

CURRICULUM VITAE

Nathan S. Pentkowski, Ph.D.

Assistant Professor
University of New Mexico
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Educational History

- 2007 Ph.D. Psychology, Behavioral Neuroscience Concentration
University of Hawaii at Manoa, Honolulu, HI USA
“Effects of site-specific CRF manipulations on defensive behaviors in rats”
Advisor: Robert J. Blanchard, Ph.D.
- 2004 M.A. Psychology
University of Hawaii at Manoa, Honolulu, HI USA
“Effects of lesions to the dorsal and ventral hippocampus on defensive behaviors in rats”
Advisor: Robert J. Blanchard, Ph.D.
- 2002 M.A. Clinical Psychology
California State University, Dominguez Hills, Carson CA USA
Advisor: Beverly B. Palmer, Ph.D.
- 1999 B.S. Psychology, Biology Minor
Northern Arizona University, Flagstaff, AZ USA

Employment History

- 2014 – current Assistant Professor
Department of Psychology
University of New Mexico
Albuquerque, NM USA
- 2010 – 2014 Postdoctoral Research Associate
School of Life Sciences
Arizona State University
Tempe, AZ USA
- 2007 – 2010 Postdoctoral Fellow
Department of Psychology
Arizona State University
Tempe, AZ USA

2002 – 2007 Graduate Research Assistant
Department of Psychology
University of Hawaii
Honolulu, HI USA

Professional Recognition and Honors

- 2016 Grice Research Enhancement Faculty Award, University of New Mexico. “Neural basis of enhanced anxiety and memory deficits in Alzheimer’s disease” (2-year award, \$3K)
- 2014 Grice Research Enhancement Faculty Award, University of New Mexico. “Role of 5-HT_{1B} receptors in nicotine reward in adolescent rats” (2-year award, \$3K)
- 2014 ACS Chemical Neuroscience Editor’s Choice, spotlighting Pentkowski et al. “Pharmacological evidence for an abstinence-induced switch in 5-HT_{1B} receptor modulation of cocaine self-administration and cocaine-seeking behavior”
- 2013 Society for Neuroscience Hot Topics, spotlighting Oliver...Pentkowski et al. “miR-495, a post-transcriptional link between gene expression and the behavioral effects of cocaine”
- 2012 National Institute on Drug Abuse Young Investigator Travel Award, 6th annual Society for Neuroscience Julius Axelrod Lecture
- 2012 National Institute on Drug Abuse Young Investigator Travel Award, International Society for Serotonin Research Silver Anniversary Meeting
- 2011 National Institute on Drug Abuse Early Career Travel Award, NIDA, NIAAA and APA divisions 28 (Psychopharmacology and Drug Abuse) and 50 (Addictions) for the 119th Annual Convention of the American Psychological Association
- 2010 Commentary in *Neuropsychopharmacology* by Cunningham et al. spotlighting Pentkowski et al. “Stimulation of medial prefrontal cortex 5-HT_{2C} receptors attenuates cocaine-seeking behavior”
- 2010 Health Disparities LRP recipient, National Institutes of Health. “The role of ventromedial PFC 5-HT_{2C} receptors in cocaine-seeking behavior” (2-year fellowship, \$40K)
- 2009 Society for Neuroscience Hot Topics, spotlighting Thiel...Pentkowski et al. “Environmental enrichment during drug abstinence attenuates cocaine-seeking behavior”
- 2009 Ruth L. Kirschstein National Research Service Award recipient, National Institute on Drug Abuse. “The role of ventromedial PFC 5-HT_{2C} receptors in cocaine-seeking behavior” (3-year fellowship, \$150K)

Short Narrative Description of Research, Teaching and Service Interests

Research in my laboratory is aimed at elucidating the neurobiological mechanisms underlying drug abuse and anxiety disorders, with a particular emphasis on the critical role of chronic stress in the etiology of these neuropsychiatric disorders. To address these goals, I utilize animal models of predatory threat to examine anxiety- and fear-like defensive behaviors, and operant self-administration to study features of drug abuse. In combination with thorough behavioral assessment, my laboratory uses various neuroscience techniques to map brain circuits controlling behavioral responsiveness. These methods include chemogenetic approaches to silence or excite brain cells in live behaving rodents, as well as the combined use of immediate early gene expression and receptor quantification to identify stress-induced changes in neural activity and plasticity in animals engaged in active defensive responses or drug self-administration. A related goal of my research program is to identify biological markers involved in these neuropsychiatric disorders in order to evaluate potential pharmacological treatments and/or preventative measures.

My neurobiological research critically involves the work of dedicated graduate students and undergraduate research assistants. Currently, three graduate students in my laboratory are pursuing their doctoral degrees in the Psychology Department's Cognition, Brain and Behavior concentration. During my tenure at UNM, I have mentored ten undergraduate research assistants in my laboratory, three of which have matriculated into M.A. or Ph.D. programs in Psychology.

Two of my major goals for my undergraduate and graduate teaching is to stimulate student interest in pursuing biomedical careers in psychology and neuroscience, and to recruit highly motivated students to join my research program. I regularly teach several undergraduate and graduate courses in the Department of Psychology, including *Psychopharmacology: Drugs and Behavior (PSY347 and PSY547)*, *Neurobiology of Addiction (PSY 450/650)* and *Molecular Psychiatry (PSY 450/650)*. I am also currently developing the graduate course *Biological Bases of Behavior (PSY 540)*.

