

**Carrie R. Ferrario**  
Curriculum Vitae

**Current Position:**

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Assistant Professor (tenure track)  
Department of Pharmacology  
University of Michigan Medical School  
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**Education:**

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2006, Ph.D. Neuroscience, University of Michigan, Ann Arbor, MI  
2001, B.A. With Distinction and Departmental Honors, Psychology  
With Distinction, English, Indiana University, Bloomington, IN

**Research Interests:**

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- Behavioral and cellular neuroscience
- Obesity
- Plasticity of glutamate transmission
- Drug addiction

**Previous Positions:**

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2010-2012 Postdoctoral Research Associate, University of Michigan, Department of Pharmacology, Changes in excitatory synaptic transmission after in vitro stretch injury. Principal Investigator: Leslie E. Satin.

2009-2010 Postdoctoral Research Associate, University of Michigan, Department of Pharmacology, Interactions between nicotine and amphetamine and the role of the dopamine system. Principal Investigator: Margaret E. Gnegy.

2006-2009 Postdoctoral Research Associate, Rosalind Franklin University of Medicine and Science. Neuroscience Department. Cellular neuroadaptations associated with cocaine sensitization and self-administration. Principal Investigator: Marina E. Wolf.

2003-2006 Editorial assistant, Behavioral Brain Research, Elsevier Scientific Publishing, Editor-in-Chief: Terry E. Robinson, Guest Editor: Jill B. Becker

1999-2001 Laboratory Technician/MEDIC-B Scholar, Indiana University, Behavioral Neuroscience Department, Effects of ethanol on appetitive and aversive operant learning in high alcohol drinking and low alcohol drinking rats. Principal Investigator: Joseph E. Steinmetz.

**Other Professional Experience:**

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Dec. 2014 Invited participant: Japanese-American Frontiers of Science Symposium, National Academy of Sciences and Japan Society for the Promotion of Science, Tokyo Japan

Dec. 2014 Panel Member: ACNP Career Development Session, "What is Academic Success Today?"

- 2014 Invited reviewer: Science Peer Reviewer for the Netherlands Organisation for Health Research and Development (ZonMw) TOP programme round 2014
- 2013-current Faculty Member: PSTP program, Neuroscience Program, Michigan Diabetes and Research Training Center
- 2013 ACNP Career Development Workshop: topics discussed: strategies for funding, graduate student and postdoctoral training, successful promotion.
- 2013 ACNP Travel Awardee Career Development Luncheon: Leadership Development, Pathways to Successful Academic Research Career.
- 2010 Preparing Future Faculty Short Course: College teaching in science and engineering. University of Michigan Center for Research on Learning and Teaching, Ann Arbor.
- 2002-2006 Ph.D. Student, Neuroscience, University of Michigan, Psychology Department: The behavioral and neurobiological effects of cocaine self-administration in an extended access model of addiction. Thesis Advisor: Terry E. Robinson.
- 2001-2002 Ph.D. Student, University of Michigan, Psychology Department: Differential effects of protein synthesis inhibition in the amygdala or thalamus after fear conditioning. Principal Investigator: Stephen S. Maren
- 1999-2001 Honors Student, Indiana University Behavioral Neuroscience Department, Honors Thesis: Single unit activity in the amygdala during classical eye blink conditioning in rats. Advisor: Joseph E. Steinmetz
- 2000 MEDIC-B Fellow, Boston University: The effect of bilateral hippocampal lesions in mice on a variable delayed-match-to-place task. Principal Investigator: Howard Eichenbaum
- 1999 Indiana University, Psychology Department, Behavioral Neuroscience, Human classical eye blink conditioning: relationship between rate of learning and arousal level. Project Director: Jo Anne Tracy
- 1998-1999 Indiana University Clinical Psychology: Male opinions of homosexuality, homosexuals, and AIDS. Principal Investigator: Leonard Bates

### **Grants & Fellowships:**

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- 2015-2017 NARSAD Young Investigator Award from the Brain & Behavior Research Foundation; PI: Ferrario CR Title: Insulin Resistance and Depression
- 2011-2012 National Institute of Neurological Disorders and Stroke (NINDS) Supplement to Promote Diversity in Research. NS069629, University of Michigan and U Penn CHOPS, PI: Cohen A, Ferrario CR
- 2009-2010 University of Michigan Substance Abuse Research Center (UMSARC) Fellow, University of Michigan, Mentor: Margaret E. Gnegy
- 2007-2009 Individual Postdoctoral NRSA DA024502, National Institute on Drug Abuse (NIDA), Rosalind Franklin University of Medicine and Science, Mentor: Marina E. Wolf

