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Education:

B.A., Colgate University, 1969

Ph.D., The University of Vermont, 1977, Physiological Psychology

Thesis title: The Effects of Norepinephrine Manipulations in the Amygdala on
Time-Dependent Memory Processes

Faculty Appointments:

Johns Hopkins University, Chair of the Department of Psychological and Brain Sciences, 2000-
present

Johns Hopkins University, Professor of Neuroscience, 1998-present

Johns Hopkins University, Professor of Psychology, 1997-present

The University of North Carolina, Chapel Hill, Kenan Professor of Psychology, 1994-1997

Director of the Graduate Training Program in Experimental and Biological Psychology,
1990-1995

Duke University, Adjunct Professor of Psychology: Experimental, 1994-1997

The University of North Carolina at Chapel Hill, Professor of Psychology,
1989-present

The University of North Carolina at Chapel Hill, Associate Professor of Psychology,
1984-1988

The University of North Carolina at Chapel Hill, Neurobiology Program Faculty,
1980-present

The University of North Carolina at Chapel Hill, Assistant Professor of Psychology,
1980-1984

The University of Vermont, Assistant Professor of Psychology, 1977-1980

Professional Affiliations:

American Association for the Advancement of Science - Fellow

American Psychological Association - Fellow

American Psychological Society - Fellow
The Society for Neuroscience

Professional Activities (1988-2002)

NIH activities

National Institute of Mental Health - Study Section, Cellular Neurobiology and Psychopharmacology Subcommittee, 1988-90:
Chair - Study Section, Neurochemistry and Neuropharmacology, 1990-1992.
National Institute on Aging - Study Section on Neuroscience, Behavior, and Sociology of Aging, Subcommittee A 1994-1997
National Institute on Aging-Oversight Committee for Alzheimer's Disease Clinical Research Unit, 1991-2001.

Editorial Activities

Associate Editor *Psychobiology*, 1986-1989
Section Editor *Neurobiology of Aging*, 1993-1998
Editor-in-chief *Behavioral Neuroscience*, Journal of the American Psychological Association, 1995-2001
Editorial Committee - Annual Review of Psychology, 1996
Guest Editor *Current Opinion in Neurobiology - Cognitive Neuroscience*, 1999
Editor *Vol 3 Biological Psychology, Handbook for Psychology*, Wiley & Sons

Professional Societies

American Psychological Society - Task Force on Graduate Education, 1988-1992
UNC Chapter of Sigma Xi -Executive Committee and President, 1989-1994
American Psychological Association - Committee on Animals in Research and Ethics, 1990-1992
Society for Neuroscience - Nominating Committee, 1990
American Psychological Society - Governing Board and Secretary, 1991-1993
Society for Neuroscience - Lindsley Award Committee, 1994-1996
AAAS - Electorate Nominating Committee, 1998-2000
Advisory Board-Society for Neuroscience Minority Fellowship Program, 1998 - 2001
Advisory Board-Beckman Institute, University of Illinois, 1998 - 2001
Society for Neuroscience - Nominating Committee, 2001
Society for Neuroscience - Lindsley Award Committee Chair, 2001-2003
Society for Neuroscience - Publication Committee, 2001-2003

Educational Activities

Sigma Xi National Lectureship Program, National Lecturer, 1995-1997
Course Director - Cold Spring Harbor, Laboratory Course on Mouse Behavior: Animal Models in Molecular Neurobiology, 1997-2000

