**Curriculum Vitae**

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# I. Education

1981-1985 University of Cincinnati, Cincinnati, OH B.A., Psychology,

1985-1987 University of Colorado, Boulder, CO Behavioral Genetics

1987-1992 University of Cincinnati, Cincinnati, OH Ph.D., Behavioral Neuroscience

# II. Professional Credentials

2021-present Director of Graduate Studies, Neuroscience Institute, Georgia State University

2018-present Professor, Neuroscience Institute, Georgia State University, Atlanta, GA 30303

2008-2017 Associate Director, Neuroscience Institute, Georgia State University, Atlanta, GA 30303

2008-present Associate Professor, Neuroscience Institute, Georgia State University, Atlanta, GA 30303

2003-present Associate Professor, Dept. Biology, Center for Behavioral Neuroscience, Georgia State University, Atlanta, GA 30303

2001-2003 Associate Professor, Dept. Anatomy & Neurobiology, Univ. of Maryland School of Medicine, Baltimore, MD 21201

1996-2001 Assistant Professor, Dept. Anatomy & Neurobiology, Univ. of Maryland School of Medicine, Baltimore, MD 21201

1995-1996 Visiting Research Scientist, Dept. Anatomy & Embryology, Rijksuniversitiet Groningen, Groningen, The Netherlands

1994-1995 Post Doctoral Fellow, Dept. Anatomy, Univ. Maryland School of Med., Baltimore, MD 21201

1992-1994 Post Doctoral Fellow, Dept. Physiology, Univ. Cincinnati College of Med., Cincinnati, OH 45236

# III. Scholarship & Professional Development

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[Google Scholar Citations](https://scholar.google.com/citations?user=-IKX09gAAAAJ&hl=en)

