *Prog Clin Biol Res* 317: 401-14.
- MUFSON, E. J., CONNER, J. M., VARON, S., KORDOWER, J. H. (1994). Nerve growth factor-like immunoreactive profiles in the primate basal forebrain and hippocampal formation. *J Comp Neurol* 341(4): 507-19.
- MUFSON, E. J., CONNER, J. M., KORDOWER, J. H. (1995). Nerve growth factor in Alzheimer's disease: defective retrograde transport to nucleus basalis. *Neuroreport* 6(7): 1063-6.
- MUFSON, E. J., LI, J. M., SOBREVIELA, T., KORDOWER, J. H. (1996). Decreased trkA gene expression within basal forebrain neurons in Alzheimer's disease. *Neuroreport* 8(1): 25-9.
- MUFSON, E. J., LAVINE, N., JAFFAR, S., KORDOWER, J. H., QUIRION, R., SARAGOVI, H. U. (1997). Reduction in p140-TrkA receptor protein within the nucleus basalis and cortex in Alzheimer's disease. *Exp Neurol* 146(1): 91-103.
- MUFSON, E. J., KROIN, J. S., SENDER, T. J., SOBREVIELA, T. (1999). Distribution and retrograde transport of trophic factors in the central nervous system: functional implications for the treatment of neurodegenerative diseases. *Prog Neurobiol* 57(4): 451-84.
- MURASE, K., HATTORI, A., KOHNO, M., HAYASHI, K. (1993a). Stimulation of nerve growth factor synthesis/secretion in mouse astroglial cells by coenzymes. *Biochem Mol Biol Int* 30(4): 615-21.
- MURASE, K., NABESHIMA, T., ROBITAILLE, Y., QUIRION, R., OGAWA, M., HAYASHI, K. (1993b). NGF level is not decreased in the serum, brain-spinal fluid, hippocampus, or parietal cortex of individuals with Alzheimer's disease. *Biochem Biophys Res Commun* 193(1): 198-203.
- MURASE, K., IGARASHI, K., HAYASHI, K. (1994). Neurotrophin-3 (NT-3) levels in the developing rat nervous system and in human samples. *Clin Chim Acta* 227(1-2): 23-36.
- NABESHIMA, T., YAMADA, K. (2000). Neurotrophic factor strategies for the treatment of Alzheimer disease. *Alzheimer Dis Assoc Disord* 14 Suppl 1: S39-46.
- NARHI, L. O., ROSENFIELD, R., TALVENHEIMO, J., PRESTRELSKI, S. J., ARAKAWA, T., LARY, J. W., KOLVENBACH, C. G., HECHT, R., BOONE, T., MILLER, J. A., ET AL. (1993). Comparison of the biophysical characteristics of human brain-derived

- neurotrophic factor, neurotrophin-3, and nerve growth factor. *J Biol Chem* 268(18): 13309-17.
- NARISAWA-SAITO, M., NAWA, H. (1996). Differential regulation of hippocampal neurotrophins during aging in rats. *J Neurochem* 67(3): 1124-31.
- NARISAWA-SAITO, M., WAKABAYASHI, K., TSUJI, S., TAKAHASHI, H., NAWA, H. (1996). Regional specificity of alterations in NGF, BDNF and NT-3 levels in Alzheimer's disease. *Neuroreport* 7(18): 2925-8.
- NITTA, A., OHMIYA, M., JIN-NOUCHI, T., SOMETANI, A., ASAMI, T., KINUKAWA, H., FUKUMITSU, H., NOMOTO, H., FURUKAWA, S. (1999). Endogenous neurotrophin-3 is retrogradely transported in the rat sciatic nerve. *Neuroscience* 88(3): 679-85.
- NONOMURA, T., NISHIO, C., LINDSAY, R. M., HATANAKA, H. (1995). Cultured basal forebrain cholinergic neurons from postnatal rats show both overlapping and non-overlapping responses to the neurotrophins. *Brain Res* 683(1): 129-39.