I have focused my departmental service on fostering student satisfaction and success in our graduate program, disseminating diverse knowledge in psychology and neuroscience, and maximizing the productivity of our preclinical facilities. For the past three years I have served on our departmental Faculty/Student Idea Exchange Committee, the Colloquia and PAL Committee, and the Animal Facilities and Use Committee. During the Fall 2017 semester I joined the Department of Psychology Alumni Advisory Committee to work with our distinguished alumni to help the department grow and continue to meet the needs of our graduate students and faculty.

Articles Published in Refereed Journals

(*Contributed equally; trainees from my laboratory are underlined)

Empirical Papers

26. **Pentkowski NS**, Litvin Y, Blanchard DC and Blanchard RJ (2018). Effects of predator odor on unconditioned and conditioned defensive behaviors in female Long-Evans rats. *Physiology & Behavior*, 194, 41-47.
25. **Pentkowski NS**, Berkowitz L, Olguin C and Clark BJ (2018). Anxiety-like behavior as an early endophenotype in the TgF344-AD rat model of Alzheimer's disease. *Neurobiology of Aging*, 61, 169-76.
24. *Bastle RM, *Oliver RJ, Gardiner AS, **Pentkowski NS**, Bolognani F, Allan AM, Chaudhury T, St. Peter M, Galles N, Smith C, Neisewander JL and Perrone-Bizzozero NI (2018). In silico identification and in vivo validation of miR-495 as a novel regulator of motivation for cocaine that targets multiple addiction-related networks in the nucleus accumbens. *Molecular Psychiatry*, Epub ahead of print, doi:10.1038/mp.2016.238.
23. Der-Ghazzarian TS, Call T, Scott SN, Dai K, Brunwasser SJ, Noudali SN, **Pentkowski NS** and Neisewander JL (2017). Effects of a 5-HT_{1B} receptor agonist on locomotion and reinstatement of cocaine-conditioned place preference after abstinence from repeated injections in mice. *Frontiers in Systems Neuroscience*, 11:73. doi: 10.3389/fnsys.2017.00073.
22. Rodriguez CI, Magcalas CM, Barto D, Fink BC, Rice JP, Bird CW, Davies S, **Pentkowski NS**, Savage DD and Hamilton DA (2016). Effects of sex and housing on social, spatial, and motor behavior in adult rats exposed to moderate levels of alcohol during prenatal development. *Behavioural Brain Research*, 313, 233-43.
21. Pockros-Burgess LA, **Pentkowski NS**, Der-Ghazarian T and Neisewander JL (2014). Effects of the 5-HT_{2C} receptor agonist CP809101 in the amygdala on reinstatement of cocaine-seeking behavior and anxiety-like behavior. *International Journal of Neuropsychopharmacology*, 17, 1751-62.
20. **Pentkowski NS**, Harder BG, Brunwasser SJ, Bastle RM, Peartree NA, Yanamandra K, Adams MD and Neisewander JL (2014). Pharmacological evidence for an abstinence-induced switch in 5-HT_{1B} receptor modulation of cocaine self-administration and cocaine-seeking behavior. *ACS Chemical Neuroscience*, 19, 168-76.
19. **Pentkowski NS**, Tovote P, Blanchard DC, Litvin Y and Blanchard RJ (2013). Cortagine infused into the medial prefrontal cortex attenuates predator-induced defensive behaviors and Fos protein production in selective nuclei of the amygdala in male CD1 mice. *Hormones and Behavior*, 64, 519-26.
18. Pockros LA, **Pentkowski NS**, Conway SM, Ullman TE, Zwick KR and Neisewander JL (2012). 5-HT_{2A} receptor blockade and 5-HT_{2C} receptor activation interact to reduce

- cocaine hyperlocomotion and Fos protein expression in the caudate-putamen. *Synapse*, 66, 989-1001.
17. Bastle RM, Kufahl PR, Turk MN, Weber SM, **Pentkowski NS**, Thiel KJ and Neisewander JL (2012). Novel cues reinstate cocaine-seeking behavior and Induce Fos protein expression as effectively as conditioned cues. *Neuropsychopharmacology*, 37, 2109-20.
 16. **Pentkowski NS**, Cheung THC, Toy WA, Adams MD, Neumaier JF and Neisewander JL (2012). Protracted withdrawal from cocaine self-administration flips the switch on 5-HT_{1B} receptor modulation of cocaine-abuse related behaviors. *Biological Psychiatry*, 72, 396-404.
 15. Thiel KJ, Painter MR, **Pentkowski NS**, Mitroi D, Crawford CA and Neisewander JL (2012). Environmental enrichment counters cocaine abstinence-induced stress and brain reactivity to cocaine cues but fails to prevent the incubation effect. *Addiction Biology*, 17, 365-77.
 14. Peartree NA, Hood LE, Thiel KJ, Sanabria F, **Pentkowski NS**, Chandler KN and Neisewander JL (2011). Limited physical contact through a mesh barrier is sufficient for social reward-conditioned place preference in adolescent male rats. *Physiology & Behavior*, 105, 749-56.
 13. **Pentkowski NS**, Painter MR, Thiel KJ, Peartree NA, Cheung THC, Deviche P, Adams M, Alba J and Neisewander JL (2011). Nicotine-induced plasma corticosterone is attenuated by social interactions in male and female adolescent rats. *Pharmacology, Biochemistry and Behavior*, 100, 1-7.
 12. Pockros LA, **Pentkowski NS**, Swinford SE and Neisewander JL (2011). Blockade of 5-HT_{2A} receptors in the medial prefrontal cortex attenuates reinstatement of cue-elicited cocaine-seeking behavior in rats. *Psychopharmacology (Berl)*, 213, 307-20.
 11. Thiel KJ, **Pentkowski NS**, Peartree NA, Painter MR and Neisewander JL (2010). Environmental living conditions introduced during forced abstinence alter cocaine-seeking behavior and Fos protein expression. *Neuroscience*, 171, 1187-96.
 10. Thiel KJ, **Pentkowski NS**, Wenzel J and Neisewander JL (2010). Stimulation of dopamine D2/D3 but not D1 receptors in the central amygdala decreases cocaine-seeking behavior. *Behavioural Brain Research*, 214, 386-94.
 9. **Pentkowski NS**, Duke FD, Weber SM, Pockros LA, Teer AP, Hamilton EC, Thiel KJ and Neisewander JL (2010). Stimulation of medial prefrontal cortex 5-HT_{2C} receptors attenuates cocaine-seeking behavior. *Neuropsychopharmacology*, 35, 2037-48.
Commentary: Cunningham KA, Bubar MJ and Anastasio NC (2010). The serotonin 5-HT_{2C} receptor in the medial prefrontal cortex exerts rheostatic control