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**A. Journal Articles**

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1. Murphy AZ, Stewart M and Wessendorf M (2021) Our Life and Times….Alan R. Gintzler, Ph.D. (1947–2021) Analgesics, Endogenous Opioids and the Variable of Sex. *Front. Pain Res*. 58. doi: 10.3389/fpain.2021.753792
2. Jansen LAR, Forster LA, Smith XL, Rubaharan M, **Murphy AZ**, Baro DJ. Changes in peripheral HCN2 channels during persistent inflammation. *Channels* 15 (2021) 165-179.
3. Shansky RM and **Murphy AZ**. Considering sex as a biological variable will require a global shift in science culture. *Nature Neuroscience* 24 (2021) 457-464. PMID: 33649507.
4. Mauvais-Jarvis F, Berthold H, Campesi I, Carrero J-J, Franconi F, Gouni-Berthold I, Heiman ML, Kautzky-Willer A, **Murphy A**, Regitz-Zagrosek V, Reue, K. Sex- and gender-based pharmacological response to drugs. *Pharmacological Review* 73 (2021) 730-762. PMID: 33653873.
5. Fullerton EF, Rubaharan M, Karom MC, Hanberry RI, **Murphy AZ**. Advanced age attenuates the antihyperalgesic effect of morphine and decreases mu opioid receptor expression and binding in the rat midbrain Periaqueductal Gray in male and female rats. *Neurobiology of Aging* 98 (2021) 78-87.
6. Althammer F, Ferreira-Neto HC, Rubaharan M, Roy RK, Patel AA, **Murphy A**, Cox DN, Stern JE. Three-dimensional morphometric analysis reveals time-dependent structural changes in microglia and astrocytes in the central amygdala and hypothalamic paraventricular nucleus of heart failure rats. J Neuroinflammation. 2020 Jul 23;17(1):221. doi: 10.1186/s12974-020-01892-4.
7. Forster LA, Jansen L-AR, Rubaharan, M, **Murphy AZ**, Baro DJ. Alterations in HCN2 SUMOylation during persistent inflammation. *Pain*, 24 (2020) 1517-1536*.*
8. Harder H and **Murphy AZ**. Early life opioid exposure and potential long term consequences. *Neurobiology of Stress* 10 (2019) 100156.
9. Eidson LN and **Murphy AZ.** Inflammatory mediators of opioid tolerance: Implications for dependency and addiction. *Peptides* 115 (2019) 51-58.
10. Fullerton EF, Doyle HH, and **Murphy AZ**. Impact of sex on pain and opioid analgesia: a review. *Current Opinion Behavioral Science* 23 (2018) 183-190.
11. Averitt DL, Eidson LN, Doyle HH, **Murphy AZ**. Neuronal and glial factors contributing to sex differences in opioid modulation of pain. *Neuropsychopharmacology* (2018) PMID: 29973654
12. Doyle HH and **Murphy AZ.** Sex-dependent influences of morphine and its metabolites on pain sensitivity in the rat. *Physiol. & Behavior* 17 (2017) 30421-30423.
13. Henderson, Y., Vazdarjanova, A., Naloor, R., **Murphy, A.Z.** and Parent, M.B. Sex-dependent effects of early life inflammatory pain on sucrose intake and sucrose-associated hippocampal arc expression in adult rats. *Physiol Beh.* 173 (2017) 1-8.
14. Doyle, H.H., L.N. Eidson, D. Sinkiewicz and **Murphy, A.Z.** Sex Differences in Microglia Activity within the Periaqueductal Gray of the Rat: A Potential Mechanism Driving the Dimorphic Effects of Morphine. *J Neurosci* 37 (2017) 3202-3214.
15. Doyle, H.H. and **Murphy, A.Z.** Sex differences in innate immunity and its impact on opioid pharmacology. *J Neurosci Research* 95 (2017) 487-499.
16. Eidson, L.N., Inoue, K., Young, L.J., Tansey, M.G. and **Murphy, A.Z.** Periaqueductal gray toll-like receptor 4 modulates morphine tolerance via soluble tumor necrosis factor signaling. *Neuropsychopharmacology* 42 (2017) 661-670.
17. Resendez, S.L., Day, J.J., Hambro, C., Austin, C.J., Kuhnmuench, M.A., Maina, F.K., Keyes, P.C., Edison, L., McLean, J.W., Porter-Stransky, K.A., Nevarez, N., **Murphy, A.Z.**, Mathews, T.A., and Aragona, B.J. Dopamine and kappa-opioid receptor interact within the nucleus accumbens shell to maintain monogamous pair bonds. *Elife* 2 (2016) 5.
18. Victoria, N.C. and **Murphy, A.Z.** Exposure to Early Life Pain: Long Term Consequences and Contributing Mechanisms. *Current Opinion in Behavioral Sciences*. 7 (2016) 61-68.
19. Victoria, N.C. and **Murphy, A.Z.** The long-term impact of early life pain on adult anxiety and stress: Historical perspectives, the clinic and empirical evidence. *Experimental Neurol* 275 Pt 2 (2016) 261-73.
20. Deak, T., Quinn, M., Cidlowski, J.A., **Murphy, A.Z.**, and Sheridan, J.F. Neuroimmune mechanisms of stress: sex differences, developmental plasticity and implications for stress-related disease. *Stress* 18 (2015) 367-80.
21. Victoria, N.C., Karom, M.C., and **Murphy, A.Z.** Analgesia for early life pain prevents deficits in adult anxiety and stress. *Developmental Neurosci* 37 (2015) 1-13.
22. Victoria, N.C., Eichenbaum, H., Karom, M. and **Murphy, A.Z.** Neonatal Injury Rapidly Alters Markers of Pain and Stress in Rat Pups. *Developmental Neurobiology* 74 (2014) 42-51.
23. Henderson, Y.O., Victoria, N.C., Inoue, K., **Murphy, A.Z.**, Parent, M.B. Early life inflammatory pain induces long-lasting deficits in hippocampal-dependent spatial memory in male and female rats. *Neurobiology of Learning & Memory* 118 (2015) 30-41.
24. Loyd, D.R. and **Murphy, A.Z.** The Neuroanatomy of sexual dimorphism in pain and opioid analgesia. *Experimental Neurol.* 259 (2014) 57-63.
25. Victoria, N.C., Inoue, K., Young, L.Y. and **Murphy, A.Z.** A Single Neonatal Injury Induces Life-Long Deficits in Stress Responsiveness and Increases Brain Enkephalin Expression. *Develop. Neurosci.* 35 (2013) 326-337.
26. Eidson, L. N. and **Murphy, A.Z.** Blockade of Toll-like Receptor 4 Attenuates Morphine Tolerance and Facilitates the Pain Relieving Properties of Morphine. *J. Neuroscience* 40 (2013) 15952-15963.
27. Victoria, N.C., Inoue, K., Young, L.Y. and **Murphy, A.Z.** Long-term dysregulation of brain corticotrophin and glucocorticoid receptors and stress reactivity by single early-life pain experience in male and female rats. *Psychoneuroendocrinology* 38 (2013) 3015-3028.
28. Eidson, L. N. and **Murphy, A.Z.** Persistent peripheral inflammation attenuates morphine-induced periaqueductal gray glial cell activation and analgesic tolerance in the male rat. *J. of Pain* 14 (2013) 393-404.
29. Normandin, JJ and **Murphy, A.Z.** Excitotoxic lesions of the nucleus paragigantocellularis facilitate male sexual behavior but attenuate female sexual behavior in rats. *Neurosci,* 175C (2011) 212-223.
30. Normandin, JJ and **Murphy, A.Z.** Serotonergic lesions of the periaqueductal gray, a primary source of serotonin to the nucleus paragigantocellularis, facilitate sexual behavior in male rats. *Pharmacology, Biochemistry & Behavior,* 98 (2011) 369-75.
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32. Normandin, JJ and **Murphy, A.Z.** The ins and outs of somatic genital reflexes in rats with a nod to humans: anatomy, physiology, and the role of the social neuropeptides. *Hormones & Behavior* 59 (2011) 656-665.
33. LaPrairie, J. and **Murphy, A.Z.** Neonatal Injury Alters Adult Pain Sensitivity by Increasing Opioid Tone in the Periaqueductal Gray. Long Term Impact of Neonatal Injury in Male and Female Rats: Sex Differences, Mechanisms and Clinical Implications. Frontiers in Neuroendocrinology, 31(2010) 193-202.
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42. LaPrairie, J. and **Murphy, A.Z.** Pre-emptive morphine analgesia attenuates the long-term consequences of neonatal inflammatory injury in male and female rats. Pediatric Research, 64 (2008) 625-30.
43. Loyd, D.R., Wang, X. and **Murphy, A.Z.** Sex Differences in Mu Opioid Receptor Expression in the Rat Midbrain Periaqueductal Gray are Essential for Eliciting Sex Differences in Morphine Analgesia. *J. Neurosci*., 28 (2008) 14007-14017.
44. Ji, Y., A.Z. Murphy, and R.J. Traub. Estrogen modulation of morphine analgesia of visceral pain in female rats is supraspinally and peripherally mediated. *J. Pain*, 8 (2007) 494-502.
45. Loyd, D.R., Morgan, M.M. and **Murphy, A.Z.** Morphine preferentially activates the Periaqueductal Gray – Rostral Ventromedial Medullary pathway in the male rat. *Neuroscience*, 147 (2007) 456-68.
46. LaPrairie, J. and **Murphy, A.Z.** Long-term consequences of neonatal pain are exacerbated in female rats. *Pain*, 132 (2007) S120-9.
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50. Marson L. and A.Z. Murphy. Identification of neural circuits involved in female sexual response: a dual virus and anterograde tracing study. *Am J Physiol Regul Integr Comp Physiol.* 291(2006) R419-28.
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57. Hoffman, G.E., Moore, N., Fiskum, G., and A.Z. Murphy. Ovarian steroid modulation of seizure severity and hippocampal neuronal damage induced by kainic acid administration. *Experimental Neurol.* 182 (2003) 124-134.
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60. Traub, R.J. and **Murphy, A.Z.** Colonic inflammation induces Fos in the thoracolumbar spinal cord and preferentially activates spino-parabrachial neurons. *Pain*, 95 (2002) 93-102.
61. **Murphy, A.Z.** and Hoffman, G.E. Distribution of gonadal steroid receptor containing neurons in the preoptic-periaqueductal gray-brainstem pathway: A unique circuit for the initiation and maintenance of male reproductive behavior. *J. Comp. Neurol.,* 438 (2001) 191-212.
62. Le, W.-W., Wise, P.M., **Murphy, A.Z.** and G.E. Hoffman. Parallel declines in Fos activation of the medial anteroventral periventricular (AVPV) nucleus and LHRH neurons in middle-aged rats. *Endocrinology*, 142 (2001) 4976-4982.
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64. Ren K., Wei1 F., Dubner R., Murphy A.Z., Hoffman G.E. Progesterone attenuates persistent inflammatory hyperalgesia in female rats: involvement of spinal NMDA receptor mechanisms. *Brain Res*. 865 (2000) 272-277.
65. **Murphy, A.Z.**, Rizvi, T.A., Ennis, M., and Shipley, M.T. The organization of preoptic-medullary circuits in the male rat: evidence for interconnectivity of neural structures involved in reproductive behavior, antinociception and cardiovascular regulation. *Neurosci*., 91 (1999)1103-1116.
66. **Murphy, A.Z.** and Hoffman, G.E. Distribution of androgen and estrogen receptor containing neurons in the male rat periaqueductal gray. *Horm. Beh.*, 36 (1999) 98-108.
67. Rizvi, T.A., **Murphy, A.Z.**, Ennis, M., Behbehani, M.M. and Shipley, M.T. Expression of *c-fos* in rat pontine tegmental neurons following electrical stimulation of the medial preoptic area. *Brain Res*., 789 (1998) 256-262.
68. Rizvi, T.A., **Murphy, A.Z.**, Ennis, M., Behbehani, M.M. and Shipley, M.T. Medial preoptic-induced fos expression in the periaqueductal gray overlaps with medial preoptic terminals and medullary output neurons: A new approach for simultaneous anatomical and functional mapping of excitatory neural circuits. *J. Neurosci.*, 16 (1996) 333-344.
69. **Murphy, A.Z.**, Ennis, M., Shipley, M. and Behbehani, M.M. Fos expression induced by changes in arterial pressure is localized in distinct, longitudinally organized columns of neurons in the rat midbrain periaqueductal gray. *J. Comp. Neurol.*, 360 (1995) 286-300.
70. **Murphy, A.Z.**, Ennis, M., Shipley, M. and Behbehani, M.M. Directionally-specific changes in arterial pressure induce differential patterns of Fos expression in discrete areas of the rat brainstem: A double labeling study for Fos and catecholamines.  *J. Comp. Neurol.*, 349 (1994) 36-50.
71. **Murphy, A.Z.** and Behbehani, M.M. Electrophysiological characterization of the projection from the nucleus raphe magnus to the lateral reticular nucleus: Possible role of an excitatory amino acid in synaptic activation. *Brain Res.*, 606 (1993) 68-78.
72. **Murphy, A.Z.** and Behbehani, M.M. Role of norepinephrine in the interaction between the lateral reticular nucleus and the nucleus raphe magnus: An electrophysiological and behavioral study. *Pain*, 55 (1993) 183-193.
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74. **Murphy, A.Z.**, Murphy, R.M. and Zemlan, F.P. Role of spinal serotonin1 receptor subtypes in thermally and mechanically elicited nociceptive reflexes. *Psychopharm.*, 108 (1992) 123-130.
75. Zemlan, F.P., Zieleniewski-Murphy, A., Murphy, R.M. and Behbehani, M.M. BMY7378: Partial agonist at spinal cord 5-HT1A receptors. *Neurochem. Int.* 16 (1990) 515-522.
76. Zemlan, F.P., **Murphy, A.Z.** and Behbehani, M.M. Effect of 5-HT1A agonists, serotonin and raphe stimulation on spinal dorsal horn nociceptive neurons in the rat. *Pharmacology*, 48 (1994) 1-10.
77. Zieleniewski, A.M., Fulker, D.W., DeFries, J.C. and LaBuda, M.C. Multiple regression analysis of twin and sibling data. *Person. Individ. Diff*. 8 (1987) 787-791.
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**B. Publications – Books/Monographs/Chapters**