Publications

- Gallagher, M., Kapp, B.S., Musty, R.E., and Driscoll, P.A. (1977). Memory formation: Evidence for a specific neurochemical system in the amygdala. Science. 198: 423-425.
- Kapp, B.S., Gallagher, M., Holmquist, B.F., and Theall, C.A. (1978) Retrograde amnesia and hippocampal stimulation: Dependence upon the nature of associations formed during conditioning. Behavioral Biology. 24: 1-23.
- Gallagher, M., and Kapp, B.S. (1978). Manipulation of opiate activity in the amygdala alters memory processes. Life Sciences. 23: 1973-1978.
- Kapp, B.S., and Gallagher, M. (1979). Opiates and memory. Trends in Neurosciences. 2: 177-180.
- Kapp, B.S., Frysinger, R.C., Gallagher, M., and Haselton, J.B.(1979). Amygdala central nucleus lesions: Effect on heart rate conditioning in the rabbit. Physiology and Behavior. 23: 1109-1117.
- Gallagher, M., Kapp, B.S., Frysinger, R.C., and Rapp, P.R. (1980). β -adrenergic manipulation in amygdala central n. alters rabbit heart rate conditioning. Pharmacology, Biochemistry and Behavior. 12: 419-426.
- Gallagher, M., and Kapp, B.S. (1981). Effect of phentolamine administration into the amygdala complex of rats on time-dependent memory process. Behavioral and Neural Biology. 31: 90-95.
- Gallagher, M., Kapp, B.S., McNall, C.L., and Pascoe, J.P. (1981). Opiate effects within the amygdala central nucleus on heart rate conditioning in rabbits. Pharmacology, Biochemistry and Behavior. 14: 497-505.
- Gallagher, M., and Kapp, B.S. (1981). Amygdala opiate sensitive mechanisms influence fear motivated responses and memory processes for aversive experiences. In J.L.Martinez, Jr., R.A. Jensen, R.B. Messing, J. Rigter, & J.L. McGaugh (Eds.), Endogenous Peptides and Learning and Memory Processes. (pp. 445-462). New York: Academic Press.
- Hynes, M., Gallagher, M., and Yacos, K.V. (1981). Systemic and intraventricular administration of naloxone: Effects on food and water intake in rats. Behavioral and Neural Biology. 32: 334-342.
- Gallagher, M., Kapp, B.S., Pascoe, J.P., and Rapp, P.R. (1981). A neuropharmacology of amygdala systems involved in learning and memory processes. In Y-Ben-Ari (Ed.), The Amygdaloid Complex. (pp. 343-354). Amsterdam: Elsevier/North Holland Biomedical Press.

- Kapp, B.S., Gallagher, M., Frysinger, R.C., and Applegate, C.D. (1981). The amygdala, emotion and cardiovascular conditioning. In Y-Ben-Ari (Ed.), The Amygdaloid Complex. (pp. 355-366). Amsterdam: Elsevier/North Holland Biomedical Press.
- Kapp, B.A., Gallagher, M., Underwood, M.D., McNall, C.L., and Whitehorn, D. (1982). Cardiovascular responses produced by stimulation of the amygdala in the rabbit. Brain Research. 234: 257-262.
- Walsh, T., Gallagher, M., Bostock, E., and Dyer, R.S. (1982). Trimethyltin impairs retention of a passive avoidance task. Neurobehavioral Toxicology and Teratology. 4: 163-167.
- Applegate, C.D., Frysinger, R.C., Kapp, B.S., and Gallagher, M. (1982). Multiple unit activity in the amygdala central nucleus during aversive Pavlovian heart rate conditioning in the rabbit. Brain Research. 238: 457-462.
- Kapp, B.S., Gallagher, M., Applegate, C.D., and Frysinger, R.C. (1982) The amygdala central nucleus: Contributions to conditioned cardiovascular responding during aversive Pavlovian conditioning in the rabbit. In C.D. Woody (Ed.), Conditioning: Representation of Involved Neural Function. New York: Plenum Press.
- Gallagher, M., Kapp, B.S., and Pascoe, J.P. (1982). Enkephalin analogue effects in amygdala central nucleus on conditioned heart rate. Pharmacology, Biochemistry and Behavior. 17: 217-222.
- Gallagher, M. (1982). Naloxone enhancement of memory processes: Effects of other opiate antagonists. Behavioral and Neural Biology. 35: 375-382.
- Pascoe, J.P., Gallagher, M., and Kapp, B.S. (1983). Benzodiazepine effects on heart rate conditioning in the rabbit. Psychopharmacology. 79: 256-261.
- Gallagher, M., King, R.A., and Young, N.B. (1983). Opiate antagonists improve spatial memory. Science. 221: 975-976.
- Gallagher, M. (1984). Neurochemical modulation of memory: A case for opioid peptides. In L. Squire and N. Butters (Eds.), Neuropsychology of Memory. pp. 579-587. New York: Guilford Publications, Inc.
- Gallagher, M. (1984). Current perspectives on memory systems and their modulation. In G. Lynch, J.L. McGaugh, and N.M. Weinberger (Eds.), The Neurobiology of Learning and Memory. pp. 368-372. New York: Guilford Publications, Inc.
- Gallagher, M., Fanelli, R.J., and Bostock, E. (1985). Opioid peptides: Their position among other neuroregulators of memory. In J.L. McGaugh (Ed.), Contemporary Psychology: Biological Processes and Theoretical Issues. pp. 69-93. Elsevier/North Holland Biomedical Press.

