

Waggoner Center for Alcohol & Addiction Research

utexas.edu/research/wcaar/

2500 Speedway, A4800

MBB 1.124

Austin, Texas 78712

USA

Tel: 512-232-2520

Fax: 512-232-2525

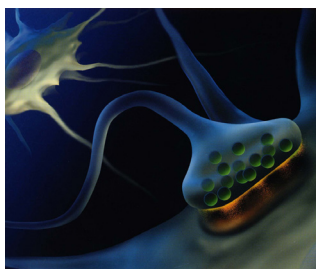
Proclivitas

Volume 12, Issue 2, Fall 2013

Waggoner Center for Alcohol & Addiction Research Newsletter

Our Mission

To develop solutions for the prevention and cure of alcoholism and related illnesses.



Above (left to right):
Michela Marinelli and
Kimberly Raab-Graham

Center Welcomes New Faculty Members

Dr. Michela Marinelli, associate professor of Pharmacology and Toxicology, and **Dr. Kimberly Raab-Graham**, assistant professor of Neuroscience, recently joined the Waggoner Center faculty.

Marinelli was an associate professor at Rosalind Franklin University of Medicine and Science in North Chicago from 2003 to 2013. Her appointment with the College of Pharmacy at The University of Texas at Austin began in October. Raab-Graham was a postdoctoral fellow at the University of California, San Francisco, before coming to the university in 2007.

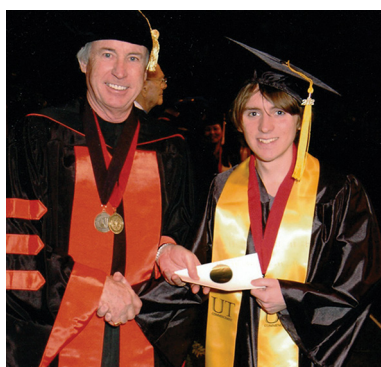
Associate Director Robert Messing said Marinelli's research focus is on understanding brain circuits that underlie addiction to cocaine and other abused drugs, with an emphasis on adolescent risk for addiction. Her expertise in behavioral and systems neuroscience will be a great asset to the center. Marinelli uses a combination of models associated with increased addiction liability, the potential to develop an addiction, in her research. Factors related to addiction liability include age (i.e., adolescence), prior exposure to drugs of abuse, and stress. A systems approach, including molecular (protein expression), cellular (neuronal activity and synaptic transmission), anatomical (optogenetics and functional neuro-

anatomy), and behavioral (self-administration) techniques, measures addiction liability. Such an approach allows better characterization of this complex disease, which will lead to more effective treatment strategies.

Raab-Graham investigates the molecular mechanisms involved in synaptic plasticity. This plasticity, or adaptability, underpins neuronal circuitry in the brain, which reinforces behavior. Neuronal communication occurs through transmission of chemicals (transmitters) that are released by the axon (presynaptically) and received by neighboring dendritic spines (postsynaptically). Raab-Graham is particularly interested in the molecular mechanisms that regulate local synaptic protein synthesis: translation of messenger RNA or mRNA (which code for protein) in response to neuronal activity, the signaling pathways involved, and the distribution of mRNA along dendrites and axons. Her work "brings new expertise in molecular biology to the Waggoner Center," said Director R. Adron Harris. "This mechanism of synaptic plasticity is a new area for addiction research and will likely prove critical for understanding the molecular remodeling of the synapse in addiction."

Fellowship Honors Gregory Frayne

The Waggoner Center's newly established Frayne Graduate Fellowship honors **Gregory Frayne**, who died March 13, 2013, at age 27. A graduate of The University of Texas at Austin, he received a bachelor's degree in Chemistry in 2008 and was accepted for admission to the doctoral program at The University of Texas at Arlington for the 2013 fall semester. Frayne is pictured at right with Stephen F. Martin, professor of Chemistry. During his undergraduate career, Frayne co-authored an article published in *Tetrahedron Letters* and received two internships from GlaxoSmithKline in Raleigh, N.C. His parents, Laurence and Marion Frayne of Flower Mound, Texas, said their son had "a deep respect for the scientific community and a passion for research and discovery. He wanted to be a part of it" and "wanted to make a difference, to have a positive impact on the world." By funding a fellowship in support of graduate studies at the university, the Fraynes wish to honor their son's dreams, unfulfilled goals, and love of Austin. They believe a gift advancing addiction research at the Waggoner Center will allow those affected by alcoholism to reach their full potential. The 2013-2014 recipient of the Frayne Graduate Fellowship is doctoral candidate **Garrett Cornelison** (Mihic Lab). Cornelison, along with Director R. Adron Harris, graduate student Laura Ferguson, and postdoctoral fellow Sean Farris, met with Mr. and Mrs. Frayne at the end of August to discuss current addiction research.