- 2004-2006 National Institute on Drug Abuse (NIDA) Supplement to Promote Diversity in Research, University of Michigan, Mentor: Terry E. Robinson
- 2001-2004 Rackham Merit Fellowship, University of Michigan, Mentor: Terry E. Robinson
- 1999-2001 Minority Education & Development Initiative for Careers in Biomedicine (MEDIC-B) Scholarship, Indiana University Mentor: Joseph E. Steinmetz

#### **Awards & Honors:**

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- 2014 Kavli Fellow, National Academy of Sciences.
- 2014 NARSAD Young Investigator Award, Brain & Behavior Research Foundation
- 2014 American College of Neuropsychopharmacology Minority Travel Award
- 2013 American College of Neuropsychopharmacology Travel Award
- 2012 Outstanding Mentor Award: University of Michigan, Undergraduate Research Opportunity Program, Ann Arbor, MI
- 2001 Excellence in Research Award: Indiana University, Department of Psychology
- 2001 Departmental Honors: Indiana University, Department of Psychology
- 2001 Departmental Honors: Indiana University, Department of English
- 1998-2001 Minority Education & Development Initiative for Careers in Biomedicine (MEDIC-B) Scholarship

#### **Teaching:**

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- 2014 Co-Instructor, Graduate Course 611, Neuropsychopharmacology, Neuroscience Program, University of Michigan, Ann Arbor, MI.
- 2014 Instructor, Graduate Course 502, Pharmacology, PIBS Program, University of Michigan, Ann Arbor, MI.
- 2014 Discussion section leader, Graduate Course 503, PIBS Program, University of Michigan, Ann Arbor, MI.
- 2013 Co-instructor, Graduate Course 615 Neuropharmacology, Dept. of Pharm. University of Michigan
- 2006 Program Instructor, Young Neuroscientists, University of Michigan, Angel School, Ann Arbor.
- 2004 Graduate Student Instructor: Drugs of Abuse, University of Michigan. Course Director: Terry E. Robinson
- 2004 Guest Lecture: Drugs of Abuse, University of Michigan

2003 Graduate Student Instructor: Introduction to Biopsychology, University of Michigan. Course Director: Bill Fantegrossi.

2003 Guest Lecture: Current Techniques in Biopsychology/Neuroscience. Introduction to Biopsychology, University of Michigan

### **Mentorship:**

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#### Postdoctoral Fellows Supervised:

2014-2015 Peter Vollbrecht, PhD; Postdoctoral Fellow; University of Michigan; Alterations in striatal intracellular signaling after exposure to drug and food rewards. *Current Position: Assistant Professor, Hope College, Department of Biology, Holland, Michigan*

2014-2014 John Corthell, PhD; University of Michigan: Alterations in striatal glutamatergic transmission after exposure to drug and food rewards. *Current Position: Educational Support, University of Michigan, Department of Chemistry, Ann Arbor, MI*

2015-current Max Oginsky, PhD; Postdoctoral Fellow; University of Michigan; Effects of striatal insulin receptor activation and interactions with depression.

#### Graduate Students Supervised:

2014-current PhD Thesis Advisor: Rebecca Derman; PIBS/Neuroscience Graduate Program; University of Michigan; Interactions between individual susceptibility to obesity and enhanced motivation for food-cues.

2014-2015 Masters Thesis Advisor: Fahmeeda Tabassum, Pharmacology University of Michigan Ann Arbor, MI 2014-2015. Potential Anti-depressant Effects of Pioglitazone

Fall 2013 Rotational Students: Joel Maust, PIBS/Pharmacology; University of Michigan.

Winter 2014 Rotational Students: Andrew Nelson PIBS/Pharm, Nicole Michmerhuizen PIBS/Pharm, Yanari Alonso PIBS/Neurosci.