over the motivational salience of cocaine-associated cues: New observations from preclinical animal research. *Neuropsychopharmacology*, 35, 2319-21.

8. Litvin Y, Tovote P, **Pentkowski NS**, Spiess J, Blanchard DC and Blanchard RJ (2010). Maternal separation modulates short term behavioral and physiological indices of the stress response. *Hormones and Behavior*, 58, 241-9.
7. Thiel KJ, Sanabria F, **Pentkowski NS** and Neisewander JL (2009). Anti-craving effects of environmental enrichment. *International Journal of Neuropsychopharmacology*, 12, 1151-6.
6. **Pentkowski NS**, Acosta J, Browning J and Neisewander JL (2009). Stimulation of 5-HT_{1B} receptors enhances cocaine reinforcement yet reduces cocaine-seeking behavior. *Addiction Biology*, 14, 419-30.
5. Kufahl PR, **Pentkowski NS**, Heintzelman K and Neisewander JL (2009). Cocaine-induced Fos expression is detectable in the frontal cortex and striatum of rats under isoflurane but not α -chloralose anesthesia: implications for FMRI. *Journal of Neuroscience Methods*, 181, 241-8.
4. **Pentkowski NS**, Litvin Y, Blanchard DC, Vasconcellos A, King LB and Blanchard RJ (2009). Effects of acidic-astressin and ovine-CRF microinfusions into the ventral hippocampus on defensive behaviors in rats. *Hormones and Behavior*, 56, 35-43.
3. Litvin Y, Blanchard DC, **Pentkowski NS** and Blanchard RJ (2007). A pinch or a lesion: A reconceptualization of biting consequences in mice. *Aggressive Behavior*, 33, 545-51.
2. Litvin Y, **Pentkowski NS**, Blanchard DC and Blanchard RJ (2007). CRF type 1 receptors in the dorsal periaqueductal gray modulate anxiety-induced defensive behaviors. *Hormones and Behavior*, 52, 244-51.
1. **Pentkowski NS**, Blanchard DC, Lever C, Litvin Y and Blanchard RJ (2006). Effects of lesions to the dorsal and ventral hippocampus on defensive behaviors in rats. *European Journal of Neuroscience*, 23, 2185-96.

Review Papers

4. *Pearson BL, *Crawley JN, ***Pentkowski NS** and *Summers CH (2017). Curiosity as an approach to ethoexperimental analysis: Behavioral neuroscience as seen by students and colleagues of Bob Blanchard. *Neuroscience and Biobehavioral Reviews*, 76, 415-22.
3. *Neisewander JL, *Cheung THC and ***Pentkowski NS** (2014). Dopamine D3 and 5-HT_{1B} receptor dysregulation as a result of psychostimulant intake and forced abstinence: Implications for medications development. *Special issue: NIDA's 40th Anniversary, Neuropharmacology*, 76 Pt B: 301-19.

2. *Neisewander JL, *Peartree NA and ***Pentkowski NS** (2012). Emotional Valence and context of social influences on drug abuse-related behavior in animal models of social stress and prosocial interaction. *Special issue: Drug Action in Social Context, Psychopharmacology (Berl)*, 224, 33-56.
1. Blanchard DC, Canteras NS, Markham CM, **Pentkowski NS** and Blanchard RJ (2005). Lesions of structures showing FOS expression to cat presentation: Effects on responsivity to a cat, cat odor, and nonpredator threat. *Neuroscience and Biobehavioral Reviews*, 29, 1243-53.

Articles Appearing in Chapters in Edited Volumes

2. Blanchard DC, Litvin Y, **Pentkowski NS** and Blanchard RJ (2009). Aggression and Defense. In Bernston, G.G. and Cacioppo, J.T. *Handbook of Neuroscience for the Behavioral Sciences*. John Wiley & Sons Inc.
1. Litvin Y, **Pentkowski NS**, Pobbe RL, Blanchard DC and Blanchard RJ (2008). Unconditioned Models of Fear and Anxiety. In Blanchard, R.J., Blanchard, D.C. and Griebel, G. *The Handbook of Anxiety and Fear*. Elsevier Inc.

Works in Progress

(Trainees from my laboratory are underlined)

In preparation

3. **Pentkowski NS**, Franco D, Salinas B, Hernandez K and Zavala AR. Effects of 5-HT_{1B} agonism and antagonism on nicotine-induced reward in adolescent rats. *Addiction Biology, In preparation*.
2. **Pentkowski NS** and Olguin C. Chemogenetic inhibition of ventral hippocampal glutamatergic projections attenuates anxiety-like behaviors in rats. *Behavioural Brain Research, In preparation*.
1. Olguin C, Martinez G and **Pentkowski NS**. Effects of synthetic predator odors on defensive behaviors in adolescent and adult rats: Fear or aversive odorants? *Behavioral Neuroscience, In preparation*.

