

University of Groningen

The study of behavioral dysfunctions

van der Staay, Franz Josef

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2000

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

van der Staay, F. J. (2000). *The study of behavioral dysfunctions: an evaluation of selected animal models.* s.n.

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

References

A

- Aaltonen, M., Riekkinen, P., Sirviö, J. & Riekkinen, P., Jr. (1991). Effects of THA on passive avoidance and spatial performance in quisqualic acid nucleus basalis-lesioned rats. *Pharmacology Biochemistry & Behavior*, **39**, 563-567.
- Abe, K., Horiuchi, M. & Yoshimura, K. (1997). Potentiation by DSP-4 of EEG slowing and memory impairment in basal forebrain-lesioned rats. *European Journal of Pharmacology*, **321**, 149-155.
- Abeliovich, A., Paylor, R., Chen, C., Kim, J.J., Wehner, J.M. & Tonegawa, S. (1993). PKC γ mutant mice exhibit mild deficits in spatial and contextual learning. *Cell*, **75**, 1263-1271.
- Abrous, D.N., Montaron, M.F., Petry, K.G., Rougon, G., Darnaudéry, M., Le Moal, M. & Mayo, W. (1997). Decrease in highly polysialylated neuronal cell adhesion molecules and in spatial learning during ageing are not correlated. *Brain Research*, **744**, 285-292.
- Adams, R.D., Victor, M. & Ropper, A.H. (1997). *Principles of neurology* (6th ed.). New York: McGraw-Hill.
- Aggleton, J. P., Blindsight, H. S. & Candy, J. M. (1989). Working memory in aged rats. *Behavioral Neuroscience*, **103**, 975-983.
- Aho, K., Harmsen, P., Hatano, S., Marquardsen, J., Smirnov, V.E. & Strasser, T. (1980). Cerebrovascular disease in the community: results of a WHO collaborative study. *Bulletin of the World Health Organisation*, **58**, 113-130.
- Aitken, D.H. & Meaney, M.J. (1989). Temporally graded, age-related impairments in spatial memory in the rat. *Neurobiology of Aging*, **10**, 273-276.
- Albert, M.S. & Moss, M.B. (1992). The assessment of memory disorders in patients with Alzheimer's disease. In: Squire, L.R. & Butters, N. (Eds.), *Neuropsychology of memory* (2nd ed.). New York: The Guilford Press, pp. 211-219.
- Alexis, N.E., Dietrich, W.D., Green, E.J., Prado, R. & Watson, B.D. (1995). Nonocclusive common carotid artery thrombosis in the rat results in reversible sensorimotor and cognitive behavioral deficits. *Stroke*, **26**, 2338-2346.
- Algeri, S., Biagini, L., Manfridi, A. & Pitsikas, N. (1991). Age-related ability of rats kept on a life-long hypocaloric diet in a spatial memory test. Longitudinal observations. *Neurobiology of Aging*, **12**, 277-282.
- Allain, H., Bentué-Ferrer, D., Belliard, S. & Derouesné, C. (1997). Pharmacology of Alzheimer's disease. In: Ellis, G.P. & Luscombe, D.K. (Eds.), *Progress in Medicinal Chemistry*, **34**, 1-67.
- Altman, H.J., Gershon, S. & Normile, H.J. (1991). Dementia: the role of behavioral models. In: Willner, P. (Ed.). *Behavioural models in psychopharmacology: theoretical, industrial and clinical perspectives*. Cambridge: Cambridge University Press, pp. 437-450.
- Altman, P.L. & Katz, D.D. (Eds.), (1979). *Inbred and genetically defined strains of laboratory animals, Part I: mouse and rat*. Bethesda: Federation of American Societies for Experimental Biology.
- American Psychiatric Association (1994). *DSM IV: diagnostic and statistical manual of mental disorders IV* (4th ed.). Washington D.C.: APA Press.
- Andersen, C.S., Andersen, A.B. & Finger, S. (1991). Neurological correlates of unilateral and bilateral "strokes" of the middle cerebral artery in the rat. *Physiology & Behavior*, **50**, 263-269.
- Anderson, A. (1986). Japan faces the old old problem. *Nature*, **321**, 553.
- Andrews, J.S. (1996). Possible confounding influence of strain, age and gender on cognitive performance in rats. *Cognitive Brain Research*, **3**, 251-267.
- Anisman, H., Zaharia, M.D., Meaney, M.J. & Merali, Z. (1998). Do early-life events permanently alter behavioral and hormonal responses to stressors? *International Journal of Developmental Neuroscience*, **16**(3/4), 149-164.
- Arai, H., Ichimiya, Y., Kosaka, K., Moroji, T. & Iizuka, R. (1992). Neurotransmitter changes in early- and late-onset Alzheimer-type dementia. *Progress in Psychopharmacology & Biological Psychiatry*, **16**, 883-890.
- Arendash, G.W., Sanberg, P.R. & Sengstock, G.J. (1995). Nicotine enhances the learning and memory of aged rats. *Pharmacology Biochemistry and Behavior*, **52**, 517-523.
- Arendt, T., Bigl, V. & Arendt, A. (1984). Neurone loss in the nucleus basalis of Meynert in Creutzfeldt-Jakob disease. *Acta Neuropathologica*, **65**, 85-88.

- 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 Neuropathologica (Berlin)*, **61**, 101-108.
- Arnold, M. (1997). Gesundheit und Krankheit im Alter. Versuch einer Grenzziehung. In: Schütz, R.-M., Ries, W. & Tews, H.P. (Eds.), *Altern in Gesundheit und Krankheit*. Melsungen: Bibliomed - Medizinische Verlagsgesellschaft, pp. 41-50.
- Auer, R.N., Jensen, M.L. & Whishaw, I.Q. (1989). Neurobehavioral deficit due to ischemic brain damage limited to half of the CA1 sector of the hippocampus. *Journal of Neuroscience*, **9**, 1641-1647.

B

- Baddeley, A.D. & Hitch, G.J. (1974). Working memory. In: Bower, G.A. (Ed.). *The psychology of learning and motivation*. Vol. 8. New York: Academic Press, pp. 47-89.
- Baddeley, A.D. & Lieberman, K. (1980). Spatial working memory. In: Nickerson, R. (Red.). Attention and performance VIII. Hillsdale, New Jersey: Erlbaum, pp. 521-539.
- Balaban, E., Alper, J.S. & Kasamori, Y.L. (1996). Mean genes and the biology of aggression: a critical review of recent animal and human research. *Journal of Neurogenetics*, **11**, 1-43.
- Bär, P.R. (1996). Apoptosis - The cell's silent exit. *Life Sciences*, **59**, 369-378.
- Bardgett, M.E., Newcomer, J.H. & Taylor, G.T. (1996). The effects of chronic corticosterone on memory performance in the platform maze task. *Physiology & Behavior*, **59**, 1111-1115.
- Barnard, N.D. & Kaufman, S.R. (1997). Animal research is wasteful and misleading. *Scientific American*, **276**(2), 64-66.
- Barnes, C.A. (1979). Memory deficits associated with senescence: a neurophysiological and behavioral study in the rat. *Journal of Comparative and Physiological Psychology*, **93**, 74-104.
- Barnes, C.A. (1988a). Aging and the physiology of spatial memory. *Neurobiology of Aging*, **9**, 563-568.
- Barnes, C.A. (1988b). Spatial learning and memory processes: the search for their neurobiological mechanisms in the rat. *Trends in Neurosciences*, **11**(4), 163-169.
- Barnes, C.A. (1990). Animal models of age-related cognitive decline. In: Boller, F. & Grafman, J. (Eds.), *Handbook of Neuropsychology*. Vol. 4, Amsterdam: Elsevier, pp. 169-196.
- Barnes, C.A., Eppich, C. & Rao, G (1989). Selective improvement of aged rat short-term spatial memory by 3,4-diaminopyridine. *Neurobiology of Aging*, **10**, 337-341.
- Barnes, C.A., Green, E.J., Baldwin, J. & Johnson, W.E. (1987). Behavioural and neurophysiological examples of functional sparing in senescent rat. *Canadian Journal of Psychology*, **41**, 131-140.
- Barnes, C.A., Markowska, A.L., Ingram, D.K., Kametani, H., Spangler, E.L., Lemken, V.J. & Olton, D.S. (1990). Acetyl-L-carnitine 2: effects on learning and memory performance of aged rats in simple and complex mazes. *Neurobiology of Aging*, **11**, 499-506.
- Barnes, C.A. & McNaughton, B.L. (1985). An age comparison of the rates of acquisition and forgetting of spatial information in relation to long-term enhancement of hippocampal synapses. *Behavioral Neuroscience*, **99**, 1040-1048.
- Barnes, C.A., Nadel, L. & Honig, W.K. (1980). Spatial memory deficit in senescent rats. *Canadian Journal of Psychology/Review of Canadian Psychology*, **34**, 29-39.
- Barone, F.C., Feuerstein, G.Z. & White, R.F. (1997). Brain cooling during transient focal ischemia provides complete neuroprotection. *Neuroscience and Biobehavioral Reviews*, **21**, 31-44.
- Barone, F.C., Knudsen, D.J., Nelson, A.H., Feuerstein, G.Z. & Willette, R.N. (1993). Mouse strain differences in susceptibility to cerebral ischemia are related to cerebral vascular anatomy. *Journal of Cerebral Blood Flow and Metabolism*, **13**, 683-692.
- Barone, F.C., Price, W.J., White, R.F., Willette, R.N. & Feuerstein, G.Z. (1992). Genetic hypertension and increased susceptibility to cerebral ischemia. *Neuroscience and Biobehavioral Reviews*, **16**, 219-233.
- Barth, T.M. & Schallert, T. (1987). Somatosensorimotor function of the superior colliculus, somatosensory cortex, and lateral hypothalamus in the rat. *Experimental Neurology*, **95**, 661-678.
- Baskerville, K.A., Chang, H.T. & Herron, P. (1993). Topography of cholinergic afferents from the nucleus basalis of Meynert to representational areas of sensorimotor cortices in the rat. *The Journal of Comparative Neurology*, **335**, 552-562.
- Bath, P.M.W. (1997). The medical management of stroke. *International Journal of Clinical Practice*, **51**(8), 504-510.
- Baxter, M.G. & Gallagher, M. (1996). Neurobiological substrates of behavioral decline: models and data analytic strategies for individual differences in aging. *Neurobiology of Aging*, **17**, 491-495.
- Beatty, W.W., Bierley, R.A. & Boyd, J.G. (1985). Preservation of accurate spatial memory in aged rats. *Neurobiology of Aging*, **6**, 219-225.
- Bechtoldt, H.P. (1959). Construct validity: a critique. *American Psychologist*, **14**, 619-629.

- Bederson, J.B., Pitts, L.H., Tsuji, M., Nishimura, M.C., Davis, R.L. & Bartkowski, H. (1986). Rat middle cerebral artery occlusion: evaluation of the model and development of a neurological examination. *Stroke*, **17**, 472-476.
- Belayev, L., Alonso, O.F., Bustó, R., Zhao, W. & Ginsberg, M.D. (1996). Middle cerebral artery occlusion in the rat by intraluminal suture. *Stroke*, **27**, 1616-1623.
- Beldhuis, H.J., Everts, H.G., van der Zee, E.A., Luiten, P.G. & Bohus, B. (1992a). Amygdala kindling-induced seizures selectively impair spatial memory: 1. behavioral characteristics and effects on hippocampal neuronal protein kinase C isoforms. *Hippocampus*, **2**, 397-409.
- Beldhuis, H.J., Everts, H.G., van der Zee, E.A., Luiten, P.G. & Bohus, B. (1992b). Amygdala kindling-induced seizures selectively impair spatial memory: 2. effects on hippocampal neuronal and glial muscarinic acetylcholine receptor. *Hippocampus*, **2**, 411-420.
- Benavides, J., Capdeville, C., Dauphin, F., Dubois, A., Duverger, D., Fage, D., Gotti, B., MacKenzie, E. & Scatton, B. (1990). The quantification of brain lesions with an ω_3 site ligand: a critical analysis of animal models of cerebral ischaemia and neurodegeneration. *Brain Research*, **522**, 275-289.
- Berger-Sweeney, J., Heckers, S., Mesulam, M.-M., Wiley, R.G., Lappi, D.A. & Sharma, M. (1994). Differential effects on spatial navigation of immunotoxin-induced cholinergic lesions of the medial septal area and nucleus basalis magnocellularis. *The Journal of Neuroscience*, **14**, 4507-4519.
- Bickford, P.C., Adams, C.E., Boyson, S.J., Curella, P., Gerhardt, G.A.; Heron, C., Ivy, G.O., Lin, A.M.L.Y., Murphy, M.P., Poth, K., Wallace, D.R., Young, D.A., Zahniser, N.R. & Rose, G.M. (1997). Long-term treatment of male F344 rats with deprenyl: assessment of effects on longevity, behavior, and brain function. *Neurobiology of Aging*, **18**, 309-318.
- Bickford, P., Heron, C., Young, D.A., Gerhardt, G.A. & de la Garza, R. (1992). Impaired acquisition of novel locomotor tasks in aged and norepinephrine-depleted F344 rats. *Neurobiology of Aging*, **13**, 475-481.
- Bierer, L.M., Haroutunian, V., Gabriel, S., Knott, P.J., Carlin, L.S., Purohit, D.P., Perl, D.P., Schmeidler, J., Kanof, P. & Davis, K.L. (1995). Neurochemical correlates of dementia severity in Alzheimer's disease: relative importance of the cholinergic deficits. *Journal of Neurochemistry*, **64**, 749-760.
- Bierley, R.A., Rixen, G.J., Tröster, A.I. & Beatty, W.W. (1986). Preserved spatial memory of rats survives 10 months without training. *Behavioral and Neural Biology*, **45**, 223-229
- Biller, J., Love, B.B., Marsh, E.E., Jones, M.P., Knepper, L.E., Jiang, D., Adams, H.P., Jr. & Gordon, D.L. (1990). Spontaneous improvement after acute ischemic stroke. *Stroke*, **21**, 1008-1012.
- Birren, J.E. (1962). Age differences in learning a two-choice water maze by rats. *Journal of Gerontology*, **17**, 207-213.
- Block, F. & Schwarz, M. (1996). Dextrometorphan reduces functional deficits and neuronal damage after global ischemia in rats. *Brain Research*, **741**, 153-159.
- Blokland, A. (1996). Acetylcholine - A neurotransmitter for learning and memory. *Brain Research Reviews*, **21**, 285-300.
- Blokland, A., Hinz, V. & Schmidt, B.H. (1995). Effects of metrifonate and tacrine in the spatial Morris task and modified Irwin test: evaluation of the efficacy / safety profile in rats. *Drug Development Research*, **26**, 166-177.
- Blokland, A., Honig, W. & Raaijmakers, W. (1994). Age-related changes in spatial discrimination learning performance in Lewis rats. *Psychobiology*, **22**, 149-155.
- Blokland, A. & Raaijmakers, W. (1993a). Age-related changes in correlation between behavioral and biochemical parameters in Lewis rats. *Behavioral and Neural Biology*, **60**, 52-61.
- Blokland, A. & Raaijmakers, W. (1993b). Food motivation in rats of different ages. *Psychobiology*, **21**, 228-232.
- Bolles, R.C. (1975). *Learning theory*. New York: Holt, Rinehart and Winston.
- Borchelt, D.R., Ratovitski, T., van Lare, J., Lee, M.K., Gonzales, V., Jenkins, N.A., Copeland, N.G., Price, D.L. & Sisodia, S.S. (1997). Accelerated amyloid deposition in the brains of transgenic mice coexpressing mutant presenilin 1 and amyloid precursor proteins. *Neuron*, **19**, 939-945.
- Borlongan, C.V., Cahill, D.W. & Sanberg, P.R. (1995). Locomotor and passive avoidance deficits following occlusion of the middle cerebral artery. *Physiology & Behavior*, **58**, 909-917.
- Botting, J.H. & Morrison, A.R. (1997). Animal research is vital to medicine. *Scientific American*, **276**(2), 67-69.
- Botwinick, J., Brinley, J.F. & Robbin, J.S. (1962). Learning a position discrimination and position reversals by Sprague-Dawley rats of different ages. *Journal of Gerontology*, **17**, 315-319.
- Botwinick, J., Brinley, J.F. & Robbin, J.S. (1963). Learning and reversing a four-choice multiple Y-maze by rats of three ages. *Journal of Gerontology*, **18**, 287-290.
- Brandeis, R., Dachir, S., Sapir, M., Levy, A. & Fisher, A. (1990). Reversal of age-related cognitive impairments by an M1 cholinergic agonist,

- AF102B. *Pharmacology Biochemistry & Behavior*, **36**, 89-95.
- Brandeis, R., Sapir, M., Kapon, Y., Borelli, G., Cadel, S. & Valsecchi, B. (1991). Improvement of cognitive function by MAO-B inhibitor L-Doprenyl in aged rats. *Pharmacology Biochemistry & Behavior*, **39**, 297-304.
- Brandon, E.P., Idzerda, R.L. & McKnight, G.S. (1995a). Targeting the mouse genome: a compendium of knockouts (part I). *Current Biology*, **5**, 625-634.
- Brandon, E.P., Idzerda, R.L. & McKnight, G.S. (1995b). Targeting the mouse genome: a compendium of knockouts (part II). *Current Biology*, **5**, 758-765.
- Brandon, E.P., Idzerda, R.L. & McKnight, G.S. (1995c). Targeting the mouse genome: a compendium of knockouts (part III). *Current Biology*, **5**, 873-881.
- Breuer, Z. & Mayevsky, A. (1992). Brain vasculature and mitochondrial responses to ischemia in gerbils. II. Strain differences and statistical evaluation. *Brain Research*, **598**, 251-256.
- Brito, G.N.O. & Brito, L.S.O. (1990). Septohippocampal system and the prelimbic sector of frontal cortex: a neuropsychological battery analysis in the rat. *Behavioural Brain Research*, **36**, 127-146.
- Britt, D.W. (1997). *A conceptual introduction to modeling: qualitative and quantitative perspectives*. Mahwah, N.J.: Lawrence Erlbaum Associates.
- Brody, J.A. (1985). Prospects for an ageing population. *Nature*, **315**, 463-466.
- Bronson, R.T. (1990). Rate of occurrence of lesions in 20 inbred and hybrid genotypes of rats and mice sacrificed at 6 month intervals during the first years of life. In: Harrison, D.E. (Ed.), *Genetic effects on aging II*. Caldwell, New Jersey: The Telford Press, Inc., pp. 279-358.
- Bruce, P.R. & Herman, J.F. (1986). Adult age differences in spatial memory: effects of distinctiveness and repeated experience. *Journal of Gerontology*, **41**, 774-777.
- Buck, K.J., Metten, P., Belknap, J.K. & Crabbe, J.C. (1997). Quantitative trait loci involved in genetic predisposition to acute alcohol withdrawal in mice. *The Journal of Neuroscience*, **17**, 3946-3955.
- Bunsey, M. & Eichenbaum, H. (1996). Conservation of hippocampal memory function in rats and humans. *Nature*, **379**, 255-257.
- Burek, J.D. (1978). *Pathology of aging rats*. West Palm Beach: CRC Press, Inc.
- Butcher, L.L. & Woolf, N.J. (1986). Cholinergic systems in the brain and spinal cord: anatomic organization and overview of functions. In: Fisher, A., Hanin, I. & Lachman, C. (Eds.), *Alzheimer's and Parkinson's diseases: strategies for research and development*. *Advances in Behavioral Biology*, **29**, 5-16. New York: Plenum Press, pp. 5-16.
- Butler, R.N. (1997). Population aging and health. *British Medical Journal*, **315**, 1082-1084.
- ## C
- Candy, J.M., Perry, R.H., Perry, E.K., Irving, D., Blessed, G., Fairbairn, A.F. & Tomlinson, B.E. (1983). Pathological changes in the nucleus of Meynert in Alzheimer's and Parkinson's diseases. *Journal of the Neurological Sciences*, **54**, 277-289.
- Campbell, B.A., Krauter, E.E. & Wallace, J.E. (1980). Animal models of aging: sensory-motor and cognitive function in the aged rat. In: Stein, D.G. (Ed.). *The psychobiology of aging: problems and perspectives*. Amsterdam: Elsevier, pp. 201-226.
- Campbell, D.T. & Fiske, D.W. (1955). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, **56**(2), 81-105.
- Campbell, I.L. & Gold, L.H. (1996). Transgenic modeling of neuropsychiatric disorders. *Molecular Psychiatry*, **1**, 105-120.
- Caplan, L.R. (Ed.), (1995). *Brain ischemia. Basic concepts and clinical relevance*. London: Springer Verlag.
- Caprioli, A., Ghirardi, O., Giuliani, A., Ramacci, M.T. & Angelucci, L. (1991). Spatial learning and memory in the radial maze: a longitudinal study in rats from 4 to 25 months of age. *Neurobiology of Aging*, **12**, 605-607.
- Caprioli, A., Markowska, A.L. & Olton, D.S. (1995). Acetyl-L-carnitine: chronic treatment improves spatial acquisition in a new environment in aged rats. *Journal of Gerontology*, **50A**, B232-B236.
- Carli, M., Robbins, T.W., Evenden, J.L. & Everitt, B.J. (1983). Effects of lesions to ascending noradrenergic neurones on performance of a 5-choice serial reaction task in rats; implications for theories of dorsal noradrenergic bundle function based on selective attention and arousal. *Behavioural Brain Research*, **9**, 361-380.
- Casamenti, F., DiPatre, P.L., Milan, F., Petrelli, L. & Pepeu, G. (1989). Effects of nerve growth factor and GM1 ganglioside on the number and size of cholinergic neurons in rats with unilateral lesion of the nucleus basalis. *Neuroscience Letters*, **103**, 87-91.
- Chen, Y., Constantini, S., Trembovler, V., Weinstock, M. & Shohami, E. (1996). An experimental model of closed head injury in mice: pathophysiology, histopathology, and cognitive deficits. *Journal of Neurotrauma*, **13**, 557-568.