#### PhD Preliminary Exam Committees:

2013 Nicolas Senese, Department of Pharmacology. University of Michigan, Ann Arbor.

2014 Coleen Carpenter, Pharmacology, University of Michigan, Ann Arbor

2014 Christopher Fitzpatrick, Neuroscience Program, University of Michigan, Ann Arbor

#### Undergraduate Students Supervised:

2014-2015 Ahmen Mandair and Reed Horwitz Undergraduate researchers, Anxiety-like behaviors in obesity models.

2013-2015 Joe Fakhoury, Undergraduate researcher, Alterations in striatal AMPAR expression after sucrose exposure. *Current: Interviewing for medical school.*

2013 Kiomaris M. Nieves Villanueva, Charles Ross Summer Research Fellowship for Underrepresented Minorities, Alterations in striatal function in preclinical models of obesity. *Currently enrolled: Post Baccalaureate Research Program (PennPREP) in Biomedical Sciences at the University of Pennsylvania, Philadelphia, PA.*

- 2012-2013 Daniel Miller, Senior Thesis, Sensitivity to amphetamine is enhanced after exposure to a junk food diet, University of Michigan.
- 2011-2012 Kylie Carpenter, Undergraduate Research Opportunity Program, University of Michigan, Alterations in neural function after mechanical stretch injury. *Currently Enrolled: MPH, Epidemiology, University of Michigan School of Public Health, Ann Arbor, MI*
- 2011-2012 Blaise Ndukwe, Research Scholars Program, Undergraduate Research Opportunity Program, University of Michigan, Calcium Permeable AMPARs contribute to cortical dysfunction after mechanical stretch injury. *Currently Enrolled: Doctor of Pharmacy Program, University of Michigan College of Pharmacy*
- 2002-2004 Jeffrey Sutton, B.S. Honors Student, University of Michigan, Honors Thesis: Effect of variable drug exposure on c-fos mRNA expression. Research staff, Johns Hopkins.
- 2003-2004 Dominique Dobson, B.S. Honors student, University of Michigan, Honors Thesis: Rate of infusion: effects on self-administration behavior.

### **Invited Talks & Seminars:**

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- March 2015 Why did I eat that? Altered striatal function in obesity. University of Wyoming, Department of Neuroscience, Laramie, WY
- Feb., 2015 Seminar Speaker; Neurobiology of Drug Addiction. Andrews University, Chemistry & Biochemistry Department, Berrien Springs, MI  
<https://www.andrews.edu/services/its/telecom/chemsem>
- Nov., 2014 Speaker; Pre-existing and diet-induced alterations in AMPARs and sensitivity to cocaine. University of Texas Health Sciences, Department of Pharmacology, San Antonio, TX
- Feb., 2013 Biology of Drug Abuse Seminar Speaker, University of Michigan Substance Abuse Research Center Series; Role of CP-AMPARs in the cue-induced drug-seeking
- Nov., 2012 Developing Future Faculty; Mentorship Panel Member. University of Michigan; How to find and interact with mentors.
- Dec., 2011 Texas A & M University, Psychology Department Colloquium. The influence of food and drug related cues on brain and behavior.
- Nov., 2011 University of Notre Dame, Psychology Department, Brain, Mind and Behavior Seminar, Neurobiology of addiction.
- April, 2010 University of Michigan, Biopsychology Department Colloquium. AMPA receptor plasticity after withdrawal from in vivo cocaine exposure.

### **Professional Societies and Related Service:**

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- 2015 National Hispanic Science Network Mentor; NHSN Conference, San Antonio, TX
- 2014-2015 Neuroscience Graduate Program, Curriculum Development Committee Member

- 2013-2015 University of Michigan Councilor, MI Chapter of the Society for Neuroscience.
- 2013-2014 University of Michigan Neuroscience Program Alumni Committee Co-Chair.
- 2013-2015 Department of Pharmacology, Departmental Advisory Committee Member, 2013-2015.
- 2013 Faculty member: Neuroscience Graduate Program, University of Michigan
- 2013 Faculty member: Pharmacological Sciences Training Program (PSTP), University of Michigan
- 2013 Faculty member: Drugs of Abuse Training Program, University of Michigan
- 2013 Member: American Society for Pharmacology and Experimental Therapeutics
- 2012 Member: Society for the Study of Ingestive Behavior
- 2011 Member: MI Chapter of the Society for Neuroscience
- 2003 Member: Society for the Advancement of Chicanos and Native Americans in Science (SACNAS)
- 1999 Member: Society for Neuroscience

