
Christa McIntyre Rodriguez: *Curriculum Vitae*

June 25, 2019

Christa McIntyre Rodriguez
School of Behavioral and Brain Sciences
Cognition and Neuroscience Program

Educational History

B.A. (1994) American University, Washington, D.C.

Thesis: A psychopharmacological comparison of cholecystokinin and morphine

Advisor: Anthony Riley

Ph.D. (1999) University of Virginia, Charlottesville, VA, Psychobiology

Dissertation Title: Competition and Cooperation of Multiple Memory Systems,

Advisor: Paul E. Gold

Postdoctoral Fellow (1999-2006) University of California, Irvine, CA

Neurobiology of Memory and Emotion

Advisor: James L. McGaugh

Employment History – positions since the Bachelor’s degree

Graduate Researcher, Psychobiology (1994-1999), University of Virginia, Charlottesville, VA

Teaching Assistant, Psychobiology Lab (1994-1998), University of Virginia, Charlottesville, VA

Postdoctoral Researcher, Center for the Neurobiology of Learning and Memory, (1999-2006), University of California, Irvine, Irvine, CA.

Editor, Write Science Right: www.writescienceright.com (2003-2006), Irvine, CA.

Instructor, Graduate level Psychopharmacology (Fall, 2005), Chapman University, Orange, CA.

Assistant Professor, Behavioral and Brain Sciences (2006-2013), University of Texas at Dallas, Richardson, TX.

Associate Professor, Behavioral and Brain Sciences (2013-present), University of Texas at Dallas, Richardson, TX.

Neuroscience Program Head, Behavioral and Brain Sciences (2014-2016), University of Texas at Dallas, Richardson, TX.

Cognition and Neuroscience Program Head, Behavioral and Brain Sciences (2016-2017), University of Texas at Dallas, Richardson, TX.

Research Interests

My research is focused on understanding the effects of acute stress on memory. Whereas chronic stress tends to have an impairing effect on memory, acute stress has the potential to enhance memory consolidation. In my laboratory, we examine the physiological responses that contribute to the enhancement of stressful memories and we test tools and approaches that might be used to treat anxiety disorders that are associated with traumatic memories.

Professional recognitions and honors (study, teaching, research, service)

Dissertation Fellowship (1998-1999), University of Virginia

Ralph W. Gerard Fellowship (1999-2000), Center for the Neurobiology of Learning and Memory, University of California, Irvine.

Roger Russell Award for scholarship and Collegiality (2002), Center for the Neurobiology of Learning and Memory, University of California, Irvine.

Aage Møller Teaching Award (2013), School of Behavioral and Brain Sciences, The University of Texas at Dallas

UTD Nominee for Chancellor’s Teaching Award (2016), The University of Texas at Dallas

Nominee for President's Teaching Award (2017), The University of Texas at Dallas

Professional memberships

Society for Neuroscience (1995-present)

Cellular and Molecular Cognition Society (2007-present)

Achievements in original investigation:

Articles in refereed journals:

1. **McIntyre, C.K.**, Ragozzino, M.E., and Gold, P.E. Intra-amygdala infusions of scopolamine impair performance on a conditioned place preference task but not a spatial radial maze task. *Behavioural Brain Research* (1998) 95(2):219-226.
2. **McIntyre, C.K.**, Pal, S.N., Marriott, L.K., and Gold, P.E. Acetylcholine output in the hippocampus correlates negatively with good performance on an amygdala-dependent memory task *Journal of Neuroscience* (2002) 22(3):1171-1176.
3. **McIntyre, C.K.**, Hatfield, T., and McGaugh, J.L. Amygdala norepinephrine levels following learning predict long-term memory. *European Journal of Neuroscience* (2002) 16:1-6.
4. McGaugh, J.L., **McIntyre, C.K.**, and Power, A.E. Amygdala modulation of memory consolidation: Interaction with other brain systems. *Neurobiology of Learning and Memory* (2002) 78:539-552
5. **McIntyre, C.K.**, Marriott L.K., and Gold, P.E. Patterns of brain acetylcholine release predict individual differences in preferred learning strategies in rats. *Neurobiology of Learning and Memory* (2003) 79:177-183.
6. **McIntyre, C.K.**, Marriott, L.K., and Gold, P.E. Cooperation between memory systems: Acetylcholine release in the amygdala correlates positively with performance on a hippocampus-dependent task. *Behavioral Neuroscience* (2003) 117:320-326.
7. **McIntyre, C.K.**, Power, A.E., Roozendaal, B. and McGaugh, J.L. Role of the basolateral amygdala in memory consolidation. *Annals of the New York Academy of Sciences* (2003) 985:273-293.
8. Power, A.E., **McIntyre, C.K.**, Litmanovich, A., and McGaugh, J.L. Memory enhancement by cholinergic activation in the basolateral amygdala involves activation of both M1 and M2 receptors. *Behavioral Pharmacology* (2003) 14:207-213.
9. **McIntyre, C.K.**, Miyashita, T., Setlow, B., Guzowski, J.G., Marjon, K.D., Steward, O., Guzowski, J.F. and McGaugh, J.L. Memory-influencing intra-basolateral amygdala drug infusions modulate Arc expression in the hippocampus. *Proceedings of the National Academy of Science, USA* (2005) 102:10718-10723.
10. Roozendaal, B., McReynolds, J.R.; Van der Zee, E.; Lee, S.; McGaugh, J.L.; and **McIntyre, C.K** Glucocorticoids effects on memory consolidation depend on functional interactions between medial prefrontal cortex and basolateral amygdala. *Journal of Neuroscience*, (2009) 29:14299-308.
11. McReynolds, J.R.; Donowho, K.M., Abdi, A.; McGaugh, J.L., Roozendaal, B., and **McIntyre, C.K.** Glucocorticoids enhance long-term memory consolidation and Arc protein expression in hippocampal synaptic fractions. *Neurobiology of Learning and Memory*, (2010) 93:312-21.
12. Holloway, C.M. and **McIntyre, C.K.** Posttraining disruption of Arc protein expression in the anterior cingulate cortex impairs long-term memory for inhibitory avoidance training. *Neurobiology of Learning and Memory*, (2011) 95:425-32.
13. Holloway, C.M.; McReynolds, J.R. and **McIntyre, C.K.** Memory-enhancing intra-basolateral amygdala infusions of clenbuterol increase Arc and CaMKII-alpha protein expression in the rostral anterior cingulate cortex. *Frontiers in Behavioral Neuroscience* (2012) 6:17.
14. **McIntyre, C.K.**; McGaugh, J.L. and Williams, C.L. Interacting brain systems modulate memory consolidation. *Neuroscience and Biobehavioral Reviews* (2012) 36:1750-1762.
15. McReynolds J.R. and **McIntyre CK.** Emotional Modulation of the Synapse. *Rev Neurosci.* (2012) Aug 18. doi:prii: /j/revneuro.ahead-of-print/revneuro-2012-0047/revneuro-2012-0047.xml. 10.1515/revneuro-2012-0047.
16. Peña D.F.; Engineer N.D. and **McIntyre CK.** Rapid Remission of Conditioned Fear Expression with Extinction Training Paired with Vagus Nerve Stimulation, *Biological Psychiatry*, (2013) doi:10.1016/j.biopsych.2012.10.021

