

Curriculum Vitae
Gregory L. Powell, Ph.D.
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Education

- ❖ **2008** Bachelor of Science in Biomedical Engineering, The Catholic University of America, Washington, DC
- ❖ **2014** Doctor of Philosophy in Physiological Sciences, University of Arizona, Tucson, AZ
Thesis: *The Effects of Developmental Nicotine Exposure on Respiratory Motoneuron Morphology and Electrophysiology*
Mentor: Dr. Ralph F. Fregosi

Position	Start Date	End Date	Area	Institution	Supervisor
<i>Coordinator Senior</i>	10/2018	Present	School of Life Sciences	Arizona State University	Dr. Janet Neisewander
<i>Postdoctoral Research Associate</i>	07/2015	10/2018	School of Life Sciences	Arizona State University	Dr. Janet Neisewander
<i>Postdoctoral Research Associate</i>	01/2016	12/31/17	Psychology	Arizona State University	Dr. Cassandra Gipson-Reichardt
<i>Graduate Research Assistant</i>	05/2009	09/2014	Physiological Sciences	University of Arizona	Dr. Ralph Fregosi
<i>Graduate Research Assistant</i>	01/2009	05/2009	Computational Neuroscience	University of Arizona	Dr. Jean-Marc Fellous
<i>Graduate Research Assistant</i>	08/2008	12/2008	Physiological Sciences	University of Arizona	Dr. Ralph Fregosi
<i>Research Assistant</i>	01/2008	05/2008	Biomedical Engineering	Catholic University of America	Dr. Otto Wilson
<i>Research Assistant</i>	08/2007	12/2007	Biomedical Engineering	Catholic University of America	Dr. Joseph Hidler
<i>Intern</i>	05/2006	08/2006	Biomedical Engineering	University of Arizona	Dr. Stuart Williams
<i>Intern</i>	05/2005	08/2005	Biomedical Engineering	University of Arizona	Dr. Jay Hoying

Publications and Presentations

1. **Powell, G. L.**, Vannan, A., Bastle, R. M., Wilson, M. A., Dell'Orco, M., Perrone-Bizzozero, N. I., & Neisewander, J. L. (*in press*). Environmental enrichment during forced abstinence from cocaine self-administration opposes gene network expression changes associated with the incubation effect. *Scientific Reports*.
2. **Powell, G.**, Beckmann, J. S., Marusich, J. A., & Gipson, C. D. (2020). Nicotine reduction does not alter essential value of nicotine or reduce cue-induced reinstatement of nicotine seeking. *Drug and Alcohol Dependence*, 108020.
3. Goenaga, J., **Powell, G. L.**, Leyrer-Jackson, J. M., Piña, J., Phan, S., Prakapenka, A. V., ... Gipson, C. D. (2019). N-acetylcysteine yields sex-specific efficacy for cue-induced reinstatement of nicotine seeking. *Addiction Biology*. <https://doi.org/10.1111/adb.12711>
 - a. [co-1st author]
4. **Powell, G. L.**, Cabrera-Brown, G., Namba, M. D., Neisewander, J. L., Marusich, J. A., Beckmann, J. S., & Gipson, C. D. (2019). Economic demand analysis of within-session dose-reduction during nicotine self-administration. *Drug and Alcohol Dependence*, 201, 188-196.
5. Namba, M. D., Kupchik, Y. M., Spencer, S. M., Garcia-Keller, C., Goenaga, J. G., **Powell, G. L.**, ... & Gipson, C. D. (2019). Accumbens neuroimmune signaling and dysregulation of astrocytic glutamate transport underlie conditioned nicotine-seeking behavior. *Addiction Biology*, e12797.
6. **Powell, G. L.**, Leyrer-Jackson, J. M., Goenaga, J., Namba, M. D., Piña, J., Spencer, S., ... & Gipson, C. D. (2019). Chronic treatment with N-acetylcysteine decreases extinction responding and reduces cue-induced nicotine-seeking. *Physiological Reports*, 7(1), e13958.
7. **Powell, G. L.**, Bonadonna, J. P., Vannan, A., Xu, K., Mach, R. H., Luedtke, R. R., & Neisewander, J. L. (2018). Dopamine D3 receptor partial agonist LS-3-134 attenuates cocaine-motivated behaviors. *Pharmacology Biochemistry and Behavior*, 171, 46-53.
8. Overby, P. F., Daniels, C. W., Del Franco, A., Goenaga, J., **Powell, G. L.**, Gipson, C. D., & Sanabria, F. (2018). Effects of nicotine self-administration on incentive salience in male Sprague Dawley rats. *Psychopharmacology*, 235(4), 1121-1130.
9. Cholanian, M., **Powell, G. L.**, Levine, R. B., & Fregosi, R. F. (2017). Influence of developmental nicotine exposure on glutamatergic neurotransmission in rhythmically active hypoglossal motoneurons. *Experimental Neurology*, 287, 254-260.
10. **Powell, G. L.**, Gaddy, J., Xu, F., Fregosi, R. F., & Levine, R. B. (2016). Developmental Nicotine Exposure disrupts dendritic arborization patterns of hypoglossal motoneurons in the neonatal rat. *Developmental Neurobiology*.
11. **Powell, G. L.**, Levine, R. B., Frazier, A. M., & Fregosi, R. F. (2015). Influence of developmental nicotine exposure on spike-timing precision and reliability in hypoglossal motoneurons. *Journal of Neurophysiology*, 113(6), 1862-1872.
12. **Powell, G. L.**, Rice, A., Bennett-Cross, S. J., & Fregosi, R. F. (2014). Respiration-related discharge of hyoglossus muscle motor units in the rat. *Journal of Neurophysiology*, 111(2), 361-368.