- ODERFELD-NOWAK, B., BACIA, A., GRADKOWSKA, M., FUSCO, M., VANTINI, G., LEON, A., ALOE, L. (1992). In vivo activated brain astrocytes may produce and secrete nerve growth factor-like molecules. *Neurochem Int* 21(3): 455-61.
- ODERFELD-NOWAK, B., BACIA, A. (1994). Expression of astroglial nerve growth factor in damaged brain. *Acta Neurobiol Exp (Wars)* 54(2): 73-80.
- OLSON, L. (1993). NGF and the treatment of Alzheimer's disease. *Exp Neurol* 124(1): 5-15.
- PALACIOS, G., MENGOD, G., TORTOSA, A., FERRER, I., PALACIOS, J. M. (1995). Increased beta-amyloid precursor protein expression in astrocytes in the gerbil hippocampus following ischaemia: association with proliferation of astrocytes. *Eur J Neurosci* 7(3): 501-10.
- PATTERSON, S. L., GROVER, L. M., SCHWARTZKROIN, P. A., BOTHWELL, M. (1992). Neurotrophin expression in rat hippocampal slices: a stimulus paradigm inducing LTP in CA1 evokes increases in BDNF and NT-3 mRNAs. *Neuron* 9(6): 1081-8.
- PENG, S., WUU, J., MUFSON, E. J., FAHNESTOCK, M. (2004). Increased proNGF levels in subjects with mild cognitive impairment and mild Alzheimer disease. *J Neuropathol Exp Neurol* 63(6): 641-9.
- PERRY, E. K. (1986). The cholinergic hypothesis--ten years on. *Br Med Bull* 42(1): 63-9.
- PERRY, E. K. (1994). Cholinergic component of cognitive impairment in dementia. *Dementia. A. BURNS und R. LEVY*. London, Chapman & Hall: 143-157.
- PHILLIPS, H. S., HAINS, J. M., ARMANINI, M., LARAMEE, G. R., JOHNSON, S. A., WINSLOW, J. W. (1991). BDNF mRNA is decreased in the hippocampus of individuals with Alzheimer's disease. *Neuron* 7(5): 695-702.
- PHINNEY, A. L., DELLER, T., STALDER, M., CALHOUN, M. E., FROTSCHER, M., SOMMER, B., STAUFENBIEL, M., JUCKER, M. (1999). Cerebral amyloid induces aberrant axonal sprouting and ectopic terminal formation in amyloid precursor protein transgenic mice. *J Neurosci* 19(19): 8552-9.
- PRICE, J. L., MORRIS, J. C. (1999). Tangles and plaques in nondemented aging and "preclinical" Alzheimer's disease. *Ann Neurol* 45(3): 358-68.
- RABIZADEH, S., BITLER, C. M., BUTCHER, L. L., BREDESEN, D. E. (1994). Expression of the low-affinity nerve growth factor receptor enhances beta-amyloid peptide toxicity. *Proc Natl Acad Sci U S A* 91(22): 10703-6.

- RAHKONEN, T., ELONIEMI-SULKAVA, U., RISSANEN, S., VATANEN, A., VIRAMO, P., SULKAVA, R. (2003). Dementia with Lewy bodies according to the consensus criteria in a general population aged 75 years or older. *J Neurol Neurosurg Psychiatry* 74(6): 720-4.
- RAIVICH, G., HELLWEG, R., KREUTZBERG, G. W. (1991). NGF receptor-mediated reduction in axonal NGF uptake and retrograde transport following sciatic nerve injury and during regeneration. *Neuron* 7(1): 151-64.
- RENNERT, P. D., HEINRICH, G. (1986). Nerve growth factor mRNA in brain: localization by in situ hybridization. *Biochem Biophys Res Commun* 138(2): 813-8.