- Gallagher, M. (1985). Re-viewing modulation of learning and memory. In N.M. Weinberger, J.L. McGaugh and G. Lynch (Eds.), Memory Systems of the Brain: Animal and Human Cognitive Processes. pp. 311-334. New York: Gilford Publications.
- Gallagher, M. (1985). Effect of β -funaltrexamine (β -FNA) on retention of passive avoidance conditioning. Behavioral and Neural Biology. 44: 499-502.
- Gallagher, M., Rapp, P.R., and Fanelli, R.J. (1985). Opiate antagonist facilitation of time-dependent memory processes: Dependence upon intact norepinephrine function. Brain Research. 347: 284-290.
- Fanelli, R.J., Rosenberg, R.A., and Gallagher, M. (1985). Role of noradrenergic function in opiate antagonist facilitation of spatial memory. Behavioral Neuroscience. 99: 751-755.
- Gallagher, M., Bostock, E., and King, R.A. (1985). Effects of opiate antagonists on spatial memory in young and aged rats. Behavioral and Neural Biology: 44: 374-385.
- Rapp, P.R., Gallagher, M., and Rosenberg, R.A. (1987). An evaluation of spatial information processing in aged rats. Behavioral Neuroscience, 101, 3-12.
- Gallagher, M., Bostock, E., and Meagher, M. (1987). Effects of opiate manipulations on latent inhibition in rabbits: Sensitivity of the medial septal area to intracranial treatments. Behavioral Neuroscience, 101, 315-324.
- Decker, M.W. and Gallagher, M. (1987). Scopolamine-disruption of radial arm maze performance: Modification by noradrenergic depletion. Brain Research, 417, 59-69.
- Rapp, P.R., Fanelli, R.F., McGuire, M., Rosenberg, R.A. and Gallagher, M. (1987). Alterations in [3H]-desmethyylimipramine binding in the aged rat brain: an in vitro autoradiographic demonstration. Neuroscience Letters. 79: 17-22.
- Pelleymounter, M.A. and Gallagher, M. (1987). The spatial learning deficit in aged rats: persistence in the presence of a simple and highly salient stimulus configuration. Psychobiology. 15: 248-254.
- Decker, M.W., Pelleymounter, M. and Gallagher, M. (1988). The effects of training on a spatial memory task on high-affinity choline uptake in hippocampus and cortex in young adult and aged rats. Journal of Neuroscience. 8: 90-99.
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- Gallagher, M. and Pelleymounter, M. A. (1988). An age-related spatial learning deficit: Choline uptake distinguishes "impaired and "unimpaired" rats. Neurobiology of Aging. 9: 363-369.
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- Gallagher, M. and Pelleymounter, M. A. (1988). Spatial learning deficits in old rats: A model for memory decline in the aged. Neurobiology of Aging. 9: 549-556.
- Gallagher, M., Meagher, M. and Decker, M.W. (1989). Distinctive functional properties of limbic system opioid peptides. In: Neuropeptides and Stress. Y. Tache (Ed.), New York: Springer-Verlag. pp. 297-312.
- Jiang, H.-K., Owang, V., Hong, J.-S., and Gallagher, M. (1989) Elevated dynorphin in the hippocampal formation of aged rats: Relation to cognitive impairment on a spatial learning task. Proceedings of the National Academy of Science (USA). 86: 2948-2951.
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- Gallagher, M. and Burwell, R. D. (1989) Effects of aging across four behavioral domains. Neurobiology of Aging. 10: 691-708.
- Gallagher, M., Burwell, R. D., Kodsi, M. H., McKinney, M. Southerland, S., Vella-Rountree, L. and Lewis, M. H. (1990) Markers for biogenic amines in the aged rat brain: Relationship to decline in spatial learning ability. Neurobiology of Aging. 11: 507-514.
- Gallagher, M. (1990) Robinson et al. (1989) deserves another look. Psychobiology, 18: 258-260.
- Gallagher, M., Graham, P. W., and Holland, P. C. (1990) The amygdala central nucleus and appetitive Pavlovian conditioning: Lesions impair one class of conditioned behavior. Journal of Neuroscience. 10: 1906-1911.
- Pelleymounter, M. A., Beatty, G., and Gallagher, M. (1990) Hippocampal [³H]-CPP binding in aged rats and spatial learning deficits. Psychobiology. 18: 298-304.
- Zhang, W.-Q., Mundy, W. R., Thai, L., Gallagher, M. Tilson, H. A. and Hong, J.-S. (1991) Decreased glutamate release correlates with elevated dynorphin content in the