Manuscripts submitted or in preparation

1. Annika Vannan, **Gregory L. Powell**, Michela Dell'Orco, Melissa A. Wilson, Nora I. Perrone-Bizzozero, Janet L. Neisewander (in preparation). *microRNA regulation related to the protective effects of environmental enrichment against cocaine-seeking behavior*
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2. **Gregory L. Powell**, Mark D. Namba, Annika Vannan, John Paul Bonadonna, Andrew Carlson, Rachel Mendoza, Peng-Jen Chen, Robert R. Luedtke, Benjamin E. Blass, Janet L. Neisewander (in preparation). *The long-acting D3 partial agonist MC-25-41 attenuates motivation for cocaine in Sprague-Dawley rats*

Book chapters

1. **Powell, G.**, McClure, E. A., Olive, M. F., & Gipson, C. D. (2019). Clinical Treatment of Addictive Disorders with N-Acetylcysteine. In *The Therapeutic Use of N-Acetylcysteine (NAC) in Medicine* (pp. 219-233). Adis, Singapore.
2. Olive, M. F., **Powell, G.**, McClure, E., & Gipson, C. D. (2019). Neurotransmitter Systems: Glutamate. In *The Therapeutic Use of N-Acetylcysteine (NAC) in Medicine* (pp. 19-28). Adis, Singapore.
3. Vannan, A., **Powell, G. L.**, Scott, S. N., Pagni, B. A., & Neisewander, J. L. (2018). Animal Models of the Impact of Social Stress on Cocaine Use Disorders. *International review of neurobiology*, 140, 131-169.
4. Namba, M.D., **Powell, G.L.**, Del Franco, A.P., Goenaga, J.G., Gipson, C.D. (2019). Brain gene expression in the context of nicotine rewards: a focus on cholinergic genes. In *Neuroscience of Nicotine*. Academic Press

Oral presentations

1. **G.L. Powell**, M. St. Peter, T. Chaudhury, T. Benson, D. Alcazar, R. Bastle, N. Perrone-Bizzozero, J.L. Neisewander. Conference on Problems of Drug Dependence, Montreal, Canada. June 21, 2017. "The effects of environmental enrichment during abstinence from cocaine on RNA expression within the nucleus accumbens".
2. **Powell, G. L.**, Goenaga, J., Del Franco, A., Holter, M. C., Garcia, R., Vannan, A., Neisewander, J. L., Gipson, C. D. Society for Research on Nicotine and Tobacco Conference, Florence, Italy. March 10, 2017. "Developmental nicotine exposure induces persistent alterations in glutamatergic circuitry".
3. Bonadonna, J.P., **Powell, G.L.**, Carlson, A.K., Mendoza, R., Mach, R.H., Luedtke, R.R., Neisewander, J.L. College on Problems of Drug Dependence, Palm Springs, CA. June 12, 2016. "Effect of dopamine D3 receptor partial agonist on cocaine-induced locomotion and self-administration". Oral presentation.