- Chiamulera, C., Terron, A., Reggiani, A. & Cristofori, P. (1993). Quantitative and qualitative analysis of the progressive cerebral damage after middle cerebral artery occlusion in mice. *Brain Research*, **606**, 251-258.
- Chiba, A.A., Bucci, D.J., Holland, P.C. & Gallagher, M. (1995). Basal forebrain cholinergic lesions disrupt increments but not decrements in conditioned stimulus processing. *The Journal of Neuroscience*, **15**(11), 7315-7322.
- Choi, D.W. (1996). Ischemia-induced neuronal apoptosis. *Current Opinion in Neurobiology*, **6**, 667-672.
- Clough, G. (1991). Suggested guidelines for the housing and husbandry of rodents for aging research. *Neurobiology of Aging*, **12**, 653-658.
- Coates, M.E. (1991). Nutritional considerations in the production of rodents for aging studies. *Neurobiology of Aging*, **12**, 679-682.
- Cockcroft, K.M., Meistrell, M., III, Zimmerman, G.A., Risucci, D., Bloom, O., Cerami, A. & Tracey, K.J. (1996). Cerebroprotective effects of aminoguanidine in a rodent model of stroke. *Stroke*, **27**, 1393-1398.
- Cohn, J., MacPhail, R.C. & Paule, M.G. (1996). Repeated acquisition and the assessment of centrally acting compounds. *Cognitive Brain Research*, **3**, 183-191.
- Collier, T.J. & Coleman, P.D. (1991). Divergence of biological and chronological aging: evidence from rodent studies. *Neurobiology of Aging*, **12**, 685-693.
- Collerton, D. (1986). Cholinergic function and intellectual decline in Alzheimer's disease. *Neuroscience*, **19**, 1-28.
- Connor, D.J., Langdon, D.J., Langlais, P.J. & Thal, L.J. (1993). Effects of NBm lesions of T-maze performance and thalamic biochemistry. *Neurobiology of Aging*, **14**, 535-537.
- Cook, L., Nickolson, V.J., Steinfels, G.F., Rohrbach, K.W. & DeNoble, V.J. (1990). Cognition enhancement by the acetylcholine releaser DuP 996. *Drug Development Research*, **19**, 301-314.
- Corbett, D., Nurse, S. & Colbourne, F. (1997). Hypothermic neuroprotection. A global ischemia study using 18- to 20-month-old gerbils. *Stroke*, **28**, 2238-2243.
- Cosette, P., Umbriaco, D., Zamar, N., Hamel, E. & Descarries, L. (1993). Recovery of choline acetyltransferase activity without sprouting of the residual acetylcholine innervation in adult rat cerebral cortex after lesion of the nucleus basalis. *Brain Research*, **630**, 195-206.
- Coyle, J.T., Price, D.L. & DeLong, M.R. (1983). Alzheimer's disease: a disorder of cortical cholinergic innervation. *Science*, **219**, 1184-1190.
- Coyle, P. (1975). Arterial patterns of the rat rhinencephalon and related structures. *Experimental Neurology*, **49**, 671-690.
- Coyle, P. & Jokelainen, P.T. (1982). Dorsal cerebral collaterals of the rat. *The Anatomical Record*, **203**, 397-404.
- Coyle, P., Odenheimer, D.J. & Sing, C.F. (1984). Cerebral infarction after middle cerebral artery occlusion in progenies of spontaneously stroke-prone and normal rats. *Stroke*, **15**, 711-716.
- Crannell, C.W. (1942). The choice point behavior of rats in a multiple path elimination problem. *The Journal of Psychology*, **13**, 201-222.
- Crawley, J.N., Belknap, J.K., Collins, A., Crabbe, J.C., Frankel, W., Henderson, N., Hitzemann, R.J., Maxson, S.C., Miner, L.L., Silva, A.J., Wehner, J.M., Wynshaw-Boris, A. & Paylor, R. (1997). Behavioral phenotypes of inbred mouse strains: implications and recommendations for molecular studies. *Psychopharmacology*, **132**, 107-124.
- Crespi, F. & Pietra, C. (1997). Middle cerebral artery occlusion alters neurotransmitter activities in ipsilateral and contralateral brain regions: an ex vivo voltammetric study. *Neuroscience Letters*, **230**, 22-80.
- Cronbach, L.J. & Meehl, P.E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, **52**(4), 281-302.
- Crumrine, C., Thomas, A.L. & Morgan, P.F. (1994). Attenuation of p53 expression protects against focal ischemic damage in transgenic mice. *Journal of Cerebral Blood Flow and Metabolism*, **14**, 887-891.
- Crusio, W.E. (1993). Bi- and multivariate analyses of diallel crosses: a tool for the genetic dissection of neurobehavioral phenotypes. *Behavior Genetics*, **23**, 59-67.
- Crusio, W.E. & Schmitt, A. (1998). A multivariate quantitative-genetic analysis of behavioral development in mice. *Developmental Psychobiology*, **32**, 339-351.
- Cummings, J.L. & Kaufer, D. (1996). Neuropsychiatric aspects of Alzheimer's disease: the cholinergic hypothesis revisited. *Neurology*, **47**, 876-883.

D

- Daniel, W.W. (1978). *Applied nonparametric statistics*. Boston: Houghton Mifflin Company.
- Davies, P. (1985). A critical review of the role of the cholinergic system in human memory and cognition. In: Olton, D.S., Gamzu, E. & Corkin, S. (Eds.), *Memory dysfunctions: an integration of animal and human research from preclinical and clinical perspectives*. *Annals of the New York Academy of Sciences*, **444**, 212-217.

- Davis, H. (1996). Underestimating the rat's intelligence. *Cognitive Brain Research*, **3**, 291-298.
- Davis, H.P., Idowu, A. & Gibson, G.E. (1983). Improvement of 8-arm maze performance in aged Fischer 344 rats with 3,4-Diaminopyridine. *Experimental Aging Research*, **9**, 211-214.
- Davison, A.N. (1987). Pathophysiology of ageing brain. *Gerontology*, **33**, 129-135.
- Dawson, G.R., Heyes, C.M. & Iversen, S.D. (1992). Pharmacological mechanisms and animal models of cognition. *Behavioural Pharmacology*, **3**, 285-297.
- Dean, R.L., III., Scozzafava, J., Goas, J.A., Regan, B., Beer, B. & Bartus, R.T. (1981). Age-related differences in behavior across the life span of the C57BL/6J mouse. *Experimental Aging Research*, **7**, 427-451.
- Decker, M.W. (1987). The effects of aging on hippocampal and cortical projections of the forebrain cholinergic system. *Brain Research Reviews*, **12**, 423-438.
- Decker, M.W. (1995). Animal models of cognitive function. *Critical Reviews in Neurobiology*, **9**(4), 321-343.
- Decker, M.W., Pelleymounter, M.A. & Gallagher, M. (1988). Effects of training on a spatial memory task on high affinity choline uptake in hippocampus and cortex in young adult and aged rats. *The Journal of Neuroscience*, **8**, 90-99.
- Deerberg, F. (1991). Age-associated versus husbandry-related pathology of aging rats. *Neurobiology of Aging*, **12**, 659-662.
- Deitrich, R.A. (1993). Selective breeding for initial sensitivity to ethanol. *Behavior Genetics*, **23**, 153-162.
- Dekker, A.J.A.M., Connor, D.J. & Thal, L.J. (1991). The role of cholinergic projections from the nucleus basalis in memory. *Neuroscience & Biobehavioral Reviews*, **15**, 299-317.
- de Koning-Verest, I.F., Knook, D.L. & Wolthuis, O.L. (1980). Behavioral and biochemical correlates of aging in rats. In: Stein, D.G. (Ed.), *The psychobiology of aging: problems and perspectives* (pp. 177-199). New York: Elsevier North Holland, Inc.
- del Zoppo, G.J., Wagner, S. & Tagaya, M. (1997). Trends and future developments in the pharmacological treatment of acute ischaemic stroke. *Drugs*, **54**(1), 9-38.
- Denenberg, V.H., Sherman, G.F., Schrott, L.M., Rosen, G.D. & Galaburda, A.M. (1991). Spatial learning, discrimination learning, paw preference and neocortical ectopias in two autoimmune strains of mice. *Brain Research*, **562**, 98-104.
- Denenberg, V.H., Talgo, N.W., Waters, N.S. & Kenner, G.H. (1990). A computer-aided procedure for measuring Morris maze performance. *Physiology & Behavior*, **47**, 1027-1029.
- De Ryck, M., Van Dellen, J., Borgers, M., Wauquier, A. & Janssen, P.A.J. (1989). Photochemical stroke model: flunarizine prevents sensorimotor deficits after neocortical infarcts in rats. *Stroke*, **20**, 1383-1390.
- Deutsch, J.A. (1993). Spatial learning in mutant mice. *Science*, **262**, 760-763.
- De Vry, J., Glaser, T., Schuurman, T., Schreiber, R. & Traber, J. (1991). 5-HT_{1A}-receptors in anxiety. In: Briley, M. & File, S.E. (Eds.), *New concepts in anxiety*. London: MacMillan Press, pp. 95-129.
- Didriksen, M. & Christensen, A.V. (1993). Differences in performance in three strains of rats in a 5-choice serial reaction time task. *Pharmacology & Toxicology*, **72**, 66-68.
- DiMatta, B.D. & Kesner, R.P. (1988). Spatial cognitive maps: differential role of parietal cortex and hippocampal formation. *Behavioral Neuroscience*, **102**, 471-480.
- Dixon, C.E., Clifton, G.L., Lighthall, J.W., Yaghmai, A.A. & Hayes, R.L. (1991). A controlled cortical impact model of traumatic brain injury in the rat. *Journal of Neuroscience Methods*, **39**, 253-262.
- Dixon, C.E., Liu, S.-J., Jenkins, L.W., Bhattacharjee, M., Whitson, J.S., Yang, K. & Hayes, R.L. (1995). Time course of increased vulnerability of cholinergic neurotransmission following traumatic brain injury in the rat. *Behavioural Brain Research*, **70**, 125-131.
- Dixon, C.E., Markgraf, C.G., Angileri, F., Pike, B.R., Wolfson, B., Newcomb, J.K., Bismar, M.M., Blanco, A.J., Clifton, G.L. & Hayes, R.L. (1998). Protective effects of moderate hypothermia on behavioral deficits but not necrotic cavitation following cortical impact injury in the rat. *Journal of Neurotrauma*, **15**, 95-103.
- D'Mello, G.D. & Steckler, T. (1996). Animal models in cognitive behavioural pharmacology: an overview. *Cognitive Brain Research*, **3**, 345-352.
- Dokla, C.P.J. & Thal, L.J. (1989). Nucleus basalis magnocellularis lesions facilitate two-way active avoidance. *Physiology & Behavior*, **46**, 763-765.
- Dolan, P. (1998). Valuing health-related quality of life. Issues and controversies. *Pharmacoconomics*, **15**, 119-127.
- Dornan, W.A., McCampbell, A.R., Tinkler, G.P., Hickman, L.J., Bannon, A.W., Decker, M.W. & Gunther, K.L. (1996). Comparison of site-specific injections into the basal forebrain on water maze and radial arm maze performance in the male rat after immunolesioning with 192 IgG saporin. *Behavioural Brain Research*, **82**, 93-101.
- Dorner, H., Otte, P. & Platt, D. (1996). Training influence on age-dependent change in the gait of rats. *Gerontology*, **42**, 7-13.

- Doty, B.A. (1966). Age differences in avoidance conditioning as a function of distribution of trials and task difficulty. *The Journal of Genetic Psychology*, **109**, 249-254.
- Duff, K. (1997). Alzheimer transgenic mouse models come to age. *Trends in Neurosciences*, **20**(7), 279-280.
- Dunnett, S.B. (1985). Comparative effects of cholinergic drugs and lesions of nucleus basalis or fimbria-fornix on delayed matching in rats. *Psychopharmacology*, **87**, 357-363.
- Dunnett, S.B., Badman, F., Rogers, D.C., Evenden, J.L. & Iverson, S.D. (1988). Cholinergic grafts in the neocortex or hippocampus of aged rats: reduction of delay-dependent deficits in the delayed non-matching to position task. *Experimental Neurology*, **102**(1), 57-64.
- Dunnett, S.B. & Barth, T.M. (1991). Animal models of Alzheimer's disease and dementia (with an emphasis on cortical cholinergic systems). In: Willner, P. (Ed.), *Behavioural models in psychopharmacology: theoretical, industrial and clinical perspectives*. Cambridge: Cambridge University Press, pp. 359-418.
- Dunnett, S.B., Everitt, B.J. & Robbins, T.W. (1991). The basal forebrain-cortical cholinergic system: interpreting the functional consequences of excitotoxic lesions. *Trends in Neurosciences*, **14**(11), 494-501.
- Dunnett, S.B., Rogers, D.C. & Jones, G.H. (1989). Effects of nucleus basalis magnocellularis lesions in rats on delayed matching and non-matching to position tasks: disruption of conditional discrimination learning but not of short-term memory. *European Journal of Neuroscience*, **1**, 395-406.
- Dusek, J.A. & Eichenbaum, H. (1997). The hippocampus and memory for orderly stimulus relations. *Proceedings of the National Academy of Sciences, USA*, **94**, 7109-7114.
- Duverger, D., Lecoffre, C. & MacKenzie, E.T. (1985). Histological quantification of cerebral infarction following middle cerebral artery occlusion in various rat strains. *Journal of Cerebral Blood Flow and Metabolism*, **5**, (Supplement 1), S415-S416.
- Duverger, D. & MacKenzie, E.T. (1988). The quantification of cerebral infarction following focal ischemia in the rat: influence of strain, arterial pressure, blood glucose concentration, and age. *Journal of Cerebral Blood Flow and Metabolism*, **8**, 449-461.
- E**
- Edwardson, J., Perry, R., Candy, J., Oakley, A. & Perry, E. (1986). Structural and chemical aspects of cortical pathology in Alzheimer's disease. In: Fisher, A., Hanin, I. & Lachman, C. (Eds.), *Alzheimer's and Parkinson's diseases: strategies for research and development. Advances in Behavioral Biology*, **29**, 43-51. New York: Plenum Press.
- Eijkenboom, M. & van der Staay, F.J. (1999). Spatial learning deficits in rats after injection of vincristine into the dorsal hippocampus. *Neuroscience*, **91**, 1299-1313.
- Eklof, B. & Siesjö, B. (1972). The effect of bilateral carotid artery ligation upon the blood flow and energy state of the rat brain. *Acta Physiologica Scandinavica*, **86**, 155-165.
- Elias, P.K. & Elias, M.F. (1976). Effects of age on learning ability: contributions from the animal literature. *Experimental Aging Research*, **2**, 165-186.
- Ellenbroek, B. & Cools, A.R. (1988). The paw test: an animal model for neuroleptic drugs which fulfills the criteria for pharmacological isomorphism. *Life Sciences*, **42**, 1205-1213.
- Ellenbroek, B.A. & Cools, A.R. (1990). Animal models with construct validity for schizophrenia. *Behavioural Pharmacology*, **1**, 469-490.
- Ellenbroek, B.A., Peeters, B.W., Honig, W.M. & Cools, A.R. (1987). The paw test: a behavioral paradigm for differentiating between classical and atypical neuroleptic drugs. *Psychopharmacology*, **93**, 343-348.
- Era, P., Jokela, J. & Heikkinen, E. (1986). Reaction and movement times in men of different ages: a population study. *Perceptual and Motor Skills*, **63**, 111-130.
- Errington, M.L., Bliss, T.V.P., Morris, R.J., Laroche, S. & Davis, S. (1997). Long-term potentiation in awake mutant mice. *Nature*, **387**, 666-667.
- Evans, G.W., Brennan, P.L., Skorpanich, M.A. & Held, D. (1984). Cognitive mapping and elderly adults: verbal and location memory for urban landmarks. *Journal of Gerontology*, **39**, 452-457.
- Everitt, B.J., Robbins, T.W., Evenden, J.L., Marston, H.M., Jones, G.H. & Sirkia, T.E. (1987). The effects of excitotoxic lesions of the substantia innominata, ventral and dorsal globus pallidus on the acquisition and retention of a conditional visual discrimination: implications for cholinergic hypotheses of learning and memory. *Neuroscience*, **22**, 441-469.

F

- Falconer, D.S. & Mackay, T.F.C. (1996). *Introduction to quantitative genetics* (4th ed.). Longman.
- Fantie, B.D. & Kolb, B. (1990). An examination of prefrontal lesion size and the effects of cortical grafts on performance of the Morris water task by rats. *Psychobiology*, **18**, 74-80.