1. Averitt DL, Hornung RS and **Murphy AZ**. Role of sex hormones on pain. In: *Encyclopedia of Neuroscience*, Randy Nelson (ed), 2019.
2. Doyle, H.H. and **Murphy, A.Z.** Immunomodulation as a source of sex differences in pain and morphine analgesia. *Primer PsychoNeuroImmunology Research*, 1st edition, M. Hutchinson and M. Opp (eds.), 2016.
3. Normandin, J.J., Pfaff, D.W. and **Murphy, A.Z.** Sexual Behavior. In: Donald W. Pfaff, editor. Neuroscience in the 21st Century, 1st edition. New York: Springer Press; (2012). pp. 1-16.
4. Loyd, D.R. and Murphy, AZ Forebrain modulation of the periaqueductal gray. *Encyclopedic Reference of Pain, 2nd edition,* R.F. Schmidt and G. Gebhart (eds.), Springer Press, pp. (2012).
5. Loyd, D. and **Murphy, A.Z.** Sex differences in descending pain modulatory pathways. *Encyclopedic Reference of Pain, 2nd edition.* R.F. Schmidt and W.D. Willis (eds.), Springer Press, pp. (2011).
6. **Murphy, A.Z.**, Berkley, K.J. and Holdcroft, A. Pain: Sex/Gender Differences. In: Donald W. Pfaff, Arthur P. Arnold, Anne M. Etgen, Susan E. Fahrbach and Robert T. Rubin, editors. Hormones, Brain and Behavior, 2nd edition, Vol 5. San Diego: Academic Press; 2009. p. 2853-2874.
7. **Murphy, A.Z.** and D. Loyd. Sex differences in descending pain modulatory pathways. *Encyclopedic Reference of Pain,* R.F. Schmidt and W.D. Willis (eds.), Springer Press, pp. (2006).
8. Ennis, M and Murphy, AZ Forebrain modulation of the periaqueductal gray. *Encyclopedic Reference of Pain,* R.F. Schmidt and W.D. Willis (eds.), Springer Press, pp. (2006).
9. Berkley, K.J., Hoffman, G., **Murphy, A.Z.** and Holdcroft, A. Pain: Sex/Gender Differences. *Hormones, Brain and Behavior*, D.W. Pfaff (ed.), Academic Press, pp. (2002).
10. Hoffman, G.E. and **Murphy, A.Z.** Anatomical markers of activity in hypothalamic neurons. *Neuroendocrinology in Physiology and Medicine*, P.M. Conn and M.E. Freeman (eds.), Humana Press, Totowa, NJ, pp. 541-552; 1999.
11. Shipley, M.T., **Murphy, A.Z.**, Rizvi, T.A., Ennis, M., and Behbehani, M.M. Olfaction and brainstem circuits of reproductive behavior in the rat. Progress in Brain Research, G. Holstege, R. Bandler and C.B. Saper (eds), Vol. 107, pp 355-377 (1996).

