

Volume 12, Issue 1, Spring 2013 Waggoner Center for Alcohol & Addiction Research Newsletter

Our Mission

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



Above : Robert Messing with lab members Sandeep Gyawali and Anna Lee

Photo by Marsha Miller

Acclaimed Researcher joins Waggoner Center as Associate Director

e are pleased to welcome distinguished addiction researcher, **Robert O. Messing,** MD, as associate director. He recently joined The University of Texas at Austin as vice provost for biomedical sciences and holds the Henry M. Burlage Centennial Professorship in Pharmacy. Messing previously served as a long-time faculty member in Neurology at the University of California, San Francisco.

Messing's research concerns the molecular mechanisms involved in addiction, anxiety, and pain. Of particular interest is signal transduction – the activation or inhibition of signals outside and/or within a cell that affects cell function – in response to drugs of abuse.

Messing's laboratory has uncovered significant regulatory roles of protein kinase C (PKC), a family of enzymes found in signal transduction pathways. For example, one form of PKC, PKC- ϵ , promotes ethanol and nicotine consumption, increases anxiety, and mediates inflammatory and neuropathic pain. A short form of this enzyme, known as PKM- ζ , has previously been implicated in maintenance of long-term memory, since a drug that inhibits PKM- ζ causes memory loss. The Messing lab recently published results in the journal *Nature*¹ that challenge that notion. They found that genetically engineered mice lacking PKM- ζ showed no memory disruption compared to wild-type mice, and that the PKM- ζ inhibitor still caused memory loss even in the mutant mice.

Other important findings include physiological roles of the N-type voltage-dependent calcium channel, a cell surface protein, and ENT1, a protein that transports nucleosides like adenosine into cells. Preventing calcium transmission by blocking the neuronal calcium channel reduced ethanol intoxication and the reinforcing and rewarding properties of ethanol consumption in rodents. In another study, the absence of ENT1 in mouse models indicated a decrease in A₁ adenosine receptor function, leading to a promotion in alcohol consumption.

These research projects have led to ongoing efforts to develop treatments for pain, anxiety, and alcohol and nicotine addition.

¹Lee AM, Kanter BR, Wang D, Lim JP, Zou ME, Qiu C, McMahon T, Dadgar J, Fischbach-Weiss SC, Messing RO (2013) Prkcz null mice show normal learning and memory. *Nature* 493:416-419.

FIRST ANNUAL WAGGONER CENTER ADVANCE



The first annual showcase of research by our principal investigators, trainees, students, and collaborators took place March 22, 2013, at the Etter-Harbin Alumni Center on the university campus. Attended by approximately 90 participants, the conference featured 15 talks, covering topics in genomics/neuroimmunology, the brain addiction circuit, diverse genetics, and medication development, and included a poster session. Robert Messing, our new associate director, gave the keynote address.

NEWS

Marion and Laurence Frayne of Flower Mound, Texas, generously donated funds to the Waggoner Center in memory of their son, Gregory Frayne. The funds will help support a fellowship for a graduate student working in addiction research. The first recipient of the fellowship will be named in our next newsletter.



Former graduate student **Leslie Whitaker**, postdoctoral fellow **Mickaël Degoulet**, and principal investigator **Hitoshi Morikawa** (left) published a study on social deprivation and brain plasticity in the journal *Neuron*² in January. Whitaker is a fellow in Bruce Hope's lab at the National Institute on Drug Abuse in Baltimore, Maryland.

²Whitaker LR, Degoulet M, Morikawa H (2013) Social deprivation enhances VTA synaptic plasticity and drug-induced contextual learning. *Neuron* 77:335-345.

R. Adron Harris, director of the Waggoner Center, addressed the San Angelo chapter of the Texas Exes on March 7, 2013. He spoke about the medical and social impact of addiction and discussed potential treatments.

Sean Farris, postdoctoral fellow in the Harris Lab, spoke at the First Annual Symposium on Big Data in Biology, hosted by the university's Center for Computational Biology and Bioinformatics, on May 10, 2013. The research discussed in his presentation, entitled *The Bits and Pieces of Alcohol Dependence*, relies on high-throughput screening, complex data, and high-performance computing.

HONORS & AWARDS

Johann Eberhart and Jon Pierce-Shimomura were two of five professors selected by the student-led Natural Sciences Council (NSC) to receive Faculty Service Awards on March 6, 2013. The awards recognize outstanding efforts by faculty members in the College of Natural Sciences (CNS) to enrich undergraduate education. Doctoral candidate **Laura Ferguson** (Harris Lab) won a travel award to the 19th annual scientific conference of the Society on NeuroImmune Pharmacology in San Juan, Puerto Rico, April 3-6, 2013. She presented a paper entitled *Genomic Signature of PPAR Agonists in Brain and Liver: Role in Alcohol Consumption.*

HONORS (continued)

Lindsay Brettmann and Rose Stewart (Pierce-Shimomura Lab) won 2013 Undergraduate Research Fellowships from the Office of the Vice President for Research to help fund their research projects. Lindsay and fellow lab mate Kevin Hu presented posters during the CNS Undergraduate Research Forum on April 12, 2013, and received innovative research awards.

Judges at the Longhorn Research Bazaar, hosted by the Office of Undergraduate Research, gave three "Best Presentation" awards to participants of a poster session held April 17, 2013. **Lindsay Becker** (Pierce-Shimomura Lab) won in the Sciences, Engineering, and Communications category.

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

Neil McCarthy (Eberhart Lab), *Gene/ Environment Interactions underlying Fetal Alcohol Spectrum Disorder*

Ben Troutwine (Atkinson Lab), *The Role of* Drosophila *CrebA in Ethanol Tolerance*

Doctoral degrees awarded:

Ashley Crisp, PhD

(Pierce-Shimomura Lab), Apr. 26, 2013 Induction and Prevention of Patterned Neurodegeneration by Amyloid Precursor Protein

Brooks Robinson, PhD (Atkinson Lab), May 8, 2013 *Ethanol Dependence in* Drosophila *Larvae*

Roseanna Robles, PhD

(Atkinson Lab), Aug. 27, 2012 Diazepam Binding Inhibitor and Tolerance to Ethanol in Drosophila melanogaster

Christy Schier, PhD

(Gonzales Lab), Nov. 19, 2012 Medial Prefrontal Cortical Extracellular Dopamine Responses after Acute Experimenter-Administered or Oral Self-Administered Ethanol

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Joshua Russell (Pierce-Shimomura Lab) received the 2013 Michael H. Granoff Outstanding Student Award for Excellence in Graduate Education. The \$6,000 award is supported by the Graduate School and University Co-op and recognizes and rewards exceptional students distinguished by scholarship, research, writing, service, and teaching.



Lindsay Becker (Pierce-Shimomura Lab) was selected by the College of Natural Sciences as a Dean's Honored Graduate for 2013. The honor is given to no more than one percent of the college's graduating class and recognizes significant achievements in academics, research, leadership, and service. Lindsay will begin graduate studies in Neuroscience at Stanford University this fall.



Lindsay Brettmann (Pierce-Shimomura Lab) received a 2013-14 Fulbright U.S. Student Award to Spain. She'll assist with English instruction and complete a community project developing book clubs in hospital or hospice settings. She'll defer her acceptance to University of Texas Southwestern Medical School for a year to participate in the program.

PUBLICATIONS

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Building a Partnership

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

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Photos above by Joshua Russell and Lindsay Brettmann

(Publications continued next page.)

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Proclivitas

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.

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Many thanks to: Robert Messing, Hitoshi Morikawa, Claire Stelly, and Kay Thomas

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PUBLICATIONS (continued)

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