- Farooqui, A.A., Liss, L. & Horrocks, L.A. (1988). Neurochemical aspects of Alzheimer's disease: involvement of membrane phospholipids. *Metabolic Brain Disease*, **3**, 19-35.
- Ferguson, G.A. (1971). *Statistical analysis in psychology & education* (3rd ed.). Tokyo: McGraw-Hill Kogakusha, Ltd.
- Fernández-Teruel, A., Escorihuela, R.M., Driscoll, P., Tobeña, A. & Bättig, K. (1994). Evaluating activity and emotional reactivity in a hexagonal tunnel maze: correlational and factorial analysis from a study with Roman/Verh rat lines. *Behavior Genetics*, **24**, 419-425.
- Festing, M.F.W. (Ed.). (1980). *International index of laboratory animals* (4th ed.). Medical Research Council, Laboratory animals centre, United Kingdom.
- Festing, M.F.W. (1991). Genetic quality control of laboratory animals used in aging studies. *Neurobiology of Aging*, **12**, 673-677.
- Festing, M.F.W. (1993). Genetic variation in outbred rats and mice and its implications for toxicological screening. *Journal of Experimental Animal Science*, **35**, 210-220.
- Festing, M.F.W. (1999). Warning: the use of heterogeneous mice may seriously damage your research. *Neurobiology of Aging*, **20**, 237-244.
- Fibiger, H. (1991). Cholinergic mechanisms in learning, memory and dementia: a review of recent evidence. *Trends in Neurosciences*, **14**, 220-223.
- File, S.E. & Fluck, E. (1994). Handling alters habituation and response to stimulus change in the holeboard. *Pharmacology Biochemistry and Behavior*, **49**, 449-453.
- Finch, C. (1991). New models for new perspectives in the biology of senescence. *Neurobiology of Aging*, **12**, 625-634.
- Finch, C.E. & Tanzi, R.E. (1997). Genetics of aging. *Science*, **278**, 407-411.
- Fischer, G. (1974). *Einführung in die Theorie psychologischer Tests*. Bern: Verlag Hans Huber.
- Fischer, W., Björklund, A., Chen, K. & Gage, F.H. (1991). NGF improves spatial memory in aged rodents as a function of age. *The Journal of Neuroscience*, **11**, 1889-1906.
- Fischer, W., Gage, F.H. & Björklund, A. (1989). Degenerative changes in forebrain cholinergic nuclei correlate with cognitive impairments in aged rats. *European Journal of Neuroscience*, **1**, 34-45.
- Flicker, C., Bartus, R.T., Crook, T.H. & Ferris, S.H. (1984). Effects of aging and dementia upon recent visuospatial memory. *Neurobiology of Aging*, **5**, 275-283.
- Flicker, C., Dean, R.L., Watkins, D.L., Fisher, S.K. & Bartus, R.T. (1983). Behavioral and neurochemical effects following neurotoxic lesions of a major cholinergic input to the cerebral cortex in the rat. *Pharmacology Biochemistry & Behavior*, **18**, 973-981.
- Flicker, C., Ferris, S.H., Crook, T., Bartus, R.T. & Reisberg, B. (1985). Cognitive function in normal aging and early dementia. In: Traber, J. & Gispen, W.H. (Eds.), *Senile dementia of the Alzheimer Type*. Berlin: Springer Verlag, pp. 2-17.
- Flint, J. & Corley, R. (1996). Do animal models have a place in the genetic analysis of quantitative human behavioural traits? *Journal of Molecular Medicine*, **74**, 515-521.
- Flood, D.G. & Coleman, P.D. (1988). Neuron numbers and sizes in aging brain: comparisons of human, monkey, and rodent data. *Neurobiology of Aging*, **9**, 453-463.
- Fonnum, F. (1975). A rapid radiochemical method for the determination of choline acetyl transferase. *Journal of Neurochemistry*, **24**, 407-409.
- Fong, T.G., Neff, N.H. & Hadjiconstantinou, M. (1997). GM1 ganglioside improves spatial learning and memory in aged rats. *Behavioural Brain Research*, **85**, 203-211.
- Forster, M.J., Dubey, A., Dawson, K.M., Stutts, W.A., Lal, H. & Sohal, R.S. (1996). Age-related loss of cognitive function and motor skills in mice are associated with oxidative protein damage in the brain. *Proceedings of the National Academy of Sciences USA*, **93**, 4765-4769.
- Foster, M.J. & Lal, H. (1991). Neurobehavioral biomarkers of aging: influence of genotype and dietary restriction. *Biomedical and Environmental Sciences*, **4**, 144-165.
- Fox, G.B., Fan, L., Levasseur, R.A. & Faden, A.I. (1998). Sustained sensory/motor and cognitive deficits with neuronal apoptosis following controlled cortical impact brain injury in the mouse. *Journal of Neurotrauma*, **15**, 599-614.
- Francis, D.D., Zaharia, M.D., Shanks, N. & Anisman, H. (1995). Stress-induced disturbances in Morris water-maze performance: interstrain variability. *Physiology & Behavior*, **58**, 57-65.
- Franssen, E.H., Reisberg, B., Kluger, A., Sinaiko, E. & Boja, C. (1991). Cognition-independent neurologic symptoms in normal aging and probable Alzheimer's disease. *Archives of Neurology*, **48**, 148-154.
- Freund, R.J. & Littell, R.C. (1985). *SAS for linear models*. Cary, N.C.: SAS Institute Inc.
- Frick, K.M., Baxter, M.G., Markowska, A.L., Olton, D.S. & Price, D.L. (1995). Age-related spatial reference and working memory deficits assessed in the water maze. *Neurobiology of Aging*, **16**, 149-160.
- Fujita, O., Annen, Y. & Kitaoka, A. (1994). Tsukuba high- and low emotional strains of rats (*rattus norvegicus*): An overview. *Behavior Genetics*, **24**, 389-415.

G

- Gage, F.H., Chen, K.S., Buzsaki, G. & Armstrong, D. (1988). Experimental approaches to age-related cognitive impairments. *Neurobiology of Aging*, **9**, 645-655.
- Gage, F.H., Dunnett, S.B. & Björklund, A. (1984). Spatial learning and motor deficits in aged rats. *Neurobiology of Aging*, **5**, 43-48.
- Gage, F.H., Dunnett, S.B. & Björklund, A. (1989). Age-related impairments in spatial memory are independent of those in sensorimotor skills. *Neurobiology of Aging*, **10**, 347-352.
- Gage, F.H., Dunnett, S.B., Stenevi, U. & Björklund, A. (1983). Aged rats: recovery of motor impairments by intrastriatal nigral grafts. *Science*, **221**, 966-969.
- Gallagher, M. (1993). Issues in the development of models for cognitive aging across primate and nonprimate species. *Neurobiology of Aging*, **14**, 631-633.
- Gallagher, M. & Burwell, R.D. (1989). Relationship of age-related decline across several behavioral domains. *Neurobiology of Aging*, **10**, 691-708.
- Gallagher, M., Burwell, R. & Burchinal, M. (1993). Severity of spatial learning impairment in aging: development of a learning index for performance in the Morris water maze. *Behavioral Neuroscience*, **107**, 618-626.
- Gallagher, M. & Pelleymounter, M.A. (1988). Spatial learning deficits in old rats: a model for memory decline in the aged. *Neurobiology of Aging*, **9**, 549-556.
- Gamzu, E. (1985). Animal behavioral models in the discovery of compounds to treat memory dysfunction. In: Olton, D.S., Gamzu, E. & Corkin, S. (Eds.), *Memory dysfunctions: an integration of animal and human research from preclinical and clinical perspectives*. *Annals of the New York Academy of Sciences*, **444**, 370-393.
- Gamzu, E.R., Hoover, T.M., Gracon, S.I. & Ninteman, M.V. (1989). Recent developments in 2-pyrrolidinone-containing nootropics. *Drug Development Research*, **18**, 177-189.
- Garattini, S. (1997). Alternatives to animal experiments: expectations and limitations. In: van Zutphen, L.F.M. & Balls, M. (Eds.), *Animal alternatives, welfare and ethics*. Amsterdam: Elsevier, pp. 55-66.
- Garcia, J.H. (1995). Mechanisms of cell death in ischemia. In: Caplan, L.R. (Ed.). *Brain ischemia. Basic concepts and clinical relevance*. London: Springer Verlag, pp. 7-18.
- Garcia, J.H., Liu, K.-F., Ye, Z.-R. & Gutierrez, J.A. (1997). Incomplete infarct and delayed neuronal death after transient middle cerebral artery occlusion in rats. *Stroke*, **28**, 2303-2310.
- Garcia, J.H., Wagner, S., Liu, K.-F. & Hu, X.-j. (1995). Neurological deficit and extent of neuronal necrosis attributable to middle cerebral artery occlusion in rats. Statistical validation. *Stroke*, **26**, 627-635.
- Gartshore, G., Dawson, D., Patterson, J. & Macrae, I.M. (1995). Topographic profile of reperfusion into MCA territory following endothelin-1-induced transient focal cerebral ischaemia. *Neuroscience Letters*, **202**, 209-213.
- Gerlai, R. (1998). A new continuous alternation task in T-maze detects hippocampal dysfunction in mice. A strain comparison and lesion study. *Behavioural Brain Research*, **95**, 91-101.
- Gershenson, H.K. & Paul, S.M. (1997). Mapping quantitative trait loci for fear-like behaviors in mice. *Genomics*, **46**, 1-8.
- Gershenson, H.K. & Paul, S.M. (1998). Towards a genetics of anxious temperament: from mice to men. *Acta Psychiatrica Scandinavica*, **98** (Suppl. 393), 56-65.
- 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 Research Reviews*, **25**, 217-245.
- Gibbon, J., Church, R.M. & Meck, W.H. (1984). Scalar timing in memory. In: Gibbon, J. & Allan, L. (Eds.), *Timing and time perception*. *Annals of the New York Academy of Sciences*, **423**, 52-77.
- Gingrich, J.R. & Roder, J. (1998). Inducible gene expression in the nervous system of transgenic mice. *Annual Review of Neuroscience*, **21**, 377-405.
- Ginsberg, M.D. & Pulsinelli, W.A. (1994). The ischemic penumbra, injury thresholds, and the therapeutic window for acute stroke. *Annals of Neurology*, **36**, 553-554.
- Gispen, W.H., Schuurman, T. & Traber, J. (1988). Nimodipine and neural plasticity in the peripheral nervous system of adult and aged rats. In: Morad, M., Nayler, W.G., Kazda, S. & Schramm, M. (Eds.), *Structure, function & implications*. Berlin: Springer-Verlag.
- Givens, B. & Olton, D.S. (1994). Local modulation of basal forebrain: effects on working and reference memory. *The Journal of Neuroscience*, **14**, 3578-3587.
- Gleiser, C.A. & Shain, S.A. (1986). The aging AXB/SSh rat: assessment of longevity and prevalence of neoplastic and nonneoplastic diseases in necropsied rats. *Journal of Gerontology*, **41**, 590-598.
- Gold, L.H. (1996). Integration of molecular biological techniques and behavioural pharmacology. *Behavioural Pharmacology*, **7**, 589-615.

- Goldman, H., Berman, R.F., Gershon, S., Murphy, S., Morehead, M. & Altman, H.J. (1991). Cerebrovascular permeability and cognition in the aging rat. *Neurobiology of Aging*, **13**, 57-62.
- Goldstein, L.B. (1989). Amphetamine-facilitated functional recovery after stroke. In M.D. Ginsberg & W.D. Dietrich (Eds.), *Cerebrovascular Diseases* (pp. 303-308). Raven Press: New York.
- Goodrick, C.L. (1968). Learning, retention, and extinction of a complex maze habit for mature-young and senescent Wistar albino rats. *Journal of Gerontology*, **23**, 298-304.
- Goodrick, C.L. (1972). Learning by mature-young and aged Wistar albino rats as a function of test complexity. *Journal of Gerontology*, **27**, 353-357.
- Goodrick, C.L. (1975). Behavioral rigidity as a mechanism for facilitation of problem solving for aged rats. *Journal of Gerontology*, **30**, 181-184.
- Gorelick, P.B. (1995). Epidemiology and trials. In: Caplan, L.R. (Ed.). *Brain ischemia. Basic concepts and clinical relevance*. London: Springer Verlag, pp. 343-353.
- Gottfries, C.-G., Adolfsson, R., Aquilonius, S.-M., Carlsson, A., Eckernas, S.-D., Nordberg, A., Oreland, L., Svennerholm, L., Wiberg, D. & Winblad, B. (1983). Biochemical changes in dementia disorders of Alzheimer type (AD/SDAT). *Neurobiology of Aging*, **4**, 261-271.
- Gotti, B., Benavides, J., MacKenzie, E.T. & Scatton, B. (1990). The pharmacotherapy of focal cortical ischaemia in the mouse. *Brain Research*, **522**, 290-307.
- Gower, A.J. & Lamberty, Y. (1993). The aged mouse as a model of cognitive decline with special emphasis on studies in NMRI mice. *Behavioural Brain Research*, **57**, 163-173.
- Gozlan, H., Daval, G., Verge, D., Spampinato, U., Fattaccini, C.M., Gallissot, M.C., el Mestikawy, S. & Hamon, M. (1990). Aging associated changes in serotonergic and dopaminergic pre- and postsynaptic neurochemical markers in the rat brain. *Neurobiology of Aging*, **11**, 437-449.
- Grant, S.G.N., O'Dell, T.J., Karl, K.A., Stein, P.L., Soriano, P., Kandel, E.R. (1992). Impaired long-term potentiation, spatial learning, and hippocampal development in *fyn* mutant mice. *Science*, **258**, 1903-1910.
- Grauer, E. & Kapon, Y. (1993). Wistar-Kyoto rats in the Morris water maze: impaired working memory and hyper-reactivity to stress. *Behavioural Brain Research*, **59**, 147-151.
- Green, E.J., Dietrich, W.D., van Dijk, F., Bustos, R., Markgraf, C.G., McCabe, P.M., Ginsberg, M.D. & Schneiderman, N. (1992). Protective effects of brain hypothermia on behavior and histopathology following global cerebral ischemia in rats. *Brain Research*, **580**, 197-204.
- Greenberg, B.D., Savage, M.J., Howland, D.S., Ali, S.M., Siedlak, S.L., Perry, G., Siam, R. & Scott, R.W. (1996). APP transgenesis: approaches toward the development of animal models for Alzheimer disease neuropathology. *Neurobiology of Aging*, **17**, 153-171.
- Grigoryan, G.A., Mitchell, S.N., Hodges, H., Sinden, J.D. & Gray, J.A. (1994a). Are the cognitive-enhancing effects of nicotine in the rat with lesions to the forebrain cholinergic projection system mediated by an interaction with the noradrenergic system? *Pharmacology Biochemistry and Behavior*, **49**, 511-521.
- Grigoryan, G.A., Peters, S., Gray, J.A. & Hodges, H. (1994b). Interactions between the effects of propranolol and nicotine on radial maze performance of rats with lesions of the forebrain cholinergic projection system. *Behavioural Pharmacology*, **5**, 265-280.
- Groó, D., Pálosi, E. & Szporny, L. (1989). Cognitive enhancers prevent the hypoxia-induced disruption of conditioned avoidance response. *Drug Development Research*, **18**, 19-28.
- Guldin, W.O. & Markowitsch, H.J. (1981). No detectable remote lesions following massive intrastriatal injections of ibotenic acid. *Brain Research*, **225**, 446-451.
- Guldin, W.O. & Markowitsch, H.J. (1982). Epidural kainate, but not ibotenate, produces lesions in local and distal regions of the brain. A comparison of the intra-cerebral actions of kainic and ibotenic acid. *Journal of Neuroscience Methods*, **5**, 83-93.
- Gutnikov, S.A., Barnes, J.C. & Rawlins, J.N.P. (1994). Working memory tasks in five-choice operant chambers: use of relative and absolute spatial memory. *Behavioral Neuroscience*, **108**, 899-910.
- Gyger, M., Kolly, D. & Guigoz, Y. (1992). Aging, modulation of food intake and spatial memory: a longitudinal study. *Archives of Gerontology and Geriatry*, Suppl. **3**, 185-196.
- ## H
- Hagan, J.J., Alpert, J.E., Morris, R.G.M. & Iversen, S.D. (1983). The effects of central catecholamine depletions on spatial learning in rats. *Behavioural Brain Research*, **9**, 83-105.
- Hagan, J.J. & Morris, R.G.M. (1988). The cholinergic hypothesis of memory: a review of animal experiments. In: Iversen, L.L., Iversen, S.D. & Snyder, S.H. (Eds.), *Handbook of Psychopharmacology*, **20**, New York: Plenum Press, pp. 237-323.
- Haines, D.E., Harkey, H.L. & Al-Mefty, O. (1993). The "subdural" space: a new look at an outdated concept. *Neurosurgery*, **32**, 111-120.

- Hamm, R.J., Dixon, C.E., Gbadebo, D.M., Singha, A.K., Jenkins, L.W., Lyeth, B.G. & Hayes, R.L. (1992). Cognitive deficits following traumatic brain injury produced by controlled cortical impact. *Journal of Neurotrauma*, **9**, 11-20.
- Hamm, R.J., Temple, M.D., Pike, B.R., O'Dell, D.M., Buck, D.L. & Lyeth, B.G. (1996). Working memory deficits following traumatic brain injury in the rat. *Journal of Neurotrauma*, **13**(6), 317-323.
- Hara, H., Kogure, K., Kato, H., Ozaki, A. & Sukamoto, T. (1991). Amelioration of brain damage after focal ischemia in the rat by a novel inhibitor of lipid peroxidation. *European Journal of Pharmacology*, **197**, 75-82.
- Hazzard, D.G. (1991). Relevance of the rodent model to human aging studies. *Neurobiology of Aging*, **12**, 645-649.
- Hazzard, D.G., Bronson, R.T., McClearn, G.E. & Strong, R. (1992). Selection of an appropriate animal model to study aging processes with special emphasis on the use of rat strains. *Journal of Gerontology*, **47**, B63-B64.
- Heinitz, M. (1997). *Schicksal Alzheimer. Ursachen - Symptome - Behandlungsmöglichkeiten*. Heidelberg: Karl F. Haug Verlag.
- Heston, L.L. & White, J.A. (1991). *The vanishing mind*. New York: W.H. Freeman and Company.
- Higgins, L.S. & Cordell, B. (1995). Genetically engineered animal models of human neurodegenerative diseases. *Neurodegeneration*, **4**, 117-129.
- Himori, N., Watanabe, H., Akaike, N., Kurasawa, M., Itoh, J. & Tanaka, Y. (1990). Cerebral ischemia model with conscious mice. *Journal of Pharmacological and Toxicological Methods*, **23**, 311-327.
- Hirakawa, M., Tamura, A., Nagashima, H., Nakayama, H. & Sano, K. (1994). Disturbance of retention of memory after focal cerebral ischemia in rats. *Stroke*, **25**, 2471-2475.
- Hodges, H. (1996). Maze procedures: the radial-arm and water maze compared. *Cognitive Brain Research*, **3**, 167-181.
- Hodges, H., Sowinski, P., Sinden, J.D., Netto, C.A. & Fletcher, A. (1995). The selective 5-HT₃ receptor antagonist, WAY100289, enhances spatial memory in rats with ibotenate lesions of the forebrain cholinergic projection system. *Psychopharmacology*, **117**, 318-332.
- Hodges, H., Sowinski, P., Turner, J.J. & Fletcher, A. (1996). Comparison of the effects of the 5-HT₃ receptor antagonists WAY-100579 and ondansetron on spatial learning in the water maze in rats with excitotoxic lesions of the forebrain cholinergic projection system. *Psychopharmacology*, **125**, 146-161.
- Holden, C. (1996). New populations of old add to poor nations' burdens. *Science*, **273**, 46-48.
- Holley, L.A., Miller, J.A., Chmielewsky, P.A., Dudchenko, P. & Sarter, M.A. (1993). Interactions between the effects of basal forebrain lesions and chronic treatment with MDL 26,479 on learning and markers of cholinergic transmission. *Brain Research*, **610**, 181-193.
- Holley, L.A., Wiley, R.G., Lappi, D.A. & Sarter, M. (1994). Cortical cholinergic deafferentation following the intracortical infusion of 192 IgG-saporin: a quantitative histochemical study. *Brain Research*, **663**, 277-286.
- Holmes, I.S. & Hastings, I.M. (1995). Behavioural changes as a correlated response to selection. *Genetical Research*, **66**, 27-33.
- Hölscher, C. (1999). Stress impairs performance in spatial water maze learning tasks. *Behavioural Brain Research*, **100**, 225-235.
- Honig, W.K. (1978). Studies on working memory in the pigeon. In: Hulse, S.H., Fowler, H. & Honig, W.K. (Eds.), *Cognitive processes in animal behavior*. Hillsdale, N.J.: Laurence Erlbaum, pp. 211-248.
- Huang, Y.-Y., Kandel, E.R., Varshavsky, L., Brandon, E.P., Qi, M., Idzerda, R.L., McKnight, G.S. & Bourchouladze, R. (1995). A genetic test of the effects of mutations in PKA on mossy fiber LTP and its relation to spatial and contextual learning. *Cell*, **83**, 1211-1222.
- Huguet, F. & Tarrade, T. (1992). α_2 -Adrenoceptor changes during cerebral ageing. The effect of ginkgo biloba extract. *Journal of Pharmacy and Pharmacology*, **44**, 24-27.
- Huidobro, A., Blanco, P., Villalba, M., Gómez-Puertas, P., Villa, A., Pereira, R., Bogómez, E., Martínez-Serrano, A., Aparicio, J.J. & Sastrústegui, J. (1993). Age-related changes in calcium homeostatic mechanisms in synaptosomes in relation with working memory deficiency. *Neurobiology of Aging*, **14**, 479-486.
- Hunter, J.A., Green, R.A. & Cross, A.J. (1995). Animal models of acute ischaemic stroke: can they predict clinically successful neuroprotective drugs? *Trends in Pharmacological Sciences*, **16**, 123-128.