**C. Professional Presentations (last 10 years)**

1. Fullerton EF, Karom M, Rubaharan M, Streicher, JM, **Murphy AZ**.The impact of advanced age and sex on Mu Opioid Receptor signaling in the midbrain periaqueductal gray: implications on analgesia. *Society for Neuroscience*, 2021.
2. Hurst A, Harder H, Hanus L, Searles C, **Murphy AZ**. Effects of early life opioid exposure on brain development and its later life consequences. *Society for Neuroscience*, 2021.
3. Gomez M, Hanus L, Harder H, Searles C, **Murphy AZ.** Early life pain exposure alters fever response to adult immune challenge. *Society for Neuroscience*, 2021.
4. Harder HJ, Searles CT, Hanus LA, Gomez MG, Austin A, **Murphy AZ.** Sex-specific impact of perigestational opioid exposure on juvenile play behavior in rats. *Society for Neuroscience*, 2021.
5. Searles CT, Harder HJ, Hanus LA, Gomez MG, **Murphy AZ.** Developmental impact of perigestational morphine exposure on the alcohol reward system of Sprague Dawley rats. *Society for Neuroscience*, 2021.
6. Fullerton EF, Rubaharan M, Karom M, **Murphy AZ**. Impact of sex and advanced age on opioid analgesia in the rat periaqueductal gray. *International Narcotics Research Conference*, 2020.
7. Fullerton EF, Karom MC, Rubaharan M, Streicher JM, **Murphy AZ**. The impact of advanced age and sex on mu opioid receptor signaling in the midbrain periaqueductal gray: implications for pain modulation in the elderly. *Society for Neuroscience*, 2020.
8. Harder, H. and **Murphy, A.Z.** (2019). Long term consequences of peri-gestational opioid exposure on stress and anxiety behavior in male and female offspring. *Soc. Neurosci.*, Chicago, IL.
9. Cantu, D., Murphy AZ and Averitt DL. (2019) Sex Differences in the Amygdaloid Projections to the Periaqueductal Gray During Inflammatory Pain in the Rat. *Experimental Biology*
10. Fullerton, E., Rubahjaran, M., Karom, M. and **Murphy A.Z.** (2019) Age induced changes in mu opioid receptor levels and the impact on morphine analgesia. *Inter’l Narcotics Res Conf.,* NYC, NY.
11. Rubahjaran, Fullerton, E., M., and **Murphy A.Z.** (2018) Neuroinflammation in the periaqueductal gray: Implications for pain and analgesia. *Inter’l Narcotics Res Conf.,* NYC, NY.
12. Fullerton, E., Rubahjaran, M., Karom, M. and **Murphy A.Z.** (2018) Impact of advanced age on opioid modulation of pain. *Soc. Neuroscience Abstr.,* San Diego, CA.
13. Doyle, H.H and **Murphy, A.Z.** (2016) Microglia activation as a primary driver of sex differences in morphine analgesia in the rat. *Soc. Neuroscience Abstr.*, 337.04, San Diego, CA.
14. Doyle, H.H., Eidson, L.N. and **Murphy, A.Z.** (2015) Astrocyte and microglia activity within the periaqueductal gray: Sex differences in pain and analgesia. *Soc. Neuroscience Abstr.*, 337.04, San Diego, CA.
15. Henderson, Y., **Murphy, A.Z.**, and Parent, MB. (2015) Neonatal inflammatory pain-induced increases in food intake and body mass in adulthood are associated with hippocampal-dependent memory deficits. *Soc. Neuroscience Abstr.*, 337.04, San Diego, CA.
16. Doyle, H.H., Eidson, L.N. and **Murphy, A.Z.** (2014) Astrocyte and microglia activity within the periaqueductal gray: Sex differences in pain and analgesia. *Soc. Neuroscience Abstr.*, 337.04, Washington, DC.
17. Eidson, L.N., Tansey, M.G. and **Murphy, A.Z.** (2014) Periaqueductal gray toll-like receptor 4 modulates morphine tolerance via soluble tumor necrosis factor alpha signaling in the male rat. *Soc. Neuroscience Abstr.*, 337.20, Washington, DC.
18. Cooke, B.M., Ross, A.P., Victoria, N.C., Hamki, A. and **Murphy, A.Z.** (2014) Neonatal injury has sex-specific effects on social play and brain vasopressin receptor binding. *Soc. Neuroscience Abstr.* 584.09,
19. Henderson, Y., **Murphy, A.Z.**, and Parent, MB. (2013) Neonatal inflammatory pain-induced increases in food intake and body mass in adulthood are associated with hippocampal-dependent memory deficits. *Soc. Behav. Neuroendocrinology,* Atlanta, GA.
20. Eidson, L., Doyle, H., Butkovich, L. and **Murphy, A.Z.** (2013) Sex differences in glia expression within the midbrain periaqueductal gray: Implications for pain and analgesia. *Soc. Behav. Neuroendocrinology,* Atlanta, GA.
21. Eidson, L. and **Murphy, A.Z.** (2012) The role of periaqueductal gray glial cell activation in the development of morphine tolerance in the male rat. *International Narcotics Research Conference,* Kansas City, KS.
22. Victoria, N. and **Murphy, A.Z.** (2012) Early life pain induces long-term changes in endogenous opioidergic circuits: Role in adult stress responses. *Soc. Neurosci Abstr.,* New Orleans, LA.
23. Ogawa, Y., Victoria, N.C., **Murphy, A.Z.** and Parent, M.B. (2012). Neonatal inflammatory pain increases food intake and body weight in adulthood and impairs hippocampal-dependent memory. *Soc. Neurosci Abstr.,* San Diego, CA.
24. Parent, M.B., Ogawa, Y., Victoria, N. and **Murphy, A.Z.** (2011) Impact of neonatal pain and inflammation on hippocampal-dependent memory in middle-aged rats. *Soc. Neurosci Abstr.,* Washington, D.C.
25. Eidson, L. and **Murphy, A.Z.** (2011) The role of peraqueductal gray glial cell activation in the development of morphine tolerance in the male rat. *EuroGlia Conference*, Prague, Czech.
26. Victoria, N. and **Murphy, A.Z.** (2011) The impact of neonatal inflammatory injury on stress-related behavior and circuits in adult male and female rats. *Soc. Neurosci Abstr.,* Washington, D.C.

