The University of Texas at Austin
Waggoner Center for
Alcohol & Addiction Research

Proclivitas

SUMMER 2019

WAGGONER CENTER FOR ALCOHOL & ADDICTION RESEARCH *Newsletter*

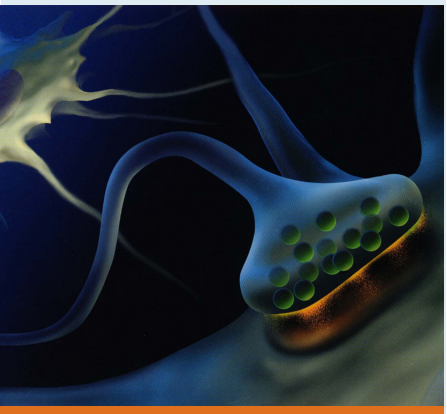
Above (left to right):

Kimberly Nixon,
Regina Mangieri
and **Lauren Dobbs**

Photo Credit:
Anthony Mireles

Our Mission

To advance knowledge of alcohol and substance use disorders and develop solutions for their prevention and treatment.



Volume 16, Issue 1

Waggoner Center Welcomes New Affiliated Faculty Members

Three researchers focused on the neurobiology of addiction at The University of Texas at Austin joined the Waggoner Center for Alcohol and Addiction Research as affiliated faculty members: **Lauren Dobbs**, assistant professor in the Department of Neuroscience, and **Regina Mangieri**, research assistant professor, and **Kimberly Nixon**, associate professor and James T. Doluisio Centennial Fellow, in the Division of Pharmacology and Toxicology.

Dobbs hopes to change public perception of alcoholism and related illnesses.

"I'm pursuing this topic because I want to help public health and because I want people to see substance use disorders as treatable diseases," she said.

Her lab studies the circuit mechanisms underlying polysubstance abuse. Though evidence indicates that opiates and cocaine target distinct components of the brain's reward circuitry, she plans to pursue the hypothesis that these distinct components interact within a common circuit to ultimately elicit the expression of similar drug seeking and taking behaviors for both substances.

Following a postdoctoral fellowship in the Laboratory on Neurobiology of Compulsive Behaviors at the National Institute on Alcohol Abuse and Alcoholism, she was drawn to the center's partnerships across disciplines—between clinicians and scientists.

"I think the science is better when we do it in a collaborative environment," said Dobbs, who also has a courtesy faculty appointment in the Department of Neurology at Dell Medical School.

Mangieri's research examines how neuroimmune signaling molecules impact neurophysiology and alcohol-reinforced behaviors.

She heads the Target Validation Electrophysiology Core of the Integrative Neuroscience Initiative on Alcoholism-Neuroimmune Consortium, which is led by R. Adron Harris, the center's associate director.

Long-term, she would like to be influential in identifying more effective drug therapies.

"It's very motivating to know that I get to go to work and do something that will hopefully one day benefit people that I care about," she said.

Nixon was previously a faculty member at the University of Kentucky and a postdoctoral fellow at the Bowles Center for Alcohol Studies at the University of North Carolina School of Medicine, where she studied the effect of alcohol on adult neurogenesis—an area her lab continues to lead today.

"We look at different cellular events that happen in response to typical binge-like exposure and how that damage then contributes to changes in the brain," she said.

Nixon, who received her Ph.D. from UT Austin, is thrilled to be back at the university and to be part of the center.

"I jumped on [the opportunity] because of the center's outstanding reputation. It is just ahead of the curve on so many fronts."

She would ultimately like to find a novel treatment that would help reverse alcoholic brain damage.

NEWS

R. Adron Harris, the M. June and J. Virgil Waggoner Chair in Molecular Biology, WCAAR associate director and professor of Neuroscience, took part in The University of Texas System's 52nd Chancellor's Council "Great Minds" Symposium April 26, 2019. The event attracted nearly 1,200 UT System friends and supporters. Harris's panel, "Addressing Addiction," which included researchers from other UT institutions, discussed improving addicition understanding and treatment.

Kim Fromme, professor of Psychology, received the 2019 award for Distinguished Scientific Contribution from the Society for Addiction Psychology, American Psychological Association.

Carlton Erickson, professor emeritus of Pharmacology and Toxicology, received the 20th Annual Research Society on Alcoholism Media Award for his authorship of "The Science of Addiction: From Neurobiology to Treatment" and for championing public outreach, for decades, as it pertains to the addiction science fields.

The **7th Annual Waggoner Center Advance**, a showcase of faculty, postdoctoral fellow and student research, took place March 29, 2019. **Thomas Kash**, the John R. Andrews Distinguished Professor in the Department of Pharmacology, University of North Carolina School of Medicine, was the featured speaker. He talked about the role of neuromodulation in alcohol abuse.

UT Brainstorms: A Conversation on the Brain, a seminar series sponsored by the Department of Neuroscience for the Austin community, featured the following talks by three WCAAR researchers.