I

- Ingram, D.K. (1983). Toward the behavioral assessment of biological aging in the laboratory mouse: concepts, terminology, and objectives. *Experimental Aging Research*, **9**, 225-238.
- Ingram, D.K. (1985). Analysis of age-related impairments in learning and memory in rodent models. In: Olton, D.S., Gamzu, E. & Corkin, S. (Eds.), *Memory dysfunctions: an integration of animal and human research from preclinical and clinical perspectives*. *Annals of the New York Academy of Sciences*, **444**, 312-331.

- Ingram, D.K. (1988). Complex maze learning in rodents as a model of age-related memory impairment. *Neurobiology of Aging*, **9**, 475-485.
- Ingram, D.K. (1996). Brain-behavior linkages in aged rodent models: strategies for examining individual differences. *Neurobiology of Aging*, **17**, 497-499.
- Ingram, D.K., London, E.D. & Goodrick, C.L. (1981) Age and neurochemical correlates of radial maze performance in rats. *Neurobiology of Aging*, **2**, 41-47.
- Ingram, D.K. & Reynolds, M.A. (1986). Assessing the predictive validity of psychomotor tests as measures of biological age in mice. *Experimental Aging Research*, **12**, 155-162.
- Ingram, D.K., Spangler, E.L., Iijima, S., Ikari, H., Kuo, H., Greig, N.H. & London, E.D. (1994). Rodent models of memory dysfunction in Alzheimer's disease and normal aging: moving beyond the cholinergic hypothesis. *Life Sciences*, **55**, 2037-2049.
- Irwin, S. (1968). Comprehensive observational assessment: Ia. a systematic, quantitative procedure for assessing the behavioral and physiologic state of the mouse. *Psychopharmacologia (Berl.)*, **13**, 222-257.
- Isaacson, R.L., Douglas, R.J., Lubar, J.F. & Schmaltz, L.W. (1971). *A primer of physiological psychology*. New York: Harper & Row.
- Itoh, A., Nitta, A., Hirose, M., Hasegawa, T. & Nabeshima, T. (1997). Effects of metrifonate on impairment of learning and dysfunction of cholinergic neuronal system in basal forebrain-lesioned rats. *Behavioural Brain Research*, **83**, 165-167.
- Iversen, S.D. (1997). Behavioural evaluation of cholinergic drugs. *Life Science*, **60**, 1145-1152.

J

- Jacobs, R.W. & Butcher, L.L. (1986). Histopathology of the basal forebrain and its targets in Alzheimer dementia. In: Fisher, A., Hanin, I. & Lachman, C. (Eds.), *Alzheimer's and Parkinson's diseases: strategies for research and development. Advances in Behavioral Biology*, **29**, 17-23. New York: Plenum Press.
- Jaen, J.C. & Davis, R.E. (1993). Cholinergic therapies for Alzheimer's disease: acetylcholinesterase inhibitors of current clinical interest. *Current Opinion in Investigational Drugs*, **2**, 363-377.
- Jarrard, L.E. (1993). On the role of the hippocampus in learning and memory in the rat. *Behavioral and Neural Biology*, **60**, 9-26.
- Jarrard, L.E. (1995). What does the hippocampus really do? *Behavioural Brain Research*, **71**, 1-10.

- Jones, D.N.C., Barnes, J.C., Kirby, D.L. & Higgins, G.A. (1995). Age-associated impairments in a test of attention: evidence for involvement of cholinergic systems. *The Journal of Neuroscience*, **15**, 7282-7292.
- Jones, D.N.C. & Higgins, G.A. (1995). Effect of scopolamine on visual attention in rats. *Psychopharmacology*, **120**, 142-149.
- Jørgensen, H.S., Nakayama, H., Raaschou, H.O. & Olsen, T.S. (1995). Intracerebral hemorrhage versus infarction: stroke severity, risk factors, and prognosis. *Annals of Neurology*, **38**, 45-50.
- Jucker, M. & Ingram, D.K. (1997). Murine models of brain aging and age-related neurodegenerative diseases. *Behavioural Brain Research*, **85**, 1-25.
- Jürgens, M. & Dinse, H.R. (1997). *Differential effects of the Ca²⁺-influxblocker nimodipine on receptive field properties and response latencies of somatosensory cortical neurons in aged rats*. Ruhr-Universität Bochum, IR-INI 97-10 (ISSN 0943-2752).

K

- Kadar, T., Silbermann, M., Brandeis, R. & Levy, A. (1990). Age-related changes in the rat hippocampus: correlation with working memory deficiency. *Brain Research*, **512**, 113-120.
- Kametani, H., Bresnahan, E.L., Chachich, M.E., Spangler, E.L. & Ingram, D.K. (1989). Comparison of retention performance between young rats with fimbria-fornix lesions and aged rats in a 14-unit T-maze. *Behavioural Brain Research*, **35**, 253-263.
- Kaplan, A. (1973). *The conduct of inquiry. Methodology for behavioral science*. Aylesbury, Buck: International Textbook Company, Ltd.
- Kaplan, R.M. & Saccuzzo, D.P. (1997). *Psychological testing. Principles, applications, and issues* (4th ed.). Pacific Grove: Brooks/Cole Publishing Company.
- Katsuta, K., Nakanishi, H., Shirakawa, K., Yoshida, K., Takagi, K. & Tamura, A. (1995). The neuroprotective effect of the novel noncompetitive NMDA antagonist, FR115427 in focal cerebral ischemia in rats. *Journal of Cerebral Blood Flow and Metabolism*, **15**, 345-348.
- Katzman, R. (1986). Alzheimer's disease. *The New England Journal of Medicine*, **314**, 964-973.
- Kelsey, J.E. & Vargas, H. (1993). Medial septal lesions disrupt spatial, but not nonspatial, working memory in rats. *Behavioral Neuroscience*, **107**, 563-574.
- Kerbusch, S., van der Staay, F.J. & Hendriks, N. (1981). A searching procedure for transformations and models in a classical Mendelian cross breeding study. *Behavior Genetics*, **11**, 239-254.

- Kerbusch, J.M.L. (1974). *Genetic analysis of exploratory behaviour, simple learning behaviour and cerebral AChE and ChE activities in mice by means of the diallel method*. Doctoral dissertation, University of Nijmegen, the Netherlands.
- Kesner, R.P., Adelstein, T. & Crutcher, K.A. (1987). Rats with nucleus basalis magnocellularis lesions mimic mnemonic symptomatology observed in patients with dementia of the Alzheimer's type. *Behavioral Neuroscience*, **101**, 451-456.
- Kesner, R.P., DiMatta, B.V. & Crutcher, K.A. (1987). Evidence for neocortical involvement in reference memory. *Behavioral and Neural Biology*, **47**, 40-53.
- Kinoshita, H., Kameyama, T., Hasegawa, T. & Nabeshima, T. (1992). Effects of vinconate, a novel vinca alkaloid, on spatial learning deficits induced by the basal forebrain lesion in rats. *Pharmacology Biochemistry and Behavior*, **42**, 19-23.
- Kirasic, K.C. (1991). Spatial cognition and behavior in young and elderly adults: implications for learning new environments. *Psychology and Aging*, **6**, 10-18.
- Kirasic, K.C., Allen, G.L., Dobson, S.H. & Binder, K.S. (1996). Aging, cognitive resources, and declarative learning. *Psychology and Aging*, **11**, 658-670.
- Kirino, T. (1982) Delayed neuronal death in the gerbil hippocampus following ischemia. *Brain Research*, **239**, 57-69.
- Kisker, G.W. (1972). *The disorganized personality* (2nd ed.). Tokyo: McGraw-Hill Kogakusha, Ltd.
- Kiyota, Y., Miyamoto, M. & Nagaoka, A. (1990). Relationship between brain damage and memory impairment in rats exposed to transient forebrain ischemia. *Brain Research*, **538**, 295-302.
- Klapdor, K., Blokland, A., Horváth, E. & van der Staay, F.J. (1997a). Bilateral subdural hematoma in the rat: effects on performance in a visual discrimination task. *Neuroscience Research Communications*, **20**(2), 79-84.
- Klapdor, K., Dulfer, B.G., Hammann, A. & van der Staay, F.J. (1997b). A low-cost method to analyse footprint patterns. *Journal of Neuroscience Methods*, **75**, 49-54.
- Klapdor, K. & van der Staay, F.J. (1996). The Morris water escape task in mice: strain differences and effects of intra-maze contrast and brightness. *Physiology & Behavior*, **60**, 1247-1254.
- Klapdor, K. & van der Staay, F.J. (1998). Repeated acquisition of a spatial navigation task in mice: effects of spacing of trials and of unilateral middle cerebral artery occlusion. *Physiology and Behavior*, **63**(5), 903-909.
- Klapdor-Dulfer, K. (1996). *On the assessment of functional deficits in rodent models of cerebrovascular disorders*. Doctoral dissertation, University of Utrecht, Netherlands, ISBN 90-393-1157-9.
- Kluger, A., Gianutsos, J.G., Golomb, J., Ferris, S.H., George, A.E., Franssen, E. & Reisberg, B. (1997). Patterns of motor impairment in normal aging, mild cognitive decline, and early Alzheimer's disease. *Journal of Gerontology*, **52B**, P28-P39.
- Köhler, W. (1990). Preventieprogramma's en het probleem van vervangende ziekten. *NRC-Handelsblad*, Supplement 'Wetenschap & onderwijs', december 13, pp. 1-2.
- Kolb, B. (1974). Some tests of response habituation in rats with discrete lesions to the orbital or medial frontal cortex. *Canadian Journal of Psychology / Review of Canadian Psychology*, **28**, 260-267.
- Kolb, B., Sutherland, R.J. & Whishaw, I.Q. (1983). A comparison of the contributions of the frontal and parietal association cortex to spatial localization in rats. *Behavioral Neuroscience*, **97**, 13-27.
- Kolb, B. & Tomie, J.-A. (1988). Recovery from early cortical damage in rats. IV. Effects of hemidecortication at 1, 5 or 10 days of age on cerebral anatomy and behavior. *Behavioural Brain Research*, **28**, 259-274.
- Kolb, B. & Walkey, J. (1987). Behavioural and anatomical studies of the posterior parietal cortex in the rat. *Behavioural Brain Research*, **23**, 127-145.
- Kordower, J.H. & Gash, D.M. (1986). Animals and experimentation: an evaluation of animal models of Alzheimer's and Parkinson's disease. *Integrative Psychiatry*, **4**, 64-80.
- Kordower, J.H. & Gash, D.M. (1988). Animal models of age- and disease-related cognitive decline: perspectives on the models and therapeutic strategies. *Neurobiology of Aging*, **9**, 685-689.
- Kovacs, D.M., Fausett, H.J., Page, K.J., Kim, T.-W., Moir, R.D., Merriam, D.E., Hollister, R.D., Hallmark, O.G., Mancini, R., Felsenstein, K.M., Hyman, B.T., Tanzi, R.E. & Wasco, W. (1996). Alzheimer-associated presenilins 1 and 2: neuronal expression in brain and localization in intracellular membranes in mammalian cells. *Nature Medicine*, **2**, 224-229.
- Kudo, Y., Shiosaka, S., Matsuda, M. & Tohyama, M. (1989). An attempt to cause the selective loss of the cholinergic neurons in the basal forebrain of the rat: a new animal model of Alzheimer's disease. *Neuroscience Letters*, **102**, 125-130.
- Kumon, Y., Sakaki, S., Watanabe, H., Nakano, K., Ohta, S., Matsuda, S., Yoshimura, H. & Sakanaka, M. (1996). Ciliary neurotrophic factor attenuates spatial cognition impairment, cortical infarction and thalamic degeneration in spontaneously hypertensive rats with focal cerebral ischemia. *Neuroscience Letters*, **206**, 141-144.

Kuroiwa, T., Bonnekoh, P. & Hossmann, K.-A. (1991). Locomotor hyperactivity and hippocampal CA1 injury after transient forebrain ischemia of gerbils. *Neuroscience Letters*, **122**, 141-144.

L

Lachman, S.J. & Brown, C.R. (1957). Behavior in a free choice multiple path elimination problem. *The Journal of Psychology*, **43**, 27-40.

Lalonde, R. & Joyal, C.C. (1991). Effects of ketamine and L-glutamic acid diethyl ester on concept learning in rats. *Pharmacology Biochemistry & Behavior*, **39**, 829-833.

Lamberts, S.W.J., van den Beld, A.W. & van der Lely, A.-J. (1997). The endocrinology of aging. *Science*, **278**, 419-424.

Lamberty, Y. & Gower, A.J. (1991a). Cholinergic modulation of spatial learning in a Morris-type water maze. *Archives Internationales de Pharmacodynamie et Thérapie* **309**, 5-19.

Lamberty, Y. & Gower, A.J. (1991b). Simplifying environmental cues in a Morris-type water maze improves place learning in old NMRI mice. *Behavioral and Neural Biology*, **56**, 89-100.

Lander, E.S. & Botstein, D. (1989). Mapping Mendelian factors underlying quantitative traits using RFLP linkage maps. *Genetics*, **121**, 185-199.

Lehr, U. (1997). Gesundheit und Lebensqualität im Alter. In: Schütz, R.-M., Ries, W. & Tews, H.P. (Eds.), *Altern in Gesundheit und Krankheit*. Melsungen: Bibliomed - Medizinische Verlagsellschaft, pp. 51-64.

Leonard, J.A. (1959). 5 choice serial reaction apparatus. *Medical Research Council, Applied Psychology Research Unit Report*, No. 326/59.

Levin, E.D., Kaplan, S. & Boardman, A. (1997). Acute nicotine interactions with nicotinic and muscarinic antagonists: working and reference memory effects in the 16-arm radial maze. *Behavioural Pharmacology*, **8**, 236-242.

Levin, E.D. & Torry, D. (1996). Acute and chronic nicotine effects on working memory in aged rats. *Psychopharmacology*, **123**, 88-97.

Liang, S.-P., Kanthan, R., Shuaib, A. & Wishart, T. (1997). Effects of clomethiazole on radial-arm maze performance following global forebrain ischemia in gerbils. *Brain Research*, **751**, 189-195.

Lieberman, H.R. & Abou-Nader, T.M. (1986). Possible dietary strategies to reduce cognitive deficits in old age. In: Swaab, D.F., Fliers, E., Mirmiran, M., van Gool, W.A. & van Haaren, F. (Eds.), *Progress in brain research*, **70**, 461-471.

Lienert, G.A. (1961). *Testaufbau und Testanalyse*. Weinheim: Verlag Julius Beltz.

Light, L.L. & Zelinski, E.M. (1983). Memory for spatial information in young and old adults. *Developmental Psychology*, **19**, 901-906.

Liljequist, R., Haapalinna, A., Åhlander, M., Li, Y.H. & Männistö, P.T. (1997). Catechol O-methyltransferase inhibitor tolcapone has minor influence on performance in experimental memory models in rats. *Behavioural Brain Research*, **82**, 195-202.

Lindner, M.D. & Gribkoff, V.K. (1991). Relationship between performance in the Morris water task, visual acuity, and thermoregulatory function in aged F-344 rats. *Behavioural Brain Research*, **45**, 45-55.

Lindner, M.D., Plone, M.A., Schallert, T. & Emerich, D.F. (1997). Blind rats are not profoundly impaired in the reference memory Morris water maze and cannot be clearly discriminated from rats with cognitive deficits in the cued platform task. *Cognitive Brain Research*, **5**, 329-333.

Lindner, M.D. & Schallert, T. (1988). Aging and atropine effects on spatial navigation in the Morris water task. *Behavioral Neuroscience*, **102**, 621-634.

Lipp, H.-P. & Wolfer, D.P. (1998). Genetically modified mice and cognition. *Current Opinion in Neurobiology*, **8**, 272-280.

Liu, L., Gauthier, L. & Gauthier, S. (1991). Spatial disorientation in persons with early senile dementia of the Alzheimer type. *The American Journal of Occupational Therapy*, **45**(1), 67-74.

Lohman, A.H.M. & Peters, K.A. (1976). A new stereotaxic instrument. *Brain Research*, **102**, 197-200.

Loring, J.F., Paszty, C., Rose, A., McIntosh, T.K., Murai, H., Pierce, J.E.S., Schramm, S.R., Wymore, K., Lee, V.M.-Y., Trojanovsky, J.Q. & Peterson, K.R. (1996). Rational design of an animal model for Alzheimer's disease: introduction of multiple human genomic transgenes to reproduce AD pathology in a rodent. *Neurobiology of Aging*, **17**, 173-182.

Lowry, O.N., Rosebrough, N.J., Farr, A.L. & Randall, R.J. (1951). Protein measurement with the Folin phenol reagent. *Journal of Biological Chemistry*, **193**, 165-175.

Luine, V., Bowling, D. & Hearn, M. (1990). Spatial memory deficits in aged rats: contributions of monoaminergic systems. *Brain Research*, **537**, 271-278.

Luiten, P.G.M., Douma, B.R.K., van der Zee, E.A. & Nyakas, C. (1995). Neuroprotection against NMDA induced cell death in rat nucleus basalis by Ca²⁺ antagonist nimodipine, influence of aging and developmental drug treatment. *Neurodegeneration*, **4**, 307-314.