# Major Invited Talks

## Local Invited Lectures

2019 Neuroscience Program, Univ. of Georgia

2018 Dept. of Biology, Georgia State University

2015 Gerontology Institute, Georgia State University

2014 Dept. of Biology, Georgia State University

2013 Dept. of Pharmacology, Univ. of Georgia

2012 Dept. of Biology, Georgia State University

2012 Brains & Behavior Retreat, Georgia State University

2011 Dept. of Physiology, Emory University

2010 Dept. of Pediatrics, Emory University

2008 Program in Neuroscience, Morehouse College

2006 Dept. of Biology, Georgia State University

2006 Frontiers in Neuroscience, Emory University

2005 Dept. of Biology, Agnes Scott University

2005 Program in Neuroscience, University of Georgia

2005 Center for Disease Control, Atlanta, GA

2004 Dept. of Physiology, Emory University

2004 Dept. of Biology, Spelman University

2003 Program in Neuroscience, Univ. Maryland College Park

2003 Dept. of Psychology, Emory University

2002 Dept. Anatomy & Neurobiology, Univ. Maryland Sch Medicine

2002 USAMRICD, Aberdeen Proving Ground, Institute for Chemical Defense

2002 Women’s Health Research Group Annual Symposium

2001 Dept. of Biology, Univ. Maryland College Park

1998 Program in Neuroscience, Univ. Maryland Sch Medicine

## National Invited Lectures

2022 Williams College, Dept. of Psychology, Williamstown, MA

2021 University of Iowa Pain Research Group

2021 Utah State University

2020 NC Triangle Society for Neuroscience meeting – Keynote Speaker

2020 Virginia Commonwealth University biennial Werner Lowenthal Symposium, Richmond, VA

2019 Temple University Neuroscience Program, Philadelphia, PA

2019 Spinal Intervention Society Annual Meeting, Sex and Gender in Chronic Pain, NYC, NY.

2019 Organization on Studies for Sex Differences, Washington DC

2019 Program in Neuroscience, Washington State University

2019 Dept. Pharmacology & Therapeutics, SUNY Downstate Medical Center, NYC, NY

2018 Food & Drug Administration, Washington DC

2018 NIH Pain Consortium Symposium, Washington, DC

2018 Michigan State University, Neuroscience Program, Lansing, MI

2017 NIH Office of Strategic Coordination, Sex as a Biological Variable Workshop, Washington, DC

2017 Western University, Los Angeles, CA

2017 Winter Conference on Brain Research, Big Sky, Montana

2016 American Pain Society, Austin, TX

2015 American Pain Society, Palm Springs, CA

2015 International Narcotics Research Conference, Phoenix, AZ

2013 Univ. Michigan, Ann Arbor, MI

2012 Winter Brain, Chair of Session

2012 American Pain Society, Honolulu, HA

2011 University of Pennsylvania, Dept. of Neuroscience

2011 International Narcotics Research Council, Miami Beach, FL

2011 Dept. of Anesthesiology, Univ. Alabama, Birmingham

2010 Dept. of Neuroscience, Univ. Minnesota

2010 National Institute of Drug Abuse, Washington, DC

2009 Dept. of Psychology, Ohio State University

2009 Dept. of Physiology & Pharm., Oregon Health & Science University

2008 Minority Access to Research Careers Distinguished Lecturer, Univ. California

2007 University of Massachusetts Program in Neuroscience, Amherst, MA

2007 American Pain Society, Chair, Pediatric Pain Symposium; Washington, DC

2007 Michigan State University, Lansing, MI

2006 Keck Center for Behavioral Neuroscience, North Carolina State University

2006 Program in Neuroscience, UCLA

2006 Society for Neuroscience, Atlanta, GA

2005 Program in Neuroscience, MeHarry University

2005 Session Chair, American College of Neuropharmacology, Kona, HI

2005 Dept. Pharmacology, Pullman University

2003 Program in Neuroscience, Univ. Minnesota

2003 American Pain Society, Chicago, IL

2003 Workshop on Steroid Hormones and Brain Function, Breckenridge, CO

2003 American Endocrine Society, Chair, Presidential Symposium

2001 Dept. Biology, Lehigh University

2001 Dept. Pharmacology, St. Louis University

2000 Workshop on Steroid Hormones and Brain Function, Breckenridge, CO

## International Invited Lectures

2020 University of Calgary Neuroscience Program

2019 Sex Differences, Dimorphisms, Divergences: Impact on Brain and Behavior in Health and Disease, Erice, Sicily, Italy

2018 Institute of Cellular and Integrative Neurosciences, University of Strasbourg

2012 International Association for the Study of Pain, Milan, Italy
 Special Interest Group: Sex Differences in Pain: Mechanisms and Clinical Implications

2010 Organization for Studies on Sex Differences, Toronto, Canada

 Symposium Chair, Sex Differences in Pain: Mechanisms and Clinical Implications

2008 Society for Behavioral Neuroendocrinology, Groningen, Netherlands

Symposium Chair, Impact of Adversity on Adult Behaviors

2008         Morningside-CAS Kunming Biology Summer Course: Genes, Behavior and Evolution.  Kunming, China

2008 International Association for the Study of Pain, Glasgow, Scotland

 Symposium Chair, Impact of Aging on Pain and Analgesia

2004 Cayman Pain Meeting, Cayman Islands

2004 Society for Behavioral Neuroendocrinology, Lisbon, Portugal

Symposium Chair, Sex differences in Behavior Without the Sex

2002 International Behavioral Neuroscience Society, Capri Island, Italy

Symposium Co-Chair, Neural Circuits and Behavior

**D. Editorial/Reviewer Projects**

*Editorial Board*

2017 – current Associate Editor, Hormones & Behavior

2014 – current Journal of Pain Research

2003-2013 Endocrinology

*Review Editor*

Frontiers in Behavioral Neuroscience

Frontiers in Pain

*Manuscript Reviewer for:*

American Journal of Physiology

Brain, Behavior & Immunity

Behavioral Brain Research

Brain Research

Developmental Neurobiology

Developmental Neuroscience

Endocrinology

European Journal of Pain

Experimental Neurology

Hormones and Behavior

Journal of Comparative Neurology

Journal of Neuroscience

Journal of Neuroscience Research

Journal of Neurobiology

Journal of Neuroendocrinology

Journal of Neurophysiology

Journal of Pain

Journal of Pharmaceutical and Experimental Therapeutics

Journal of Rehabilitative Medicine

Journal of Urology

Nature

Nature Neuroscience

Neuroscience

Neuroscience Letters

Neuropharmacology

Pain
Pharmacology, Biochemistry & Behavior

Science

Grant Reviewer (Continuous NIH Submission Status):