Invited or Refereed Abstracts and/or Presentations at Professional Meetings

(Trainees from my laboratory are underlined)

57. Maestas-Olguin CR, Martinez GM, Bouquin S, **Pentkowski NS**. Determining the efficacy of 2-phenylethylamine and coyote urine as chemical surrogates for eliciting unconditioned and conditioned defensive behavior. *Society for Neuroscience, Washington DC* (2017).
56. Bouquin S, Maestas-Olguin CR, Wagner J, Savage DD and **Pentkowski NS**. Effects of prenatal alcohol exposure in rats on corticotropin-releasing factor type 1 receptor

- expression throughout the limbic system and hypothalamus. *Society for Neuroscience*, Washington DC (2017).
55. Franco D, Salinas B, Hernandez K, **Pentkowski NS**, Cabrera RA and Zavala AR. SB224289, a 5-HT_{1B} antagonist, decreases the aversion of nicotine in male, but not female adolescent rats. *Society for Neuroscience*, Washington DC (2017).
 54. Der-Ghazarian TS, Scott S, Noudali S, Call T, Dai K, Brunwasser S, Garcia R, Stefanko K, **Pentkowski NS** and Neisewander JL. Effects of a 5-HT_{1B} receptor agonist on locomotion and reinstatement of cocaine-conditioned place preference after abstinence from repeated injections in C57BL/6 mice. *International Society on Serotonin Research*, Seattle, WA (2016).
 53. Neisewander JL, **Pentkowski NS**, Garcia R and Der-Ghazarian TS. Dysregulation of 5-HT_{1B} receptors and its implications for novel treatments in drug dependence. *International Society on Serotonin Research*, Seattle, WA (2016).
 52. Bates EA, **Pentkowski NS** and Zavala AR. Alcohol reward in male and female periadolescent rats: Effects of fixed vs. Ascending dosing. *Society for Neuroscience*, San Diego, CA (2016).
 51. Der-Ghazarian TS, Scott S, Noudali S, Call T, Dai K, Brunwasser S, Garcia R, Stefanko K, **Pentkowski NS** and Neisewander JL. Effects of a 5-HT_{1B} receptor agonist on locomotion and reinstatement of cocaine-conditioned place preference after abstinence from repeated injections in C57BL/6 mice. *Society for Neuroscience*, San Diego, CA (2016).
 50. Dixon K, Wagner J, Davis S, Savage D and **Pentkowski NS**. Potential interactive effects of prenatal alcohol exposure combined with adolescent alcohol and/or nicotine exposure on vulnerability to alcohol and nicotine reward during adulthood. *Society for Neuroscience*, San Diego, CA (2016).
 49. Hernandez K, Salinas BJ, Abella AE, Iniguez SD, **Pentkowski NS** and Zavala AR. Zolmotriptan, a 5-HT_{1B} receptor agonist, modulates the rewarding properties of nicotine in female and male adolescent rats. *Society for Neuroscience*, San Diego, CA (2016).
 48. Garcia R, **Pentkowski NS**, Venault J, Leslie K, Bonadonna JP, Cotter A, Campagna A, Benson T, Ennis K, Olive MF and Neisewander JL. Different modulatory effects of the 5-HT_{1B} receptor agonist CP 94,253 on methamphetamine self-administration compared to cocaine self-administration. *American Psychological Association*, Toronto, Canada (2015).
 47. Garcia R, **Pentkowski NS**, Venault J, Leslie K, Bonadonna JP, Cotter A, Campagna A, Olive MF and Neisewander JL. Modulatory effects of the 5-HT_{1B} receptor agonist, CP 94,253, on methamphetamine self-administration. *Society for Neuroscience*, Chicago, IL (2015).

46. Bastle RM, **Pentkowski NS**, Kufahl PR, Peartree NA, Chaudhury T, Smith CD, Oliver RJ, Perrone-Bizzozero NI and Neisewander JL. Dynamic changes in nucleus accumbens miR-495 expression across cocaine self-administration, reinstatement and relapse. *Society for Neuroscience*, Chicago, IL (2015).
45. **Pentkowski NS**. The good and the bad: Social influences on drug abuse. *International Behavioral Neuroscience Society*, Victoria, BC (2015).
44. Hernandez K, Salinas BJ, Iniguez SD, **Pentkowski NS** and Zavala AR. Nicotine-induced conditioned place preference in female and male adolescent rats: Role of conditioning session length. *Society for Neuroscience*, Chicago, IL (2015).
43. Der-Ghazarian TS, Dai K, Brunwasser S, Garcia K, Stefanko K, **Pentkowski NS** and Neisewander JL. Contribution of stress to the effects of a 5-HT_{1B} receptor agonist on cocaine-induced locomotion before and after abstinence from repeated injections in C57BL/6 mice. *Society for Neuroscience*, Chicago, IL (2015).
42. Bastle RM, **Pentkowski NS**, Chaudhury T, St. Peter M, Smith CD, Galles N, Leslie KR, Oliver RJ, Gardiner AS, Perrone-Bizzozero NI and Neisewander JL. Viral-mediated overexpression of miR-495 in the nucleus accumbens shell reduces addiction-related gene expression and motivation for cocaine. *International Behavioral Neuroscience Society*, Victoria BC (2015).
41. Garcia R, **Pentkowski NS**, Venault J, Leslie K, Bonadonna J, Cotter A, Olive MF and Neisewander JL. Effects of the 5-HT_{1B} receptor agonist CP 94,253 on methamphetamine self-administration. *College on Problems of Drug Dependence*, Phoenix, AZ (2015).
40. Bastle RM, **Pentkowski NS**, Smith CD, Chaudhury T, Leslie KR, Oliver RJ, Gardiner AS, Perrone-Bizzozero NI and Neisewander JL. Overexpression of miR-495 in the nucleus accumbens shell reduces cocaine-taking and -seeking behavior, but not motivation for food. *Society for Neuroscience*, Washington DC (2014).
39. Der-Ghazarian TS, Brunwasser S, Dai K, **Pentkowski NS** and Neisewander JL. Effects of a 5-HT_{1B} receptor agonist on cocaine-induced locomotion before and after abstinence in C57BL/6 mice. *Society for Neuroscience*, Washington DC (2014).
38. Bastle RM, Oliver RJ, Gardiner AS, **Pentkowski NS**, Perrone-Bizzozero NI and Neisewander JL. Over-expression of the microRNA miR-495 in nucleus accumbens attenuates cocaine intake on a progressive ratio schedule of reinforcement. *College on Problems of Drug Dependence*, Puerto Rico (2014).
37. Der-Ghazarian TS, Pockros L, Mirando R, Brunwasser S, **Pentkowski NS** and Neisewander JL. 5-HT_{2A}R antagonism and 5-HT_{2C}R stimulation attenuates hyperlocomotion produced by intra-striatal cocaine infusions. *Society for Neuroscience*, San Diego, CA (2013).

