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**Education and Training**

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*Education*

04/08 Ph.D., Behavioral Neuroscience, Oregon Health & Science University, Portland, OR  
05/01 B.S., Neuroscience, University of Minnesota, Minneapolis, MN

*Training*

09/08 - 01/15 Post-doctoral trainee with Drs. Rui Costa and Dave Lovinger at NIAAA/NIH, Bethesda, MD  
09/02 – 07/08 Ph.D. in Behavioral Neuroscience with Dr. Christopher Cunningham,  
Oregon Health & Science University, Portland, OR  
06/99 – 07/02 Research assistant with Dr. Marilyn Carroll, Department of Psychiatry, University of Minnesota.  
06/00 – 03/01 Research assistant with Dr. Brenda Weigel, Department of Pediatrics,  
University of Minnesota.

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**Current Funding**

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2017-2022 NIH R01 AA026077 (NIAAA). Dependence induced dysfunction of decision-making circuits.  
2017-2019 Whitehall Foundation.

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**Funding History**

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2013-2018 NIH K99/R00 (NIAAA). Chronic alcohol-induced alterations in CB1 receptor modulation of corticostriatal circuits governing the shift between goal-directed and habitual actions.  
2016-2017 NARSAD (Brain & Behavior Research Foundation). Investigating corticostriatal circuits governing goal directed behavior.  
2005-2007 NIH 5F31AA0160410. Ruth L. Kirschstein National Research Service Award (NIAAA). Dopamine involvement in the rewarding properties of ethanol.  
2003-2004 NIH 2T32AA007468. Institutional Pre-doctoral Training Fellowship (NIAAA). Biological bases of Alcoholism.  
2002-2003 NIH 5T32NS007466. Institutional Pre-doctoral Training Fellowship (NINDS). Multidisciplinary training in neuroscience.

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**Honors & Awards**

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Brain and Behavior Research Foundation Daniel X. Freedman Award Honorable Mention, 2018  
Winter Conference on Brain Research *Ann Kelly Memorial Travel Fellowship*, 2015  
Research Society on Alcoholism Merit Award (NIAAA), 2012  
Gordon Research Conference Merit Award, 2011  
Winter Conference on Brain Research Poster Award Nomination, 2011  
International Basal Ganglia Society Poster Excellence Award, 2010  
International Basal Ganglia Merit Award (2010)  
Research Society on Alcoholism Merit Award (NIAAA), 2010  
Research Society on Alcoholism Merit Award (NIAAA), 2009  
Best BEHN Graduate Student Paper Award, OHSU, 2009

Pavlovian Society Student Poster Award, 2007  
Research Society on Alcoholism Student Merit Award (NIAAA), 2007  
N.L. Tartar Research Fellow Award, 2005  
Research Society on Alcoholism Student Merit Award (NIAAA), 2006  
NIAAA Trainee Workshop Travel Award, 2005  
Research Society on Alcoholism Student Merit Award (NIAAA), 2004  
N.L. Tartar Research Fellow Award, 2003  
NIAAA Trainee Workshop Travel Award, 2003