Long-time Research Manager Retires



Research Manager **Debra James** (left) retired in August after 15 years at the Waggoner Center and 26 years at the university. With Director R. Adron Harris, James was instrumental in establishing the Waggoner Center in 1999. She helped recruit the center's faculty fellows, researchers, and trainees and hosted scores of visiting scientists, potential donors, congressional staffers, and visitors from the public-at-large. In addition, she managed grants resulting in approximately \$50 million in funding. Harris said the center "could never have achieved its success without Debbie." She "is one of those very, very special people who is responsible for the success of

The University of Texas at Austin." Jayna Dixon succeeded James as research manager in September. Dixon can be reached at jaynadixon@austin.utexas.edu.

NEWS

The Integrated Neuroscience Initiative Consortium on Alcoholism awarded a pilot project grant to **Dr. Kimberly Raab-Graham** to study the role of the mammalian target of rapamycin (mTOR), a protein involved in protein synthesis, in response to ethanol exposure. The study will test two hypotheses: 1) ethanol changes the function of a specific GABA receptor, which leads to increased mTOR activity, and 2) ethanol promotes local protein synthesis in the dendrites. The study will help elucidate the connection between molecular sites of ethanol action and changes in gene expression.

A recent paper published in *Molecular Pharmacology*, "Functional Validation of Virtual Screening for Novel Agents with General Anesthetic Action at Ligand-gated Ion Channels," by collaborators in the lab of **R. Adron Harris**, was selected for F1000Prime, a curated list of significant publications about biology and medicine.

Dr. Armando Salinas (Morrisett Lab) began a postdoctoral fellow position this fall at The National Institutes of Health. Collaborating with Drs. Kim Blackwell (George Mason University) and David Lovinger (National Institute of Alcohol Abuse and Alcoholism), he studies post-synaptic calcium dynamics in brain.

HONORS & AWARDS

Patrick Quinn (Fromme Lab) won the 2013 Lee Willerman Award for Excellence in Research at the annual "PsychFest" hosted by the Psychology Department. The award recognizes the outstanding student publication. Quinn's paper, "An Event-level Examination of Sex Differences and Subjective Intoxication in Alcohol-related Aggression," was published in *Experimental and Clinical Psychopharmacology*.

Dana Most (Harris Lab) received the International Behavioural and Neural Genetics Society Young Investigator Travel Award to attend the 2013 Genes, Brain and Behavior Meeting in Leuven, Belgium. Her presentation was titled "The Synaptoneurosome Transcriptome: A Model for Profiling the Molecular Effects of Alcohol."

Recipient of the National Science Foundation Minority Postdoctoral Fellowship in Biology:

Farr Niere, Ph.D. (Raab-Graham Lab), "Defining the Mechanism that Regulates the Insertion of the Voltage-dependent Potassium Channel 1.1 into the Surface Membrane of Neuronal Dendrites"

Recipients of the National Research Service Award from The National Institutes of Health:

Dana Most (Harris Lab), "Synaptic mRNA and microRNA: Regulation by Chronic Alcohol Consumption"

Patrick Quinn (Fromme Lab), "Alcohol Response, Cognitive Impairment, and Alcohol-related Negative Consequences"

John Valenta (Gonzales Lab), "Monocyte Chemotactic Protein-1 (MCP-1) Modulation of Ethanol Self-Administration"

Doctoral degrees awarded:

Armando Salinas, Ph.D. (Morrisett Lab), Aug. 13, 2013 "Central Amygdala CART modulates Ethanol Withdrawal-induced Anxiety"

PUBLICATIONS

Agrawal RG, Owen JA, Levin PS, Hewetson A, Berman AE, Franklin SR, Hogue RJ, Chen Y, Walz C, Colvard BD, Nguyen J, Velasquez O, Al-Hasan Y, **Blednov YA**, Fowler AK, Syapin PJ, Bergeson SE (2013) Bioinformatics Analyses Reveal Age-Specific Neuroimmune Modulation as a Target for Treatment of High Ethanol Drinking. *Alcohol Clin Exp Res* doi: 10.1111/acer.12288. PMID: 24125126.