- ROBAKIS, N. K., ANDERSON, J. P., REFOLO, L. M., WALLACE, W. (1991). Expression of the Alzheimer amyloid precursor in brain tissue and effects of NGF and EGF on its metabolism. *Clin Neuropharmacol* 14 Suppl 1: S15-23.
- ROCAMORA, N., MASSIEU, L., BODDEKE, H. W., MENGOD, G., PALACIOS, J. M. (1993). Neuronal death and neurotrophin gene expression: long-lasting stimulation of neurotrophin-3 messenger RNA in the degenerating CA1 and CA4 pyramidal cell layers. *Neuroscience* 53(4): 905-8.
- ROHRER, H., HOFER, M., HELLWEG, R., KORSCHING, S., STEHLE, A. D., SAADAT, S., THOENEN, H. (1988). Antibodies against mouse nerve growth factor interfere in vivo with the development of avian sensory and sympathetic neurones. *Development* 103(3): 545-52.
- ROSENTHAL, A., GOEDDEL, D. V., NGUYEN, T., LEWIS, M., SHIH, A., LARAMEE, G. R., NIKOLICS, K., WINSLOW, J. W. (1990). Primary structure and biological activity of a novel human neurotrophic factor. *Neuron* 4(5): 767-73.
- ROSSNER, S., UEBERHAM, U., SCHLIEBS, R., PEREZ-POLO, J. R., BIGL, V. (1998). The regulation of amyloid precursor protein metabolism by cholinergic mechanisms and neurotrophin receptor signaling. *Prog Neurobiol* 56(5): 541-69.
- ROUX, P. P., BARKER, P. A. (2002). Neurotrophin signaling through the p75 neurotrophin receptor. *Prog Neurobiol* 67(3): 203-33.
- RUBERTI, F., CAPSONI, S., COMPARINI, A., DI DANIEL, E., FRANZOT, J., GONFLONI, S., ROSSI, G., BERARDI, N., CATTANEO, A. (2000). Phenotypic knockout of nerve growth factor in adult transgenic mice reveals severe deficits in basal forebrain cholinergic neurons, cell death in the spleen, and skeletal muscle dystrophy. *J Neurosci* 20(7): 2589-601.
- RUSH, R. A., MAYO, R., ZETTLER, C. (1995). The regulation of nerve growth factor synthesis and delivery to peripheral neurons. *Pharmacol Ther* 65(1): 93-123.
- RYLETT, R. J., WILLIAMS, L. R. (1994). Role of neurotrophins in cholinergic-neurone function in the adult and aged CNS. *Trends Neurosci* 17(11): 486-90.
- SALEHI, A., VERHAAGEN, J., DIJKHUIZEN, P. A., SWAAB, D. F. (1996). Co-localization of high-affinity neurotrophin receptors in nucleus basalis of Meynert neurons and their differential reduction in Alzheimer's disease. *Neuroscience* 75(2): 373-87.
- SALEHI, A., OCAMPO, M., VERHAAGEN, J., SWAAB, D. F. (2000). P75 neurotrophin receptor in the nucleus basalis of meynert in relation to age, sex, and Alzheimer's disease. *Exp Neurol* 161(1): 245-58.
- SALEHI, A., DELCROIX, J. D., SWAAB, D. F. (2004). Alzheimer's disease and NGF signaling. *J Neural Transm* 111(3): 323-45.

- SALTIEL, A. R., DECKER, S. J. (1994). Cellular mechanisms of signal transduction for neurotrophins. *Bioessays* 16(6): 405-11.
- SANTUCCI, A. C., KANOF, P. D., HAROUTUNIAN, V. (1995). Transient enhancement of cholinergic neurochemical markers induced by NGF in aged F344 rats. *Dementia* 6(4): 179-84.
- SAPORITO, M. S., CARSWELL, S. (1995). High levels of synthesis and local effects of nerve growth factor in the septal region of the adult rat brain. *J Neurosci* 15(3 Pt 2): 2280-6.