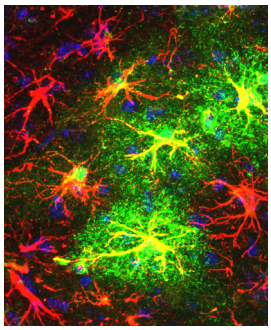
"The Addicted Brain, A Conversation about Alcohol and Drug Addiction" - **Robert O. Messing**, WCAAR director, professor of Neurology and Neuroscience

"The Inflamed Brain: A Conversation about Immune Responses, Addiction, Depression & PTSD" - **R. Adron Harris**

"The Craving Brain: A Conversation about Vunerability to Drug Addiction" - **Michela Marinelli**, associate professor of Neuroscience

Videos of their talks can be found at: neuroscience.utexas.edu/brainstorms

The Waggoner Center made a substantial contribution to UT Austin's new **Nikon Center of Excellence**, housed at Dell Medical School. The imaging center is one of several sites around the world that provides state-of-the-art technology to researchers. Instrumentation includes A1R multiphoton and confocal microscopes and can be used to study the effects of alcohol on development of the nervous system and the structure and function of specific brain regions that control addiction-related behaviors. A recent color image from the new A1R confocal microscope, and a 19th century drawing by the father of Neuroscience, Santiago Ramon y Cajal, of perivascular astrocytes, are shown below. These star-like cells in brain, like certain neurons, are critical regulators of addition-related behaviors.



Far Left: Created by Olga Ponomareva using a slide from Emma Erickson.

Left: From the collection of the Cajal Legacy at the Cajal Institute of the Spanish Research Council (CSIC), Madrid, Spain. Available via license: Creative Commons Attribution 4.0 International

FUNDING NEWS

Rajani Maiya, Reseach Scientist

NIAAA R01: "Role of the Transcriptional Regulator in Alcohol Consumption and Reward," 5-Year Award Total: $1,125,000

Khoi Le, Mayfield Lab

2018-19 Unrestricted, Undergradate Endowed Presidential Scholarship, Award Total: $4,750

Dylan Kirsch, Lippard Lab

Texas Research Society on Alcoholism Travel Award - $300

"Childhood Maltreatment and Correlated Prefrontal-Paralimbic Gray Matter Volume and Activity during Emotional and Cognitive Processing in Young Adults with Familial Risk for Bipolar Disorder"

NATIONAL RESEARCH SERVICE AWARDS

Annie Park, Atkinson Lab

NIAAA F31: "Neurogenetic Basis of Sexually Dimorphic Alcohol Behaviors in *Drosophila,*" 3-Year Award Total: $104,898

Tim Kuka, Eberhart Lab

NIAAA F31: "The Disruption of Receptor-Mediated Endocytosis in Ethanol Teratogenesis," 3-Year Award Total: $106,458

UNDERGRADUATE RESEARCH AWARDS - $1,000

Moatasem Azzam, Harris Lab

"Role of Type-1 Interferons in Regulation of Excessive Alcohol Drinking."

Thi Tran, Maiya Lab

"Neural Mechanisms of Social-Defeat Induced Enhancement of Alcohol Consumption"

DOCTORAL DEGREES AWARDED

Laura Ferguson | Mar. 2018 | Harris Lab
"Alcohol Use Disorders: Transcriptomic and Bioinformatic Approaches"

Chris Tulisiak | May 2018 | Harris/Ponomarev Labs
"Regulation of the DNA Methylome in Models of Alcohol Use Disorders"

Roberto Cofresi | May 2018 | Gonzales Lab
"Attenuating Enduring Alcohol Cue Reactivity via Extinction during Memory Reconsolidation"

Emily Wilhite | Aug. 2018 | Fromme Lab
"Alcohol-related Hookups, Online Dating, and the Associated Negative and Positive Outcomes in Young Women"

Matthew Pomrenze | Nov. 2018 | Messing Lab
"Genetic Dissection of an Amygdala CRF Circuit for Fear and Anxiety"

Natasha Pflanz | Dec. 2018 | Mihic Lab
"Endogenous, Exogeneous and Novel Allosteric Modulators of Ligand- gated Ion Channels"

Joel Shillinglaw | Feb. 2019 Gonzales/Mangieri Labs
"Synaptic Effects of Ethanol on the Agranular Insular Cortex"

PUBLICATIONS

Augier E, Barbier E, Dulman RS, Licheri V, Augier G, Domi E, Barchiesi R, Farris S, Nätt D, **Mayfield RD,** Adermark L, Heilig M (2018) A molecular mechanism for choosing alcohol over an alternative reward. *Science* 360:1321-1326.

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Buckley DM, Sidik A, Kar RD, **Eberhart JK** (2019) Differentially sensitive neuronal subpopulations in the central nervous system and the formation of hindbrain heterotopias in ethanol-exposed zebrafish. *Birth Defects Res.* Feb 21. doi: 10.1002/bdr2.1477. [Epub ahead of print].