Borghese C, Hicks JA, Lapid DJ, Trudell JR, **Harris RA** (2013) GABA receptor transmembrane amino acids are critical for alcohol action: disulfide crosslinking and alkyl methanethiosulfonate labeling reveal relative location of binding sites. *J Neurochem* doi: 10.1111/jnc.12476. PMID: 24117469.

Brager DH, Lewis AS, Chetkovich DM, **Johnston D** (2013) Short- and long-term potentiation in CA1 neurons from mice lacking the h-channel auxiliary subunit TRIP8b. *J Neurophysiol* doi: 10.1152/jn.00218.2013. PMID: 23966674.

Bromstrup T, Howard RJ, Trudell JR, **Harris RA**, Lindahl E (2013) Inhibition versus potentiation of ligand-gated ion channels can be altered by a single mutation that moves ligands between intra- and intersubunit sites. *Structure* 21: 1307-1316.

Ghezzi A, Al-Hasan YM, Krishnan HR, Wang Y, **Atkinson NS** (2013) Functional mapping of the neuronal substrates for drug tolerance in *Drosophila*. *Behav Genet* 43: 227-240.

Gorini G, **Harris RA**, **Mayfield RD** (2013) Proteomic Approaches and Identification of Novel Therapeutic Targets for Alcoholism. *Neuropsychopharmacology* doi: 10.1038/npp.2013.182. PMID: 23900301.

Heusser SA, Howard RJ, Borghese CM, Cullins MA, Broemstrup T, Cullins MA, Broemstrup T, Lee US, Lindahl E, Carlsson J, **Harris RA** (2013) Functional validation of virtual screening for novel agents with general anesthetic action at ligand-gated ion channels. *Mol Pharmacol* 84: 670-678.

Kirson D, Cornelison GL, Philpo AE, Todorovic J, **Mihic SJ** (2013) Physiological concentrations of zinc reduce taurine-activated GlyR responses to drugs of abuse. *Neuropharmacology* 75C: 286-294.

Lee AM, Zou ME, Lim JP, Stecher J, McMahon T, **Messing RO** (2013) Deletion of *Prkcz* Increases Intermittent Ethanol Consumption in Mice. *Alcohol Clin Exp Res* doi: 10.1111/acer.12211. PMID: 23905844.

Lee C, **Harris RA**, Wall JK, **Mayfield RD**, Wilke CO (2013) RNaseIII and T4 polynucleotide Kinase sequence biases and solutions during RNA-seq library construction. *Biol Direct* 8: 16.

Li X, Ghezzi A, Pohl JB, Bohm AY, **Atkinson NS** (2013) A DNA element regulates drug tolerance and withdrawal in *Drosophila*. *PLoS One* 8: e75549.

Maranhao AC, **Ellington AD** (2013) Endowing cells with logic and memory. *Nat Biotechnol* 31: 413-415.

Martin SF, Clements JH (2013) Correlating structure and energetics in protein-ligand interactions: paradigms and paradoxes. *Annu Rev Biochem* 82: 267-293.

McAleer LM, **Schallert T**, **Duvauchelle CL** (2013) Weekend Ecstasy use disrupts memory in rats. *Neurosci Lett* 549: 173-176.

McCarthy N, Wetherill L, Lovely CB, Swartz ME, Foroud TM, **Eberhart JK** (2013) *Pdgfra* protects against ethanol-induced craniofacial defects in a zebrafish model of FASD. *Development* 140: 3254-3265.

McCracken LM, Trudell JR, McCracken ML, **Harris RA** (2013) Zinc-Dependent Modulation of alpha2- and alpha3-Glycine Receptor Subunits by Ethanol. *Alcohol Clin Exp Res* doi: 10.1111/acer.12192. PMID: 23895467.

Nunez YO, Truitt JM, Gorini G, Ponomareva ON, **Blednov YA**, **Harris RA**, **Mayfield RD** (2013) Positively correlated miRNA-mRNA regulatory networks in mouse frontal cortex during early stages of alcohol dependence. *BMC Genomics* 14: 725.

Ozburn AR, **Harris RA**, **Blednov YA** (2013) Chronic voluntary alcohol consumption results in tolerance to sedative/hypnotic and hypothermic effects of alcohol in hybrid mice. *Pharmacol Biochem Behav* 104: 33-39.

Pohl JB, Ghezzi A, Lew LK, Robies RB, Cormack L, **Atkinson NS** (2013) Circadian genes differentially affect tolerance to ethanol in *Drosophila*. *Alcohol Clin Exp Res* 37: 1862-1871.