- hippocampus of aged rats with spatial learning impairment. Hippocampus, 1: 391-398.
- Gallagher, M. (1992) Understanding the function of the central nucleus: Is simple conditioning enough?. In The Amygdala, Ed. J. Aggleton, New York: John Wiley & Sons. 307-321.
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- Gallagher, M. and Holland, P. C. (1992) Preserved configural learning and spatial learning impairment in rats with hippocampal damage. Hippocampus. 2: 81-88.
- Hatfield, T., Graham, P. H., and Gallagher, M. (1992) Taste potentiated odor aversion learning: Role of the amygdala basolateral complex and central nucleus. Behavioral Neuroscience. 106: 286-293.
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- Burwell, R. D. and Gallagher, M. (1993) A longitudinal study of reaction time performance in Long-Evans rats. Neurobiology of Aging. 14: 57-64
- Holland, P. C. and Gallagher M. (1993) The effects of amygdala central nucleus lesions on blocking and unblocking. Behavioral Neuroscience. 107: 235-245.
- Holland, P. C. and Gallagher M. (1993) Amygdala central nucleus lesions disrupt increments, but not decrements, in CS processing. Behavioral Neuroscience. 107: 246-253.
- Nagahara, A. H., Nicolle, M. N., and Gallagher, M. (1993) Alterations in [³H]-kainate receptor binding in the hippocampal formation of aged Long-Evans rats. Hippocampus. 3: 269-277.
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- Gallagher, M., Gill, T. M., Baxter, M. G. and Bucci, D. J. (1994) The development of neurobiological models for cognitive decline in aging. Seminars in Neuroscience. 6: 351-358.
- Nagahara, A. H., Otto, T. and Gallagher, M. (1995) Entorhinal/Perirhinal cortex lesions impair performance on two versions of place learning in the Morris water maze. Behavioral Neuroscience. 109: 3-9.
- Burwell, R. D., Lawler, C. P. and Gallagher, M. (1995) Substantial preservation of mesostriatal dopamine markers in aged Long-Evans rats with sensorimotor impairment. Neurobiology of Aging. 16: 175-186.
- Bucci, D. J., Chiba, A. A. and Gallagher, M. (1995) A study of spatial learning in male and female Long-Evans rats. Behavioral Neuroscience. 109: 180-183.
- Smith, T. D., Gallagher, M. and Leslie, F. M. (1995) Cholinergic binding sites in rat brain: Analysis by age and cognitive status. Neurobiology of Aging. 16: 161-173.
- Gallagher, M. and Colombo, P. (1995) Aging and cognitive function. Curr Opin Neurobiol. 5: 161-168.
- Baxter, M. G., Bucci, D. J., Gorman, L. K., Wiley, R. G. and Gallagher, M. (1995). Selective immunotoxic lesions of basal forebrain cholinergic cells: Effects on learning and memory in rats. Behavioral Neuroscience. 109: 714-722.
- Hatfield, T. and Gallagher, M. (1995) Taste-potentiated odor conditioning: Impairment produced by infusion of N-Methyl-D-aspartate antagonist into basolateral amygdala. Behavioral Neuroscience. 109: 663-668.