- SAUNDERS, A. M. (2000). Apolipoprotein E and Alzheimer disease: an update on genetic and functional analyses. *J Neuropathol Exp Neurol* 59(9): 751-8.
- SAVASKAN, E., MULLER-SPAHN, F., OLIVIERI, G., BRUTTEL, S., OTTEN, U., ROSENBERG, C., HULETTE, C., HOCK, C. (2000). Alterations in trk A, trk B and trk C receptor immunoreactivities in parietal cortex and cerebellum in Alzheimer's disease. *Eur Neurol* 44(3): 172-80.
- SCHENK, D., BARBOUR, R., DUNN, W., GORDON, G., GRAJEDA, H., GUIDO, T., HU, K., HUANG, J., JOHNSON-WOOD, K., KHAN, K., KHOLODENKO, D., LEE, M., LIAO, Z., LIEBERBURG, I., MOTTER, R., MUTTER, L., SORIANO, F., SHOPP, G., VASQUEZ, N., VANDEVERT, C., WALKER, S., WOGULIS, M., YEDNOCK, T., GAMES, D., SEUBERT, P. (1999). Immunization with amyloid-beta attenuates Alzheimer-disease-like pathology in the PDAPP mouse. *Nature* 400(6740): 173-7.
- SCHENK, D. (2002). Amyloid-beta immunotherapy for Alzheimer's disease: the end of the beginning. *Nat Rev Neurosci* 3(10): 824-8.
- SCINTO, L. F., DAFFNER, K. R., DRESSLER, D., RANSIL, B. I., RENTZ, D., WEINTRAUB, S., MESULAM, M., POTTER, H. (1994). A potential noninvasive neurobiological test for Alzheimer's disease. *Science* 266(5187): 1051-4.
- SCOTT, S. A., CRUTCHER, K. A. (1994). Nerve growth factor and Alzheimer's disease. *Rev Neurosci* 5(3): 179-211.
- SCOTT, S. A., MUFSON, E. J., WEINGARTNER, J. A., SKAU, K. A., CRUTCHER, K. A. (1995). Nerve growth factor in Alzheimer's disease: increased levels throughout the brain coupled with declines in nucleus basalis. *J Neurosci* 15(9): 6213-21.
- SELKOE, D. J. (1993). Physiological production of the beta-amyloid protein and the mechanism of Alzheimer's disease. *Trends Neurosci* 16(10): 403-9.
- SENUT, M. C., LAMOUR, Y., LEE, J., BRACHET, P., DICOU, E. (1990). Neuronal localization of the nerve growth factor precursor-like immunoreactivity in the rat brain. *Int J Dev Neurosci* 8(1): 65-80.
- SEROOGY, K. B., LUNDGREN, K. H., TRAN, T. M., GUTHRIE, K. M., ISACKSON, P. J., GALL, C. M. (1994). Dopaminergic neurons in rat ventral midbrain express brain-derived neurotrophic factor and neurotrophin-3 mRNAs. *J Comp Neurol* 342(3): 321-34.
- SHAUGHNESSY, L. W., BARONE, S., JR. (1997). Damage to the NBM leads to a sustained lesion-induced increase in functional NGF in the cortex. *Neuroreport* 8(12): 2767-74.
- SHELTON, D. L., REICHARDT, L. F. (1986). Studies on the expression of the beta nerve growth factor (NGF) gene in the central nervous system: level and regional distribution of NGF mRNA suggest that NGF functions as a trophic factor for several distinct populations of neurons. *Proc Natl Acad Sci U S A* 83(8): 2714-8.
- SHELTON, D. L., SUTHERLAND, J., GRIPP, J., CAMERATO, T., ARMANINI, M. P., PHILLIPS, H. S., CARROLL, K., SPENCER, S. D., LEVINSON, A. D. (1995).

- Human trks: molecular cloning, tissue distribution, and expression of extracellular domain immunoadhesins. *J Neurosci* 15(1 Pt 2): 477-91.