#### **Publications:**

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- 1) Robinson, M.J.F, Burghardt, P.R., Patterson, C.M., Nobile, C.W., Akil, H., Watson, S.J., Berridge, K.C., **Ferrario, C.R.** (2015) Individual Differences in Cue-Induced Motivation and Striatal Systems in Rats Susceptible to Diet-Induced Obesity. *Neuropsychopharmacology* Mar 12. doi: 10.1038/npp.2015.71. [Epub ahead of print] PMID: 25761571. See also: F1000 Prime: <http://f1000.com/prime/725387667>
- 2) Newman, M.E.J. and **Ferrario C.R.**, Interacting epidemics and coinfection on contact networks, *PLOS One*, 2013; 8(8):e71321, PMID: PMC3738632
- 3) **Ferrario, C.R.**, Goforth, P.B., Ndukwe, B., Satin, L.S. Stretch injury selectively enhances the activity of extrasynaptic, GluN2B-containing NMDA receptors in cortical neurons. *J Neurophysiol* 2013; 110(1):131-40, PMID: PMC3727039
- 4) Li, X., DeJoseph M.R., Urban, J.H., Bahi A., Dreyer J-L., Meredith GE, Ford, K.A., **Ferrario, C.R.**, Loweth, J.A., Wolf, M.E. Different roles of BDNF in nucleus accumbens core versus shell during the incubation of cue-induced cocaine craving and its long-term maintenance and its long term maintenance. *J Neurosci* 2013; 33:1130-42, PMID: PMC3711541
- 5) **Ferrario, C.R.**, Goussakov, I., Stutzmann, E.G., Wolf, M.E. Withdrawal from cocaine self-administration alters NMDA receptor-mediated calcium entry in nucleus accumbens dendritic spines. *PLoS ONE* 2012;7(8):e40898. PMID: PMC3411692
- 6) Boudreau, A.C., Milovanovic, M., Conrad, K.L., Nelson, C., **Ferrario, C.R.**, Wolf, M.E. (2012) A protein crosslinking assay for measuring cell surface expression of glutamate receptor subunits in the rodent brain after in vivo treatments. *Current Protocol in Neurosci.* 59:5.30.1-5.30.19, PMID: PMC3356776
- 7) **Ferrario, C.R.**, Loweth, J.A., Milovanovic, M., Ford, K.A., Galinanes, G.L., Heng, L-J., Tseng, K.Y., Wolf, M.E. (2011) Alterations in AMPA receptor subunits and TARPs in the rat nucleus accumbens

related to the formation of Ca<sup>2+</sup>-permeable AMPA receptors during the incubation of cocaine craving. *Neuropharmacol.* 61:1141-1151. PMID:PMC3094740