## Publications

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- Cazares C & **Gremel CM** (2019) Alcohol dependence blunts OFC modulation supporting continuous goal-directed decision-making. *In preparation*.
- Renteria R, Schreiner D, Baltz E, Cazares C, Stalnaker T, Hnasko T, & **Gremel CM** (2019) Endocannabinoid regulation of OFC transmission in the transition to habitual control. *In preparation*.
- Renteria R, Cazares C, & **Gremel CM** (2019) Habitual alcohol seeking and licking microstructure of enhanced alcohol self-administration after the induction of alcohol dependence. *In revision*.
- Cuzon Carlson V\*, **Gremel CM\***, Lovinger D (2019) Prenatal ethanol exposure disrupts striatal circuits underlying habit formation. *Accepted, Nature Communications*
- Renteria R, Schreiner D, & **Gremel CM** (2019) Fractionating the all-or-nothing definition of goal-directed and habitual decision-making. *Invited Review, Journal of Neuroscience Research*, doi: 10.1002/jnr.24545.
- Schreiner DC, & **Gremel CM** (2018). Orbital frontal cortex projections to secondary motor cortex mediate exploitation of learned rules. *Scientific Reports*, 8(1):10979 DOI:10.1038/s41598-018-29285-x.
- Baltz ET, Yalcinbas EA, Renteria, R & **Gremel CM** (2018). Orbitofrontal cortex updates state-dependent value change for decision-making. *eLife*, 13;7 DOI:10.7554/eLife.35988
- Renteria R, Baltz ET, & **Gremel CM** (2018) Chronic alcohol exposure and repeated withdrawal disrupts top-down control over basal ganglia action selection to produce habits. *Nature Communications* 9(211) DOI: 10.1038/s41467-017-02615-9
- Gremel CM** & Lovinger DL (2016). Associative and sensorimotor corticobasal ganglia circuit roles in effects of abused drugs. *Genes, Brain, & Behavior*. 16(1): 71-85.
- Gremel CM**, Chancey JH, Atwood BK, Luo GL, Neve R, Deisseorth K M, Lovinger DM, Costa RM (2016) Endocannabinoid modulation of orbitostriatal circuits gates habit formation. *Neuron*, 90, 1-13.
- Barker JM, Corbit LH, Robinson DL, **Gremel CM**, Gonzales RA, Chandler LJ (2015) Corticostriatal circuitry and habitual ethanol seeking. *Invited review of Volterra Conference Proceeding, Alcohol*, 49: 817-834
- Holroyd KB, Adrover MF, Fuino RL, Bock R, Kaplan AR, **Gremel CM**, Rubinstein M, Alvarez VA (2015) Loss of feedback inhibition via D2 autoreceptors enhances acquisition of cocaine taking and reactivity to drug-paired cues. *Neuropsychopharmacology*, doi:10.1038/npp.2014.336
- Gremel CM**, Costa RM (2014) Secondary motor cortex is necessary for goal-directed actions. *Frontiers Computational Neuroscience*, 7(110): doi:10.3389/fncom.2013.00110
- Gremel CM** & Costa RM (2013) Orbitofrontal and striatal circuits dynamically encode the shift between goal-directed and habitual actions. *Nature Communications*, 4:2264 doi: 10.1038/ncomms3264.
- Bock R, Shin JH, Dobi A, Markey E, Kramer PF, Funo R, Kaplan AR, **Gremel CM**, Christensen CH, Androver MF, Alvarez VA (2013) Synaptic potentiation at accumbal indirect-pathway neurons protects against cocaine addictive-like behaviors. *Nature Neuroscience*, 16(5): 632-638.
- Gremel CM**, Young EM, Cunningham CL (2010) Blockade of opioid receptors in anterior cingulate cortex disrupts

ethanol-seeking behavior in mice. *Behav Brain Res*, 219(2): 358-362.

**Gremel CM** & Cunningham CL (2010) Effects of disconnection of amygdala dopamine and nucleus accumbens *N*-methyl-d-aspartate receptors on ethanol-seeking behavior in mice. *Eur J Neurosci*. 31(1):148-155.

**Gremel CM** & Cunningham CL (2009) Involvement of amygdala dopamine and nucleus accumbens NMDA receptors in expression of ethanol seeking behavior in mice. *Neuropsychopharm*. 34: 1443-1453.

**Gremel CM** & Cunningham CL (2008) Roles of the nucleus accumbens and amygdala in the acquisition and expression of ethanol conditioned behavior in mice. *J. Neurosci*, 28(5): 1076-1084.

Cunningham CL, **Gremel CM**, Groblewski PA (2009) Genetic influences on conditioned taste aversion. In S. Reilly & T. R. Schachtman (Eds.), *Conditioned taste aversion: Behavioral and neural processes* (pp. 387-421). New York: Oxford University Press.

Cunningham CL & **Gremel CM** (2006) Proximal ethanol pretreatment interferes with acquisition of ethanol-induced conditioned place preference. *Pharm, Biochem, Behav*, 85(3): 612-619.

**Gremel CM**, & Cunningham CL (2007) Role of test activity in ethanol-induced disruption of place preference expression in mice. *Psychopharm*, 191(2): 195-202.