- SHETTY, A. K., ZAMAN, V., SHETTY, G. A. (2003). Hippocampal neurotrophin levels in a kainate model of temporal lobe epilepsy: a lack of correlation between brain-derived neurotrophic factor content and progression of aberrant dentate mossy fiber sprouting. *J Neurochem* 87(1): 147-59.
- SIEGEL, G. J., CHAUHAN, N. B. (2000). Neurotrophic factors in Alzheimer's and Parkinson's disease brain. *Brain Res Brain Res Rev* 33(2-3): 199-227.
- SIGURDSSON, E. M., SCHOLTZOVA, H., MEHTA, P. D., FRANGIONE, B., WISNIEWSKI, T. (2001). Immunization with a nontoxic/nonfibrillar amyloid-beta homologous peptide reduces Alzheimer's disease-associated pathology in transgenic mice. *Am J Pathol* 159(2): 439-47.
- SIGURDSSON, E. M., KNUDSEN, E., ASUNI, A., FITZER-ATTAS, C., SAGE, D., QUARTERMAIN, D., GONI, F., FRANGIONE, B., WISNIEWSKI, T. (2004). An attenuated immune response is sufficient to enhance cognition in an Alzheimer's disease mouse model immunized with amyloid-beta derivatives. *J Neurosci* 24(28): 6277-82.
- SKUP, M. H., FIGUEIREDO, B. C., CUELLO, A. C. (1994). Intraventricular application of BDNF and NT-3 failed to protect nucleus basalis magnocellularis cholinergic neurones. *Neuroreport* 5(9): 1105-9.
- SMEYNE, R. J., KLEIN, R., SCHNAPP, A., LONG, L. K., BRYANT, S., LEWIN, A., LIRA, S. A., BARBACID, M. (1994). Severe sensory and sympathetic neuropathies in mice carrying a disrupted Trk/NGF receptor gene. *Nature* 368(6468): 246-9.
- SMITS, H. A., BOVEN, L. A., PEREIRA, C. F., VERHOEF, J., NOTTET, H. S. (2000). Role of macrophage activation in the pathogenesis of Alzheimer's disease and human immunodeficiency virus type 1-associated dementia. *Eur J Clin Invest* 30(6): 526-35.
- SNIDER, W. D. (1994). Functions of the neurotrophins during nervous system development: what the knockouts are teaching us. *Cell* 77(5): 627-38.
- SOBREVIELA, T., CLARY, D. O., REICHARDT, L. F., BRANDABUR, M. M., KORDOWER, J. H., MUFSON, E. J. (1994). TrkB-immunoreactive profiles in the central nervous system: colocalization with neurons containing p75 nerve growth factor receptor, choline acetyltransferase, and serotonin. *J Comp Neurol* 350(4): 587-611.
- SOLOMON, B., KOPPEL, R., FRANKEL, D., HANAN-AHARON, E. (1997). Disaggregation of Alzheimer beta-amyloid by site-directed mAb. *Proc Natl Acad Sci U S A* 94(8): 4109-12.
- SOMMER, B., STAUFENBIEL, M. (1998). A beta peptide deposition in the brains of transgenic mice: evidence for a key event in Alzheimer's disease pathogenesis. *Mol Psychiatry* 3(4): 284-6, 282-3.
- SOMMER, B., STURCHLER-PIERRAT, C., ABRAMOWSKI, D., WIEDERHOLD, K. H., CALHOUN, M., JUCKER, M., KELLY, P., STAUFENBIEL, M. (2000). Transgenic approaches to model Alzheimer's disease. *Rev Neurosci* 11(1): 47-51.
- STAECCKER, H., LIU, W., HARTNICK, C., LEFEBVRE, P., MALGRANGE, B., MOONEN, G., VAN DE WATER, T. R. (1995). NT-3 combined with CNTF promotes survival of neurons in modiolus-spiral ganglion explants. *Neuroreport* 6(11): 1533-7.