36. Bastle RM, **Pentkowski NS**, Turk MN, Adams MD, Berger AL, Dado N, Smith K, Hammer RP, Perrone-Bizzozero NI and Neisewander JL. Regulation of plasticity-related gene expression through miR-495 as a potential mediator of cocaine reinforcement and motivation. *International Behavioral Neuroscience Society*, Malahide, Ireland (2013).
35. Oliver RJ, Bastle RM, Gardiner AS, Wright C, Saavedra JL, **Pentkowski NS**, Allan AM, Neisewander JL and Perrone-Bizzozero NI. miR-495, a post-transcriptional link between gene expression and the behavioral effects of cocaine. *Society for Neuroscience*, San Diego, CA (2013).
Media: Hot Topics
34. **Pentkowski NS**, Harder BG, Brunwasser S, Yanamandra K, Bastle RM, Der-Ghazarian TS, Adams MD, Alba J and Neisewander JL. The effects of 5-HT_{1B} receptors on motivation for cocaine vary depending on the length of abstinence. *Society for Neuroscience*, New Orleans, LA (2012).
33. Pockros LA, Der-Ghazarian TS, **Pentkowski NS**, Conway SM, Zwick KR, Harder BG and Neisewander JL. Effects of 5-HT_{2C} receptor stimulation in the BLA on reinstatement of cocaine-seeking behavior and anxiety-like behavior in the elevated plus-maze. *Society for Neuroscience*, New Orleans, LA (2012).
32. Bastle RM, **Pentkowski NS**, Turk MN, Adams MD, Berger AL, Perrone-Bizzozero NI and Neisewander JL. The role of a microRNA, miR495, in regulating target gene expression and cocaine self-administration in rats. *Society for Neuroscience*, New Orleans, LA (2012).
31. **Pentkowski NS**, Harder B, Brunwasser S, Bastle RM, Der-Ghazarian TS, Alba J, Adams M and Neisewander JL. Stimulation of serotonin-1B receptors attenuates cocaine-abuse related behaviors following protracted withdrawal. *The College on Problems of Drug Dependence*, Palm Springs, CA (2012).
30. **Pentkowski NS**, Cheung THC, Toy WA, Adams MD, Neumaier JF and Neisewander JL. Protracted withdrawal from cocaine self-administration flips the switch on 5-HT_{1B} receptor modulation of cocaine reinforcement. *American College of Neuropsychopharmacology*, Kona, HI (2011).
29. **Pentkowski NS**, Cheung THC, Toy WA, Adams MD, Alba J, Neumaier JF and Neisewander JL. Abstinence from cocaine self-administration switches the function of 5-HT_{1B} receptors from enhancing drug reinforcement to blunting drug seeking. *Society for Neuroscience*, Washington, DC (2011).
28. Pockros LA, **Pentkowski NS**, Weber SM and Neisewander JL. Stimulation of serotonin 2C receptors in the mPFC attenuates cocaine-induced hyperlocomotion and alters Fos expression in brain regions containing dopamine neurons. *Society for Neuroscience*, Washington, DC (2011).