17. McReynolds JR, Holloway-Erickson CM, Parmar TU, **McIntyre CK**. Corticosterone-induced enhancement of memory and synaptic Arc protein in the medial prefrontal cortex. *Neurobiology of Learning and Memory* (2014) doi: 10.1016/j.nlm.2014.02.007. PMID: 24603007
18. Peña DF, Childs JE, Willett S, Vital A, **McIntyre CK**, Kroener S. Vagus nerve stimulation enhances extinction of conditioned fear and modulates plasticity in the pathway from the ventromedial prefrontal cortex to the amygdala. *Front Behav Neurosci.* (2014) doi: 10.3389/fnbeh.2014.00327. PMID:25278857
19. McReynolds JR, Anderson KM, Donowho KM, **McIntyre CK**. Noradrenergic actions in the basolateral complex of the amygdala modulate Arc expression in hippocampal synapses and consolidation of aversive and non-aversive memory. *Neurobiol Learn Mem.* (2014) doi: 10.1016/j.nlm.2014.08.016. PMID:25196704
20. Powers, M B, Medina, J, Burns, S, Kauffman, B, Monfils, M, **McIntyre, C**, Diamond, A, & Smits, JAJ. A case for exercise augmentation of exposure therapy: Rational and pilot data. *Cognitive Behaviour Therapy.* (2015) doi:10. 1080/1606073. PMID: 25706090
21. Ploski, JE, and **McIntyre, CK** Emotional Modulation of the Synapse. Invited Editorial in *Frontiers in Behavioral Neuroscience.* (2015) doi:10.3389/fnbeh2015.00035. PMID: 25745390
22. Childs, JE, Alvarez, AC, **McIntyre, CK**, and Kroener, S. Vagus Nerve Stimulation as a Tool to Induce Plasticity in Pathways Relevant for Extinction Learning. *JoVE.* (2015) doi:10.3791/53032. PMID: 26325100
23. Alvarez-Dieppa AC, Griffin K, Cavalier S, **McIntyre, CK**. Vagus Nerve Stimulation Enhances Extinction of Conditioned Fear in Rats and Modulates Arc Protein, CaMKII, and GluN2B-Containing NMDA Receptors in the Basolateral Amygdala. *Neural Plasticity* (2016) PMID: 27957346
24. LaLumiere RT, McGaugh JL, and **McIntyre CK**. Emotional modulation of learning and memory: Pharmacological Implications. *Pharmacological Reviews* (2017) doi: 10.1124/pr. 116.013474. PMID: 28420719.
25. Noble L, Gonzalez I, Meruva V, Callahan K, Belfort B, Ramanathan K, Meyers E, Kilgard M, Rennaker R, and **McIntyre CK**. Effects of vagus nerve stimulation on extinction of conditioned fear and posttraumatic stress disorder symptoms in rats. *Translational Psychiatry* (2017) doi: 10.1038/tp.2017.191 PMID: 28892066.
26. Ketchersid A, Noble LJ, **McIntyre CK**, and Filbey FM. Cannabinoid Receptor 1 Gene by Cannabis Use Interaction on CB1 Receptor Density. *Cannabis and Cannabinoid Research* (Published online, August 1, 2017) 2(1): 202-209. <https://doi.org/10.1089/can.2017.0007>.
27. Souza R, Noble L, and **McIntyre CK**. Using the Single Prolonged Stress Model to Examine the Pathophysiology of PTSD. *Frontiers in Neuropharmacology* (2017) doi: 10.3389/fphar.2017.00615 PMID: 28955225.
28. Goodman J. and **McIntyre CK**. Impaired spatial memory and enhanced habit memory in a rat model of post-traumatic stress disorder. *Frontiers in Neuropharmacology* (2017) doi: 10.3389/fphar.201700663 PMID: 29018340.
29. Wahlstrom KL, Huff ML, Emmons EB, Freeman JH, Narayanan NS, **McIntyre CK**, and LaLumiere RT. Basolateral amygdala inputs to the medial entorhinal cortex selectively modulate the consolidation of spatial and contextual learning. *The Journal of Neuroscience* (2018) doi:10:1523/JNEUROSCI.2848-17 PMID: 29431646.
30. Souza RR, Robertson NM, Pruitt DT, Noble L, Meyers EC, Gonzales PA, Bleker NP, Carey HL, Hays SA, Kilgard MP, McIntyre CK, Rennaker RL. The M-Maze task: An automated method for studying fear memory in rats exposed to protracted aversive conditioning. *The Journal of Neuroscience Methods* (2018) doi:10.1016/j.jneumeth.2018.02.004 PMID 29452180.
31. **McIntyre CK**. Is there a role for vagus nerve stimulation in the treatment of posttraumatic stress disorder? *Bioelectronics in Medicine* (2018) doi:10.2217/bem-2019-0002.
32. Noble LJ, Souza RR, McIntyre CK. Vagus nerve stimulation as a tool for enhancing extinction in exposure-based therapies. *Psychopharmacology* (2019) doi: 10.1007/s00213-018-4994-5. PMID 30091004.
33. Noble LJ, Meruva VB, Hays SA, Rennaker RL, Kilgard MP, and **McIntyre CK**. Vagus nerve stimulation promotes generalization of conditioned fear extinction and reduces anxiety in rats. *Brain Stimulation* (2018) doi:10.1016/j.brs.2018.09.013. PMID 30287193.
34. Souza R, Robertson NM, Pruitt DT, Gonzales PA, Hays SA, Rennaker RL, Kilgard MP, and **McIntyre CK**. VNS reverses extinction impairment in a severe model of PTSD *Stress* (2019) doi:10.1080/10253890. PMID: 3110369.