Luiten, P.G.M., Stuiver, B., de Jong, G.I., Nyakas, C. & De Keyser, J.H.A. (1997). Calcium

- homeostasis, nimodipine, and stroke. In: ter Horst, G.J. & Korf, J. (Eds.), *Clinical pharmacology of cerebral ischemia*. Totowa, N.J.: Humana Press, pp. 67-99.
- Lyden, P.D., Jackson-Friedman, C. & Lonzo-Dokter, L. (1997). Medical therapy for intracerebral hematoma with the γ -aminobutyric acid-A agonist muscimol. *Stroke*, **28**, 387-391.
- Lyden, P.D., Lonzo, L.M., Nunez, S.Y., Dockstader, T., Mathieu-Costello, O. & Zivin, J.A. (1997). Effect of ischemic cerebral volume changes on behavior. *Behavioural Brain Research*, **87**, 59-67.
- M**
- Mabry, T.R., McCarty, R., Gold, P.E. & Foster, T.C. (1996). Age and stress history effects on spatial performance in a swim task in Fischer-344 rats. *Neurobiology of Learning and Memory*, **55**, 1-10.
- Macphail, E.M. (1996). Cognitive function in mammals: the evolutionary perspective. *Cognitive Brain Research*, **3**, 279-290.
- Mahadik, S.P. & Wakade, C.G. (1992). Cortical focal stroke model to evaluate neuroprotective action of drugs. *Drug Development Research*, **27**, 307-327.
- Maître, L. & Pepeu, G. (1989). New drugs in memory and learning. *Pharmacopsychiatry*, **22**, S51.
- Mancuso, A., Numura, T. & Weinstein, P.R. (1997). Prediction of delayed ischemic injury with diffusion-weighted MRI following temporary middle cerebral artery occlusion in rats. *Brain Research*, **760**, 42-51.
- Mann, D.M.A. (1997). Molecular biology's impact on our understanding of aging. *British Medical Journal*, **315**, 1078-1081.
- Männistö, P.T., Kutepova, O., Leinonen, K., Lang, A., Soosaar, A., Suomela, A. & Borisenko, S.A. (1993). Amiridine (NIK-247) and cerebrocrast in the alleviation of cholinergic lesion-induced learning deficit in male rats. *Drug Development Research*, **30**, 219-228.
- Marczynski, T.J., Artwohl, J. & Marczynska, B. (1994). Chronic administration of flumazenil increases life span and protects rats from age-related loss of cognitive functions: a benzodiazepine/GABAergic hypothesis of brain aging. *Neurobiology of Aging*, **15**, 69-84.
- Margaill, I., Parmentier, S., Callebert, J., Allix, M., Boulu, R.G. & Plotkine, M. (1996). Short therapeutic window for MK-801 in transient focal cerebral ischemia in normotensive rats. *Journal of Cerebral Blood Flow and Metabolism*, **16**, 107-113.
- Markel, E., Felszeghy, K., Luiten, P.G.M. & Nyakas, C. (1995). Beneficial effect of chronic nimodipine treatment on behavioral dysfunctions of aged rats exposed to perinatal ethanol treatment. *Archives of Gerontology and Geriatrics*, **21**, 75-88.
- Markgraf, C.G., Green, E.J., Hurwitz, B.E., Morikawa, E., Dietrich, W.D., McCabe, P.M., Ginsberg, M.D. & Schneiderman, N. (1992). Sensorimotor and cognitive consequences of middle cerebral artery occlusion in rats. *Brain Research*, **575**, 238-246.
- Markgraf, C.G., Green, E.J., Watson, B., McCabe, P.M., Schneiderman, N., Dietrich, W.D. & Ginsberg, M.D. (1994). Recovery of sensorimotor function after distal middle cerebral artery photothrombotic occlusion in rats. *Stroke*, **25**, 153-159.
- Markgraf, C.G., Johnson, M.P., Braun, D.L. & Bickers, M.V. (1997). Behavioral recovery patterns in rats receiving the NMDA receptor antagonist MDL 100,453 immediately post-stroke. *Pharmacology Biochemistry and Behavior*, **56**, 391-397.
- Markou, A. & Koob, G.F. (1991). Construct validity of a self-stimulation threshold paradigm: effects of reward and performance manipulations. *Physiology & Behavior*, **51**, 111-119.
- Markowska, A.J., Ingram, D.K., Barnes, C.A., Spangler, E.L., Lemken, V.J., Kametani, H., Yee, W. & Olton, D.S. (1990). Acetyl-l-carnitine 1: effects on mortality, pathology and sensory-motor performance in aging rats. *Neurobiology of Aging*, **11**, 491-498.
- Markowska, A.L., Stone, W.S., Ingram, D.K., Reynolds, J., Gold, P.E., Conti, L.H., Pontecorvo, M.J., Wenk, G.L. & Olton, D.S. (1989). Individual differences in aging: behavioral and neurobiological correlates. *Neurobiology of Aging*, **10**, 31-43.
- Marshall, J.F. (1982). Sensorimotor disturbances in the aging rodent. *Journal of Gerontology*, **37**, 548-554.
- Marshall, J.F. & Berrios, N. (1979). Movement disorders of aged rats: reversal by dopamine receptor stimulation. *Science*, **206**, 477-479.
- Marston, H.M., Faber, E.S.L., Crawford, J.H., Butcher, S.P. & Sharkey, J. (1995). Behavioural assessment of endothelin-1 induced middle cerebral artery occlusion in the rat. *NeuroReport*, **6**, 1067-1071.
- Martín, G.M. & Mian, I.S. (1997). New mice for old questions. *Nature*, **390**, 18-19.
- Martin, L.G. (1991). Population aging policies in east Asia and the United States. *Science*, **251**, 527-531.
- Marx, J. (1992). Major setback for Alzheimer's models. *Science*, **255**, 1200-1202.
- Marx, J. (1996). Searching for drugs that combat Alzheimer's. *Science*, **273**, 50-53.
- Masoro, E.J. (1980). Mortality and growth characteristics of rat strains commonly used in

- aging research. *Experimental Aging Research*, **6**, 219-233.
- Masoro, E.J. (1991). Use of rodents as models for the study of "normal aging": conceptual and practical issues. *Neurobiology of Aging*, **12**, 639-643.
- Matsumoto, K., Sakaki, T., Kohmura, E., Hayakawa, T. & Yamada, K. (1996). Amelioration of ischemic brain damage by preischemic administration of propentofylline (HWA285) in a rat focal ischemia. *Brain Research*, **723**, 228-230.
- Maurer, R. & Séguinot, V. (1995). What is modelling for? A critical review of the models of path integration. *Journal of Theoretical Biology*, **175**, 457-475.
- Mayevsky, A. (1990). Level of ischemia and brain function in the Mongolian gerbil *in vivo*. *Brain Research*, **524**, 1-9.
- McAuley, M.A. (1995). Rodent models of focal ischemia. *Cerebrovascular and Brain Metabolism Reviews*, **7**, 153-180.
- McBean, D.E., Winters, V., Wilson, A.D., Oswald, C.B., Alps, B.J. & Armstrong, J.M. (1995). Neuroprotective efficacy of lifarizine (RS-87476) in a simplified rat survival model of 2 vessel occlusion. *British Journal of Pharmacology*, **116**, 3093-3098.
- McClearn, G.E. & DeFries, J.C. (1973). *Introduction to behavioral genetics*. San Francisco: W.H. Freeman and Company.
- McClearn, G.E. & Hofer, S.M. (1999). Genes as gerontological variables: uniform genotypes. *Neurobiology of Aging*, **20**, 95-104.
- McEntee, W.J. & Crook, T.H. (1991). Serotonin, memory, and the aging brain. *Psychopharmacology*, **103**, 143-149.
- McGeer, E.G., McGeer, P.L. (1975). Age changes in the human for some enzymes associated with metabolism of catecholamines, GABA, and acetylcholine. In: Ord, J.M. & Brizzee, K.R. (Eds.), *Neurobiology of aging. Advances in Behavioral Biology*, **16**, 287-305. New York: Plenum Press.
- McGeer, P.L. & McGeer, E.G. (1978). Aging and neurotransmitter systems. In: Finch, C.E., Potter, D.E. & Kenny, A.D. (Eds.), *Parkinson's disease II. Advances in experimental medicine and biology*, **113**, 41-47. New York: Plenum Press.
- McKinney, W.T. (1984). Animal models of depression: an overview. *Psychiatric Developments*, **2**, 77-96.
- McKinney, W.T. & Bunney, W.E. (1969). Animal model of depression: I. review of evidence: implications for research. *Archives of General Psychiatry*, **21**, 240-248.
- Meaney, M.J., Aitken, D.H., Bhatnagar, S. & Sapolsky, R.M. (1991). Postnatal handling attenuates certain neuroendocrine, anatomical, and cognitive dysfunctions associated with aging in female rats. *Neurobiology of Aging*, **12**, 31-38.
- Means, L.W. & Kennard, K.J.P. (1991). Working memory and the aged rat: deficient two-choice win-stay water-escape acquisition and retention. *Physiology & Behavior*, **49**, 301-307.
- Meck, W.H. (1983). Selective adjustment of the speed of internal clock and memory processes. *Journal of Experimental Psychology: Animal Behavior Processes*, **9**, 171-201.
- Meck, W.H. (1996). Neuropharmacology of timing and time perception. *Cognitive Brain Research*, **3**, 227-242.
- Meck, W.H. & Church, R.M. (1987). Nutrients that modify the speed of internal clock and memory storage processes. *Behavioral Neuroscience*, **101**, 465-475.
- Meier, G.W. (1964). Differences in maze performances as a function of age and strain of housemice. *Journal of Comparative and Physiological Psychology*, **58**, 418-422.
- Memezawa, H. (1993). *Focal ischemia in the rat. Factors modulating ischemic damage*. Doctoral dissertation, University of Lund, Sweden.
- Merlini, L. & Pinza, M. (1989). Trends in searching for new cognition enhancing drugs. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, **13**, S61-S75.
- Merlo Pich, E., Grimaldi, R., Zini, I., Frasoldati, A., Marrama, P. & Agnati, L.F. (1993). Involvement of α_2 -receptors in the analgesia induced by transient forebrain ischaemia in rats. *Pharmacology Biochemistry and Behavior*, **45**, 607-614.
- Mervis, R. (1981). Cytomorphological alterations in the aging animal brain with emphasis on Golgi studies. In: Johnson, J.E., Jr. (Ed.), *Aging and cell structure*, Vol. 1, New York: Plenum Press Corporation, pp. 143-186.
- Meudell, P.R. (1983). The development and dissolution of memory. In: Mayes, A. (Ed.), *Memory in animals and humans. Some Comparisons and their theoretical implications*. Wokingham: van Nostrand Reinhold, pp 83-132.
- Meyer, R.C. & Coover, G.D. (1996). Double dissociation of passive avoidance and milk maze performance deficits with discrete lesions of substantia innominata or globus pallidus of rats. *Behavioural Brain Research*, **72**, 157-180.
- M'Harzi, M., Palacios, A., Monmaur, P., Willig, F., Houcine, O. & Delacour, J. (1987). Effects of selective lesions of fimbria-fornix on learning set in the rat. *Physiology & Behavior*, **40**, 181-188.
- Michel, M.E. & Klein, A.W. (1978). Performance differences in a complex maze between young and aged rats. *Age*, **1**, 13-16.
- Miller, G.L. (1959). Protein determination for large numbers of samples. *Analytical Chemistry*, **31**, 964.

- Miller, J.D., Bullock, R., Graham, D.I., Chen, M.H. & Teasdale, G.M. (1990). Ischemic brain damage in a model of acute subdural hematoma. *Neurosurgery*, **27**, 433-439.
- Miyamoto, M., Kiyota, Y., Yamazaki, N., Nagaoka, A., Matsuo, T., Nagawa, Y. & Takeda, T. (1986). Age-related changes in learning and memory in the senescence-accelerated mouse (SAM). *Physiology & Behavior*, **38**, 399-406.
- Moghaddam, M. & Bures, J. (1996). Contribution of egocentric spatial memory to place navigation of rats in the Morris water maze. *Behavioural Brain Research*, **78**, 121-129.
- Mohs, R. C. (1988). Memory impairment in amnesia and dementia: implications for the use of animal models. *Neurobiology of Aging*, **9**, 465-468.
- Molnar, F.J. & Dalziel, W.B. (1997). The pharmacoeconomics of dementia therapy. *Drugs & Aging*, **19**(3), 219-233.
- Monk, T.H. & Fort, A. (1983). 'Cosina': a cosine curve fitting program suitable for small computers. *International Journal of Chronobiology*, **8**, 193-223.
- Moore, H., Dudchenko, P., Bruno, J.P. & Sarter, M. (1992). Toward modeling age-related changes of attention abilities in rats: simple and choice reaction time tasks and vigilance. *Neurobiology of Aging*, **13**, 759-772.
- Moore, T.E., Richards, B. & Hood, J. (1984). Aging and the coding of spatial information. *Journal of Gerontology*, **39**, 210-212.
- Moran, T.H., Kubos, K.L., Sanberg, P.R. & Robinson, R.G. (1984). Marked behavioral and biochemical sensitivity to lesion size in the posterior cortex of the rat. *Life Sciences*, **35**, 1337-1342.
- Morris, R.G. & Kopelman, M.D. (1986). The memory deficits in Alzheimer-type dementia: a review. *The Quarterly Journal of Experimental Psychology*, **38A**, 575-602.
- Morris, R.G.M. (1984). Development of a water-maze procedure for studying spatial learning in the rat. *Journal of Neuroscience Methods*, **11**, 47-60.
- Morrison, J.H. & Hof, P.R. (1997). Life and death of neurons in the aging brain. *Science*, **278**, 412-419.
- Mos, J. & Hollander, C.F. (1987). Analysis of survival data on aging rat cohorts: pitfalls and some practical considerations. *Mechanisms of Ageing and Development*, **38**, 89-105.
- Moser, V. (1990). Approaches for assessing the validity of the functional observational battery. *Neurotoxicology and Teratology*, **12**, 483-488.
- Muir, J.L., Everitt, B.J. & Robbins, T.W. (1996). The cerebral cortex of the rat and visual attentional function: dissociable effects of mediofrontal, cingulate, anterior dorsolateral, and parietal cortex lesions on a five-choice serial reaction time task. *Cerebral Cortex*, **6**, 470-481.
- Mundy, W.R., Barone, S. & Tilson, H.A. (1990). Neurotoxic lesions of the nucleus basalis induced by colchicine: effects on spatial navigation in the water maze. *Brain Research*, **512**, 221-228.
- Munn, N.L. (1950). *Handbook of psychological research on the rat*. Boston: Houghton Mifflin Company.
- Murray, C.L. & Fibiger, H.C. (1985). Learning and memory deficits after lesions of the nucleus basalis magnocellularis: reversal by physostigmine. *Neuroscience*, **14**, 1025-1032.
- Mutschler, E., Derendorf, H., Schäfer-Korting, M., Elrod, K. & Estes, K.S. (1995). *Drug action: basic principles and therapeutic aspects*. Boca Raton: CRC Press.
- N**
- Nagahara, AH. & McGaugh, J.L. (1992). Muscimol infused into the medial septal area impairs long-term memory but not short-term memory in inhibitory avoidance, water maze place learning and rewarded alternation tasks. *Brain Research*, **591**, 54-61.
- Nakamura, S., Tani, Y., Maezono, Y., Ishihara, T. & Ohno, T. (1992). Learning deficits after unilateral AF64A lesions in the rat basal forebrain: role of cholinergic and noncholinergic systems. *Pharmacology, Biochemistry and Behavior*, **42**, 119-130.
- Naritomi, H. (1991). Experimental basis of multi-infarct dementia: memory impairments in rodent models of ischemia. *Alzheimer disease and associated disorders*, **5**(2), 103-111.
- Nelson, A., Lebessi, A., Sowinski, P. & Hodges, H. (1997). Comparison of effects of global cerebral ischemia on spatial learning in the standard and radial water maze: relationship of hippocampal damage to performance. *Behavioural Brain Research*, **85**, 93-115.
- Netto, C.A., Hodges, H., Sinden, J.D., le Peillet, E., Kershaw, T., Sowinski, P., Meldrum, B.S. & Gray, J.A. (1993). Effects of fetal hippocampal field grafts on ischaemic-induced deficits in spatial navigation in the water maze. *Neuroscience*, **54**(1), 69-92.
- Niiro, M., Simon, R.P., Kadota, K. & Asakura, T. (1996). Proximal branching patterns of middle cerebral artery (MCA) in rats and their influence on the infarct size produced by MCA occlusion. *Journal of Neuroscience Methods*, **64**, 19-23.
- Nilsson, O.G. & Gage, F.H. (1993). Anticholinergic sensitivity in the aging rat septohippocampal system as assessed in a spatial memory task. *Neurobiology of Aging*, **14**, 487-497.
- Nitsch, R.M. (1996). From acetylcholine to amyloid: neurotransmitters and the pathology of

- Alzheimer's disease. *Neurodegeneration*, **5**, 477-482.
- Nordborg, C. & Johansson, B.B. (1980). Morphometric study on cerebral vessels in spontaneously hypertensive rats. *Stroke*, **11**, 266-270.
- Nosten-Bertrand, M., Errington, M.L., Murphy, K.P.S.J., Tokugawa, Y., Barboni, E., Kozlova, E., Michalovich, D., Morris R.G.M., Silver, J., Stewart, C.L., Bliss, T.V.P. & Morris R.J. (1996). Normal spatial learning despite regional inhibition of LTP in mice lacking Thy-1. *Nature*, **379**, 826-829.
- Nunn, J. & Hodges, H. (1994). Cognitive deficits induced by global cerebral ischaemia: relationship to brain damage and reversal by transplants. *Behavioural Brain Research*, **65**, 1-31.
- ## O
- Oades, R.D. (1981a). Impairments of search behaviour in rats after haloperidol treatment, hippocampal or neocortical damage suggest a mesocorticolimbic role in cognition. *Biological Psychology*, **12**, 77-85.
- Oades, R.D. (1981b). Dopaminergic agonistic and antagonistic drugs in the ventral tegmentum of rats inhibit and facilitate changes of food-search behaviour. *Neuroscience Letters*, **27**, 75-80.
- Oades, R.D. (1982). Search strategies on a hole-board are impaired in rats with ventral tegmental damage: animal model for tests of thought disorder. *Biological Psychiatry*, **17**, 243-258.
- Oades, R.D. & Isaacson, R.L. (1978). The development of food search behavior by rats: the effects of hippocampal damage and haloperidol. *Behavioral Biology*, **24**, 327-337.
- Obana, W.G., Pitts, L.H. & Nishimura, M.C. (1988). Effects of opiate antagonists on middle cerebral artery occlusion infarct in the rat. *Journal of Neurosurgery*, **69**, 98-103.
- O'Connell, A., Earley, B. & Leonard, B.E. (1994). Phencyclidine prevents spatial navigation and passive avoidance deficits in ibotenate lesioned rats. *Neuropharmacology*, **33**, 1095-1101.
- Ofri, D., Fan, L.-Q., Simon, E.J. & Hiller, J.M. (1992). Lesioning of the nucleus basalis of Meynert has differential effects on mu, delta and kappa opioid receptor binding in rat brain: a quantitative autoradiographic study. *Brain Research*, **581**, 252-260.
- Ogasawara, T., Itoh, Y., Tamura, M., Ukai, Y., Yoshikuni, Y. & Kimura, K. (1996). NS-3, a TRH-analog, reverses memory disruption by stimulating cholinergic and noradrenergic systems. *Pharmacology Biochemistry and Behavior*, **53**, 391-399.
- Ohara, T., Tanaka, K.-I., Fukaya, N., Demura, N., Iimura, A. & Seno, N. (1997). SDZ ENA 713 facilitates central cholinergic function and ameliorates spatial memory impairment in rats. *Behavioural Brain Research*, **83**, 229-233.
- Ohlsson, A.-L. & Johansson, B.B. (1995). Environment influences functional outcome of cerebral infarction in rats. *Stroke*, **26**, 644-649.
- Okada, M., Tamura, A., Urae, A., Nakagomi, T., Kirino, T., Mine, K. & Fujiwara, M. (1995a). Long-term spatial cognitive impairment following middle cerebral artery occlusion in rats. A behavioral study. *Journal of Cerebral Blood Flow and Metabolism*, **15**, 505-512.
- Okada, M., Nakanishi, H., Tamura, A., Urae, A., Mine, K., Yamamoto, K. & Fujiwara, M. (1995b). Long-term spatial cognitive impairment after middle cerebral artery occlusion in rats: no involvement of the hippocampus. *Journal of Cerebral Blood Flow and Metabolism*, **15**, 1012-1021.
- Okaichi, H. & Oshima, Y. (1990). Choice behavior of hippocampectomized rats in the radial arm maze. *Psychobiology*, **18**, 416-421.
- Okamoto, K., Yamori, X. & Nagaoka, A. (1974). Establishment of the stroke prone spontaneously hypertensive rat (SHR). *Circulation Research*, **34-35** (Suppl. 1), I143-I153.
- Oliff, H.S., Coyle, P. & Weber, E. (1997). Rat strain and vendor differences in collateral anastomoses. *Journal of Cerebral Blood Flow and Metabolism*, **17**, 571-576.
- Oliff, H.S., Weber, E., Eilon, G. & Marek, P. (1995a). The role of strain/vendor differences on the outcome of focal ischemia induced by intraluminal middle cerebral artery occlusion in the rat. *Brain Research*, **675**, 20-26.
- Oliff, H.S., Weber, E., Miyazaki, B. & Marek, P. (1995b). Infarct volume varies with rat strain and vendor in focal cerebral ischemia induced by transcranial middle cerebral artery occlusion. *Brain Research*, **699**, 329-331.
- Oliverio, A., Cabib, S. & Puglisi-Allegra, S. (1992). Nonhuman behavioral models in the genetics of disturbed behavior. *Journal of Psychiatric Research*, **26**, 367-382.
- Olshansky, S.J., Carnes, B.A. & Cassel, C.K. (1993). The aging of the human species. *Scientific American*, **268**(4), 18-24.
- Olton, D.S., Becker, J.T. & Handelmann, G.E. (1979). Hippocampus, space, and memory. *The Behavioral and Brain Sciences*, **2**, 313-365.
- Olton, D.S., Becker, J.T. & Handelmann, G.E. (1980). Hippocampal function: working memory or cognitive mapping? *Physiological Psychology*, **8**, 239-246.
- Olton, D.S. & Papas, B.C. (1979). Spatial memory and hippocampal function. *Neuropsychologia*, **17**, 669-682.