Scholarly presentations

1. S.N. Scott, **G.L. Powell**, R. Garcia, A.M. Garcia, O.I. Villareal, K.M. Blattner, B.E. Blass, J.L. Neisewander. Society for Neuroscience, Chicago, IL. October 21, 2019. "The effects of a selective 5-HT1B receptor agonist on cocaine demand before and after abstinence from self-administration in freely cycling female rats". Poster presentation.
2. A. Vannan, **G.L. Powell**, A.M.H. Mokbel, A.L. Esquer, M. Dell'Orco, N. Perrone-Bizzozero, J.L. Neisewander. Society for Neuroscience, Chicago, IL. October 21, 2019. "Differential microRNA expression in nucleus accumbens shell after prolonged cocaine abstinence in environmentally-enriched rats". Poster presentation.
3. Perrone-Bizzozero, N., Dell'Orco, M., **Powell, G.L.**, Vannan, A., Oliver, R.J., Sekar, S., Liang, W.S., Neisewander, J.L. Society for Neuroscience, San Diego, CA. November 5, 2018. "RNA binding proteins and circular RNAs are linked to nucleus accumbens gene expression changes during environmental enrichment following prolonged abstinence from cocaine self-administration". Poster presentation.
4. Cassandra Gipson-Reichardt, Mark Namba, **Gregory Powell**, Julianna Goenaga, Armani Del Franco, Joseph McCallum. American College of Neuropsychopharmacology, Palm Springs, CA. December 4, 2017. "N-Acetylcysteine Inhibits Cue-Induced Nicotine Seeking in a GLT-1-Dependent Manner and Suppresses Proinflammatory TNF α Expression in the Nucleus Accumbens Core". Poster presentation.
5. Janet Neisewander, **Gregory Powell**, Madeleine St. Peter, Annika Vannan, Trisha Chaudhury, Thomas Benson, Daniela Alcazar, Ryan Bastle, Nora Perrone-Bizzozero. American College of Neuropsychopharmacology, Palm Springs, CA. December 4, 2017. "Environmental Enrichment and Length of Abstinence Alter Motivation for Cocaine Revealing Novel RNA Expression Changes in the Nucleus Accumbens Correlated With Cocaine Seeking". Poster presentation.
6. C. D. Gipson, **G. L. Powell**, J. G. Goenaga, A. P. Del Franco, M. C. Holter, R. Garcia, A. Vannan, J. L. Neisewander. Society for Neuroscience Conference, Washington, DC. November 15, 2017. "Developmental nicotine exposure induces persistent alterations in accumbens glutamatergic circuitry". Poster presentation.
7. J. G. Goenaga, J. J. McCallum, M. D. Namba, A. P. Del Franco, **G. L. Powell**, M. F. Olive, C. D. Gipson. Society for Neuroscience Conference, Washington, DC. November 15, 2017. "Nicotine relapse-induced rapid

potentiation of excitatory synapses is regulated by GluN2B-containing NMDA receptors in the nucleus accumbens core”. Poster presentation.