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- Han, J.-S., Gallagher, M. and Holland, P. C. (1995) Hippocampal lesions disrupt decrements but not increments in conditioned stimulus processing. Journal of Neuroscience. 15: 7323-7329.
- Chouinard, M. L., Gallagher, M., Uasuda, R. P., Wolfe, B. B. and McKinney, M.(1995) Hippocampal muscarinic receptor function in spatial learning impaired aged rats. Neurobiology of Aging. 16: 955-963.
- Thai, L. Hong, J.-S., Wiley, R. G., and Gallagher, M. (1996) The regulation of hippocampal dynorphin by neural/neuroendocrine pathways: Models for effects of aging on an opioid peptide system. Neuroscience. 70: 661-671.
- Nagahara, A. H., Gill, M., Nicolle, M. and Gallagher, M. (1996) Alterations in opiate receptor binding in hippocampus of aged Long-Evans rats. Brain Research. 707: 22-30.
- Baxter, M. G. and Gallagher, M. (1996) Neurobiological substrates of behavioral decline: Models and data analytic strategies for individual differences in aging. Neurobiology of Aging. 17: 491-495.
- Stenvers, K. L., Lund, P. K., and Gallagher, M. (1996) Increased hippocampal expression of type 1 insulin-like growth factor (IGF) receptor messenger RNA is associated with cognitive decline in aged rats. Neuroscience. 72: 505-518.
- Gallagher, M. and Chiba, A. (1996) The Amygdala and emotion. Current Opinion in Neurobiology. 6: 221-227.
- Sugaya, K., Xu, S.-J., Kent, C., Personett, D., Chouinard, M., Pauly, T. and Gallagher, M., and McKinney, M. (1996) Molecular indices of neuronal and glial plasticity in the hippocampal formation in a rodent model of age-induced spatial learning impairment. Journal of Neuroscience. 16: 3427-3443.
- Baxter, M. G. and Gallagher, M. (1996) Intact spatial learning in both young and aged rats following selective removal of hippocampal cholinergic input. Behavioral Neuroscience. 110: 460-467.
- Hatfield, T., Han, J.-S., Conley, M. Gallagher, M. and Holland, P. (1996) Neurotoxic lesions of the basolateral, but not central, amygdala interfere with Pavlovian second-

- order conditioning and reinforcer-devaluation effects. Journal of Neuroscience. 16: 5256-5265.
- Nicolle, M. M., Bizon, J., and Gallagher, M. (1996) In vitro autoradiography of ionotropic glutamate receptors in the hippocampus and striatum of aged Long-Evans rats: Relationship to spatial learning. Neuroscience. 74: 741-756.
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- Nicolle, M. M., Shivers, A., Gill, T.M., and Gallagher, M. (1997) Hippocampal NMDA and Kainate binding in response to entorhinal cortex aspiration or 192 IgG-saporin lesions of the basal forebrain. Neuroscience. 77: 649-659.
- Baxter, M. G. and Gallagher, M. (1997) Cognitive effects of selective loss of basal forebrain cholinergic neurons: Implications for cholinergic therapies of Alzheimer's disease. In Pharmacological Treatment of Alzheimer's Disease: Molecular and Neurobiological Foundations. Ed. J. D. Brioni and M. W. Decker. New York: John Wiley and Sons, Inc. pp. 87-103
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- Baxter, M. G., Gallagher, M. and Holland, P. C. (1997) Disruption of decremental processing of conditioned stimuli by selective removal of hippocampal cholinergic input. Journal of Neuroscience. 17: 5230-5236.
- Tanila, H. , Shapiro, M., Gallagher, M., and Eichenbaum, H. (1997) Brain

- Aging: changes in the nature of information coding by the hippocampus. Journal of Neuroscience. 17: 5155-5166.
- Rapp, P. R. and Gallagher, M. (1997) Toward a cognitive neuroscience of normal aging. Advances in Cell Aging and Gerontology. 2: 1-21.
- Gallagher, M. (1997) Animal models of memory impairment. Philosophical Transactions of the Royal Society London. B 352: 1711-1717.
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