- Olton, D.S. & Samuelson, R.J. (1976) Remembrance of places passed: spatial memory in rats, *Journal of Experimental Psychology: Animal Behavior Processes*, **2**, 97-116.
- Olton, D.S. & Schlosberg, P. (1978). Food-searching strategies in young rats: win-shift predominates over win stay. *Journal of Comparative and Physiological Psychology*, **92**, 609-616.
- Olton, D.S. & Wenk, G.L. (1987). Dementia: animal models of the cognitive impairments produced by degeneration of the basal forebrain cholinergic system. In: Meltzer, H.Y. (Ed.), *Psychopharmacology: the third generation of progress*. New York: Raven Press, pp. 941-953.
- Ordy, J.M. (1975). Principles of mammalian aging. In: Ordy, J.M. & Brizzee, K.R. (Eds.), *Advances in behavioral biology. Neurobiology of aging*, **16**, 1-22, New York: Plenum Press, pp. 1-23.
- Ordy, J.M., Brizzee, K.R., Kaack, B. & Hansche, J. (1978). Age differences in short-term memory and cell loss in the cortex of the rat. *Gerontology*, **24**, 276-285.
- Ossenkopp, K.-P. & Mazmanian, D.S. (1985). The principle of aggregation in psychobiological correlational research: an example from the open-field test. *Animal Learning & Behavior*, **13**, 339-344.
- Overstreet, D.H. (1992). Genetic animal models of endogenous depression. In: Driscoll, P. (Ed.), *Genetically defined models of neurobehavioral dysfunctions*. Boston: Birkhäuser, pp. 253-275.
- Overstreet, D.H., Russell, R.W., Crocker, A.D. & Schiller, G.D. (1984). Selective breeding for differences in cholinergic function: pre- and postsynaptic mechanisms involved in sensitivity to the anticholinesterase, DFP. *Brain Research*, **294**, 327-332.
- P**
- Parent, A. & Hazrati, L.-N. (1995a). Functional anatomy of the basal ganglia. I. The cortico-basal ganglia-thalamo-cortical loop. *Brain Research Reviews*, **20**, 91-127.
- Parent, A. & Hazrati, L.-N. (1995b). Functional anatomy of the basal ganglia. II. The place of subthalamic nucleus and external pallidum in basal ganglia circuitry. *Brain Research Reviews*, **20**, 128-154.
- Park, C.K. & Hall, E.D. (1994). Dose-response analysis of the effect of 21-aminosteroid tirlazad mesylate (U-74006F) upon neurological outcome and ischemic brain damage in permanent focal cerebral ischemia. *Brain Research*, **645**, 157-163.
- Paxinos, G. & Watson, C. (1986). *The rat brain in stereotaxic coordinates* (2nd ed.). San Diego: Academic Press.
- Paylor, R. & Crawley, J.N. (1997). Inbred strain differences in prepulse inhibition of the mouse startle response. *Psychopharmacology*, **132**, 169-180.
- Paylor, R. & Rudy, J.W. (1990). Cholinergic receptor blockade can impair the rat's performance on both the place learning and cued version of the Morris water task: the role of age and pool brightness. *Behavioural Brain Research*, **36**, 79-90.
- Pearlson, G.D., Kubos, K.L. & Robinson, R.G. (1984). Effect of anterior-posterior lesion location on the asymmetrical behavioral and biochemical response to cortical suction ablations in the rat. *Brain Research*, **293**, 241-250.
- Pelleymounter, M.A., Smith, M.Y. & Gallagher, M. (1987). Spatial learning impairments in aged rats trained with a salient configuration of stimuli. *Psychobiology*, **15**, 248-254.
- Perlmutter, M., Metzger, R., Nezworski, T. & Miller, K. (1981). Spatial and temporal memory in 20 to 60 year olds. *Journal of Gerontology*, **36**, 59-65.
- Perry, E.K. (1980). The cholinergic system in old age and Alzheimer's disease. *Age and Ageing*, **9**, 1-8.
- Perry, E.K., Tomlinson, B.E., Blessed, G., Bergmann, K., Gibson, P.H. & Perry, R.H. (1978). Correlation of cholinergic abnormalities with senile plaques and mental test scores in senile dementia. *British Medical Journal*, **2**, 1457-1459.
- Persson, L., Hårdemark, H.-G., Bolander, H.G., Hillered, L. & Olsson, Y. (1989). Neurologic and neuropathologic outcome after middle cerebral artery occlusion in rats. *Stroke*, **20**, 641-645.
- Peternel, A., Hughey, D., Wenk, G. & Olton, D. (1988). Basal forebrain and memory: neurotoxic lesions impair serial reversals of a spatial discrimination. *Psychobiology*, **16**, 54-58.
- Petrie, B.F. (1995). Learning set spatial navigation performance in three mouse strains. *Psychological Reports*, **77**, 1339-1342.
- Phelan, J. P. & Austad, S. N. (1994). Selecting animal models of human aging: inbred strains often exhibit less biological uniformity than F₁ hybrids. *Journal of Gerontology*, **49**, B1-B11.
- Picciotto, M.R. & Wickman, K. (1998). Using knockout and transgenic mice to study neurophysiology and behavior. *Physiological Reviews*, **78**, 1131-1163.
- Pierce, J.E.S., Smith, D.H., Eison, M.S. & McIntosh, T.K. (1993). The nootropic compound BMY-21502 improves spatial learning ability in brain injured rats. *Brain Research*, **624**, 199-208.
- Pitsikas, N. & Algeri, S. (1992). Deterioration of spatial and nonspatial reference and working memory in aged rats: protective effect of life-long calorie restriction. *Neurobiology of Aging*, **13**, 369-373.

- Pitsikas, N., Biagini, L. & Algeri, S. (1991). Previous experience facilitates preservation of spatial memory in the senescent rat. *Physiology & Behavior*, **49**, 823-825.
- Pitsikas, N., Brambilla, A. & Borsini, F. (1993). DAU 6215, a novel 5-HT₃ receptor antagonist, improves performance in the aged rat in the Morris water maze task. *Neurobiology of Aging*, **14**, 561-564.
- Plomin, R., DeFries, J.C. & McClearn, G.E. (1980). *Behavioral genetics*. San Francisco: W.H. Freeman and Company.
- Plotkin, D.A. & Jarvik, L.F. (1986). Cholinergic dysfunction in Alzheimer disease: cause or effect? In: van Ree, J.M., & Matthysse, S. (Eds.), *Progress in Brain Research*, **65**, 91-103.
- Porsolt, R.D., McArthur, R.A. & Lenègre, A. (1993). Psychotropic drug screening. In: van Haaren, F. (Ed.), *Methods in behavioral pharmacology*. Amsterdam: Elsevier, pp. 23-51.
- Porsolt, R.D., Roux, S & Lenègre, A. (1991). Preclinical evaluation of potential cognitive enhancers. In: Langer, S.Z. Mendlewicz, J. & Racagni, G. (Eds.), *Treatment of age-related cognitive dysfunction: pharmacological and clinical evaluation*. Basel: Karger.
- Poschel (1988). New pharmacological perspectives on nootropic drugs. In: Iversen, L.L. & Iversen, S.D. (Eds.), *Handbook of Psychopharmacology*, Vol. 20, New York: Plenum Press, pp. 437-469.
- Price, D.L., Tanzi, R.E., Borchelt, D.R. & Sisodia, S.S. (1998). Alzheimer's disease: genetic studies and transgenic models. *Annual Review of Genetics*, **32**, 461-493.
- Procter, A.W. (1996). Neurochemical correlates of dementia. *Neurodegeneration*, **5**, 403-407.
- Pulsinelli, W.A. & Brierley, J.B. (1979). A new method of bilateral hemispheric ischemia in the unanesthetized rat. *Stroke*, **10**, 267-272.
- Puumala, T., Sirviö, J., Ruotsalainen, S. & Riekkinen, P., Sr. (1996). Effects of St-587 and Prazosin on water maze and passive avoidance performance of scopolamine-treated rats. *Pharmacology Biochemistry & Behavior*, **55**, 107-115.
- Puurunen, K., Sirviö, J., Koistinaho, J., Miettinen, R., Haapalinna, A., Riekkinen, P. Sr. & Sivenius, J. (1997). Studies on the influence of enriched-environment housing combined with systemic administration of α_2 -adrenergic antagonist on spatial learning and hyperactivity after global ischemia in rats. *Stroke*, **28**, 623-631.
- Raaijmakers, W.G.M. (1978). *Brain cholinesterase activity*. doctoral dissertation, University of Nijmegen, The Netherlands.
- Raaijmakers, W.G.M., Blokland, A. & van der Staay, F.J. (1993). Spatial discrimination learning in rats as an animal model of cognitive ageing. *Behavioural Processes*, **30**, 165-174.
- Raaijmakers, W.G.M., van der Staay, F.J., Drinkenburg, W.H.I.M. & Blokland, A. (1990). Age differences and effects of lesions in the nucleus basalis magnocellularis on a seven-choice task in a radial alley maze. In: van Bezooijen, C.F.A., Ravid, R. & Verhofstad, A.A.J. (Eds.), *From gene to man*. Rijswijk: Stichting Gerontologie en Geriatrie (ISBN 90-9003996-1), pp. 159-163.
- Raleigh, V.S. (1997). The demographic timebomb. *British Medical Journal*, **315**, 442-443.
- Rapp, P.R. & Gallagher, M. (1996). Preserved neuron number in the hippocampus of aged rats with spatial learning deficits. *Proceedings of the National Academy of Sciences of the United States of America*, **93**, 9926-9930.
- Rapp, P.R., Rosenberg, R.A. & Gallagher, M. (1987). An evaluation of spatial information processing in aged rats. *Behavioral Neuroscience*, **101**, 3-12.
- Rashidy-Pour, A., Motamedi, F. & Motahed-Larijani, Z. (1996). Effects of reversible inactivations of the medial septal area on reference and working memory versions of the Morris water maze. *Brain Research*, **709**, 131-140.
- Rasmussen, T., Schliemann, T., Sørensen, J.C., Zimmer, J. & West, M.J. (1996). Memory impaired aged rats: no loss of principal hippocampal and subiculum neurons. *Neurobiology of Aging*, **17**, 143-147.
- Read, S.J., Hirano, T., Davis, S.M. & Donnan, G.A. (1999). Limiting neurological damage after stroke. A Review of pharmacological treatment options. *Drugs & Aging*, **14**(1), 11-39.
- Ren, J. & Finklestein, S.P. (1997). Time window of infarct reduction by intravenous basic fibroblast growth factor in focal cerebral ischemia. *European Journal of Pharmacology*, **327**, 11-16.
- Reuter, W. (1997). Risikofaktoren des Schlaganfalls im Alter. In: Schütz, R.-M., Ries, W. & Tews, H.P. (Eds.), *Altern in Gesundheit und Krankheit*. Melsungen: Bibliomed - Medizinische Verlagsgesellschaft, pp. 147-153.
- Ricklefs, R.E. & Finch, C.E. (1995). *Aging: a natural history*. New York: W.H. Freeman and Company.

Q

Quirion, R., Wilson, A., Rowe, W., Aubert, I., Richard, J., Doods, H., Parent, A., White, N. & Meaney, M.J. (1995). Facilitation of acetylcholine release

- Riekkinen, P., Jr., Riekkinen, M. & Sirviö, J. (1992). Effects of tetrahydroaminoacridine on spatial navigation and nucleus-basalis- and frontal-cortex-lesioned rats. *Pharmacology Biochemistry and Behavior*, **41**, 637-641.
- Riekkinen, P., Jr., Schmidt, B. & Riekkinen, M. (1997). Behavioral characterization of metrifonate-improved acquisition of spatial information in medial septum-lesioned rats. *European Journal of Pharmacology*, **323**, 11-19.
- Riekkinen, P., Jr., Schmidt, B.H. & van der Staay, F.J. (1998). Animal models in the development of symptomatic and preventive drug therapies for Alzheimer's disease. *Annals of Medicine*, **30**, 566-576.
- Rikke, B.A. & Johnson, T.E. (1998). Towards the cloning of genes underlying murine QTLs. *Mammalian Genome*, **9**, 963-968.
- Robbins, T.W. (1998). Homology in behavioural pharmacology: an approach to animal models of human cognition. *Behavioural Pharmacology*, **9**, 509-519.
- Robbins, T.W., Everitt, B.J., Marston, H.M., Wilkinson, J., Jones, G.H. & Page, K.J. (1989). Comparative effects of ibotenic acid- and quisqualic acid-induced lesions of the substantia innominata on attentional function in the rat: further implications for the role of the cholinergic neurons of the nucleus basalis in cognitive processes. *Behavioural Brain Research*, **35**, 221-240.
- Robbins, T.W., McAlonan, G., Muir, J.L. & Everitt, B.J. (1997). Cognitive enhancers in theory and practice: studies of the cholinergic hypothesis of cognitive deficits in Alzheimer's disease. *Behavioural Brain Research*, **83**, 15-23.
- Roberts, A.C. (1996). Comparison of cognitive function in human and non-human primates. *Cognitive Brain Research*, **3**, 319-327.
- Roberts, S. (1981). Isolation of an internal clock. *Journal of Experimental Psychology: Animal Behavior Processes*, **7** (3), 242-268.
- Robinson, J.K., Wenk, G.L., Wiley, R.G., Lappi, D.A. & Crawley, J.N. (1996). ¹⁹²IgG-saporin immunotoxin and ibotenic acid lesions of nucleus basalis and the medial septum produce comparable deficits on delayed nonmatching to position in rats. *Psychobiology*, **24** (3), 179-186.
- Robinson, R.G. (1979). Differential behavioral and biochemical effects of right and left hemispheric cerebral infarction in the rat. *Science*, **205**, 707-710.
- Robinson, R.G. (1981). A model for the study of stroke using the rat. Surgical ligation of the middle cerebral artery in the rat. *American Journal of Pathology*, **104**, 103-105.
- Robinson, R.G. & Coyle, J.T. (1980). The differential effect of right versus left hemispheric cerebral infarction on catecholamines and behavior in the rat. *Brain Research*, **188**, 63-78.
- Roderick, T.H. (1960). Selection for cholinesterase activity in the cerebral cortex of the rat. *Genetics*, **45**, 1123-1140.
- Rodin, J. (1986). Aging and health: effects of the sense of control. *Science*, **233**, 1271-1276.
- Rogers, D.C., Campbell, C.A., Stretton, J.L. & Mackay, K.B. (1997). Correlation between motor impairment and infarct volume after permanent and transient middle cerebral artery occlusion in the rat. *Stroke*, **28**, 2060-2066.
- Rosenberg, G.A., Estrada, E., Kelley, R.O. & Kornfeld, M. (1993). Bacterial collagenase disrupts extracellular matrix and opens blood-brain barrier in rat. *Neuroscience Letters*, **160**, 117-119.
- Rosenzweig, M.R., Bennett, E.L. & Diamond, M.C. (1972). Cerebral changes in response to experience. *Scientific American*, **226**(2), 22-29.
- Roses, A.D. (1996). The Alzheimer diseases. *Current Opinion in Neurobiology*, **6**, 644-650.
- Roßner, S., Schliebs, R. & Bigl, V. (1994). Ibotenic acid lesion of nucleus basalis magnocellularis differentially affects cholinergic, glutamatergic and GABAergic markers in cortical rat brain regions. *Brain Research*, **668**, 85-99.
- Roth, G.S., Ingram, D.K. & Lane, M.A. (1995). Slowing ageing by caloric restriction. *Nature Medicine*, **1**, 414-415.
- Roush, W. (1997). New knockout mice point to molecular basis of memory. *Science*, **275**, 32-33.
- Roux, S., Hubert, I., Lenègre, A., Milinkevitch, D. & Porsolt, R. (1994). Effects of piracetam on indices of cognitive function in a delayed alternation task in young and aged rats. *Pharmacology Biochemistry and Behavior*, **49**, 683-688.
- Roux, S., Hubert, I., Wettstein, J.G., Soubrié, P., Le Fur, G. & Porsolt, R.D. (1995). Facilitating effects of SR 57746A on short-term memory in an operant delayed alternation task in aged rats. *Drug Development Research*, **35**, 83-93.
- Rowan, A.N. (1997). The benefits and ethics of animal research. *Scientific American*, **276**(2), 63.
- Royce, J.R. (1977). On the construct validity of open-field measures. *Psychological Bulletin*, **84**, 1098-1106.
- Runkel, P.J. & McGrath, J.E. (1972). *Research on human behavior. A systematic guide to method*. New York: Holt, Rinehart and Winston.
- Russell, E.S. (1972). Genetic considerations in the selection of rodent species and strains for research in aging. In: Gibson, D.C. (Ed.), *Development of the rodent as a model system of aging* (pp. 33-53). Bethesda: DHEW publication no. (NIH) 72-121.