2018 RFA-DA18-015 “HIV-associated neuropathic pain, opioids", SEP reviewer

2017-present NIH F03B Review Panel (Biophysical, Physiological, Pharmacological and Bioengineering Neuroscience Fellowship Study Section)

2011-2016 NIDA-NIH Cutting Edge Basic Research Awards, Reviewer

2012-2014 BRLE Study section, Biobehavioral and Behavioral Processes IRG, Ad-Hoc Member

ZDE1 Study section, Review of Centers for Oral Research – Pain, NIDCR Ad-Hoc Member

2009-2011 ZRG1/RUSD, UKGD, NIDK, Ad-Hoc Member

2008-2016 Welcome Trust, Grant Reviewer

2003-2006 National Science Foundation, Neuroendocrinology Division, Reviewer

2003-2004 IFCN-4, Special Emphasis Study Section, Ad Hoc Member

2003 Austrian Research Council, Grant Reviewer

2002 NIH R15, Panel Review Member

**E. Grants and External Funding**

**R01DA041529 Dates: 2/1/2017 – 1/31/2022**

*“Impact of Advanced Age on Opiate Analgesia”*

Role: Principal Investigator Funding Agency: NIDA/NIH

Total Award: $1,799,065

Costs per year: $325,813

**R01MH128176 (PI: Hamm) Dates: 12/20/2021-11/30/2026**

*“Sex differences in microglia-neuron-circuit interactions in adolescence”*

Role: co-Investigator Funding Agency: NIMH/NIH

Total Award: $1,726,000

Costs per year: $345,200

**R21 DA053761 Dates: Pending**

*“Influence of Peri-gestational opioid exposure on immune function”*

Role: Principal Investigator Funding Agency: NIDA/NIH

Total Award: $275,000

Costs per year: $150.000

***Internal Funding***

2021 Center for Neuroinflammation & Cardiovascular Disorders $15,000

2020 Center for Neuroinflammation & Cardiovascular Disorders $15,000

2019 Brains & Behavior Seed Grant (PI: Murphy) $30,000

2018 Brains & Behavior Seed Grant (PI: Baro) $30,000

 *The role of SUMOylation in HCN2 trafficking and chronic pain*

2013 Brains & Behavior Seed Grant 6/1/13-5/30/14 $30,000

 *Impact of Advanced Age on Opiate Analgesia*

2012 Brains & Behavior Seed Grant 6/1/12-5/30/13 $30,000

 *Long Term Consequences of Early Life Pain*

2011 Brains & Behavior Seed Grant 6/1/11-5/30/12 $30,000

*Sex Differences in Opiate Modulation of Pain*

2006 Brains & Behavior Seed Grant 10/1/05-9/30/06 $30,000

*Neuroanatomy of Sexual Solicitation*

2006 CBN Venture Grant 7/1/06-6/30/07 $ 30,000

*Sex Differences in Nucleus Paragigantocellularis Afferents*

2006 CBN Venture Grant 7/1/06-6/30/07 $15,000

*Delineation of oxytocin circuits that regulate affiliative behaviors*

2006 CBN Venture Grant 7/1/06-6/30/07 $30,000

*Stress-induced modulation of ERα and ERβ densities in the amygdala and extended amygdala of the female rat*

2005 B&B Seed 10/1/04-9/30/05 $35,000

#### Impact of Neonatal Injury on Adult Drug Use and Abuse

**F. Professional and Honor Organization Activities**

# Society Memberships

2020-present US Association for Studies in Pain

2006-present Organization for the Study of Sex Differences

2002-2019 American Pain Society

2002-present Endocrine Society

2002-present Society for Women’s Health Research

2001-present International Association for the Study of Pain

2001-present International Behavioral Neuroscience Society

2000-present American Neuroendocrine Society

1996-present Society for Behavioral Neuroendocrinology

1987-present Society for Neuroscience

# Offices/Committees/Presentations

2021-2023 Chair, Local Host Committee, International Narcotics Research Conference

2021-2022 Chair, Local Host Committee, Society for Behavioral Neuroendocrinology

2021-2022 Member, Scientific Program Committee, US Assoc. for the Study of Pain

2021 Executive Comm., Special Interest Group, Aging, US Assoc. for the Study of Pain

2020-2021 Chair, Local Host Committee, Society for Behavioral Neuroendocrinology

2019-2020 Chair, Local Host Committee, Society for Behavioral Neuroendocrinology

2019-2022 Member, Advisory Committee, Society for Behavioral Neuroendocrinology

2017-2020 Secretary, Organization for the Study of Sex Differences

2017-2018 Chair, Local Host Committee, Organization Studies of Sex Differences

2016-2017 Chair, Scientific Program Committee, Organization Studies of Sex Differences

2015-present Awards Committee, Society for Behavioral Neuroendocrinology

2014-2016 Nominations Committee, Society for Behavioral Neuroendocrinology

2013 Chair, Local Host Committee, Society for Behavioral Neuroendocrinology

2012-2014 Program Committee, Society for Behavioral Neuroendocrinology

2011-2014 Program Committee, American Pain Society

2010-2015 Councilor, Atlanta Chapter Society for Neuroscience

2010-2015 Councilor, Organization for the Study of Sex Differences

2010 Program Committee, Organization for the Study of Sex Differences

2009-present Reviewer, Society for Neuroscience Newsworthy abstracts

2009-2013 Advisory Board, Society for Behavioral Neuroscience

2008-2010 Secretary, Organization for the Study of Sex Differences

2007-2012 Associate Director, Brains & Behavior Program

2007-2015 Reviewing Editor, Frontiers in Behavioral Neuroscience

2006-201o Executive Council, Atlanta Chapter Society for Neuroscience

2006-2014 Executive Council, Organization for the Study of Sex Differences

2006-2009 Committee for Elections, Soc. Behavioral Neuroendocrinology

2005-2006 President, Atlanta Chapter Society for Neuroscience

2005-2012 Member, Institutional Animal Care & Use Committee

2005-2008 Treasurer, International Association for the Study of Pain

# Honors, Awards and Recognition

2021 GSU Exceptional Faculty Service Award

2020 Keynote Speaker, NC Triangle Society for Neuroscience meeting

2020 Keynote Speaker, Werner Lowenthal Symposium, VCU

2019 Research Intensive Semester award

2018 Keynote Address, Georgia State University Ph.D. Hooding Ceremony

2018 GSU Faculty Entrepreneurship & Innovation Workshop Fellow

2003 Patricia Sokolov Award for Outstanding Mentorship, presented by the University of Maryland Graduate Student Association