- 8) **Ferrario, C.R.**, Li, X., Wolf, M.E. (2011) Effects of acute cocaine or dopamine receptor agonists on AMPA receptor distribution in the rat nucleus accumbens. *Synapse* 65: 54-63. PMID: PMC2965794
- 9) **Ferrario, C.R.**, Loweth, J.A., Milovanovic, M, Wolf, M.E., (2011) Distribution of AMPA receptor subunits and TARPs in synaptic and extrasynaptic membranes of the adult rat nucleus accumbens. *Neurosci. Lett.* 490:180-184. PMID:PMC3038183
- 10) **Ferrario, C.R.**, Li, X., Wang, X., Reimers, J.R., Uejima, J.L, Wolf, M.E. (2010) The role of glutamate receptor redistribution in locomotor sensitization to cocaine. *Neuropsychopharmacology* 35: 818-833. PMID: PMC3014646
- 11) Wolf, M.E. and **Ferrario, C.R.** (2010) AMPA receptor plasticity in the nucleus accumbens after repeated exposure to cocaine. *Neurosci. & Biobehav. Rev.* 35: 185-211. PMID: PMC2962767 (Invited Review)
- 12) Boudreau, A.C., **Ferrario, C.R.**, Glucksman, M., Wolf, M.E. (2009) Signaling pathway adaptations and novel protein kinase A substrates related to behavioral sensitization to cocaine. *J. Neurochem.* 110: 363-377. PMID: PMC2856133
- 13) **Ferrario, C.R.**, Shou, M., Samaha, A.N., Watson, C.J., Kennedy, R.T., Robinson, T.E. (2008) The rate of intravenous cocaine infusion alters c-fos mRNA expression and the temporal dynamics of dopamine, but not glutamate, overflow in the striatum. *Brain Res.* 1209:151-156. PMID: PMC2430427
- 14) Crombag, H.S., **Ferrario, C.R.**, Robinson, T.E. (2008) The rate of intravenous cocaine or amphetamine delivery does not influence drug-taking and drug-seeking behavior in rats. *Pharmacology, Biochemistry and Behavior* 90:797-804. PMID: PMC2576488
- 15) **Ferrario, C.R.** and Robinson, T.E. (2007) Amphetamine pretreatment accelerates the subsequent escalation of cocaine self-administration behavior. *Eur. Neuropsychopharmacol.* 17:352-357. PMID:17029912
- 16) Shou, M., **Ferrario, C.R.**, Shultz, K.N., Robinson, T.E., Kennedy, R.T. (2006) Monitoring dopamine in vivo by microdialysis sampling and on-line CE-laser-induced fluorescence. *Anal. Chem.* 78:6717-6725. PMID:17007489
- 17) **Ferrario, C.R.**, Gorny, G., Crombag, H.S., Li, Y., Kolb, B., Robinson, T.E. (2005) Neural and behavioral plasticity associated with the transition from controlled to escalated cocaine use. *Biol. Psychiatry* 58:751-759. PMID: 16098484
- 18) Maren, S. **Ferrario, C.R.**, Corcoran, K.A., Desmond, T.J., Frey, K.A. (2003) Protein synthesis in the amygdala, but not the auditory thalamus, is required for consolidation of pavlovian fear conditioning in rats. *Eur. J. Neurosci.* 18:3080-3088. PMID:14656303

#### **Abstracts & Meeting Presentations:**

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Derman R and **Ferrario CR** (2015) Obesity-Prone Rats Show Enhanced Cue-triggered Food Seeking. *Annual Meeting of the Society for the Study of Ingestive Behavior*, Denver, CO.

Alonso-Caraballo Y, Vollbrecht PJ, Mabrouk O, Kennedy RT and **Ferrario, CR** (2015) Altered striatal function and sensitivity to the norepinephrine reuptake inhibitor, Desipramine, in selectively bred obesity-prone versus obesity-resistant rats. *Behavior, Biology and Chemistry, Translational Research in Addiction*, San Antonio, TX.

**Ferrario CR**, Nobile CW, Berridge KB, Robinson MJF, Goforth PG (2015) Diet-induced increases in NAc CP-AMPA receptors and enhanced sensitivity to cocaine in obesity-prone vs. obesity-resistant rats. *Winter Conference on Brain Research*, Big Sky, MT

**Ferrario CR**, Nobile CW, Vollbrecht P, Corthell JT, Lopez-Santiago LF and Goforth PG (2014) Pre-existing and diet-induced alterations in striatal function in preclinical models of obesity. *Annual Meeting of the American College of Neuropsychopharmacology*, Phoenix, AZ

Nobile CW, Goforth PB, Corthell JT, Robinson MJF, Berridge KC, **Ferrario CR** (2014) The enhancement of cue-induced motivation in obesity-prone vs. resistant rats is accompanied by sensitization to cocaine and increased CP-AMPA receptor expression in the NAc. *Annual Meeting of the Society for Neuroscience*. Washington DC

Selective enhancement of cue-induced motivation in obesity prone vs. resistant rats is accompanied by sensitization to cocaine and increased striatal AMPA receptor expression. **Ferrario CR**, Nobile CW, Robinson MJF, Berridge KC (2014). *Behavior, Biology and Chemistry: Translational Research in Addiction*. San Antonio, TX

**Ferrario CR**, Nobile CW, Robinson MJF, Berridge KC (2013) Selective enhancement of cue-induced motivation in obesity prone vs. resistant rats is accompanied by sensitization to cocaine and increased striatal AMPA receptor expression. *Annual Meeting of the American College of Neuropsychopharmacology*, Hollywood, FL