- Russell, E.S. & Gibson D.C. (Eds), (1972). *Development of the rodent as a model system in aging*. Bethesda: DHEW publication no. (NIH) 72-121, pp. 33-53.
- Russell, W.M.S. & Burch, R.L. (1959). *The principles of humane experimental technique*. London: Methuen.
- Russell, W.M.S. (1997). A festival of animals. In: van Zutphen, L.F.M. & Balls, M. (Eds.), *Animal alternatives, welfare and ethics*. Amsterdam: Elsevier, pp. 9-20.
- Rye, D.B., Wainer, B.H., Mesulam, M.-M., Mufson, E.J. & Saper, C.B. (1984). Cortical projections arising from the basal forebrain: a study of cholinergic and noncholinergic components employing combined retrograde tracing and immunohistochemical localization of choline acetyltransferase. *Neuroscience*, **13**, 627-643.
- S**
- Sahakian B.J. (1988). Cholinergic drugs and human cognitive performance. In: Iversen, L.L., Iversen, S.D. & Snyder, S.H. (Eds.), *Handbook of Psychopharmacology*, **20**, New York: Plenum Press, pp. 393-424.
- Sahgal., A., Keith, A.B. & Lloyd, S. (1990). Opposing effect of vasopressin on matching versus non-matching to position: further evidence for response, not memory, modulation. *Psychopharmacology*, **102**, 130-135.
- Sakai, N., Yanai, K., Ryu, J.H., Nagasawa, H., Hasegawa, T., Sasaki, T., Kogure, K. & Watanabe, T. (1996). Behavioral studies on rats with transient cerebral ischemia induced by occlusion of the middle cerebral artery. *Behavioural Brain Research*, **77**, 181-188.
- Sams-Dodd, F. (1995). Automation of the social interaction test by a video tracking system: behavioural effects of repeated phenacyclidine treatment. *Journal of Neuroscience Methods*, **59**, 157-167.
- Sanberg, P.R. (1986). Neurobehavioral aspects of some animal models of age-related neuropsychiatric disorders. In: Fisher, A., Hanin, I. & Lachman, C. (Eds.), *Alzheimer's and Parkinson's diseases: strategies for research and development. Advances in Behavioral Biology*, **29**, 479-485. New York: Plenum Press.
- Sansone, M., Castellano, C., Battaglia, M. & Ammassari-Teule, M (1991). Effects of oxiracetam-nicotine combinations on active and passive avoidance learning in mice. *Pharmacology Biochemistry & Behavior*, **39**, 197-200.
- Sarter, M., Bruno, J.P., Givens, B., Moore, H., McGaughy, J. & McMahon, K. (1996). Neuronal mechanisms mediating drug-induced cognition enhancement: cognitive activity as a necessary intervening variable. *Cognitive Brain Research*, **3**, 329-343.
- Sarter, M., Hagan, J. & Dudchenko, P. (1992a). Behavioral screening for cognition enhancers: from indiscriminate to valid testing: part I. *Psychopharmacology*, **107**, 144-159.
- Sarter, M., Hagan, J. & Dudchenko, P. (1992b). Behavioral screening for cognition enhancers: from indiscriminate to valid testing: part II. *Psychopharmacology*, **107**, 461-473.
- SAS Institute Inc., (1990). *SAS/STAT User's Guide*, vol. 2, version 6, 4th edition. Cary, NC.
- Sauter, A. & Rudin, M. (1995). Strain-dependent drug effects in rat middle cerebral artery occlusion model of stroke. *Journal of Pharmacology and Experimental Therapeutics*, **274**, 1008-1013.
- Schindler, U. (1989). Pre-clinical evaluation of cognition enhancing drugs. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, **13**, S99-S115.
- Schramm, A. (1997). Akuttherapie des Schlaganfalls in einer geriatrischen Klinik. In: Schütz, R.-M., Ries, W. & Tews, H.P. (Eds.), *Altern in Gesundheit und Krankheit*. Melsungen: Bibliomed - Medizinische Verlagsgesellschaft, pp. 155-169.
- Schuurman, T., Horváth, E., Spencer, D.G., Jr. & Traber, J. (1986). Old rats: an animal model for senile dementia. In: Bès, A. (Ed.), *Senile dementias: early detection*. London: John Libbey Eurotext, pp. 624-630.
- Schuurman, T., Klein, H., Beneke, M. & Traber, J. (1987). Nimodipine and motor deficits in the aged rat. *Neuroscience Research Communications*, **1**(1), 9-15.
- Schuurman, T. & Traber, J. (1989a) Effects of nimodipine on behavior of old rats. In: Traber, J. and Gispen, W.H. (Eds.) *Nimodipine and central nervous system function: new vistas*. Stuttgart: Schattauer, pp. 195-208.
- Schuurman, T. & Traber, J. (1989b). Old rats as an animal model for senile dementia: behavioural effects of nimodipine. In: Bergener, M. & Reisberg, B. (Eds.), *Diagnosis and treatment of senile dementia*. Berlin: Springer Verlag, pp. 295-307.
- Schwarz, R., Hökfelt, T., Fuxe, K., Jonsson, G., Goldstein, M. & Terenius, L. (1979). Ibotenic acid-induced neuronal degeneration: a morphological and neurochemical study. *Experimental Brain Research*, **37**, 199-215.
- Schwegler, H. & Crusio, W.E. (1995). Correlations between radial-maze learning and structural variations of septum and hippocampus in rodents. *Behavioural Brain Research*, **67**, 29-41.
- Sebesteny, A. (1991). Necessity of a more standardized microbiological characterization of

- rodents for aging studies. *Neurobiology of Aging*, **12**, 663-668.
- Shapiro, M.L. & O'Connor, C. (1992). N-methyl-D-aspartate receptor antagonist MK-801 and spatial memory representation: working memory is impaired in an unfamiliar but not in a familiar environment. *Behavioral Neuroscience*, **106**, 604-612.
- Sharps, M.J. & Gollin, E.S. (1987). Memory for object locations in young and elderly adults. *Journal of Gerontology*, **42**, 336-341.
- Shaughnessy, L.W., Barone, S., Jr., Mundy, W.R., Herr, D.W. & Tilson, H.A. (1994). Comparison of intracranial infusions of colchicine and ibotenic acid as models of neurodegeneration in the basal forebrain. *Brain Research*, **637**, 15-26.
- Shaughnessy, L.W., Barone, S., Jr., Mundy, W.R. & Tilson, H.A. (1996). Neurochemical and behavioral recovery after colchicine lesions of the nucleus basalis magnocellularis in rats. *Restorative Neurology and Neuroscience*, **10**, 135-146.
- Shaughnessy, L.W., Mundy, W.R., Tilson, H.A. & Barone, S., Jr. (1998). Time course of changes in cholinergic and neurotrophin-related markers after infusion of colchicine into the basal forebrain. *Brain Research*, **781**, 62-77.
- Sherman, K.A. & Friedman, E. (1990). Pre- and post-synaptic cholinergic dysfunction in aged rodent brain regions: new findings and an interpretative review. *International Journal of Developmental Neuroscience*, **8**, 689-708.
- Shigeno, T., McCulloch, J., Graham, D.I., Mendelow, A.D. & Teasdale, G.M. (1985). Pure cortical ischemia versus striatal ischemia. Circulatory, metabolic, and neuropathologic consequences. *Surgical Neurology*, **24**, 47-51.
- Shiino, A. (1989). Experimental studies on pharmacological protection of the brain against focal ischemia. 1. Focal brain ischemia model in rats. *Archiv der Japanischen Chirurgie*, **58**(5), 431-437.
- Shimokawa, I., Higami, Y., Hubbard, G.B., McMahan, C.A., Masoro, E.J. & Yu, B.P. (1993). Diet and the suitability of the male Fischer 344 rat as a model for aging research. *Journal of Gerontology*, **48**, B27-B32.
- Shinoda, M., Matsuo, A. & Toide, K. (1996). Pharmacological studies of a novel prolyl endopeptidase inhibitor, JTP-4819, in rats with middle cerebral artery occlusion. *European Journal of Pharmacology*, **305**, 31-38.
- Shiraishi, K. & Simon, R.P. (1989). A model of proximal middle cerebral artery occlusion in rat. *Journal of Neuroscience Methods*, **30**, 169-174.
- Shukitt-Hale, B., Stillman, M.J. & Liebermann, H.R. (1996). Tyrosine administration prevents hypoxia-induced decrements in learning and memory. *Physiology & Behavior*, **59**, 867-871.
- Siesjö, B.K. (1994). Calcium-mediated processes in neuronal degeneration. In: Disterhoft, J.F., Gispen, W., Traber, J. & Khachaturian, Z.S. (Eds.), *Calcium hypothesis of aging and dementia. Annals of the New York Academy of Sciences*, **747**, 140-161.
- Silva, A.J., Giese, K.P., Fedorov, N.B., Frankland, P.W. & Kogan, J.H. (1998). Molecular, cellular, and neuroanatomical substrates of place learning. *Neurobiology of Learning and Memory*, **70**, 44-61.
- Silva, F. (1993). *Psychometric foundations and behavioral assessment*. Newbury Park: Sage Publications.
- Simon, S.L., Walsh, D.A., Regnier, V.A. & Krauss, I.K. (1992). Spatial cognition and neighborhood use: the relationship in older adults. *Psychology and Aging*, **7**, 389-394.
- Singer, P. (Ed.), (1985). *In defense of animals*. Oxford: Basil Blackwell Publishers, Ltd.
- Sirviö, J., Jäkälä, P., Mazurkiewicz, M., Haapalinna, A., Riekkinen, P., Jr. & Riekkinen, P.J. (1993). Dose- and parameter-dependent effects of atipamezole, and a₂-antagonist, on the performance of rats in a five-choice serial reaction time task. *Pharmacology Biochemistry & Behavior*, **45**, 123-129.
- Sirviö, J., Riekkinen, P., Jr., Valjakka, A., Jolkonen, J. & Riekkinen, P.J. (1991). The effects of noradrenergic neurotoxin, DSP-4, on the performance of young and aged rats in spatial navigation task. *Brain Research*, **563**, 297-302.
- Smith, G. (1988). Animal models of Alzheimer's disease: experimental cholinergic denervation. *Brain Research Reviews*, **13**, 103-118.
- Smith, S.E., Hodges, H., Sowinski, P., Man, C.-M., Leach, M.J., Sinden, J.D., Gray, J.A. & Meldrum, B.S. (1996). Long-term effects of BW619C89 on neurological deficit, cognitive deficit and brain damage after middle cerebral artery occlusion in the rat. In: Kriegstein, J. (Ed.), *Pharmacology of Cerebral Ischemia* 1996. Stuttgart: Medpharm Scientific Publishers, pp. 655-666.
- Smoller, J.W. & Tsuang, M.T. (1998). Panic and phobic anxiety: defining phenotypes for genetic studies. *American Journal of Psychiatry*, **155**, 1152-1162.
- Sobey, C.G., Heistad, D.D. & Faraci, F.M. (1997). Effect of subarachnoid hemorrhage on cerebral vasodilatation in response to activation of ATP-sensitive K⁺ channels in chronically hypertensive rats. *Stroke*, **28**, 392-397.
- Socci, D.J., Sanberg, P.R. & Arendash, G.W. (1995). Nicotine enhances Morris water maze performance of young and aged rats. *Neurobiology of Aging*, **16**, 857-860.

- Soffié, M. & Lejeune, H. (1991). Acquisition and long-term retention of a two-lever DRL schedule: comparison between mature and aged rats. *Neurobiology of Aging*, **12**, 25-30.
- Sommer, B. (1998). Recent advances in transgenic model development for Alzheimer's disease. *Expert Opinion on Investigational Drugs*, **7**, 2017-2025.
- Sparks, D.L., Hunsaker, J.C., III, Slevin, J.T., DeKosky, S.T., Kryscio, R.J. & Markesberry, W.R. (1992). Monoaminergic and cholinergic synaptic markers in the nucleus basalis of Meynert (nbM): normal age-related changes and the effect of heart disease and Alzheimer's disease. *Annals of Neurology*, **31**, 611-620.
- Spangler, E.L., Waggle, K.S., Hengemihle, J., Roberts, D., Hess, B. & Ingram, D.K. (1994). Behavioral assessment of aging in male Fischer 344 and Brown Norway rat strains and their F₁ hybrid. *Neurobiology of Aging*, **15**, 319-328.
- Spengler, F., Godde, B. & Dinse, H.R. (1995). Effects of ageing on topographic organization of somatosensory cortex. *NeuroReport*, **6**, 469-473.
- Sprott, R.L. (1991). Development of animal models of aging at the National Institute of Aging. *Neurobiology of Aging*, **12**, 635-638.
- Spruijt, B.M. (1991). An ACTH₄₋₉ analog enhances social attention in aging rats: a longitudinal study. *Neurobiology of Aging*, **13**, 153-158.
- Spruijt, B.M., Hol, T. & Rousseau, J.B.I. (1992). Approach, avoidance, and contact behavior of individually recognized animals automatically quantified with an imaging technique. *Physiology and Behavior*, **51**, 747-752.
- Spruijt, B., Pitsikas, N., Algeri, S. & Gispen, W.H. (1990). Org2766 improves performance of rats with unilateral lesions in the fimbria fornix in a spatial learning task. *Brain Research*, **527**, 192-197.
- Stam, F.C. (1987). *Dementieën*. Arnhem: Ciba-Geigy b.v.
- Steckler, T., Andrews, J.S., Marten, P. & Turner, J.D. (1993). Effects of NBM lesions with two neurotoxins on spatial memory and autoshaping. *Pharmacology Biochemistry and Behavior*, **44**, 877-889.
- Steckler, T. & Muir, J.L. (1996). Measurement of cognitive function: relating rodent performance with human mind. *Cognitive Brain Research*, **3**, 299-308.
- Stephens, D. & Andrews, J.S. (1991). Screening for anxiolytic drugs. In: Willner, P. (Ed.), *Behavioural models in psychopharmacology: theoretical, industrial and clinical perspectives*. Cambridge: Cambridge University Press, pp. 50-75.
- Stevens, H., Jansen, H.M.L., DeReuck, J. & Korf, J. (1997). Imaging of stroke. In: ter Horst, G.J. & Korf, J. (Eds.), *Clinical pharmacology of cerebral ischemia*. Totowa, N.J.: Humana Press, pp. 31-41.
- Steward, J., Mitchell, J. & Kalant, N. (1989). The effects of life-long food restriction on spatial memory in young and aged Fischer 344 rats measured in the eight-arm radial and the Morris water mazes. *Neurobiology of Aging*, **10**, 669-675.
- Stoehr, J.D. & Wenk, G.L. (1995). Effects of age and lesions of the nucleus basalis on contextual fear conditioning. *Psychobiology*, **23**, 173-177.
- Stone, C.P. (1929a). The age factor in animal learning. I. Rats in the problem box and the maze. *Genetic Psychology Monograph*, **5**, 1-130.
- Stone, C.P. (1929b). The age factor in animal learning. II. Rats on a multiple light discrimination box and a difficult maze. *Genetic Psychology Monographs*, **6**, 125-202.
- Stone, W.S., Altman, H.J., Berman, R.F., Caldwell, D.F. & Kilbey, M.M. (1989). Association of sleep parameters and memory in intact old rats and young rats with lesions in the nucleus basalis magnocellularis. *Behavioral Neuroscience*, **103**, 755-764.
- Strickberger, M.W. (1976). *Genetics* (2nd ed.). New York: Macmillan Publishing Co., Inc.
- Stubley-Weatherly, L.A., Harding, J.W. & Wright, J.W. (1996). Effects of discrete kainic acid-induced hippocampal lesions on spatial and contextual learning and memory in rats. *Brain Research*, **716**, 29-38.
- Sulter, G. & De Keyser, J. (1999). From stroke unit care to stroke care unit. *Journal of Neurological Sciences*, **162**, 1-5.
- Sutherland, G.R., Dix, G.A. & Auer, R.N. (1996). Effect of age in rodent models of focal and forebrain ischemia. *Stroke*, **27**, 1663-1668.
- Sweeney, J.E., Höhmann, C.F., Moran, T.H. & Coyle, J.T. (1988). A long-acting cholinesterase inhibitor reverses spatial memory deficits in mice. *Pharmacology Biochemistry & Behavior*, **31**, 141-147.
- T**
- Tagliavini, F. & Pillari, G. (1983). Basal nucleus of Meynert. A neuropathological study in Alzheimer's disease, simple senile dementia, Pick's disease and Huntington's chorea. *Journal of the Neurological Sciences*, **62**, 243-260.
- Tagliavini, F., Pillari, G., Bouras, C. & Constantinidis, J. (1984). The basal nucleus of Meynert in idiopathic Parkinson's disease. *Acta Neurologica Scandinavica*, **69**, 20-28.
- Takeda, T. (1999). Senescence-accelerated mouse (SAM): a biogerontological resource in aging research. *Neurobiology of Aging*, **20**, 105-110.

- Takeda, T., Hosokawa, M., Takeshita, S., Irino, M., Higuchi, K., Matsushita, T., Tomita, Y., Yasuhira, K., Hamamoto, H., Shimizu, K., Ishii, M. & Yamamuro, T. (1981). A new murine model of accelerated senescence. *Mechanisms of Ageing and Development*, **17**, 183-194.
- Tamura, A., Graham, D.I., McCulloch, J. & Teasdale, G.M. (1981). Focal cerebral ischaemia in the rat: I. description of technique and early neuropathological consequences following middle cerebral artery occlusion. *Journal of Cerebral Blood Flow and Metabolism*, **1**, 53-60.
- Tamura, A., Kawai, K. & Takagi, K. (1997). Animal models used in cerebral ischemia and stroke research. In: Ter Horst, G.J. & Korf J. (Eds.), *Clinical pharmacology of cerebral ischemia*. Totowa, N.J.: Humana Press, pp. 265-294.
- Tamura, A., Yamamoto, M., Shimizu, M., Kirino, T. & Sano, K. (1985). Behavioral change after focal cerebral ischemia in the rat. *Journal of Cerebral Blood Flow and Metabolism*, **5**(Suppl.1), 379-380.
- Thal, L.J., Dokla, C.P.J. & Armstrong, D.M. (1988). Nucleus basalis magnocellularis lesions: lack of biochemical and immunocytochemical recovery and effect of cholinesterase inhibitors on passive avoidance. *Behavioral Neuroscience*, **102**, 852-860.
- Thompson, C.B. (1995). Apoptosis in the pathogenesis and treatment of disease. *Science*, **267**, 1458-1462.
- Thompson, R. (1978). *A behavioral atlas of the rat brain*. New York: Oxford University Press.
- Tominaga, T. & Ohnishi, S.T. (1989). Interrelationship of brain edema, motor deficits, and memory impairment in rats exposed to focal ischemia. *Stroke*, **20**, 513-518.
- Torres, E.M., Perry, T.A., Blokland, A., Wilkinson, L.S., Wiley, R.G., Lapp, D.A. & Dunnett, S.B. (1994). Behavioural, histochemical and biochemical consequences of selective immunolesions in discrete regions of the basal forebrain cholinergic system. *Neuroscience*, **63**, 95-122.
- Tucker, M.J. (1993). Variations in disease in inbred and outbred strains of rodents. *Journal of Experimental Animal Science*, **35**, 244-250.
- Turchi, J. & Sarter, M. (1997). Cortical acetylcholine and processing capacity: effects of cortical cholinergic deafferentation on crossmodal divided attention in rats. *Cognitive Brain Research*, **6**, 147-158.
- Uhl, G.R., Hilt, D.C., Hedreen, J.C., Whitehouse, P.J. & Price, D.L. (1983). Pick's disease (lobar
- sclerosis): depletion of neurons in the nucleus basalis of Meynert. *Neurology*, **33**, 1470-1473.
- Uttl, B. & Graf, P. (1993). Episodic spatial memory in adulthood. *Psychology and Aging*, **8**, 257-273.

V

- van Dellen, J.R. & Becker, D.P. (1988). *Current concepts: craniocerebral trauma*. Kalamazoo: The Upjohn Company.
- van der Logt, J.T.M. (1991). Necessity of more standardized virological characterization of rodents for aging studies. *Neurobiology of Aging*, **12**, 669-672.
- van der Staay, F.J. (1989). *Behavioral consequences of chronic dietary choline enrichment*. Doctoral dissertation, University of Nijmegen, Nijmegen, The Netherlands (ISBN 90-9002811-0).
- van der Staay, F.J. (1992). Ansatz zur Konstruktvalidierung mittels genetisch definierter Stämme am Beispiel ethologischer Angstmodelle. In: Oldigs-Kerber, J. & Leonard, J.P. (Eds.), *Pharmakopsychologie. Experimentelle und klinische Aspekte*. Jena: Gustav Fischer Verlag (ISBN 3-334-60424-1), pp. 69-86.
- van der Staay, F.J. (1997). Shift in performance of 24-month-old Wistar rats in the Morris water escape task: a comparison across thirty-six experiments. *Behavioural Brain Research*, **87**, 213-222.
- van der Staay, F.J., Augstein, K.-H. & Horváth, E. (1996a). Sensorimotor impairments in Wistar Kyoto rats with cerebral infarction, induced by unilateral occlusion of the middle cerebral artery: recovery of function. *Brain Research*, **715**, 180-188.
- van der Staay, F.J., Augstein, K.-H. & Horváth, E. (1996b). Sensorimotor impairments in rats with cerebral infarction, induced by unilateral occlusion of the left middle cerebral artery: strain differences and effects of the occlusion site. *Brain Research*, **735**, 271-284.
- van der Staay, F.J. & Blokland, A. (1996a). Behavioral differences between outbred Wistar, inbred Fischer 344, Brown Norway, and hybrid Fischer 344*Brown Norway rats. *Physiology & Behavior*, **60**(1), 97-109.
- van der Staay, F.J. & Blokland, A. (1996b). Repeated assessment of spatial discrimination performance of aged rats in the Morris water escape task. *Neurobiology of Learning and Memory*, **65**, 99-102.
- van der Staay, F.J., Blokland, A. & Raaijmakers, W. (1990). Different time course for age-related changes of behavior in a complex spatial one-field discrimination task in Lewis rats. *Psychobiology*, **18**(3), 305-311.