Cofresí RU, Grote DJ, Le EVT, Monfils MH, Chaudhri N, **Gonzales RA**, Lee HJ (2018) Alcohol-associated antecedent stimuli elicit alcohol seeking in non-dependent rats and may activate the insula. *Alcohol* 76:91-102.

Erickson EK, Farris SP, **Blednov YA, Mayfield RD, Harris, RA** (2018) Astrocyte-specific transcriptome responses to chronic ethanol consumption. *Pharmacogenomics* J 18:578-589.

Farris SP, Riley BP, Williams RW, Mulligan MK, Miles MF, Lopez MF, Hitzemann R, Iancu OD, Colville A, Walter NAR, Darakjian P, Oberbeck DL, Daunais JB, Zheng CL, Searles RP, McWeeney SK, Grant KA, **Mayfield RD** (2018) Cross-species molecular dissection across alcohol behavioral domains. *Alcohol* 72:19-31.

Ferguson LB, Ozburn AR, Ponomarev I, Metten P, Reilly M, Crabbe JC, **Harris RA, Mayfield RD** (2018) Genome-wide expression profiles drive discovery of novel compounds that reduce binge drinking in mice. *Neuropsychopharmacology* 43:1257-1266.

Ferguson LB, Zhang L, Kircher D, Wang S, **Mayfield RD**, Crabbe JC, Morrisett RA, **Harris RA**, Ponomarev I (2019) Dissecting brain networks underlying alcohol binge drinking using a systems genomics approach. *Mol Neurobiol* 56:2791-2810.

Fernandes Y, Rampersad M, **Eberhart JK** (2019) Social behavioral phenotyping of the zebrafish casper mutant following embryonic alcohol exposure. *Behav Brain Res* 356:46-50.

Hankosky ER, Westbrook SR, Haake RM, **Marinelli M**, Gulley JM (2018) Reduced sensitivity to reinforcement in adolescent compared to adult Sprague-Dawley rats of both sexes. *Pyschopharmacol (Berl)* 235:861-871.

Kapoor M, Wang JC, Farris SP, Liu Y, McClintick J, Gupta I, Meyers JL, Bertelsen S, Chao M, Nurnberger J, Tischfield J, Harari O, Zeran L, Hesselbrock V, Bauer L, Raj T, Porjesz B, Agrawal A, Foroud T, Edenberg HJ, **Mayfield RD**, Goate A (2019) Analysis of whole genome-transcriptomic organization in brain to identify genes associated with alcoholism. *Transl Psychiatry* 9:89.

Kircher DM, Aziz H, **Mangieri RA**, Morrisett RA (2019) Ethanol experience enhances glutamatergic ventral hippocampal inputs to D1 receptor-expressing medium spiny neurons in the nucleus accumbens shell. *J Neurosci* 39:2459-2469.

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Mallard TT, Ashenhurst JR, Harden KP, **Fromme K** (2018) GABRA2, alcohol, and illicit drug use: An event-level model of genetic risk for polysubstance use. *J Abnorm Psychol* 127:190-201.

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(Publications continued next page.)

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

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USEFUL WEBSITES

Addiction Science Research and Education Center
sites.utexas.edu/asrec/

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

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

Research Society on Alcoholism (RSA), rsoa.org

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

Integrative Neuroscience Initiative on Alcoholism-Neuroimmune (INIA-N)
sites.cns.utexas.edu/inia-neuroimmune/about-inia-0

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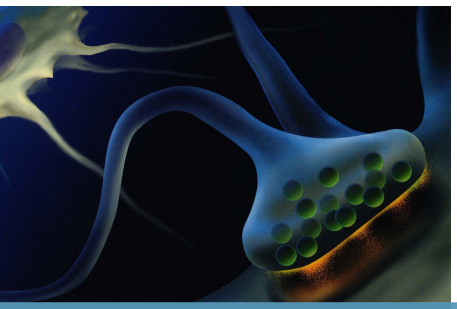

The Waggoner Center for Alcohol and Addiction Research was established in 1999 at The University of Texas at Austin. The center was made possible by a donation from M. June and J. Virgil Waggoner and matching funds from the university. The mission of the center is to advance knowledge of alcohol and substance use disorders and develop solutions for their prevention and treatment.

PUBLICATIONS *continued*

Park A, Tran T, **Atkinson NS** (2018) Monitoring food preference in Drosophila by oligonucleotide tagging. *Proc Natl Acad Sci* 115:9020-9025.

Pflanz NC, Daszkowski AW, Cornelison GL, Trudell JR, **Mihic SJ** (2018) An intersubunit electrostatic interaction in the GABAA receptor facilitates its responses to benzodiazepines. *J Biol Chem* 293:8264-8274.

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Wolfe SA, Farris SP, Mayfield JE, Heaney CF, Erickson EK, **Harris RA, Mayfield RD**, Raab-Graham KF (2019) Ethanol and a rapid-acting antidepressant produce overlapping changes in exon expression in the synaptic transcriptome. *Neuropharmacology* 146:289-299.