2002-2007 Office of Research on Women’s Health REAP Award

1997-1999 NSF POWRE Award

1993-1995 NIH-HLB Individual Research Service Award

1992-1993 NIH Post-Doctoral Training Fellow

1985 Allen Award for Outstanding Psychology Student

1985 Graduated Magna Cum Laude, Highest Honors in Psychology

# IV. Teaching, including advising

**Student Honors, Awards and Recognition**

2022 Brains & Behavior Fellowship, Morgan Gomez

2021 GSU Dissertation Award, Hannah Harder

2021 Brains & Behavior Fellowship, Hannah Harder

2021 Provost Dissertation Award, Evan Fullerton

2020 GSU Dissertation Award, Evan Fullerton

2020 Center for Neuroinflammation & Cardiometabolic Disease Graduate Fellowship, Meghan Vogt

2019 Center for Neuroinflammation & Cardiometabolic Disease Graduate Fellowship, Morgan Gomez

2019 Molecular Basis of Disease Graduate Fellowship, Christopher Searles

2018 Molecular Basis of Disease Graduate Fellowship, Evan Fullerton

2018 Molecular Basis of Disease Undergraduate Research Fellowship, Jonassie Zamor

2018 Brains & Behavior Undergraduate Research Fellowship, William Bell

2017 Center for Neuromics Graduate Fellowship, Hannah Harder

2017 Molecular Basis of Disease Undergraduate Research Fellowship, William Bell

2017 ‘Catch Them Young’ Summer Research Fellowship, Vineet Reddy

2017 ‘Catch Them Young’ Summer Research Fellowship, Jack Whelchel

2017 Brains & Behavior Undergraduate Research Fellowship, Jonassie Zamor

2017 Molecular Basis of Disease Undergraduate Research Fellowship, William Bell

2015 Honeycutt Fellowship, Hillary Doyle

2015 1st place, Atlanta Chapter Soc. Neuroscience poster presentation, Hillary Doyle

2013 Brains & Behavior Fellowship, Hillary Doyle

2012 Dissertation Award, Lori Eidson

2012 Sigma Xi Award, Lori Eidson

2012 Honeycutt Fellowship, Lori Eidson

2011 NIH Research Fellowship, Hila Eichenbaum

2011 BRAIN Best Poster award, Anthony Jordan

2010 BRAIN Best Poster award, Todd Jackson

2009 Early Life Trauma Travel Award, Nicole Victoria

2009 William Suttles Fellowship, Joseph Normandin

2008 IASP Travel Award, Dayna R. Loyd

2008 Soc Behavioral Neuroendocrinology Travel Award, Joseph J. Normandin

2008 BRAIN Scholar Presentation Award, Erica Famorjure

2008 William Suttles Fellowship, Dayna Loyd

***Graduate Students Under Direct Supervision***

Evan Fullerton, Thesis Advisor and Laboratory Mentor

Christopher Searles, Thesis Advisor and Laboratory Mentor

Hannah Harder, Thesis Advisor and Laboratory Mentor

Morgan Gomez, Thesis Advisor and Laboratory Mentor

Meghan Vogt, Thesis Advisor and Laboratory Mentor

## **Graduate Students Previously Under Direct Supervision**

Sarah Adeosun-Oyekunle, Thesis Advisor and Laboratory Mentor

Clint (Jed) Casper, Thesis Advisor and Laboratory Mentor

Alexus Austin, Thesis Advisor and Laboratory Mentor

Amirah Hurst, Thesis Advisor and Laboratory Mentor

Hillary Doyle, Ph.D., 2017, currently a freelance science writer

Lauren Hanus, M.S., 2017, currently a research assistant

Lori Eidson, Ph.D., 2014; currently a Post-Doctoral Fellow at Emory University

Nicole Victoria, Ph.D., 2013; currently an Inspector, FDA

Dayna Loyd, Ph.D., 2010; currently an Assistant Professor at Texas Women’s College

Richard Hanberry, M.S., 2011

Jamie LaPrairie, Ph.D., 2010; currently an Assistant Professor at Emory University

Geary Smith, M.S. 2010; currently a DVM at Univ. Pennsylvania

Joseph Normandin, Ph.D., 2010; currently a Lecturer at Georgia State University

## **Graduate Student Thesis Committees: Present**

Alice Van Derveer, Georgia State University, Neuroscience Institute

Lori Forester, Georgia State University, Neuroscience Institute

## **Graduate Student Thesis Committees: Past**

Jamin Letcher, Georgia State University, Neuroscience Institute (PhD 2021)

Kathrine Partrick, Georgia State University, Neuroscience Institute (PhD 2019)

Ivan Weinsanto, University of Strasbourg, France (PhD 2019)

Andrew James Jacobs, Georgia State University, Neuroscience Institute (MS 2019)

Christopher Fields, Georgia State University, Neuroscience Institute (PhD 2019)

Stephanie Hare, Georgia State University, Neuroscience Institute (PhD 2018)

Emily Bruggeman, Georgia State University, Neuroscience Institute (PhD 2015)

Jill Weathington, Georgia State University, Neuroscience Institute (PhD 2014)

Yoko Ogawa, Georgia State University, Neuroscience Institute (Ph.D., 2014)

Josh Lilvis, Ph.D., Georgia State University, Dept. Biology (Ph.D., 2012)

Laura Been, Ph.D., Georgia State University, Neuroscience Institute (Ph.D., 2011)

James Dougherty, Ph.D., Georgia State University, Neuroscience Institute (Ph.D., 2011)
Pam Maras, Ph.D., Georgia State University, Neuroscience Institute (Ph.D., 2009)