U

- Uhl, G.R., Hilt, D.C., Hedreen, J.C., Whitehouse, P.J. & Price, D.L. (1983). Pick's disease (lobar

- van der Staay, F.J. & de Jonge, M. (1993). Effects of age on water escape behavior and on repeated acquisition in rats. *Behavioral and Neural Biology*, **60**, 33-41.
- van der Staay, F.J., Hinz, V.C. & Schmidt, B. (1996a). Effects of metrifonate on escape and avoidance learning in young and aged rats. *Behavioural Pharmacology*, **7**, 56-64.
- van der Staay, F.J., Hinz, V.C. & Schmidt, B. (1996b). Effects of metrifonate, its transformation product dichlorvos, and other organophosphorus and reference cholinesterase inhibitors on Morris water-escape behavior in young-adult rats. *The Journal of Pharmacology and Experimental Therapeutics*, **278**, 697-708.
- van der Staay, F.J., Kerbusch, S. & Raaijmakers, W. (1990). Genetic correlations in validating emotionality. *Behavior Genetics*, **20**, 51-62.
- van der Staay, F.J., Krechting, B., Blokland, A. & Raaijmakers, W. (1990). The cone field: a spatial discrimination task for the automatic and simultaneous assessment of working and reference memory in rats. *Journal of Neuroscience Methods*, **31**, 13-22.
- van der Staay, F.J., Raaijmakers, W.G.M. & Blokland, A. (1990). Age differences in spatial memory of rats in two tasks differing only for the response required to find and obtain the food reward. In: van Bezooijen, C.F.A., Ravid, R. & Verhofstad, A.A.J. (Eds.), *From gene to man*. Rijswijk: Stichting Gerontologie en Geriatrie (ISBN 90-9003996-1), pp. 154-158.
- van der Staay, F.J., Raaijmakers, W.G.M. & Collijn, T.H. (1986). Spatial discrimination and passive avoidance behavior in the rat: age-related changes and modulation by chronic dietary choline enrichment. In: Fisher, A., Hanin, I. & Lachman, C. (Eds.), *Alzheimer's and Parkinson's diseases: strategies for research and development. Advances in Behavioral Biology*, Vol. **29**. New York: Plenum Press, pp. 603-608.
- van der Staay, F.J., Raaijmakers, W.G.M., Lammers, A.J.J.C. & Tonnaer, J.A.D.M. (1989). Selective fimbria lesions impair acquisition of working and reference memory of rats in a complex spatial discrimination task. *Behavioural Brain Research*, **32**, 151-161.
- van der Staay, F.J., Raaijmakers, W.G.M., Sakkee, A.N. & van Bezooijen, C.F.A. (1988). Spatial working and reference memory of adult and senescent rats after thiopental anaesthesia. *Neuroscience Research Communications*, **3**, 55-61.
- van der Staay, F.J., Stollenwerk, A., Horváth, E. & Schuurman, T. (1992). Unilateral middle cerebral artery occlusion does not affect water-escape behavior of CFW1 mice. *Neuroscience Research Communications*, **11**, 11-18.
- van der Staay, F.J., van Nies, J. & Raaijmakers, W.G.M. (1990). The effects of aging in rats on working and reference memory in a spatial holeboard discrimination task. *Behavioral and Neural Biology*, **53**, 356-370.
- van der Zee, C.E.E.M., Schuurman, T., Gerritsen van der Hoop, R., Traber, J. & Gispen, W.H. (1989). Beneficial effects of nimodipine on peripheral nerve function in aged rats. *Neurobiology of Aging*, **11**, 451-456.
- van Gool, W.A., Mirmiran, M. & van Haaren, F. (1985). Spatial memory and visual evoked potentials in young and old rats after housing in an enriched environment. *Behavioral and Neural Biology*, **44**, 454-469.
- van Hest, A. (1989). Spatial matching and non-matching in male and female Wistar rats: effects of delay interval duration. In: *Behavioral differences between male and female rats: learning and memory*. Doctoral dissertation, University of Amsterdam, pp. 161-170.
- van Luijtelaar, E.L.J.M., van der Staay, F.J. & Kerbusch, J.M.L. (1989). Spatial memory in rats: a cross validation study. *Quarterly Journal of Experimental Psychology*, **41B**, 287-306.
- van Rijzingen, I.M.S., van Dorlemalen, E., Josephy, M., Gispen, W.H. & Spruijt, B.M. (1996). ACTH(4-9) analog ORG2766 treatment 7 months delayed still improves Morris maze performance of fimbria-lesioned rats. *Pharmacology Biochemistry and Behavior*, **53**, 163-169.
- van Zutphen, L.F.M. (1993). Toxicity testing and genetic quality control. *Journal of Experimental Animal Science*, **35**, 202-209.
- van Zutphen, L.F.M. & den Bieman, M.G.C.W. (1984). Genetische karakterisering van rat inteeltstammen: resultaten van een internationaal samenwerkingsproject. *Biotechniek*, **5**, 65-68.
- Vincent, G.P. & Sepinwall, J. (1992). AF102B, a novel M1 agonist, enhanced spatial learning in WISTAR/10 rats with a long duration of action. *Brain Research*, **597**, 264-268.
- Vogels, O.J.M., Broere, C.A.J., ter Laak, H.J., ten Donkelaar, H.J., Nieuwenhuys, R. & Schulte, B.P.M. (1990). Cell loss and shrinkage in the nucleus basalis Meynert complex in Alzheimer's disease. *Neurobiology of Aging*, **11**, 3-13.
- Voits, M., Fink, H., Gerhardt, P. & Huston, J.P. (1995). Application of 'nose-poke habituation' validation with post-trial diazepam- and cholecystokinin-induced hypo- and hypermnesia. *Journal of Neuroscience Methods*, **57**, 101-105.
- Volpe, B.T., Waczek, B. & Davis, H.P. (1988). Modified T-maze training demonstrates dissociated memory loss in rats with ischemic hippocampal injury. *Behavioural Brain Research*, **27**, 259-268.

- Voytko, M.L. (1996). Cognitive functions of the basal forebrain cholinergic system in monkeys: memory or attention? *Behavioural Brain Research*, **75**, 12-25.
- Vrijmoed-de Vries, M.C., Tönissen, H. & Cools, A.R. (1987). The relationship between hindlimb disturbances, forelimb disturbances and catalepsy after increasing doses of muscimol injected into the striatal-pallidal complex. *Psychopharmacology*, **92**, 73-77.
- W**
- Wahl, F., Allix, M., Plotkine, M. & Boulu, R.G. (1992). Neurological and behavioral outcomes of focal cerebral ischemia in rats. *Stroke*, **23**, 267-272.
- Wahl, F., Allix, M., Plotkine, M. & Boulu, R.G. (1993). Effect of riluzole on focal cerebral ischemia in rats. *European Journal of Pharmacology*, **230**, 209-214.
- Waite, J.J. & Thal, L.J. (1996). Lesions of the cholinergic nuclei in the rat basal forebrain: excitotoxins vs. an immunotoxin. *Life Sciences*, **58**, 1947-1953.
- Walker, M.D., Salek, S.S. & Bayer, A.J. (1998). A review of quality of life in Alzheimer's disease. *Pharmacoeconomics*, **14**, 499-530.
- Wallace, J.E., Krauter, E.E. & Campbell, B.A. (1980a). Animal models of declining memory in the aged: short-term and spatial memory in the aged rat. *Journal of Gerontology*, **35**, 355-363.
- Wallace, J.E., Krauter, E.E. & Campbell, B.A. (1980b). Motor and reflexive behavior in the aging rat. *Journal of Gerontology*, **35**, 364-370.
- Walsh, R.N. & Cummins, R.A. (1976). The open-field test: a critical review. *Psychological Bulletin*, **83**, 482-504.
- Walsh, T.J. (1998). Models of cholinergic degeneration: AF64A and 192-IgG-Saporin. In: Fisher, A., Hanin, I. & Yoshida, M. (Eds.), *Alzheimer's and Parkinson's diseases. Advances in Behavioral Biology*, **49**, 667-674. New York: Plenum Press.
- Watson, B.D., Dietrich, W.D., Busto, R., Wachtel, M.S. & Ginsberg, M.D. (1985). Induction of reproducible brain infarction by photochemically initiated thrombosis. *Annals of Neurology*, **17**, 497-504.
- Wauquier, A., Melis, W. & Janssen, P.A.J. (1989). Long-term neurological assessment of the post-resuscitative effects of flunarizine, verapamil and nimodipine in a new model of global complete ischaemia. *Neuropharmacology*, **28**, 837-846.
- Wehner, J.M., Sleigh, S. & Upchurch, M. (1990). Hippocampal protein kinase C activity is reduced in poor spatial learners. *Brain Research*, **523**, 181-187.
- Weindruch, R. & Masoro, E.J. (1994). Concerns about rodent models for aging research. *Journal of Gerontology*, **46**, B87-B88.
- Welsh, F.A., Sakamoto, T., McKee, A.E. & Sims, R.E. (1987). Effect of lactacidosis on pyridine nucleotide stability during ischemia in mouse brain. *Journal of Neurochemistry*, **49**, 846-851.
- Wenk, G.L. (1996). Neuroprotection and selective vulnerability of neurons within the nucleus basalis magnocellularis. *Behavioural Brain Research*, **72**, 17-24.
- Wenk, G.L., Cribbs, B. & McCall, L. (1984). Nucleus basalis magnocellularis: optimal coordinates for selective reduction of choline acetyltransferase in frontal neocortex by ibotenic acid injections. *Experimental Brain Research*, **56**, 335-340.
- Wenk, G.L., Danysz, W. & Mobley, S.L. (1995). MK-801, memantine and amantadine show neuroprotective activity in the nucleus basalis magnocellularis. *European Journal of Pharmacology*, **293**, 267-270.
- Wenk, G.L., Markowska, A.L. & Olton, D.S. (1989). Basal forebrain lesions and memory: alterations in neuropeptides, not acetylcholine, may cause amnesia. *Behavioral Neuroscience*, **103**, 765-769.
- Wenk, G.L. & Olton, D.S. (1984). Recovery of neocortical choline acetyltransferase activity following ibotenic acid injection into the nucleus basalis of Meynert in rats. *Brain Research*, **293**, 184-186.
- Wenk, G.L. & Olton, D.S. (1989). Cognitive enhancers: potential strategies and experimental results. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, **13**, S117-S139.
- Wenk, G.L. & Rökaeus, Å. (1988). Basal forebrain lesions differentially alter galanin levels and acetylcholinergic receptors in the hippocampus and neocortex. *Brain Research*, **460**, 17-21.
- Wenk, G.L., Stoehr, J.D., Mobley, S.L., Gurney, J. & Morris, R.J. (1996). Age-related decrease in vulnerability to excitatory amino acids in the nucleus basalis. *Neurobiology of Aging*, **17**, 1-7.
- Whalley, L.J. (1989). Drug treatment of dementia. *British Journal of Psychiatry*, **155**, 595-611.
- Whishaw, I.Q. (1985). Formation of a place learning-set by the rat: a new paradigm for neurobehavioral studies. *Physiology & Behavior*, **35**, 139-143.
- Whishaw, I.Q. (1987). Hippocampal, granule cell and CA3-4 lesions impair formation of a place learning-set in the rat and induce reflex epilepsy. *Behavioural Brain Research*, **24**, 59-72.
- Whishaw, I.Q. (1995). A comparison of rats and mice in a swimming pool place task and matching to place task: some surprising differences. *Physiology & Behavior*, **58**, 687-693.
- Whishaw, I.Q., O'Connor, W.T. & Dunnett, S.B. (1985). Disruption of central cholinergic systems

- in the rat by basal forebrain lesions or atropine: effects on feeding, sensorimotor behavior, locomotor activity and spatial navigation. *Behavioural Brain Research*, **17**, 103-115.
- White, B.C., Grossman, L.I. & Krause, G.S. (1993). Brain injury by global ischemia and reperfusion: a theoretical perspective on membrane damage and repair. *Neurology*, **43**, 1656-1665.
- Whitehouse, P.J., Hedreen, J.C., White, C.L. III & Price, D.L. (1983). Basal forebrain neurons in the dementia of Parkinson disease. *Annals of Neurology*, **13**, 243-248.
- Wiebers, D.O., Adams, H.P. & Whisnant, J.P. (1990). Animal models of stroke: are they relevant to human disease? *Stroke*, **21**, 1-3
- Wiebers, D.O., Feigin, V.L. & Brown, R.D., Jr. (1997). *Handbook of stroke*. Philadelphia: Lippincott - Raven.
- Wilcock, G.K., Esiri, M.M., Bowen, D.M. & Smith, C.C.T. (1982). Alzheimer's disease: correlation of cortical choline acetyltransferase activity with the severity of dementia and histological abnormalities. *Journal of the Neurological Sciences*, **57**, 407-417.
- Willner, P. (1986). Validation criteria for animal models of human mental disorders: learned helplessness as a paradigm case. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, **10**, 677-690.
- Willner, P. (1991). Behavioural models in psychopharmacology. In: Willner, P. (Ed.), *Behavioural models in psychopharmacology: theoretical, industrial and clinical perspectives*. Cambridge: Cambridge University Press, pp. 3-18.
- Willner, P., Wise, D. & Ellis, T. (1986). Specific disruption of spatial behaviour in rats by central muscarinic receptor blockade. *Psychopharmacology*, **90**, 229-235.
- Winblad, B., Hardy, J., Backman, L. & Nilsson, L.-G. (1985). Memory function and brain biochemistry in normal aging and in senile dementia. In: Olton, D.S., Gamzu, E. & Corkin, S. (Eds.), *Memory dysfunctions: an integration of animal and human research from preclinical and clinical perspectives*. *Annals of the New York Academy of Sciences*, **444**, pp. 255-268.
- Winer, B.J. (1971). *Statistical principles in experimental design* (2nd ed.). New York: McGraw-Hill Book Company.
- Winkler, J., Power, A.E., Ramirez, G.A. & Thal, L.J. (1998). Short-term and complete reversal of NGF effects in rats with lesions of the nucleus basalis magnocellularis. *Brain Research*, **788**, 1-12.
- Winkler, J., Suhr, S.T., Gage, F.H., Thal, L.J. & Fisher, L.J. (1995). Essential role of neocortical acetylcholine in spatial memory. *Nature*, **375**, 484-487.
- Wirsching, B.A., Beninger, R.J., Jhamandas, K., Boegman, R.J. & Bialik, M. (1989). Kynurenic acid protects against the neurochemical and behavioral effects of unilateral quinolinic acid injections into the nucleus basalis of rats. *Behavioral Neuroscience*, **103**, 90-97.
- Wong, P.C., Zheng, H., Chen, H., Becher, M.W., Sirinathsinghji, D.J.S., Trumbauer, M.E., Chen, H.Y., Price, D.L., van der Ploeg, L.H.T. & Sisodia, S.S. (1997). Presenilin 1 is required for Notch 1 DII expression in the paraxial mesoderm. *Nature*, **387**, 288-292.
- Wood, N.I., Sopesen, B.V., Roberts, J.C., Pambakian, P., Rothaul, A.L., Hunter, A.J. & Hamilton, T.C. (1996). Motor dysfunction in a photothrombic focal ischaemia model. *Behavioural Brain Research*, 113-120.
- Woolf, N.J. (1991). Cholinergic systems in mammalian brain and spinal cord. *Progress in Neurobiology*, **37**, 475-524.
- Wozniak, D.F., Stewart, G.R., Finger, S., Olney, J.W. & Cozzari, C. (1989). Basal forebrain lesions impair tactile discrimination and working memory. *Neurobiology of Aging*, **10**, 173-179.
- ## X
- Xiong, Y., Gu, Q., Peterson, P.L., Muizelaar, J.P. & Lee, C.P. (1997). Mitochondrial dysfunction and calcium perturbation induced by traumatic brain injury. *Journal of Neurotrauma*, **14**, 23-34.
- ## Y
- Yager, J.Y., Shuaib, A. & Thornhill, J. (1996). The effect of age on susceptibility to brain damage in a model of global hemispheric hypoxia-ischemia. *Developmental Brain Research*, **93**, 143-154.
- Yamamoto, M., Tamura, A., Kirino, T., Shimizu, M. & Sano, K. (1988). Behavioral changes after focal cerebral ischemia by left middle cerebral artery occlusion in rats. *Brain Research*, **452**, 323-328.
- Yamamoto, M., Tamura, A., Kirino, T., Shimizu-Sasamata, M. & Sano, K. (1991). Effects of thyrotropin-releasing hormone on behavioral disturbances in middle cerebral artery-occluded rats. *European Journal of Pharmacology*, **197**, 117-123.
- Yamazaki, M., Matsuoka, N., Maeda, N., Kuratani, K., Ohkubo, Y. & Yamaguchi, I. (1995). FR121196, a potential antidiementia drug, ameliorates the impaired memory of rat in the Morris water maze. *The Journal of Pharmacology and Experimental Therapeutics*, **272**, 256-263.
- Yamori, Y., Nara, Y., Nabika, T., Tagami, M. & Horie, R. (1991). Cellular mechanisms of spontaneous hypertension and stroke: role of vascular smooth muscle cells. In: Bruschi, G. & Borghetti, A.

- (Eds.), *Cellular aspects of hypertension*. New York: Springer Verlag, pp. 25-40.
- Yang, G.-Y., Betz, A.L., Chenevert, T.L., Brunberg, J.A. & Hoff, J.T. (1994). Experimental intracerebral hemorrhage: relationship between brain edema, blood flow, and blood-brain barrier permeability in rats. *Journal of Neurosurgery*, **81**, 93-102.
- Yashin, A.I., Iachine, I.A. & Harris, J.R. (1999). Half of the variation in susceptibility to mortality is genetic: findings from Swedish twin survival data. *Behavior Genetics*, **29**, 11-19.
- Yau, J.L.W., Morris, R.G.M. & Seckl, J.R. (1994). Hippocampal corticosteroid receptor mRNA expression and spatial learning in the aged Wistar rat. *Brain Research*, **657**, 59-64.
- Yoerg, S.I. & Kamil, A.C. (1982) Response strategies in the radial arm maze: running around in circles. *Animal Learning and Behavior*, **10**, 530-534.
- Yonemori, F., Yamada, H., Yamaguchi, T., Uemura, A. & Tamura, A. (1996). Spatial memory disturbance after focal cerebral ischemia in rats. *Journal of Cerebral Blood Flow and Metabolism*, **16**, 973-980.
- Youngblood, B.D., Zhou, J., Smagin, G.N., Ryan, D.H. & Harris, R.B.S. (1997). Sleep deprivation by the "flower pot" technique and spatial reference memory. *Physiology & Behavior*, **61**, 249-256.
- Zawia, N., Arendash, G.W. & Wecker, L. (1992). Basal forebrain cholinergic neurons in aged rat brain are more susceptible to ibotenate-induced degeneration than neurons in young adult brain. *Brain Research*, **589**, 333-337.
- Zhang, Z., Chopp, M & Powers, C. (1997). Temporal profile of microglial response following transient (2h) middle cerebral artery occlusion. *Brain Research*, **744**, 189-198.
- Zhang, R.L., Chopp, M., Zhang, Z.G., Jiang, Q. & Ewing, J.R. (1997). A rat model of focal embolic cerebral ischemia. *Brain Research*, **766**, 83-92.
- Zhao, Q. (1995). *Transient middle cerebral artery occlusion in rats*. Doctoral dissertation, University of Lund, Sweden.
- Zhao, W., Ginsberg, M., Prado, R. & Belayev, L. (1996). Depiction of infarct frequency distribution by computer-assisted image mapping in rat brains with middle cerebral artery occlusion. *Stroke*, **27**, 1112-1117.
- Zhou, Y., Elkins, P.D., Howell, L.A., Ryan, D.H. & Harris, R.B.S. (1998). Apolipoprotein-E deficiency results in an altered stress responsiveness in addition to an impaired spatial memory in young mice. *Brain Research*, **788**, 151-159.
- Zippel, C. (1994). *Schlagenfall*. Frankfurt/Main: Ullstein Medicus.
- Zola-Morgan, S. & Squire, L.R. (1992). The components of the medial temporal lobe memory system. In: Squire, L.R. & Butters, N. (Eds.), *Neuropsychology of memory* (2nd ed.). New York: The Guilford Press, pp. 325-335.