Cunningham CL, **Gremel CM**, Groblewski PA (2006) Drug-induced conditioned place preference and aversion in mice. *Nature Protocols*, 1(4): 1662-1670.

**Gremel CM**, Gabriel KA, Cunningham CL (2006) Topiramate does not affect the acquisition or expression of ethanol conditioned place preference by ethanol in mice. *Alcohol Clin Exp Res*, 30(5): 783-790.

Bechtholt AJ, **Gremel CM**, Cunningham CL (2004) Handling blocks expression of conditioned place aversion but not conditioned place preference produced by ethanol in mice. *Pharm. Biochem. Behav*, 79(4): 739 – 744.

## Presentations

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*Invited Seminar* Fourth quadrennial meeting of OFC (November, 2019).

*Invited Seminar* UC Berkeley, (April, 2019)

Winter Conference on Brain Research (February, 2019)

*Invited Seminar* UC Denver (January, 2019)

*Invited Seminar* A&M, College Station (November, 2018)

*Invited Seminar* UT Dallas (October, 2018)

*Invited Seminar* MUSC (September, 2018)

*Invited Seminar* Gordon Conference on Basal Ganglia (March, 2018)

*Invited Seminar* UCSD Neuroscience seminar (November, 2017).

*Invited Seminar* John Hopkins (December, 2016).

Society for Neuroscience (November, 2016).

*Invited Seminar* UCSF (November, 2016).

*Invited Seminar* Scripps. (September, 2016).

*Invited Seminar* NeuroCog. (July, 2016).

*Invited Seminar* Addiction: In Theory (May, 2016).

*Invited Seminar* UCLA Southern California Learning and Memory Symposium (May, 2016).

*Invited Seminar* Gordon Research Conference on Alcohol & the Nervous System (February, 2016).

*Invited Seminar* Fourth quadrennial meeting of OFC (September, 2015).

*Invited Seminar* Winter Conference on Brain Research (January, 2015).

*Invited Seminar* Winter Conference on Brain Research (January, 2015).

*Invited Seminar* Volterra Alcoholism and Stress (May, 2014).

*Invited Seminar* University of North Carolina (April, 2014).

*Invited Seminar* University of California Irvine (February, 2014).

*Invited Seminar* University of California San Diego (February, 2014).

*Invited Seminar* Vanderbilt University (February, 2014).

*Invited Seminar* Rutgers University (February, 2013).

*Invited Seminar* University of Rochester (January, 2014).

*Invited Seminar* University of North Carolina (January, 2014).

*Invited Seminar* European Brain and Behaviour Society (September, 2013).

*Invited Seminar* University of Maryland (August, 2013).

*Invited Seminar* Oregon Health & Science University (March, 2013).  
Research Society on Alcoholism (June, 2011).  
*Invited Seminar* Gordon Conference on Cannabinoids (May, 2011).  
*Invited Seminar* COSYNE Computational and Systems Neuroscience (February, 2011).  
*Invited Seminar* ANGST NIMH/NIH (December, 2010).  
Research Society on Alcoholism (June, 2010).  
*Invited Seminar* Pavlovian Society (October, 2009).  
Research Society on Alcoholism (NIAAA) (July, 2007).  
Student Research Forum (2007).  
NIAAA workshop (2005).  
Student Research Forum (2004).

## Professional Experience

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Associate Editor for The Journal of Neuroscience

Ad hoc reviewer NIH MNPS, NAL, and ERB-M study sections

Co-chair of *Gordon Research Seminar: Endocannabinoids in Neurophysiology and Neuropathology*, 2013.

Co-chair of Winter Conference on Brain Research: Synaptic and Circuit Mechanisms of Compulsive Drug Seeking. 2018.

Reviewer for journals including: *Addiction Biology*, *Alcoholism: Clinical & Experimental Research*, *Alcohol*, *Biological Psychiatry*, *Cell Reports*, *ELife*, *European Journal of Neuroscience*, *Journal of Comparative Neurology*, *Journal of Neuroscience*, *Nature Communications*, *Nature Neuroscience*, *Nature Reviews Neuroscience*, *Neuropsychopharmacology*, *Neuropharmacology*, *Neuroscience Letters*, *Scientific Reports*.