35. Noble LJ, Chua A, Callahan KK, Souza RR, **McIntyre CK**. Peripheral effects of vagus nerve stimulation on anxiety and extinction of conditioned fear in rats *Learning and Memory* (2019) doi:10.1101/lm140447. PMID:31209119

Chapters in edited volumes:

1. Gold PE, **McIntyre C**, McNay E, Stefani MR, and Korol DL. From memory consolidation to modulation: Referees of dueling memory systems. In: P.E.Gold and W.T. Greenough (Eds), Forty Years of Memories: A Festschrift for James L. McGaugh, APA Publishers, Washington, D.C. (2001), pp. 219-248.
2. **McIntyre CK** and Roozendaal B. Glucocorticoid interaction with arousal-induced noradrenergic activity in influencing consolidation of emotional memories. In: F. Bermudez-Rattoni (Ed.), Neuroplasticity and Memory: From Genes to Brain Imaging, CRC Press (2007) pp. 265-283.
3. Goodman J, **McIntyre C**, and Packard MG. The amygdala and the emotional modulation of multiple memory systems. In: Amygdala. InTech (2017) ISBN 978-953-51-5000-8.

Contributed (unrefereed) abstracts and/or oral presentations at professional meetings:

1. **Memory-enhancing intra-basolateral amygdala clenbuterol treatment increases dendritic Arc protein in the dorsal hippocampus**, C.K. McIntyre, A. Abdinezhad, T. Miyashita, J. Tu, D. Ibrahim, J.F. Guzowski, J.L. McGaugh *Society for Neuroscience Annual Meeting* Atlanta, GA: (November, 2006)
2. **Glucocorticoid receptor activation in the basolateral amygdala after inhibitory avoidance training increases medial prefrontal cortex phosphorylation of Erk I/II but decreases expression of Arc protein** C.K. McIntyre, J.R. McReynolds, and B. Roozendaal *Society for Neuroscience Annual Meeting* San Diego, CA: (November 2007); Society for Neuroscience (2007)
3. **Glucocorticoid receptor activation in the medial prefrontal cortex induces parallel effects on hippocampal Arc protein expression and memory** J.R. McReynolds, B. Roozendaal, and C.K. McIntyre *Society for Neuroscience Annual Meeting* San Diego, CA: (November 2007); Society for Neuroscience (2007)
4. **Memory enhancing corticosterone treatment increases Arc protein expression in hippocampal synaptic fractions** J.R. McReynolds, K. Donowho, B. Roozendaal, and C.K. McIntyre *Society for Neuroscience Annual Meeting* Washington, DC: (November, 2008); Society for Neuroscience (2008)
5. **Training induced Arc protein expression in the rat anterior cingulate cortex** C.M. Holloway, J.R. McReynolds, and C.K. McIntyre *Society for Neuroscience Annual Meeting* Washington, DC: (November, 2008); Society for Neuroscience (2008)
6. **Environmentally induced modification of the long term consolidation process of contextual fear memory** D.F. Pena, M. Kilgard, and C.K. McIntyre *Society for Neuroscience Annual Meeting* Washington, DC: (November, 2008); Society for Neuroscience (2008)
7. **Plasticity in excitability of CA1 and CA3 pyramidal cells after conditioned avoidance learning** G. E. Farmer, C.K. McIntyre, K. M. Bruckmann, and L.T. Thompson *Society for Neuroscience Annual Meeting* Washington, DC: (November, 2008); Society for Neuroscience (2008)
8. **Arc protein expression in the anterior cingulate cortex is critically involved in long-term memory of inhibitory avoidance training.** C.M. Holloway, J.R. McReynolds, and C.K. McIntyre, *Society for Neuroscience Annual Meeting* Chicago (2009)
9. **Posttraining intra-basolateral amygdala infusions of clenbuterol enhance memory for conditioned cue preference.** M.B. Carriera, J.R. McReynolds, and C.K. McIntyre, *Society for Neuroscience Annual Meeting* Chicago (2009)
10. **Intra-basolateral amygdala infusions of propranolol attenuate glucocorticoid effects on hippocampal Arc protein.** K.M. Donowho, J.R. McReynolds, B. Roozendaal and C.K. McIntyre, *Society for Neuroscience Annual Meeting* Chicago (2009)
11. **Posttraining intra-basolateral amygdala infusions of clenbuterol enhance object recognition memory.** K.M. Bruckmann, J.R. McReynolds, and C.K. McIntyre, *Society for Neuroscience Annual Meeting* Chicago (2009)
12. **The role of the vagus nerve in consolidation of extinction memory.** D.F. Pena, T. Jasti, and C.K. McIntyre, *Society for Neuroscience Annual Meeting* Chicago (2009)