Stephanie Gutzler, Ph.D., Georgia State University, Dept. Biology (Ph.D., 2009)

Heather Ross, Ph.D., Emory University; External Member (Ph.D., 2009)

Meghan Daily, Ph.D., Georgia State University, Dept. Biology (Ph.D., 2008)

Raimi Quintin, Ph.D. Univ of Maryland School of Medicine, Program in Neuroscience (Ph.D., 2007)

Aline Davis, Ph.D. University of Maryland, Dept. of Physiology (Ph.D., 2007)

Yun Guan, M.D., Ph.D., University of Maryland School of Dentistry (Ph.D., 2006)

Cynthia Wren, Ph.D., University of Maryland School of Dentistry (Ph.D., 2006)

Natasha Flake, Ph.D., D.D.S., University of Maryland School of Dentistry (Ph.D., 2005)

Takisha Galor, M.S. University of Maryland, Dept. of Anatomy & Neurobiology (Ph.D., 2004)

Jing Wang, Ph.D., Lehigh University; External Member (Ph.D., 2004)

## **Laboratory Supervisees**

Varun Joshi, Presidential Honors Student

Malika Pandit, Undergraduate Honors Student

Masha Hashemi, Undergraduate Honors Student

Tayisha Vilceus, Presidential Honors Student

Elliott Woods, Emory undergraduate

Ryan Castineira, Research Associate

Shelby Suckow, Research Associate

Erica Famojure, Presidential Honors Student

Malcolm John, Research Associate

Angus White, Undergraduate Research Associate

Geary Smith, Masters Student

Hai Bui, Undergraduate Honors Student

Brittany Grandy, Undergraduate Honors Student

Aneeta Poole, Undergraduate Honors Student

Vincent Laufer, Undergraduate Honors Student
Whitney Huguelet, Undergraduate Honors Student

Nina Waldron, BRAIN Fellow

LaTrenda Dumes, McNair Fellow

Hela Eichenbaum, Undergraduate Honors Student

Brynn Travis, Undergraduate Honors Student

Todd Jackson, BRAIN student

Lauren Hanus, neuroscience undergraduate Honors student

Jean-Marc Sauzier, undergraduate Honor’s Thesis
Anthony Jordan, BRAIN & NETWORK student

Ronek Shah, undergraduate

Preston Giradot, undergraduate

Sierra Moore, Presidential Honors undergraduate

Ozaer Faroqui, undergraduate

Laura Butkovich, undergraduate honors student

Kehinde Idowu, Meharry medical student

Tyler Upchurch, Neuroscience undergraduate

Elizabeth Sandy, Biology undergraduate student

Kathrine Partrick, Neuroscience graduate student

Gregory Seuss, Neuroscience graduate student

Alyssa Barrett, Neuroscience undergraduate honors student

William Bell, Neuroscience undergraduate honors student

Abby Schwartz, Galloway high school student

Jonassie Zamor, Biology undergraduate honors 4+1 student

Jack Whelchel, Catch Them Young, Paideia high school student

Vineet Reddy, Catch Them Young, John’s Creek high school student

Rosalyn Chandler, Neuroscience undergraduate honors student

Meira Robbins, Neuroscience Presidential Honors student

Alexus Austin, Neuroscience honors 4+1 student

Sydney Ross, Biology undergraduate honors student

Eden Cox, Neuroscience undergraduate honors student

Sarah Adeosun Oyekunle, Neuroscience honors 4+1 student

Andrew Soule, Neuroscience undergraduate honors student

Malika Pandit, Neuroscience undergraduate honors student

# V. Service

## **University Service**

2021 Associate Chair, University Student Academic Disciplinary Committee

2020, 2021 Member, Fiscal Advisory Committee – President

2020 Member, Provost Committee on Academic Integrity

2020 Member, University Senate Committee on Salary and Wage Equity

2019 Workshop, GSU Research Office, Effective Grantsmanship – R awards

2019 Workshop, Graduate School, Effective Grantsmanship – F awards

2019-2021 Vice-Chair of the Faculty, College of Arts & Sciences

2019-2020 Chair, Neuroscience Institute Faculty Search Committee

2019 Chair, Triennial review of the Dean, College of Arts & Sciences

2018 Chair, Triennial review of the Director of the Neuroscience Institute

2017,2018, Workshop, GSU Research Office, Effective Grantsmanship

2017, 2018 Workshop, GSU Honors College, Effective poster presentation

2017-2021 Chair, University Student Academic Disciplinary Committee

2017-present Member, University Senate Research Committee

2017-2018 Member, Neuroscience Institute Faculty Search Committee

2017 Chair, Neuroscience Institute Director Search Committee

2016-2021 Elected Member, Executive Committee, Neuroscience

2016-2021 Elected Member, Graduate Program Committee, Neuroscience

2016-present Elected Member, Faculty Senate, College of Arts and Sciences

2016-2017 Member, Neuroscience Institute Faculty Search Committee

2016-2017 Member, Neuroscience Director Triennial Evaluation Committee

2014-2016 Member, Neuroscience Institute Faculty Search Committee

2014-2017 Member, Neuroethics 2CI Faculty Search Committee

2011-2014 GSU Academic Professional 5 year review committee

2008-2012 Member, Institutional Animal Care & Use Committee

1. Member, Operations Committee, Center for Advance Biological Imaging
2. Graduate Director, Center for Behavioral Neuroscience
3. Associate Director, B­­­­rains & Behavior Program
4. Neurobiology & Behavior Graduate Recruitment Committee
5. Past-President, Atlanta Chapter Society of Neuroscience
6. Chair, Brains & Behavior Seminar Committee
7. Member, Institutional Animal Care & Use Committee
8. President, Atlanta Chapter Society for Neuroscience
9. Vice President, Atlanta Chapter Society for Neuroscience
10. Chairperson, Atlanta Neuroscience-Center Behavioral Neuroscience Spring Symposium
11. Member, Brains & Behavior Scientific Advisory Board
12. Director, Brains & Behavior – Social Behavior Research Division

2002-2003 Executive Advisory Committee Member, Maryland’s BIRCH

2002-2003 Graduate Training Committee, Dept. Anatomy & Neurobiology

2002-2003 Chairperson, Women’s Health Research Group, Research & Education Committee

1999-2003 Univ. Maryland Medical Student Admissions Committee