27. Bastle RM, Kufahl PR, Turk M, **Pentkowski NS**, Thiel KJ, Weber SM and Neisewander JL. Novel and conditioned stimuli reinstate extinguished reward-seeking behavior and induce similar patterns of fos expression. *Society for Neuroscience*, Washington, DC (2011).
26. **Pentkowski NS**, Cheung THC, Toy WA, Liu S, Neumaier JF and Neisewander JL. Elevated expression of 5-HT_{1B} receptors in the mesolimbic pathway enhances the reinforcing effects of cocaine using the self-administration model in rats. Oral Communications 2: Up Front with Drug Addiction: Role of Frontal Cortex. *The College on Problems of Drug Dependence*, Scottsdale, AZ (2010).
25. **Pentkowski NS**, Cheung THC, Toy WA, Adams MD, Jensen A, Valles C, Alba J, Liu S, Robertson L, Neumaier JF and Neisewander JL. Elevated expression of serotonin 1B (5-HT_{1B}) receptors in the mesolimbic pathway enhances the reinforcing effects of cocaine yet reduces cocaine-seeking behavior. *Society for Neuroscience*, San Diego, CA (2010).
24. Pockros LA, **Pentkowski NS**, Berger AL and Neisewander JL. Synergistic effects of 5-HT_{2A} receptor blockade and 5-HT_{2C} receptor activation on inhibition of spontaneous locomotion. *Society for Neuroscience*, San Diego, CA (2010).
23. Neisewander JL, Thiel KJ, **Pentkowski NS**, Painter MR, Peartree NA, Mitroi D and Crawford CA. Environmental enrichment during abstinence from cocaine self-administration attenuates cocaine-seeking behavior and functional brain activation in rats. *Society for Neuroscience*, San Diego, CA (2010).
22. Pockros LA, **Pentkowski NS**, Swinford SE, Robertson LM, Ostos M and Neisewander JL. Blockade of 5-HT_{2A} receptors in the medial prefrontal cortex attenuates cue-elicited reinstatement of cocaine-seeking behavior in rats. Oral Communication, *The College on Problems of Drug Dependence*, Scottsdale, AZ (2010).
21. Thiel KJ, Engelhardt B, Hood LE, **Pentkowski NS**, Peartree NA, Painter MR and Neisewander JL. Preclinical examination of environmental enrichment as an anti-relapse strategy. Oral Communication, *The College on Problems of Drug Dependence*, Scottsdale, AZ (2010).
20. **Pentkowski NS**, Cheung THC, Toy WA, Liu S, Neumaier JF and Neisewander JL. Elevated expression of 5-HT_{1B} receptors in the mesolimbic pathway enhances the reinforcing effects of cocaine using the self-administration model in rats. *Society for Neuroscience*, Chicago, IL (2009).
19. Pockros LA, **Pentkowski NS**, Swinford SE, Shepard AJ and Neisewander JL. Blockade of 5-HT_{2A} receptors in the prefrontal cortex attenuates cue- and cocaine-primed reinstatement of cocaine-seeking behavior in rats. *Society for Neuroscience*, Chicago, IL (2009).

18. Perrone-Bizzozero N, Nixon S, Bolognani F, Kufahl PR, **Pentkowski NS** and Neisewander, JL. Decreased expression of miR-495 in the nucleus accumbens after cocaine exposure. *Society for Neuroscience*, Chicago, IL (2009).
17. Kufahl PR, Heintzelman K, Thiel KJ, **Pentkowski NS**, Vargas C, Hood L and Neisewander JL. A novel cue reinstates extinguished cocaine-seeking behavior. *Society for Neuroscience*, Chicago, IL (2009).
16. Thiel KJ, Painter M, Hills D, **Pentkowski NS**, Sanabria F, Neisewander JL. Environmental enrichment during drug abstinence attenuates cocaine-seeking behavior. *Society for Neuroscience*, Chicago, IL (2009).
Media: Hot Topics
15. Thiel KJ, Painter M, Hills D, Crow A, Cuhaciyani C, Sanabria F, **Pentkowski NS** and Neisewander JL. Protective effects of environmental enrichment on cocaine-seeking behavior during abstinence. *The College on Problems of Drug Dependence*, Reno, NV (2009).
14. **Pentkowski NS**, Duke F, Weber SM, Hamilton EC, Pockros LA and Neisewander JL. Stimulation of medial prefrontal cortex 5-HT_{2C} attenuates cocaine-seeking, but not cocaine self-administration. Oral Communications 11: Upping the Ante, Craving Psychostimulants. *The College on Problems of Drug Dependence*, Reno, NV (2009).
13. **Pentkowski NS** and Neisewander JL. Stimulation of medial prefrontal cortex 5-HT_{2C} attenuates cocaine-seeking, but not cocaine self-administration. *American College of Neuropsychopharmacology*, Scottsdale, AZ (2008).
12. **Pentkowski NS**, Duke F, Hamilton EC and Neisewander JL. Stimulation of medial prefrontal cortex 5-HT_{2C} attenuates cocaine-seeking, but not cocaine self-administration. *Society for Neuroscience*, Washington, DC (2008).
11. Kufahl PR, **Pentkowski NS**, Routt VT, Duke F and Neisewander JL. Cocaine-induced Fos expression is detectable in the frontal cortex and striatum of rats under isoflurane but not alpha-chloralose anesthesia: Implications for fMRI. *Society for Neuroscience*, Washington, DC (2008).
10. **Pentkowski NS**, Browning J, Acosta JI, Hamilton L, Duke F and Neisewander JL. Stimulation of 5-HT_{1B} receptors enhances cocaine reinforcement yet reduces cocaine-seeking behavior. *International Behavioral Neuroscience Society*, St. Thomas, USVI (2008).
9. Litvin Y, Tovote, P, **Pentkowski NS**, Spiess J, Blanchard DC and Blanchard RJ. Maternal separation effects on adaptive fear responses, stressor-induced corticosterone secretion, and related gene expression in the hippocampus. *Society for Neuroscience*, San Diego, CA (2007).