- STAECKER, H., KOPKE, R., MALGRANGE, B., LEFEBVRE, P., VAN DE WATER, T. R. (1996). NT-3 and/or BDNF therapy prevents loss of auditory neurons following loss of hair cells. *Neuroreport* 7(4): 889-94.
- STALDER, M., PHINNEY, A., PROBST, A., SOMMER, B., STAUFENBIEL, M., JUCKER, M. (1999). Association of microglia with amyloid plaques in brains of APP23 transgenic mice. *Am J Pathol* 154(6): 1673-84.
- STEINER, H., CAPELL, A., LEIMER, U., HAASS, C. (1999). Genes and mechanisms involved in beta-amyloid generation and Alzheimer's disease. *Eur Arch Psychiatry Clin Neurosci* 249(6): 266-70.
- STEVENS, T., LIVINGSTON, G., KITCHEN, G., MANELA, M., WALKER, Z., KATONA, C. (2002). Islington study of dementia subtypes in the community. *Br J Psychiatry* 180: 270-6.
- STEWART, W. F., KAWAS, C., CORRADA, M., METTER, E. J. (1997). Risk of Alzheimer's disease and duration of NSAID use. *Neurology* 48(3): 626-32.
- STRADA, O., HIRSCH, E. C., JAVOY-AGID, F., LEHERICY, S., RUBERG, M., HAUW, J. J., AGID, Y. (1992). Does loss of nerve growth factor receptors precede loss of cholinergic neurons in Alzheimer's disease? An autoradiographic study in the human striatum and basal forebrain. *J Neurosci* 12(12): 4766-74.
- STRAUSS, S., OTTEN, U., JOGGERST, B., PLUSS, K., VOLK, B. (1994). Increased levels of nerve growth factor (NGF) protein and mRNA and reactive gliosis following kainic acid injection into the rat striatum. *Neurosci Lett* 168(1-2): 193-6.
- STURCHLER-PIERRAT, C., ABRAMOWSKI, D., DUKE, M., WIEDERHOLD, K. H., MISTL, C., ROTHACHER, S., LEDERMANN, B., BURKI, K., FREY, P., PAGANETTI, P. A., WARIDEL, C., CALHOUN, M. E., JUCKER, M., PROBST, A., STAUFENBIEL, M., SOMMER, B. (1997). Two amyloid precursor protein transgenic mouse models with Alzheimer disease-like pathology. *Proc Natl Acad Sci U S A* 94(24): 13287-92.
- TAKEDA, A., ONODERA, H., YAMASAKI, Y., FURUKAWA, K., KOGURE, K., OBINATA, M., SHIBAHARA, S. (1992). Decreased expression of neurotrophin-3 mRNA in the rat hippocampus following transient forebrain ischemia. *Brain Res* 569(1): 177-80.
- TEMPLE, S., QIAN, X. (1995). bFGF, neurotrophins, and the control or cortical neurogenesis. *Neuron* 15(2): 249-52.
- THALER, C. D., SUHR, L., IP, N., KATZ, D. M. (1994). Leukemia inhibitory factor and neurotrophins support overlapping populations of rat nodose sensory neurons in culture. *Dev Biol* 161(2): 338-44.
- THOENEN, H., BARDE, Y. A. (1980). Physiology of nerve growth factor. *Physiol Rev* 60(4): 1284-335.
- THOENEN, H., BANDTLOW, C., HEUMANN, R. (1987a). The physiological function of nerve growth factor in the central nervous system: comparison with the periphery. *Rev Physiol Biochem Pharmacol* 109: 145-78.
- THOENEN, H., BARDE, Y. A., DAVIES, A. M., JOHNSON, J. E. (1987b). Neurotrophic factors and neuronal death. *Ciba Found Symp* 126: 82-95.
- THOENEN, H. (1991). The changing scene of neurotrophic factors. *Trends Neurosci* 14(5): 165-70.
- THOENEN, H. (1995). Neurotrophins and neuronal plasticity. *Science* 270(5236): 593-8.