13. **Memory enhancing corticosterone treatment increases Arc protein expression in medial prefrontal synaptic fractions.** J.R. McReynolds, K.M. Donowho, C.M. Holloway, B. Roozendaal, and C.K. McIntyre, *Society for Neuroscience Annual Meeting Chicago* (2009)
14. **Plasticity in amygdala pyramidal cell excitability after conditioned avoidance learning.** G.E. Farmer, K.M. Bruckmann, A. Lovitz, C.K. McIntyre, and L.T. Thompson, *Society for Neuroscience Annual Meeting Chicago* (2009)
15. **Arc protein expression in the anterior cingulate cortex is modulated by the basolateral complex of the amygdala.** C.M. Holloway, I.A. Villalobos, A.E. Montana, C.K. McIntyre, *Society for Neuroscience Annual Meeting, San Diego, CA* (2010)
16. **Posttraining blockade of basolateral amygdala norepinephrine attenuates corticosterone-induced Arc expression in prefrontal cortical synaptic fractions.** J.R. McReynolds, C.M. Holloway, T.U. Parmar, C.K. McIntyre, *Society for Neuroscience Annual Meeting, San Diego, CA* (2010)
17. **Posttraining infusions of lidocaine into the basolateral complex of the amygdala impair novel object recognition memory and decrease Arc protein expression in the dorsal hippocampus.** K.M. Prewitt, J.R. McReynolds, N.M. Vu, C.K. McIntyre, *Society for Neuroscience Annual Meeting, San Diego, CA* (2010)
18. **Vagus nerve stimulation enhances extinction of auditory fear conditioning.** D.F. Pena, S. McAfee, C.K. McIntyre, *Society for Neuroscience Annual Meeting, San Diego, CA* (2010)
19. **CaMKII α protein expression in the anterior cingulate cortex is modulated by the basolateral complex of the amygdala.** C.M. Holloway, J.R. McReynolds, I. A. Villalobos, E.-A. E. Inyang, C. K. McIntyre, *Society for Neuroscience Annual Meeting, Washington, DC* (2011).
20. **Post-training intra-basolateral complex of the amygdala infusions of clenbuterol enhance memory for conditioned place preference and increase Arc protein expression in hippocampal synaptic fractions.** J.R. McReynolds, A. Wang, C.K. McIntyre, *Society for Neuroscience Annual Meeting, Washington, DC* (2011).
21. **Precise pairing of vagus nerve stimulation with exposure to fear conditioned tones enhances extinction** D.F. Peña, C. McIntyre, *Society for Neuroscience Annual Meeting, Washington, DC* (2011).
22. **Intra-BLA infusions of propranolol enhance corticosterone-induced Arc protein expression in the rACC.** C.M. Erickson, J.R. McReynolds, E. Inyang, H.N. McCoy, C.K. McIntyre, *Society for Neuroscience Annual Meeting, New Orleans, LA* (2012).
23. **Vagus Nerve Stimulation coincident with conditioned fear stimuli during extinction facilitates metaplasticity between the prefrontal cortex and the basolateral amygdala.** D.F. Peña, S. Kroener, C.K. McIntyre, *Society for Neuroscience Annual Meeting, New Orleans, LA* (2012).
24. **Vagus Nerve Stimulation Facilitates Extinction and Reduces Reinstatement in Rats.** A. Alvarez-Dieppa, S.M. Willett, C.K. McIntyre, *Society for Neuroscience Annual Meeting, San Diego, CA* (2013).
25. **Effect of VNS-Paired Extinction on Expression of Synaptic Plasticity-Associated Proteins.** A. Alvarez-Dieppa and C. K. McIntyre, *Molecular and Cellular Cognition Society Annual Meeting, San Diego, CA* (2013).
26. **Effect of VNS-Paired Extinction on Expression of Synaptic Plasticity-Associated Proteins.** A. Alvarez-Dieppa and C. K. McIntyre, *18th Annual UT Austin Neuroscience Symposium, Austin, TX* (2014).
27. **Effect of Acute Vagus Nerve Stimulation on Anxiety in Rats.** L.J. Noble and C. K. McIntyre, *18th Annual UT Austin Neuroscience Symposium, Austin, TX* (2014).
28. **Role of CaMKII and NMDA receptors in VNS-enhanced extinction of fear.** Alvarez-Dieppa AC, McIntyre CK. *Wisconsin Symposium on Emotion, Madison, WI.* (2014).
29. **Molecular Mechanisms of VNS-Enhanced Extinction of Fear.** A. Alvarez-Dieppa, J. Childs, S. Willett, S. Kroener, and C. McIntyre *Society for Neuroscience Annual Meeting, Washington, DC* (2014).
30. **Molecular Mechanisms of VNS-Enhanced Extinction of Fear.** A. Alvarez-Dieppa, J. Childs, S. Willett, S. Kroener, and C. McIntyre; *Molecular and Cellular Cognition Society Annual Meeting, Washington, DC.* (2014).
31. **Effect of Acute Vagus Nerve Stimulation on Anxiety in Rats.** L.J. Noble and C.K. McIntyre; *Society for Neuroscience Annual Meeting, Washington, DC* (2014).
32. **Effect of VNS-paired extinction of conditioned fear in a VPA-induced animal model of autism.** A. C. Alvarez-Dieppa, S. H. Cavalier, K. N. Griffin, C. K. McIntyre; *Gordon Research Conference on: The Amygdala in Health and Disease, Stonehill College, Boston MA* (2015)