**Ferrario, C.R.**, Robinson, M.J.F., Burghardt P.R., Nobile, C.M., Akil H., Watson, S.J., Berridge K.C. (2013) Prolonged exposure to a “junk food” diet decreases D2 mRNA expression in NAc and VTA of all rats, while selectively enhancing cue-induced motivation for sweet incentives in obesity-prone rats. *Annual Meeting of the Society for Neuroscience* San Diego, CA

Nobile, C.W. and **Ferrario, C.R.** (2013) Enhanced motivation for cues paired with sucrose and sucrose itself in rats selectively bred for propensity or resistance to diet induced obesity. *Annual Meeting of the Society for Neuroscience*. San Diego, CA

Villanueva, K.M.N., Fakhoury J.W., and Ferrario, C.R. (2013) Changes in AMPA Receptor Expression after Exposure to a Palatable “Junk-Food” Diet” *Annual Biomedical Research Conference for Minority Students (ABRCMS)*. Nashville, TN.

Nobile, C.W. and **Ferrario, C.R.** (2013) Enhanced motivation in rats selectively bred for propensity (DIO) or resistance (DR) to diet induced obesity. *Annual Meeting of the Michigan Chapter of the Society for Neuroscience*. Ann Arbor, MI

**Ferrario, C.R.**, Robinson, Burghardt P.R., Paterson, C.M., Akil H., Watson, S.J., Berridge K.C. (2013) A “junk food” diet enhances motivation for a sucrose paired cue in obesity prone, but not obesity resistant, rats. *Keystone Symposium: Neuronal Control of Appetite, Metabolism, and Weight; Alberta, CA*

**Ferrario, C.R.**, Robinson, M.J.F., Paterson, C.M., Burghardt P.R., Akil H., Watson, S.J., Berridge K.C. (2012) A “junk food” diet enhances motivation for a sucrose paired cue in obesity prone, but not obesity resistant, rats. *Annual Meeting of the Society for Neuroscience* New Orleans, LO \*\* Selected as “hot topic”.



**Ferrario, C.R.**, Goforth, P.B., Satin, L.S. (2012) Injury increases extrasynaptic NR2B-containing NMDA receptor-mediated current in cortical neurons. *Neurotrauma, Meeting of the National Neurotrauma Society, Phoenix, AZ.*

**Ferrario, C.R.**, Goforth, P.B., Satin, L.S. (2011) Effects of Mechanical Stretch Injury on AMPA and NMDA receptor-mediated transmission and expression in Cortical Neurons. *Annual Meeting of the Michigan Chapter of the Society for Neuroscience. Ann Arbor, MI*

**Ferrario, C.R.**, Milovaonovic, M., Ford, K.A., Wang, X., Wolf, M.E. (2009) Subcellular distribution of AMPA receptors and related alterations at the PSD after prolonged withdrawal from cocaine self-administration *Annual Meeting of the Society for Neuroscience Chicago, IL*

**Ferrario, C.R.**, Milovanovic M., Ford, K.A., Conrad, K.L., Marinelli, M., Wolf, M.E. (2008) Plasticity of excitatory synapses in the nucleus accumbens after prolonged withdrawal from cocaine self-administration. *Annual Meeting of the Society for Neuroscience Washington D.C*

C.L., **Ferrario, C.R.**, Li, X.A., Wolf M.E. (2008). Comparison of the effect of a single exposure to cocaine or amphetamine on AMPA receptor distribution in the nucleus accumbens. *Annual Meeting of the Society for Neuroscience Washington D.C.*

Wolf, M.E., **Ferrario, C.R.** (2008) Alterations in AMPA receptor expression in the nucleus accumbens of cocaine sensitized rats after re-exposure to cocaine. *Annual Meeting of the Society for Neuroscience, Washington D.C.*

**Ferrario, C.R.**, Reimers, J.M., Milovanovic, M., Ford, K.A., Uejima, J., Conrad, K.L., Marinelli, M., Wolf, M.E. (2008) AMPA receptor trafficking after withdrawal from cocaine administration: role of transmembrane AMPA receptor regulatory proteins (TARPs). *Winter Conference on Brain Research, Salt Lake City, UT*

**Ferrario, C.R.**, Sun, X., Conrad, K.L., Wolf, M.E. (2007) TARPs and AMPA receptor trafficking in the nucleus accumbens. *Annual Meeting of the Society for Neuroscience, San Diego, CA*