- THOME, J., NARA, K., FOLEY, P., MICHEL, T., GSELL, W., RETZ, W., ROSLER, M., RIEDERER, P. (1997). Ciliary neurotrophic factor (CNTF) genotypes: influence on choline acetyltransferase (ChAT) and acetylcholine esterase (AChE) activities and neurotrophin 3 (NT3) concentration in human post mortem brain tissue. *J Hirnforsch* 38(4): 443-51.
- TSOULFAS, P., SOPPET, D., ESCANDON, E., TESSAROLLO, L., MENDOZA-RAMIREZ, J. L., ROSENTHAL, A., NIKOLICS, K., PARADA, L. F. (1993). The rat TrkC locus encodes multiple neurogenic receptors that exhibit differential response to neurotrophin-3 in PC12 cells. *Neuron* 10(5): 975-90.
- TUSZYNSKI, M. H., GAGE, F. H. (1990). Potential use of neurotrophic agents in the treatment of neurodegenerative disorders. *Acta Neurobiol Exp (Wars)* 50(4-5): 311-22.
- TUSZYNSKI, M. H., U, H. S., AMARAL, D. G., GAGE, F. H. (1990). Nerve growth factor infusion in the primate brain reduces lesion-induced cholinergic neuronal degeneration. *J Neurosci* 10(11): 3604-14.
- TUSZYNSKI, M. H., SANG, H., YOSHIDA, K., GAGE, F. H. (1991). Recombinant human nerve growth factor infusions prevent cholinergic neuronal degeneration in the adult primate brain. *Ann Neurol* 30(5): 625-36.
- VALENZUELA, D. M., MAISONPIERRE, P. C., GLASS, D. J., ROJAS, E., NUNEZ, L., KONG, Y., GIES, D. R., STITT, T. N., IP, N. Y., YANCOPOULOS, G. D. (1993). Alternative forms of rat TrkC with different functional capabilities. *Neuron* 10(5): 963-74.
- VANTINI, G. (1992). The pharmacological potential of neurotrophins: a perspective. *Psychoneuroendocrinology* 17(4): 401-10.
- VENERO, J. L., HEFTI, F. (1993). TrkA NGF receptor expression by non-cholinergic thalamic neurons. *Neuroreport* 4(7): 959-62.
- VOYVODIC, J. T. (1996). Cell death in cortical development: How much? Why? So what? *Neuron* 16(4): 693-6.
- WALLACE, W. C., BRAGIN, V., ROBAKIS, N. K., SAMBAMURTI, K., VANDERPUTTEN, D., MERRIL, C. R., DAVIS, K. L., SANTUCCI, A. C., HAROUTUNIAN, V. (1991). Increased biosynthesis of Alzheimer amyloid precursor protein in the cerebral cortex of rats with lesions of the nucleus basalis of Meynert. *Brain Res Mol Brain Res* 10(2): 173-8.
- WANG, Y., HAGEL, C., HAMEL, W., MULLER, S., KLUWE, L., WESTPHAL, M. (1998). Trk A, B, and C are commonly expressed in human astrocytes and astrocytic gliomas but not by human oligodendrocytes and oligodendrogloma. *Acta Neuropathol (Berl)* 96(4): 357-64.
- WHITEHOUSE, P., PRICE, D., STRUBLE, R., CLARKE, A., COYLE, J., DELONG, M. (1982). Alzheimer's disease in senile dementia: loss of neurones in the basal forebrain. *Science* 215(1237-1239).
- WHITTEMORE, S. R., EBENDAL, T., LARKFORS, L., OLSON, L., SEIGER, A., STROMBERG, I., PERSSON, H. (1986). Development and regional expression of beta nerve growth factor messenger RNA and protein in the rat central nervous system. *Proc Natl Acad Sci U S A* 83(3): 817-21.