33. **Vagus nerve stimulation enhances extinction of conditioned fear in an animal model of PTSD.** L. J. Noble, I. J. Gonzalez, T. T. Ngo, S. Malhotra, K. R. Ramanathan, B. D. Belfort, M. P. Kilgard, and C. K. McIntyre; *The Annual Meeting of the Pavlovian Society*, Portland, OR (2015)
34. **Effect of VNS-paired extinction of conditioned fear in a VPA-induced animal model of autism.** A. C. Alvarez-Dieppa, S. H. Cavalier, K. N. Griffin, C. K. McIntyre, *The Annual Meeting of the Society for Neuroscience*, Chicago, IL (2015)
35. **Vagus nerve stimulation enhances extinction of conditioned fear in an animal model of PTSD.** L. J. Noble, I. J. Gonzalez, T. T. Ngo, S. Malhotra, K. R. Ramanathan, B. D. Belfort, M. P. Kilgard, and C. K. McIntyre; *The Annual Meeting of the Society for Neuroscience*, Chicago, IL (2015) ** Selected by the Society for Neuroscience as a “Hot Topic”.
36. **Extinction training-induced changes in synaptic plasticity-associated proteins in the basolateral complex of the amygdala of valproic acid-exposed rats.** S. H. Cavalier, K. N. Griffin, A. C. Alvarez-Dieppa, and C. K. McIntyre; *The Annual Meeting of the Molecular and Cellular Cognition Society*, Chicago, IL (2015)
37. **Effect of VNS-paired extinction of conditioned fear in a VPA-induced animal model of autism.** A. C. Alvarez-Dieppa, S. H. Cavalier, K. N. Griffin, C. K. McIntyre, *The Annual Meeting of the Molecular and Cellular Cognition Society*, Chicago, IL (2015)
38. **Abnormal phosphorylation of AMPA receptor subunit GluR1 in the basolateral amygdala of the valproic acid-exposed rat model of autism following extinction learning.** S.H.-M. Cavalier, K. Griffin, A. Alvarez-Dieppa, C. McIntyre, *The Annual Meeting of the Society for Neuroscience*, San Diego, CA (2016)
39. **The effects of vagus nerve stimulation on abnormal emotional learning and social anxiety in an animal model of autism.** A. Alvarez-Dieppa, S. Cavalier, K. Griffin, C. McIntyre, *The Annual Meeting of the Society for Neuroscience*, San Diego, CA (2016)
40. **Behavioral correlates of neuronal allocation in auditory fear conditioning.** J.L. Straight, C. McIntyre, *The Annual Meeting of the Society for Neuroscience*, San Diego, CA (2016)
41. **Vagus nerve stimulation reverses extinction impairments and alters PTSD symptoms in the SPS animal model.** L.J. Noble, I.J. Gonzalez, V.B. Meruva, A.K. Hutchinson, T.-A. Dam, S.K. Thomas, E. Meyers, M.P. Kilgard, C.K. McIntyre, *The Annual Meeting of the Society for Neuroscience*, San Diego, CA (2016). ** Selected by the Society for Neuroscience as a “Hot Topic”
42. **Impaired spatial memory and enhanced habit memory in an animal model of post-traumatic stress disorder.** J. Goodman and C.K. McIntyre, *The Annual Meeting of the Society for Neuroscience*, Washington DC (2017)
43. **Mechanisms of VNS-induced extinction enhancement and PTSD symptom reduction in rats.** LJ Noble, JE Childs AV Chuah, VB Meruva, S Kroener, CK McIntyre, *The Annual Meeting of the Society for Neuroscience*, Washington DC (2017)
44. **Parametric comparison of vagus nerve stimulation effects on fear extinction.** RR Souza, NM Robertson, DT Pruitt, RR Rennaker, SA Hays, MP Kilgard, and CK McIntyre, *The Annual Meeting of the Society for Neuroscience*, Washington DC (2017)
45. **Vagus nerve stimulation promotes cross-modality extinction generalization between auditory and olfactory cues.** RR Souza, CR Oleksiak, MN Tabet, SA Hays, RR Rennaker, MP Kilgard, CK McIntyre, *The UT Austin Conference on Learning and Memory*, Austin, TX (2019)
46. **The involvement of the left infralimbic prefrontal cortex in anxiety and fear extinction resistance after a single prolonged stress procedure.** L Souza, PG Demetrovich, RL Nunes-de-Souza, CS Planeta, CK McIntyre, *The UT Austin Conference on Learning and Memory*, Austin, TX (2019)

Manuscripts in preparation:

1. Mathew E, Robertson NM, Tabet M, Hays SA, Rennaker RR, Kilgard MP, **McIntyre CK**, Souza RR. Vagus nerve stimulation produces immediate dose-dependent anxiolytic effect in rats. (Submitted – May, 2019)
2. Souza RR, Robertson NM, Pruitt DT, Rennaker RR, Hays SA, **McIntyre CK**, and Kilgard MP. Parametric comparison of vagus nerve stimulation effects on fear extinction. (Submitted - June, 2019)
3. Souza R, Hays SA, Kilgard MP, and **McIntyre CK**. Optimization of vagus nerve stimulation timing parameters for enhancement of extinction of conditioned fear in rats. (In preparation)
4. Souza RR, Oleksiak CR, Tabet MN, Hays SA, Rennaker RR, Kilgard MP, **McIntyre CK**. Vagus nerve stimulation promotes cross-modality extinction generalization between auditory and olfactory cues. (In preparation)
5. Souza L, Demetrovic PG, Nunes-de-Souza RL, Planeta CS, Lalumiere R, **McIntyre CK**. The involvement of the left infralimbic prefrontal cortex in anxiety and fear extinction resistance after a single prolonged stress procedure. (In preparation)
6. Alvarez-Dieppa AC, Cavalier S, Griffin K, and **McIntyre CK**. Vagus nerve stimulation reverses extinction deficit in a rat model of autism. (In preparation).

Invited or refereed presentations in professional meetings and seminar or colloquia assemblies:

1. **The Brain** California State, Fullerton, Fullerton CA (summer 2002)
2. **Roger Russell Award**, Center for the Neurobiology of Learning and Memory, Irvine, CA (fall 2002)
3. **Brain system interactions in the consolidation of memory**, Dartmouth College, Hanover, NH (spring 2004)
4. **Brain system interactions in the consolidation of memory**, Texas A& M, College Station, TX (spring 2005)
5. **Brain system interactions in the consolidation of memory**, Florida Atlantic University, Boca Raton, FL (spring 2005)
6. **Brain system interactions in the consolidation of memory**, University of Texas at Dallas (fall 2005)
7. **Brain system interactions in the consolidation of memory**, University of Vermont, Burlington, VT. (spring 2006)
8. **Brain system interactions in the consolidation of memory**, University of California, Santa Barbara, CA. (spring 2006)
9. **The Brain**, Plano East High School, Plano, TX. (fall 2006)
10. **Intra-medial prefrontal cortex glucocorticoid infusions enhance memory consolidation and increase phosphorylation of Erk I/II in the amygdala**, Annual Learning and Memory Winter Conference, Park City, UT. (January 2007)
11. **Anxiety and posttraumatic stress disorder**, Microtransponder, Inc., Richardson, TX: (August 2008).
12. **Emotionally arousing experiences leave a mark on the brain**, Association for Psychological Sciences, San Francisco, CA. (May 2009)
13. **Vagus nerve stimulation as adjunct therapy in the treatment of anxiety disorders**, DARPA - Enabling Stress Resistance Workshop, San Diego, CA. (June 2009)
14. **Does synaptic protein translation underlie memory consolidation?** Annual Neurobiology of Learning and Memory meeting, Park City, UT (January 2010)
15. **Emotional modulation of the synapse** Annual Conference of the International Behavioral Neuroscience Society, Sardinia, Italy (June 2010)
16. **Stress effects on memory and the synapse** Annual Conference of the American Psychological Association. San Diego, CA (August 2010)
17. **Stress effects on memory and the synapse** Colloquium presentation, Institute of Neurobiology, Universidad Nacional Autónoma de México (UNAM), Querétaro, Mexico (September 2010)
18. **Vagus nerve stimulation enhances extinction of fear conditioning in rats** North American Neuromodulation Society, Las Vegas, NV (December 2010)
19. **Modulation of memory and plasticity by acute stress** Dallas Area Conference on the Neuroscience of Stress and Memory, Richardson, TX (May 2011).
20. **Vagus nerve stimulation enhances extinction of conditioned fear in rats** Annual Learning and Memory Winter Conference, Park City, UT (January 2011).