8. **Pentkowski NS**, Vasconcellos A, Sabugo J, Blanchard DC and Blanchard RJ. Effects of ovine-CRF and acidic-astressin infusions into the ventral hippocampus on defensive behaviors in rats. *Society for Neuroscience*, Atlanta, GA (2006).
7. Litvin Y, Blanchard DC, Stocker H, **Pentkowski NS** and Blanchard RJ. Effects of selective CRF receptor agonist infusion into the dorsal periaqueductal gray on defensive behaviors in Swiss-Webster mice. *Society for Neuroscience*, Atlanta, GA (2006).
6. **Pentkowski NS**, Blanchard DC, Lever C and Blanchard RJ. Effects of lesions to the dorsal and ventral hippocampus on defensive behaviors in rats. *Society for Neuroscience*, Washington DC (2005).
5. Litvin Y, Blanchard DC, **Pentkowski NS**, Yang M and Blanchard RJ. A pinch or a lesion: Consequences of biting in mice. *Society for Neuroscience*, Washington DC (2005).
4. Markham CM, **Pentkowski NS**, Blanchard RJ and Blanchard DC. Disruption in defensive behavior toward predatory stimuli following lesions of the bed nucleus of the stria terminalis. *Society for Neuroscience*, Washington DC (2005).
3. **Pentkowski NS**, Blanchard DC and Blanchard RJ. Effects of ibotenic acid lesions of the dorsal hippocampus on defensive behaviors in rats. *Society for Neuroscience*, San Diego, CA (2004).
2. Blanchard DC, Yang M, Markham CM, Farrokhi CF, **Pentkowski NS**, Blanchard RJ and Griebel G. Diazepam and buspirone effects in C57/BL/6J mice in the rat exposure test. *Society for Neuroscience*, San Diego, CA (2004).
1. **Pentkowski NS**, Blanchard DC and Blanchard RJ. Effects of ibotenic acid lesions of the dorsal hippocampus on defensive behaviors in rats. *International Behavioral Neuroscience Society*, Key West, FL (2004).

Contributed (un-refereed) Abstracts and/or Oral Presentations at Professional Meetings

20. **Pentkowski NS**. Neurobiology of fear- and anxiety-like defensive behaviors: Focus on stress and the hippocampus. *Psychology Colloquia Series*, University of New Mexico, Albuquerque, NM (2017).
19. **Pentkowski NS**. Behavioral genetics. *Obsessive-Compulsive Spectrum Disorders Seminar*, University of New Mexico, Albuquerque, NM (2017).
18. **Pentkowski NS**. Genetic applications to neuropsychiatric disorders. *Developmental Neuroscience Laboratory*, University of New Mexico, Albuquerque, NM (2017).
17. **Pentkowski NS**. Animal models of neuropsychiatric disorders. *Psychology Junior Honors Seminar*, University of New Mexico, Albuquerque, NM (2017).

16. Bates E, Yang Y, **Pentkowski NS** and Zavala AR. Alcohol reward in male and female periadolescent rats: Effects of fixed vs. ascending dosing. *The 29th Annual CSU Biotechnology Symposium*, Santa Clara, CA (2017).
15. **Pentkowski NS**. Serotonin 1B and 2C receptor subtypes as novel targets for treating psychostimulant addiction. *HSC Neuroscience Symposium*, University of New Mexico, Albuquerque, NM (2017).
14. **Pentkowski NS**. A transgenic rat model of Alzheimer's disease. *Psychology Junior Honors Seminar*, University of New Mexico, Albuquerque, NM (2016).
13. **Pentkowski NS**. 5-HT_{1B} receptors: A cause and a cure for cocaine addiction? Cavanaugh Cognitive Rhythms and Computation Lab, University of New Mexico, Albuquerque, NM (2016).
12. **Pentkowski NS**. Neurobiology of defensive and addictive behaviors. *Psychology Junior Honors Seminar*, University of New Mexico, Albuquerque, NM (2015).
11. **Pentkowski NS**. Neurobiology of addiction. *Psychology Addiction Seminar*, University of New Mexico, Albuquerque, NM (2015).
10. **Pentkowski NS**. Serotonin-1B receptors: A novel target for relapse prevention? *Department of Psychology, University of New Mexico*, Albuquerque, NM (2013).
9. **Pentkowski NS** and Neisewander JL. The influence of 5-HT_{1B} receptors on cocaine abuse-related behaviors. *4th ASU-BNI Neuroscience Symposium*, Phoenix, AZ (2012).
8. Bastle RM, Dickey ED, Thiel KJ, **Pentkowski NS**, Hammer RP Jr. and Neisewander JL. Region-specific changes in zif268 mRNA following cocaine self-administration, abstinence and extinction training. *The 4th ASU-BNI Neuroscience Symposium*, Phoenix, AZ (2012).
7. **Pentkowski NS**. Neural mechanisms of unconditioned and conditioned defense. *Behavioral Neuroscience Colloquium*, Arizona State University, Tempe, AZ (2008).
6. **Pentkowski NS**. mPFC CRF₁ activation: Effects on defensive behavior. *Specialized Neuroscience Research Program Colloquium*, University of Hawaii, Honolulu, HI (2007).
5. Herrera E, **Pentkowski NS** and Dowds D. The importance of intimacy, communication, and commitment in relationship satisfaction. *Western Psychological Association*, Irvine, CA (2002).
4. Santos SJ, **Pentkowski NS**, Lirios N and Dowds D. Barriers to bicultural competence in young adults. *Western Psychological Association*, Irvine, CA (2002).

3. Santos SJ, **Pentkowski NS**, Lirios N and Dowds D. The Development of biculturalism in young adults. *Western Psychological Association*, Irvine, CA (2002).
2. Palmer BB, Dowling R and **Pentkowski NS**. Decision-making in heterogeneous versus homogeneous groups. *Malaysian Psychological Association* (2001).
1. Henschel D, Gritney K, Reigadas E and **Pentkowski NS**. Personality and presidential choices. *American Psychological Society*, Toronto, Canada (2001).

Research

Research Funding

Title: Neural basis of enhanced anxiety and memory deficits in Alzheimer's disease.

Award: Grice Foundation

Principal investigator: NS Pentkowski

Funding organization: University of New Mexico

Funding period: 2016 – 2017

Total costs: \$3,000

Role: PI

Title: Role of 5-HT_{1B} receptors in nicotine reward in adolescent rats.