- WHITTEMORE, S. R., SEIGER, A. (1987). The expression, localization and functional significance of beta-nerve growth factor in the central nervous system. *Brain Res* 434(4): 439-64.

- WILCOX, B. J., APPLEGATE, M. D., PORTERA-CAILLIAU, C., KOLIATSOS, V. E. (1995). Nerve growth factor prevents apoptotic cell death in injured central cholinergic neurons. *J Comp Neurol* 359(4): 573-85.
- WILLIAMS, L. R., VARON, S., PETERSON, G. M., WICTORIN, K., FISCHER, W., BJORKLUND, A., GAGE, F. H. (1986). Continuous infusion of nerve growth factor prevents basal forebrain neuronal death after fimbria fornix transection. *Proc Natl Acad Sci U S A* 83(23): 9231-5.
- WILLIAMS, L. R., JODELIS, K. S., DONALD, M. R. (1989). Axotomy-dependent stimulation of choline acetyltransferase activity by exogenous mouse nerve growth factor in adult rat basal forebrain. *Brain Res* 498(2): 243-56.
- WILLIAMS, L. R., INOUYE, G., CUMMINS, V., PELLEYMOUNTER, M. A. (1996). Glial cell line-derived neurotrophic factor sustains axotomized basal forebrain cholinergic neurons in vivo: dose-response comparison to nerve growth factor and brain-derived neurotrophic factor. *J Pharmacol Exp Ther* 277(2): 1140-51.
- WISNIEWSKI, T., GHISO, J., FRANGIONE, B. (1997). Biology of A beta amyloid in Alzheimer's disease. *Neurobiol Dis* 4(5): 313-28.
- WOOLF, N. J., GOULD, E., BUTCHER, L. L. (1989a). Nerve growth factor receptor is associated with cholinergic neurons of the basal forebrain but not the pontomesencephalon. *Neuroscience* 30(1): 143-52.
- WOOLF, N. J., JACOBS, R. W., BUTCHER, L. L. (1989b). The pontomesencephalotegmental cholinergic system does not degenerate in Alzheimer's disease. *Neurosci Lett* 96(3): 277-82.
- YANKNER, B. A., CACERES, A., DUFFY, L. K. (1990). Nerve growth factor potentiates the neurotoxicity of beta amyloid. *Proc Natl Acad Sci U S A* 87(22): 9020-3.
- YUEN, E. C., MOBLEY, W. C. (1995). Therapeutic applications of neurotrophic factors in disorders of motor neurons and peripheral nerves. *Mol Med Today* 1(6): 278-86.
- YUEN, E. C., HOWE, C. L., LI, Y., HOLTZMAN, D. M., MOBLEY, W. C. (1996). Nerve growth factor and the neurotrophic factor hypothesis. *Brain Dev* 18(5): 362-8.
- YUEN, E. C., MOBLEY, W. C. (1996). Therapeutic potential of neurotrophic factors for neurological disorders. *Ann Neurol* 40(3): 346-54.
- ZABEL, B. U., EDDY, R. L., LALLEY, P. A., SCOTT, J., BELL, G. I., SHOWS, T. B. (1985). Chromosomal locations of the human and mouse genes for precursors of epidermal growth factor and the beta subunit of nerve growth factor. *Proc Natl Acad Sci U S A* 82(2): 469-73.
- ZHOU, L., BAUMGARTNER, B. J., HILL-FELBERG, S. J., MCGOWEN, L. R., SHINE, H. D. (2003). Neurotrophin-3 expressed in situ induces axonal plasticity in the adult injured spinal cord. *J Neurosci* 23(4): 1424-31.
- ZHOU, X. F., RUSH, R. A. (1994). Localization of neurotrophin-3-like immunoreactivity in the rat central nervous system. *Brain Res* 643(1-2): 162-72.
- ZHOU, X. F., RUSH, R. A. (1996). Functional roles of neurotrophin 3 in the developing and mature sympathetic nervous system. *Mol Neurobiol* 13(3): 185-97.