8. M. D. Namba, **G. L. Powell**, J. G. Goenaga, A. P. Del Franco, J. J. McCallum, C. D. Gipson. Society for Neuroscience Conference, Washington, DC. November 15, 2017. “N-acetylcysteine inhibits cue-induced nicotine seeking through a glutamate transporter GLT-1-dependent mechanism and decreases neuroinflammatory I κ B kinase expression in the nucleus accumbens core”. Poster presentation.
9. **G. L. Powell**, M. St. Peter, T. Chaudhury, D. Alcazar, R. M. Bastle, R. J. Oliver, N. I. Perrone-Bizzozero, J. L. Neisewander. Society for Neuroscience Conference, Washington, DC. November 13, 2017. “Environmental enrichment during abstinence from cocaine self-administration alters cocaine-seeking behavior and addiction-related gene expression in female rats”. Poster presentation.
10. J. A. Marusich, **G. L. Powell**, J. S. Beckmann, J. L. Neisewander, A. P. Del Franco, J. Goenaga, C. D. Gipson. Society for Neuroscience Conference, Washington, DC. November 11, 2017. “Analysis of economic demand for nicotine using an abbreviated behavioral economics protocol in rats”. Poster presentation.
11. **Powell, G. L.**, Neisewander, J. L., Beckmann, J. S., Marusich, J. A., Del Franco, A. P., Goenaga, J., Gipson, C. D. Arizona State University – Barrow Neurological Institute Neuroscience Symposium, Phoenix, AZ. January 5, 2017. “Analysis of a new behavioral economics protocol for examination of consumption of drugs of abuse”. Poster presentation.
12. St. Peter, M., **Powell, G. L.**, Benson, T., Chaudhury, T., Alcazar, D., Bastle, R., Perrone-Bizzozero, N., Neisewander, J. L. Society for Neuroscience Conference, San Diego, CA. November 16, 2016. “Effects of environmental enrichment and abstinence on cocaine seeking and RNA expression within the nucleus accumbens shell”. Poster presentation.
13. Bonadonna, J. P., **Powell, G. L.**, Carlson, A., Mendoza, R., Mach, R. H., Luedtke, R. R., Xu, K., Neisewander, J. L. Society for Neuroscience Conference, San Diego, CA. November 16, 2016. “Effect of a dopamine D₃ receptor partial agonist on cocaine-induced locomotion and self-administration”. Poster presentation.
14. **Powell, G. L.**, Kupchik, Y. M., Spencer, S., Garcia-Keller, C., Stankeviciute, N., Schwartz, D., Del Franco, A., Goenaga, J., Gipson, C. D. Society for Neuroscience Conference, San Diego, CA. November 13, 2016. “N-Acetylcysteine inhibits cue-induced nicotine seeking and relapse-associated rapid, synaptic plasticity”. Poster presentation.
15. Neisewander, J. L., Cheung, T., Nolan, B., Bonadonna, J. P., **Powell, G. L.**, Carlson, A., Xu, K., Mach, R. H., Luedtke, R. R. Dopamine Conference, Vienna, Austria. September 5-8, 2016. “Comparison of dopamine antagonists and partial agonists: Selectivity for dopamine D₃ receptors produces selective effects on motivation for cocaine in rats”. Poster presentation.
16. Del Franco, A., **Powell, G. L.**, Pagni, B., Goenaga, J., Scofield, M., Gipson, C. D. College on Problems of Drug Dependence, Palm Springs, CA. June 13, 2016. “Role of accumbens nicotinic acetylcholine receptors in cue-induced nicotine seeking and synaptic plasticity”. Poster presentation.
17. Gipson, C. D., **Powell, G. L.**, del Franco, A., Pagni, B., Goenaga, J., Scofield, M. Society for Research on Nicotine and Tobacco, Chicago, IL. March 5, 2016. “Role of accumbens nicotinic acetylcholine receptors in cue-induced nicotine seeking and synaptic plasticity”. Poster presentation.
18. **Powell, G. L.**, Del Franco, A., Pagni, B., Goenaga, J., Scofield, M. D., Gipson-Reichardt, C. D. Arizona State University – Barrow Neurological Institute Neuroscience Symposium, Phoenix, AZ. January 7, 2016. “Role of accumbens nicotinic acetylcholine receptors in cue-induced nicotine seeking and synaptic plasticity”. Poster presentation.
19. **Powell, GL**, Levine, RB, & Fregosi, RF. Federation of American Societies of Experimental Biology Conference, San Diego, CA. April 28, 2014, Poster Presentation. “The effects of developmental nicotine exposure on hypoglossal motoneuron morphology and electrophysiology”.
20. Wollman, LB, **Powell, GL**, Levine, RB, & Fregosi, RF. Federation of American Societies of Experimental Biology Conference, San Diego, CA. April 27, 2014, Poster Presentation. “Leptin acutely inhibits respiratory function in neonatal rats”.

21. David Margolis, **Gregory Powell**, David Bennett, Ralph Fregosi, and Lisa Truchan. "Decreased Nerve Conduction Velocity in Peripheral Nerves Following Exposure to Bone Morphogenetic Protein-2". *Arizona Orthopaedic Society*. June 2013.
22. **Powell GL**, Pilarski JQ, Fregosi RF, Fellous JM. Society for Neuroscience Conference, Chicago, Ill. October 21, 2009, Poster Presentation. "Computational neural model of the alterations in respiratory rhythm generation caused by developmental, environmental, and genetic abnormalities".

Professional Affiliations

- Society for Neuroscience, Postdoctoral Member
- College on Problems of Drug Dependence, Member-in-Training (past)
- Society for Research on Nicotine and Tobacco, Postdoctoral Member (past)
- Drug and Alcohol Dependence manuscript reviewer
- Addiction Biology manuscript reviewer
- Arizona Physiological Society Member (past)

Teaching

- Guest lecturer, Biology 477: Systems & Behavioral Neuro. February 21, 2018. "Brain Control of Movement".
- Guest lecturer, Psychology 470: Psychopharmacology. March 1, 2016. "Sleep Disorders and Medications".
- Guest lecturer, Biology 467: Neurobiology. October 20, 2015. "Motor Systems".

Awards, Honors, and Grants

1. National Institute of General Medical Sciences (NIGMS) Computational and Mathematical Modeling of Biomedical Systems Training Grant Fellowship (2011-2013)
2. Science Foundation of Arizona, Graduate Fellowship (2008-2010)