21. **Using emotional systems to direct neural plasticity** Dallas Area Conference on Emotional Learning and Memory, Richardson, TX (June 2014).
22. **Emotional Modulation of the Synapse.** Department of Psychology, The University of Iowa (summer 2014)
23. **Emotional Modulation of the Synapse.** Department of Psychology, The University of Texas Arlington (fall 2014).
24. **Emotional Modulation of the Synapse.** Professional Seminar in Behavioral and Brain Sciences, The University of Texas at Dallas (September 2016).
25. **Harnessing the Power of Stress.** Brain Matters Public Lecture, The University of Texas at Dallas (October 2016).
26. **Targeting Arousal Systems to Enhance Memory and Neural Plasticity.** Nanosymposium on Stress and Cognition, The Annual Meeting of the Society for Neuroscience (November 2016).
27. **Vagus Nerve Stimulation Enhances Extinction and Protects against Reinstatement in a Rat Model of PTSD.** Symposium on extinction and inhibition of drug seeking and fear-based memories, American College of Neuropsychopharmacology (ACNP; December 2016).
28. **Targeting Arousal Systems to Enhance Memory and Neural Plasticity.** Biology Department Seminar, Texas Women's University (April 2017)
29. **Targeting Arousal Systems to Enhance Memory and Neural Plasticity** Honors Seminar: Exploring Research, The University of Texas at Dallas (April 2017)
30. **Vagus Nerve Stimulation Enhances Extinction and Protects against Reinstatement in a Rat Model of PTSD.** Symposium on extinction of drug seeking and fear-based memories: Mechanisms and therapeutic implications, European Behavioral Pharmacology Society (August 2017).
31. **Effects of Stress on the Brain and Behavior** Sips of Science, Plano, Texas (October 2017)
32. **Preclinical Studies of Vagus Nerve Stimulation as a Potential Adjunct to Exposure-Based Therapies.** Department of Psychology. Texas Christian University (February 2018).
33. **Preclinical Studies of Vagus Nerve Stimulation as a Potential Adjunct to Exposure-Based Therapies.** Department of Pharmacology and Toxicology seminar series. Medical College of Georgia (March 2018)
34. **Targeting Arousal Systems to Enhance Memory and Neural Plasticity.** Center for Brain Health (April 2018)
35. **Vagus Nerve Stimulation Enhances Extinction and Protects against Reinstatement in a Rat Model of PTSD.** International Conference on Learning and Memory. Irvine, CA (April 2018).
36. **Preclinical Studies of Vagus Nerve Stimulation as a Potential Adjunct to Exposure-Based Therapies.** Waggoner Center for Alcohol and Addiction Research, The University of Texas at Austin, TX (September, 2018).
37. **Preclinical Studies of Vagus Nerve Stimulation as a Potential Adjunct to Exposure-Based Therapies.** Department of Pharmacology, Physiology, and Neuroscience. University of South Carolina Medical School (October 2018).
38. **Preclinical Studies of Vagus Nerve Stimulation as a Potential Adjunct to Exposure-Based Therapies.** Department of Pharmacology, UT Health Science Center, San Antonio, TX (January 2019).
39. **Preclinical Studies of Vagus Nerve Stimulation as a Potential Adjunct to Exposure-Based Therapies.** International Brain Stimulation conference. Vancouver, Canada (February, 2019)
40. **Preclinical Studies of Vagus Nerve Stimulation as a Potential Adjunct to Exposure-Based Therapies.** Texas Association for Behavior Analysis (TxABA) conference. Fort Worth, TX (March 2019).
41. **Preclinical Studies of Vagus Nerve Stimulation as a Potential Adjunct to Exposure-Based Therapies.** 2nd Annual Carolina Neurostimulation Conference. Chapel Hill, NC (June, 2019)
42. **Vagus Nerve Stimulation Enhances Extinction and Protects against Reinstatement in a Rat Model of PTSD.** 9th World Congress of Behavioural and Cognitive Therapies. The Effects of Neurostimulation on the Extinction of Fear Symposium. Berlin, Germany (July, 2019).

Patents:

Title: *Timing Control for Paired Plasticity*

Inventors: Michael Kilgard, Lawrence Cauller, Navzer Engineer, **Christa McIntyre**, and Will Rosellini

Issued date: 7/16/13

Title: *Methods for Enhancing Exposure Therapy using Vagus Nerve Stimulation*

Inventors: Christa McIntyre, Navzer Engineer, and Michael Kilgard

Issued date: 7/28/15

Title: *Systems, Methods, and Devices for Paired Plasticity*

Inventors: Lawrence Cauller, Michael Kilgard, Navzer Engineer, **Christa McIntyre**, and Will Rosellini

Issued date: 7/28/15

External funding for original investigations:

Grants/contracts awarded:

Neural pathways modulating memory consolidation

CoPI, Christa McIntyre and Ryan Lalumiere

National Institute of Mental Health, R01

(3/1/2015 – 2/29/2020) \$1,500,000 Total direct and indirect

DARPA ElectRX grant through Texas Center for Biomedical Devices

PI: Robert Rennaker, Co-Investigators: Michael Kilgard, Seth Hayes, and Christa McIntyre

(9/1/2015 – 9/30/2019) \$3,500,000 Total direct and indirect

DARPA seed grant through Texas Center for Biomedical Devices

CoPI, Michael Kilgard, Robert Rennaker, Seth Hayes, and Christa McIntyre

(4/10/2015 – 10/9/2016) \$632,609 Total direct and indirect

An adjunct to prolonged exposure therapy for treating refractory PTSD patients

Co-PI, Christa McIntyre and Navzer Engineer

National Institute of Mental Health, R43

(2/11/2016 – 1/31/2018) \$224,257 Total direct and indirect

Mechanisms of enhancement of extinction of conditioned fear by vagus nerve stimulation

PI, Christa McIntyre

National Institute of Mental Health, R15

(6/1/2013 – 5/31/2016) \$444,437 Total direct and indirect

Targeted Plasticity: Head-to-Head comparison of extinction effects of d-cycloserine vs. vagus nerve stimulation pairing with exposure to conditioned cues.