Award: Grice Foundation

Principal investigator: NS Pentkowski

Funding organization: University of New Mexico

Funding period: 2014 – 2015

Total costs: \$2,820

Role: PI

Title: Role of 5-HT_{1B} receptors in drug reward during adolescence.

Award: BILDRSG

Principal investigator: AR Zavala

Funding organization: California State University, Long Beach

Funding period: 2016 – 2017

Total costs: \$10,000

Role: Co-I

Title: The role of ventromedial PFC 5-HT_{2C} receptors in cocaine-seeking behavior.

Award: F32 DA025413

Principal investigator: NS Pentkowski

Funding organization: National Institute on Drug Abuse

Funding period: 2009 – 2012

Total costs: \$150,726

Role: PI

Pending Research Funding

Title: Assessment of Pimavanserin in a rat model of chronic stress: Significance for treating anxiety and depression.

Award: Industry contract

Principal investigator: NS Pentkowski

Funding organization: Acadia Pharmaceuticals Inc.

Funding period: Pending

Total costs: \$43,363

Role: PI

Status: Pending UNM Legal Approval. See the negotiated contract in dossier.

Title: The effects of chronic social subordination stress on cocaine abuse-related behaviors.

Award: R03 DA040010

Principal investigator: NS Pentkowski

Funding organization: National Institute on Drug Abuse

Funding period: Pending

Total costs: \$113,625

Role: PI

Status: Collecting preliminary data. See reviews in dossier.

Teaching

Masters Thesis Advisement (Chair)

Kyle Dixon, Completed in April 2017. The modulation of reward to nicotine and ethanol by sex and stage of exposure.

Carlos Olguin, Expected in November 2018. Determining the efficacy of novel predatory odors as chemical surrogates for natural predator odor in contextual fear conditioning.

Samuel Bouquin, Expected in November 2018. Effects of chronic stress on anxiety- and fear-like behaviors in a rat transgenic model of Alzheimer's disease.

John Madden, Expected in November 2018. Effects of 5-HT_{1B} receptors on methamphetamine-induced reward and markers of plasticity.

Bachelor's Honors Advisement

Tamara Zera, B.S., Completed May 2017. Do CRF₁ receptors in the hippocampus and prefrontal cortex mediate anxiety in a genetic model of Alzheimer's disease?

Undergraduate and Graduate Student Mentoring

Amanda Luna, 2017 – current.	Research assistant (volunteer).
Sarina Ochoa, 2017 – current.	Research assistant (volunteer).
John Fennelly, 2017 – current.	Independent research study (PSY 499).
Andrew Tourigny, 2017 – current.	Independent research study (PSY 499).
Anastasia Marjenhoff, 2017 – current.	Independent research study (PSY 499).
Gabriela Martinez, 2015 – 2017.	Independent research study (PSY 499).
Lilliana Sanchez, 2016 – completed.	Independent research study (PSY 551).
Chelsie Padilla, 2016 – 2017.	Research assistant (volunteer).
Carlos Olguin, 2014 – 2016.	Independent research study (PSY 499).
Mallory Kruse, 2014 – 2016.	Independent research study (PSY 499 & 551).
Jennifer Espinosa, 2014 – 2016.	Independent research study (PSY 499 & 551).

Classroom Teaching

- 2017; Fall; Psychopharmacology, Drugs & Behavior; PSY 347; 100 students.
- 2017; Fall; Neurobiology of Addiction; PSY 450/650; 11 students.
- 2017; Summer; Psychopharmacology, Drugs & Behavior; PSY 347; 39 students (online).
- 2017; Spring; Seminar in Cognition, Brain & Behavior; PSY 641; 21 students.
- 2017; Spring; Molecular Psychiatry; PSY 450/650; 9 students.
- 2016; Fall; Neurobiology of Addiction; PSY 450/650; 16 students
- 2016; Fall; Psychopharmacology, Drugs & Behavior; PSY 347; 96 students.
- 2015; Fall; Psychopharmacology, Drugs & Behavior; PSY 547; 9 students.
- 2015; Fall; Psychopharmacology, Drugs & Behavior; PSY 347; 79 students.
- 2015; Spring; Psychopharmacology, Drugs & Behavior; PSY 347; 93 students.
- 2014; Fall; Psychopharmacology, Drugs & Behavior; PSY 347; 48 students.

Service

Manuscript Review

ACS Chemical Neuroscience, 2015 – current
Addiction Biology, 2015 – current
Behavioural Brain Research, 2008 – current
Brain Research Bulletin, 2012 – current
Brain Research, 2012 – current
Drug and Alcohol Dependence, 2009 – current
Hormones and Behavior, 2013 – current
International Journal of Neuropsychopharmacology, 2009 – current
Journal of Neuroscience, 2015 – current
Neuropsychopharmacology, 2011 – current
Neuroscience & Biobehavioral Reviews, 2016 – current
Physiology & Behavior, 2012 – current
Psychopharmacology, 2015 – current

Departmental Committees

2017 – current, Alumni Advisory Committee
2014 – current, Animal Facilities and Use Committee
2014 – 2017, Colloquia and PAL Committee
2014 – current, Faculty/Student Idea Exchange Committee
2014 – current PCNC Committee

M.A. Thesis & Ph.D. Dissertation Examination Committees

2017 – current, Lilliana Sanchez, (MA), Department of Psychology
2016 – current, Christy Magcalas, (PhD), Department of Psychology
2016 – completed, Ryan Harvey, (MA), Department of Psychology

Graduate Comprehensive Examination Committees

2017, Danielle Rudder, Department of Psychology
2016, Carlos Rodriguez, Department of Psychology

Teaching Observations

2017, Carlos Rodriguez, Department of Psychology

University Service

2017, Poster judge, University of New Mexico Psychology Research Day