Building a Partnership

Individual, foundation and corporate support is essential to the continued growth and success of this world-class research center. To support the Waggoner Center for Alcohol and Addiction Research, please visit:

utdirect.utexas.edu/apps/utgiving/online/nlogon/?menu1=NSWC

or call: 512-471-3299

or contact:

College of Natural Sciences
Dean's Office

The University of Texas
at Austin

120 Inner Campus Drive
Stop G2500
Austin, TX 78712

Useful Websites

Addiction Science Research
and Education Center,
utexas.edu/research/asrec

National Institute on Alcohol
Abuse and Alcoholism
(NIAAA), niaaa.nih.gov

National Institute on Drug
Abuse (NIDA), nida.nih.gov

Research Society on Alco-
holism (RSA), rsoa.org

International Society for
Biomedical Research on
Alcoholism (ISBRA)
isbra.com

(Publications continued
next page.)

THE UNIVERSITY OF TEXAS AT AUSTIN

Waggoner Center

for Alcohol & Addiction Research

utexas.edu/research/wcaar/

2500 Speedway, A4800

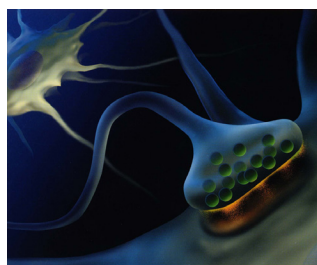
MBB 1.124

Austin, Texas 78712

USA

Tel: 512-232-2520

Fax: 512-232-2525



Proclivitas

Waggoner Center for Alcohol & Addiction Research Newsletter

The Waggoner Center for Alcohol and Addiction Research was established in 1999 at The University of Texas at Austin.

The center was made possible by a donation from M. June and J. Virgil Waggoner and matching funds from the university.

The mission of the center is to create a premier research center for alcohol and addiction research, thereby developing solutions for the prevention and cure of these diseases.

Director:

R. Adron Harris, Ph.D.

Associate Director:

Robert O. Messing, M.D.

Editing/Design:

Marsha Berkman, Jody Mayfield

Many thanks to:

Michela Marinelli, Kimberly Raab-Graham, Kay Thomas

PUBLICATIONS (continued)

Quinn PD, Stappenbeck CA, **Fromme K** (2013) An event-level examination of sex differences and subjective intoxication in alcohol-related aggression. *Exp Clin Psychopharmacol* 21: 93-102.

Reilly MT, Faulkner GJ, Dubnau G, **Ponomarev I**, Gage FH (2013) The Role of Transposable Elements in Health and Diseases of the Central Nervous System. *J Neuroscience*, 33(45):17577–17586.

Robinson BG, Khurana S, **Atkinson NS** (2013) Drosophila larvae as a model to study physiological alcohol dependence. *Commun Integr Biol* 6: e23501.

Ron D, **Messing RO** (2013) Signaling pathways mediating alcohol effects. *Curr Top Behav Neurosci* 13: 87-126.

Seif T, Chang SJ, Simms JA, Gibb SL, Dadgar J, Chen BT, Harvey BK, Ron D, **Messing RO**, Bonci A, Hopf FW (2013) Cortical activation of accumbens hyperpolarization-active NMDARs mediates aversion-resistant alcohol intake. *Nat Neurosci* 16: 1094-1100.

Sparta DR, Hopf FW, Gibb SL, Cho SL, Stuber GD, **Messing RO**, Ron D, Bonci A (2013) Binge ethanol-drinking potentiates corticotropin releasing factor r1 receptor activity in the ventral tegmental area. *Alcohol Clin Exp Res* 37: 1680-1687.

Stappenbeck CA, **Fromme K** (2013) The Effects of Alcohol, Emotion Regulation, and Emotional Arousal on the Dating Aggression Intentions of Men and Women. *Psychol Addict Behav* doi: 10.1037/a0032204. PMID: 23586449.

Swartz ME, Wells MB, Griffin M, McCarthy N, Lovely CB, McGurk P, Rozacky J, **Eberhart JK** (2013) A Screen of Zebrafish Mutants Identifies Ethanol-Sensitive Genetic Loci. *Alcohol Clin Exp Res* doi 10.1111/acer.12286. PMID: 24164477.

Workman ER, Niere F, **Raab-Graham KF** (2013) mTORC1-dependent protein synthesis underlying rapid antidepressant effect requires GABABR signaling. *Neuropharmacology* 73: 192-203.

Zlotkowski K, **Pierce-Shimomura J**, Siegel D (2013) Small-molecule-mediated axonal branching in *Caenorhabditis elegans*. *Chembiochem* 14: 307-310.