PI, Christa McIntyre

Texas biomedical Device Center

(April, 2014-August, 2015) \$42,000 Total direct

Use of vagal nerve stimulation as a method to enhance fear extinction

PI, Christa K. McIntyre and MicroTransponder Inc (Navzer Engineer, P.I.)

1R43MH086960-01A1 - National Institute of Health, SBIR

(7/1/2010 – 6/30/2011) \$198,899 total direct and indirect

Enhancing Fear Extinction Using Vagus Nerve Stimulation

PI, Christa McIntyre

Microtransponder Inc. contract

(2008-2009) \$21,593.00 total direct and indirect

Enhancing fear extinction using vagus nerve stimulation

Christa K. McIntyre

Microtransponder, Inc.,

(9/1/2009- 5/31/2011) \$36,000 direct and indirect

Teaching:

Doctoral student mentor:

Jayne McReynolds

Recipient of BBS Women in Biobehavioral Research Award (2008)

Thesis: *Basolateral Complex of the Amygdala Modulation of Encoding Emotional Valence and Arc Protein Expression* – Earned Ph.D. May 2012

Crystal Holloway

Thesis: *Interaction of the Amygdala and the Rostral Anterior Cingulate Cortex in the Consolidation of Long-Term Memory* – Earned Ph.D. December 2011

David Pena

Thesis: *The Use of Vagus Nerve Stimulation to Enhance the Treatment of Posttraumatic Stress Disorder* – Earned Ph.D. April 2013.

Amanda Alvarez

Recipient of Dissertation Award (2015)

Thesis: *Molecular Mechanisms of Vagus Nerve Stimulation Enhancement of Extinction in an Impaired Animal Model.* – Earned Ph.D. March 2017

Lindsey Noble

Thesis: *Effects of Vagus Nerve Stimulation on Extinction of Conditioned Fear* – Earned Ph.D. December 2017

Master's student mentor:

- | | |
|--|---|
| 1. Rosemary Wright
Graduated 2007
Physician, UTSW Psychiatry | Graduated 2014
Medical School |
| 2. Carrie Williamson
Graduated 2008
Intra-operative monitoring | 10. Yousef Abdel-Raziq
Graduated 2014
Medical School |
| 3. Kyle Donowho
Graduated 2008
Ph.D. program at UTD | 11. Shawn Willet
Graduated 2014
PhD program, Duke University |
| 4. Maria Carriera
Graduated 2009
Ph.D. program, Harvard University | 12. Karthik Ramakrishnan Ramanathan
Graduated 2015
Ph.D. program, Texas A&M |
| 5. Isabel Villalobos
Graduated 2011 | 13. Kayla Klein
Graduated 2015
Medical School, University of Michigan |
| 6. Sibby Spurgeon
Graduated 2011 | 14. Prathibha Sekar
Graduated 2015
Research Technician, UT Southwestern |
| 7. Justin Rhode
Pilot training program for US Military | 15. Rachel Wilhelm
Graduated 2016
PhD program, UT Dallas |
| 8. Chelsea Smith
Graduated 2013 | 16. Charles Dam |
| 9. Michael Kandaloft | |

Graduated 2015
Research Technician, UT Southwestern

17. Kimberly Griffin
Graduated 2017
PhD program, Yale University

Current master's students

Archana Iyer (Master's student in Molecular and Cell Biology)
Peyton Demetrovich (Master's student in Applied Cognition and Neuroscience)

Classroom teaching: (*indicates core course)

1. Fall, 2006	HCS7372.002	Neurobiology of Memory and Emotion
2. Spring, 2007	HCS6336.001	Principles of Developmental Neuroscience*
3. Fall, 2007	NSC 4357.001	Brain and Memory
4. Fall, 2007	NSC 4353.001	Neuroscience Laboratory Methods*
5. Spring, 2008	ACN 6346/HCS 6346	Systems Neuroscience *
6. Spring, 2008	NSC 4353.001	Neuroscience Laboratory Methods*
7. Fall, 2008	NSC 4353.001	Neuroscience Laboratory Methods*
8. Fall, 2008	NSC 4353.002	Neuroscience Laboratory Methods*
9. Spring, 2009	NSC 4353.001	Neuroscience Laboratory Methods*
10. Spring, 2009	NSC 4353.002	Neuroscience Laboratory Methods*
11. Fall, 2009	NSC 4353.002	Neuroscience Laboratory Methods*
12. Spring, 2011	NSC 4353.002	Neuroscience Laboratory Methods*
13. Spring, 2011	NSC 4353.003	Neuroscience Laboratory Methods*
14. Fall, 2011	NSC 4353.002	Neuroscience Laboratory Methods*
15. Fall, 2011	NSC 4353.003	Neuroscience Laboratory Methods*
16. Spring, 2012	NSC 4357.001	The Neurobiology of Learning and Memory (optional core)
17. Fall, 2012	ACN 6346/HCS6343	The Neurobiology of Learning and Memory
18. Spring, 2013	NSC 4353.004	Neuroscience Laboratory Methods
19. Spring, 2013	NSC 4357.001	The Neurobiology of Learning and Memory (optional core)
20. Fall, 2013	ACN 6346/HCS 6346	Systems Neuroscience*
21. Fall, 2013	NSC 4353.002	Neuroscience Laboratory Methods*
22. Spring, 2014	NSC 4353.005	Neuroscience Laboratory Methods*
23. Spring, 2014	NSC 4357.001	The Neurobiology of Learning and Memory (optional core)
24. Fall, 2014	NSC 4353.005	Neuroscience Laboratory Methods*
25. Spring, 2015	NSC 4353.002	Neuroscience Laboratory Methods*
26. Spring, 2015	HCS 6346.001	Neurobiology of Learning and Memory Seminar
27. Fall, 2015	NSC 1100.007	Freshman Experience
28. Spring, 2016	NSC 4353.002	Neuroscience Laboratory Methods*
29. Fall, 2016	NSC 3361.002	Introduction to Neuroscience*
30. Spring, 2017	NSC 4357.001	The Neurobiology of Learning and Memory (optional core)
31. Spring, 2018	NSC 4357.001	The Neurobiology of Learning and Memory (optional core)
32. Fall, 2018	HCS 6346.001	Neurobiology of Learning and Memory Seminar
33. Spring, 2019	NSC 4357.001	The Neurobiology of Learning and Memory (optional core)
34. Spring, 2019	NSC 3361.HN2	Honors College Introduction to Neuroscience*