**Ferrario, C.R.**, Shou, M., Samaha, A.N., Watson, C.J., Kennedy, R.T & Robinson, T.E. (2006) The influence of rate of intravenous cocaine infusion on extracellular dopamine and glutamate measured with rapid dialysis sampling coupled to CE-LIF. *Annual Meeting of the Society for Neuroscience, Atlanta, GA*

**Ferrario, C.R.** and Robinson, T.E. (2005) Amphetamine pretreatment facilitates subsequent escalation of cocaine self-administration behavior. *Annual Meeting of the Society for Neuroscience, Washington, DC*

**Ferrario, C.R.**, Gorny, G., Crombag, H.S., Li, Y., Kolb, B., Robinson, T.E (2004) Escalated cocaine self-administration produces robust psychomotor sensitization and changes in spine density in the nucleus accumbens core and medial prefrontal cortex. *Annual Meeting of the Society for Neuroscience, San Diego, CA*

**Ferrario, C.R.**, Crombag, H.S., Gorny, G., Li, Y., Kolb, B., Robinson, T.E. (2003) Cocaine self-administration experience produces specific changes in spine density in the rat prefrontal cortex that are not affected by duration of drug experience. *NIDA Frontiers in Addiction Research, New Orleans LA*

**Ferrario C.**, Crombag H.S., Gorny G., Li Y., Kolb B., Robinson T.E. (2003) Amphetamine or cocaine self-administration experience produces persistent regionally specific changes in spine density in the prefrontal cortex of rats. *Annual Meeting of the Society for Neuroscience, New Orleans LA*

Maren, S. **Ferrario, C.**, Corcoran, K.A., Desmond, T.J., Frey, K.A. (2003) Protein synthesis in the amygdala, but not the auditory thalamus, is required for consolidation of pavlovian fear conditioning in rats. *Annual Meeting of the Society for Neuroscience, New Orleans LA*

Crombag, H.S., **Ferrario, C.** Myc, P., Robinson, T.E. (2003) The effects of rate of intravenous drug infusion on psychostimulant drug taking and seeking. *The European Behavioural Pharmacology Society meeting, Antwerp*

Tracy, J., Boals, T.A., **Ferrario, C.**, Pieper, K.J., Rychener, M.C., McFall, R.M., Steinmetz, J.E. (2000) Emotion and learning: differential responses during human eyeblink conditioning. *Annual Meeting of the Society for Neuroscience, New Orleans, LA*

**Ferrario, C.** and Steinmetz, J.E. (2000) The effects of ethanol on high alcohol drinking and low alcohol drinking rats. Oral Presentation *Indiana University Undergraduate Research Conference. Indiana University, Kokomo, IN*

**Ferrario, C.** and Steinmetz, J.E. (1999) The effects of ethanol on high alcohol drinking and low alcohol drinking rats. Poster Presentation, *GMAP/MEDIC-B Scholars: CIC Research Conference. Buffalo, NY*

### **References:**

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Dr. Marina E. Wolf, Professor and Chair of Neuroscience, Rosalind Franklin University of Medicine and Science, 3333 Green Bay Road, North Chicago, IL 60045-4095; Office: (847) 578-8659; email: [marina.wolf@rosalindfranklin.edu](mailto:marina.wolf@rosalindfranklin.edu)

Dr. Terry E. Robinson, Elliot S. Valenstein Distinguished University Professor of Psychology & Neuroscience, Department of Psychology, University of Michigan, 530 Church Street, Ann Arbor, MI 48109; Office: (734) 763-4361; email: [ter@umich.edu](mailto:ter@umich.edu)

Dr. Kent C. Berridge, James Olds Collegiate Professor of Psychology and Neuroscience, Department of Psychology, University of Michigan, 530 Church Street, Ann Arbor, MI 48109; Office: (734) 763-4365; email: [berridge@umich.edu](mailto:berridge@umich.edu)

Dr. Margaret E. Gnegy, Professor of Pharmacology, University of Michigan Med. School. 2220E MSRB III SPC 5632 Ann Arbor, MI 48109; Office: (734) 763- 5358; email: [pgnegy@umich.edu](mailto:pgnegy@umich.edu)