Service:

Panelist and ad-hoc grant reviewer for:

National Institute of Mental Health (NIMH)

Study Section: July 2010 (**National Institute of Aging**; telephone conference)

February 2012 (National Institute of Mental Health, **Learning and Memory** Panel; San Francisco, CA)
 September 2012 (National Institute of Mental Health, **Learning and Memory** Panel; Chevy Chase, MD)
 June 2014 (National Institute of Mental Health, **Learning and Memory** Panel; Chevy Chase, MD)
 June 2015 (National Institute of Mental Health, **Pathophysiological Basis of Mental Disorders and Addiction** Panel; Phoned in)
 June 2016 (National Institute of Mental Health, **NIH BRAIN Special Emphasis** Panel; Tyson's Corner, VA)
 October 2016 (National Institute of Mental Health, **Pathophysiological Basis of Mental Disorders and Addiction** Panelist; New Orleans, LA)
 October 2016 (National Institute of Health, **Acute Neural Injury and Epilepsy**; Mail in reviewer)
 February 2017 (National Institute of Health, **Biobehavioral Regulation Learning and Ethology**, Member; Annapolis, MD)
 June 2017 (National Institute of Health, **Biobehavioral Regulation Learning and Ethology**, Member, Bethesda, MD)
 October 2017 (National Institute of Health, **Biobehavioral Regulation Learning and Ethology**, Member, Bethesda, MD)
 June 2018 (National Institute of Health, **Biobehavioral Regulation Learning and Ethology**, Member, Bethesda, MD)
 February 2019 (National Institute of Health, **Biobehavioral Regulation Learning and Ethology**, Member, Bethesda, MD)
 October 2019 (National Institute of Health, **Biobehavioral Regulation Learning and Ethology**, Member, Bethesda, MD)

National Science Foundation (NSF)

Panelist October 2009 (Arlington, VA)
 October 2011 (Arlington, VA)

Ad hoc reviewer (December 2013)

Human Frontiers Science Program (HFSP)

Mail Reviewer (November 2011)

Professional activities:

- Review editor for the journal *Frontiers in Behavioral Neuroscience*
- Review editor for the journal *Frontiers in Cellular Neuroscience*
- Co-editor of Research Topic: "Emotional Modulation of the Synapse" published in *Frontiers in Behavioral Neuroscience*.
- Co-organizer of annual winter conference on the neurobiology of learning and memory (Jan. 2010)
- Co-organizer of Dallas Area Conference on the Neuroscience of Stress and Memory (May 2011)
- Interviewed by Scientific American (July 2013)
- Interviewed by Lauren Silverman for NPR (October 2015)
- Interviewed by Dallas Morning News (October 2015)
- Interviewed by Melanie Brown at BBC Science Radio (November 2018)

Review journal manuscripts for:

- | | |
|----------------------------|-------------------------------------|
| 1. Nature Communications | 4. European Journal of Neuroscience |
| 2. Journal of Neuroscience | 5. European Journal of Pharmacology |
| 3. Cerebral Cortex | 6. Behavioural Brain Research |

7. Frontiers in Behavioral Neuroscience
8. Hippocampus
9. Brain Research
10. Anesthesiology
11. Neuroscience
12. Learning and Memory
13. Neurobiology of Learning and Memory
14. Neuroscience Letters
15. Brain Stimulation
16. Current Biology
17. Psychopharmacology
18. Pharmacology, Biochemistry and Behavior
19. Physiology and Behavior
20. PNAS
21. Biological Psychiatry
22. Nature

School of Behavioral and Brain Sciences Committees

- Undergraduate studies committee (2010-present)
- Faculty search committee (2009-2010)
- Graduate student recruiting and admission committee (2011, 2012, 2013)
- Website redesign committee (2013)
- Teaching effectiveness committee (2013- present)
- Committee to Identify Women in Bio-Behavioral Research Awardees (2013)
- Cognition and Neuroscience Program Review Committee (2013)
- Academic Advisory committee (2013-2014) (2015-2017)
- Associate Head of Cognition and Neuroscience (2014-2016)
- Head of Neuroscience Program (2014-2016)
- Chair of Faculty Search Committee (2014-2015)
- Lead move of Neuroscience research labs and offices to new building (2015-2016)
- Wrote SACS review of undergraduate Neuroscience Program (2015)
- Assisted in preparing SACS review of graduate program in Cognition and Neuroscience (2015)
- Chair of Cognition and Neuroscience PhD Admissions committee (2016)
- Chair of Cognition and Neuroscience PhD Recruiting committee (2016)
- BBS Strategic Planning Committee (2016)
- Head of Cognition and Neuroscience Program (2016-2017)
- Chair of faculty search committee (2 positions; 2016-2017)
- Chair of Cognition and Neuroscience PhD Recruiting and Admissions committee (2018-2019)

Course Development

- Neurobiology of Learning and Memory (undergraduate core)
- Neurobiology of Learning and Memory (graduate seminar)
- Neuroscience Laboratory Methods (undergraduate core)
- Organized Neuroscience Brownbag Series (spring 2010-fall 2011)
- Freshmen Seminar (fall, 2015)

University Committees and Activities

- Quality Enhancement Plan committee (QEP; April-December, 2007)
- Institutional Animal Care and Use Committee (IACUC; 2010-2014)
- Conflict of Interest in Research (2012-2014)
- Review and rank UTD applicants to Goldwater Program (2012-2014)
- BSB core facilities committee (2015-2016)
- VP of Research Search committee (2017)